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Causal Effects of Wiki Site Design on Anxiety and Usability

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Declaration of Originality

This thesis is submitted for the Degree of Doctor of Philosophy. I declare that it has been composed by me, that the work described is my own research and that it has not been submitted for any other degree or professional qualification except as specified.

Benjamin Richard Cowan

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Abstract

Within society Information Technology (IT) is becoming pervasive. This is no more pronounced than in Higher Education where IT is almost ubiquitously used. Current developments have also seen Web 2.0 tools such as wikis being used in pedagogical contexts. Research in computer anxiety has identified that quality of initial experience may be important in the onset of anxiety towards IT. However the concept of computer anxiety is too vague to reflect likely reactions to specific IT scenarios especially in interactions with social technology such as wikis. Although wikis are growing in popularity little is known about users' emotional reaction towards contributing to them, how their experiences shape these emotions as well as the users' view of usability above that mentioned in qualitative research. Due to the interface, social and flexible nature of wikis users may be anxious towards editing. This research aims to offer causal insight into the influence of wiki site design characteristics on anxiety towards wiki editing and users usability evaluation of wiki editing experiences. Three experiment-based studies are presented addressing the effects of site characteristics such as in-built training spaces (i.e. tutorials and sandboxes commonly used on wikis), user editing identity as well as aspects inherent to wiki sites such as content flexibility, on anxiety felt by users in editing scenarios and users usability rating of their editing experiences. The research also aimed to identify whether initial experiences affected anxiety about further editing, as suggested by computer anxiety research, or whether emotions are only affected during editing experience. The findings of the initial study on in-built training spaces suggest that the concept of wiki anxiety measured in this research more accurately reflects anxiety experienced during interaction than computer anxiety. Additionally

the in-built training spaces using tutorials were seen to lead to better first experiences for novice users in using the wiki markup interface than those without (such as when experiencing sandbox training spaces and no training). Similarly the presence of a tutorial reduced wiki anxiety during interaction but did not affect anxiety towards future editing. From these findings the work advanced to study the effect of identity salience on wiki anxiety during editing and wiki usability focusing on contributing content using a user group with experience editing wikis. This was so as to explore the effect of wiki characteristics on user experience variables above that from first exposure anxiety likely in novice users. The research found that participants were less anxious when editing the wiki anonymously than when editing using a pseudonym and full name identity. There was however no effect of identity salience on usability rating. Additionally the type of edit conducted by participants, in terms of addition or deletion and replacement of content, did not have a significant effect on either anxiety during editing or usability evaluation. Further research exploring the effect of flexibility and other user behaviour on user anxiety and usability evaluation when contributing subsequently found that there was no significant effect of flexibility on the wiki user experience variables. The work demonstrates successful empirical evaluation of the wiki user editing experience can be achieved and can lead to important causal insight into the effects of wiki site design on the users' experience. It also identifies aspects of the site that can lead to the reduction of anxiety towards editing during interaction and influence usability rating towards the system.

List of Publications

Cowan, B.R., & Jack, M.A. (2011). Exploring the wiki user experience: The effects of training spaces on novice user usability and anxiety towards wiki editing. *Interacting with Computers*, 23, pp.117-128.

Cowan, B.R., & Jack, M.A. (2010). Now you see it, now you don't: The effect of wiki flexibility on anxiety during wiki editing. In *Proceedings of the 4th Irish Human Computer Interaction Conference* (pp. 29-36). Presented at the iHCI 2010, Dublin, Ireland: Dublin City University.

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Cowan, B.R., Vigentini, L., & Jack, M.A. (2009). Exploring the effects of experience on wiki anxiety and wiki usability: An online study. In *Proceedings of the 23rd BCS Conference on Human Computer Interaction* (pp. 175-183). Presented at BCS HCI 2009, Cambridge, UK: ACM.

Cowan, B.R., Vigentini, L., & Jack, M.A. (2008). Exploring the relationship between anxiety and usability evaluation- An online study of Internet and wiki anxiety. In *Proceedings of IADIS International Conference; Interfaces and Human Computer Interaction 2008* (pp. 69-76). Presented at the IADIS Multi Conference on Computer Science and Information System, Amsterdam, Netherlands: IADIS.

List of Abbreviations

IT- Information Technology

HTML- Hypertext Markup Language

WML- Wiki Markup Language

WYSIWYG- What You See Is What You Get

HCI- Human Computer Interaction

UX- User Experience

CMC- Computer Mediated Communication

EASE- Edinburgh Authentication Service

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CHAPTER 1- INTRODUCTION

The thesis expounded in this work is that anxiety due to wiki editing and usability of editing experience are significantly influenced by wiki site characteristics. Through engineering the site this work will aim to explore whether site characteristics which can be manipulated in real world wikis such as in-built training spaces and user editing identity as well as aspects inherent to wikis, such as wiki content flexibility, significantly affect the anxiety felt by users in editing scenarios and users' usability rating of their editing experiences. It also aims to explore whether such experiences affect anxiety about further editing or whether emotions are only affected during editing experience.

The aim of this thesis is to make a contribution to the research area of wiki user experience and produce evidence for its effective study using experiment-based methodology. The foundations of the research lie in the study of computer anxiety, the effect positive first experiences have on the development of anxiety towards technology as well as the growth of wiki use in Higher Education. The research is based on a series of experiments conducted to explore the influence of different wiki site characteristics on the anxiety and usability evaluations towards the editing experience.

The work begins in Chapter 2 by exploring the literature that forms the basis for this research. The chapter discusses IT anxieties and how quality of initial experience has been seen to influence their onset. It also highlights the limitations of IT anxiety research that need to be addressed if HCI is to interact with claims about quality of experience on negative emotions towards technology. The discipline of

HCI, methods of HCI research and the growth of research in the more emotionally focused area of user experience (where this thesis is firmly based) are also explored. The chapter then focuses on wikis, their growth in Higher Education, the existing research on the wiki user experience and how anxiety may manifest in the user experience due to interface, social and flexibility attributes of the wiki. It argues that due to the qualitative nature of existing research there is a lack of empirical study on the wiki user experience. Causal insight into the effects of site design on emotions during wiki use and users usability evaluation is also lacking, something which the work in this thesis aims to contribute to. A causal insight into the effects of site attributes on wiki user experience is important as wikis are growing in popularity in Higher Education and, as seen in computer anxiety research, first experience may lead to a risk of anxiety development towards wiki editing.

Chapter 3 (*The Training Spaces Experiment*) begins the experiment-based study of site characteristics on the wiki user experience by experimentally investigating the effect of in-built training spaces commonly used on wiki sites on wiki usability and anxiety towards wiki editing specifically when using the wiki markup language interface. It aims to identify how the use of specific training spaces such as sandboxes, tutorials or a combination of both affects the quality of novice users' first experiences. It also explores whether these training spaces significantly affect anxiety experienced during editing and whether any effect during editing extends to anxiety towards further editing. The findings from this chapter form the basis for the focus towards anxiety during interaction in both Chapter 4 and 5.

Chapter 4 reports an experiment-based study observing the effect of identity saliency on anxiety during editing and usability rating (*The Editing Identity*

Experiment). This chapter focuses on contribution to the wiki and on users who have previous experience editing wikis. The research was based on the desire to understand whether site characteristics influence student users' user experience in contribution above that experienced due to initial exposure towards wikis.

Chapter 5 reports the findings of an experiment-based study onto the effects of wiki content flexibility and other user editing behaviour on wiki anxiety and usability rating during subsequent editing experiences (*The Content Flexibility Experiment*). It observes whether the experience of wiki flexibility through other user's editing behaviour towards a users' edit, in terms of deleting and replacing content or adding content, affect users' anxiety during editing and their usability rating of the wiki system. Wiki content flexibility is a core concept of the wiki system but little is known about the effect this flexibility has on the user editing experience. The research develops on previous chapters by simulating the existence of other users in real time rather than only implying that other users are editing the site.

Chapter 6 details the main conclusions from this research, the contributions and implications it has and makes suggestions for further work.

CHAPTER 2- ANXIETY TOWARDS INFORMATION TECHNOLOGY, HCI AND THE WIKI USER EXPERIENCE

This chapter introduces and explores the concepts and literature that forms the motivations for this work. The chapter commences by discussing IT anxieties, their causes and correlates and the role of quality of experience in their onset. It aims to argue that rather than amount of experience a user has with computer systems, it is the type of experience that is more likely to effect emotions towards use of specific IT systems thus meaning a role for usability and user experience research. It also aims to highlight the limitations of current IT anxiety concepts in terms of their scope and lack of specificity in terms of the causes of negative emotion and the inadequacy of these concepts in a 21st century IT landscape. This is something needing to be addressed if HCI and usability engineering methods are to be applied to observe effects of system experience on anxiety. The discipline of HCI is then discussed and methods commonly used in assessing HCI issues described. The chapter aims to highlight the shift in HCI away from usability to more subjective evaluations and experiences of interaction due to the recent development of the user experience concept. The chapter then focuses on wiki systems and describes the wiki concept and their use in Higher Education. It then discusses how aspects of the system experience may lead to anxiety towards editing content, the exploration of which is the focus of the work expounded in this thesis.

2.1 Anxiety towards Information Technology

Within society IT is becoming pervasive. The growth of IT is no more pronounced than in Higher Education where IT is almost ubiquitous. From the use of

word processors, virtual learning environments and more recently the use of Web 2.0 tools in a pedagogical context, students are expected to be familiar with a plethora of systems and interfaces. Although IT on campus is commonplace, over 20 years of research has shown that a significant percentage of students find IT a source of anxiety and discomfort (Farina et al. 1991; Heinssen et al. 1987; Joiner et al. 2007; McIlroy et al. 2007). Yet many students are forced to face their stressor daily as IT becomes essential to the learning process or face being left without the benefits of IT on campus and possibly even disadvantaged academically.

2.1.1 Prevalence and Definition

Most research on anxiety towards IT focuses on the two concepts of computer anxiety and Internet anxiety. The concepts have both been shown to be correlated positively with each other yet are seen as distinct concepts (Thatcher et al. 2007; Chou 2003). Computer anxiety is the most commonly investigated of the two anxieties. Due to this most of the literature mentioned in this review is computer anxiety related although findings relevant to Internet anxiety will be included where available. Around 30% of some samples have been shown to suffer mild to severe anxiety of computers (McIlroy et al. 2007) although estimates vary (Rosen & Weil 1994; Todman & Day 2006; Weil et al. 1990). The prevalence of Internet anxiety is much lower with significant levels being demonstrated in 9% of individuals tested (Joiner et al. 2007). Although no specific definition of Internet anxiety is offered by the literature it is described as a situational anxiety related to the risks of Internet threats such as viruses, the need for specific terminology (Thatcher et al. 2007) as well as negative emotions towards Internet search, time delay and a general fear of Internet failure (Presno 1998). In relation to computer anxiety, a clear definition in

the literature is also elusive (Chua, Chen, & Wong, 1999; Smith & Caputi, 2001) as many researchers interchange computer anxiety with terms such as technophobia, technostress and computerphobia thus confusing the research area (Chua et al. 1999). The use of the term phobia tends to reflect an inaccurate assumption of pathological levels of anxiety felt about computer technology in its sufferers. There is however a distinction between the concept of computerphobia and the related concept of computer anxiety. The literature highlights that the concept of computerphobia tends to focus around 3 core concepts of computer anxiety, computer attitudes and negative computer cognitions (Rosen et al. 1987). Computer anxiety, although a related concept, is distinct as it focuses on negative emotional reaction towards computers rather than cognitive or attitudinal elements. Their independence has been demonstrated in research (McIlroy et al. 2001; Rosen et al. 1987). Research mentioned in this review will mostly focus on relevant findings to computer anxiety although findings from the computerphobia literature are also mentioned due to the role of computer anxiety in the computerphobia concept.

Computer anxiety is best described as:

“...an irrational anticipation of fear evoked by the thought of using (or actually using) computers, the effects of which result in avoiding, or minimising, computer usage” (Brosnan, 1998, p.17).

This definition highlights two important elements of the computer anxiety concept. Firstly anxious feelings can be experienced at the thought of as well as during interaction with the computer stressor. Secondly it implies that the avoidance of computer related interaction is likely to be dependent on the severity of anxiety. Users who are anxious about computer use are likely to interact with their stressor or minimise its use whereas more serious behavioural avoidance may be more common

in cases where anxiety is severe and likely to meet levels of phobic disorder, making categorisation as computerphobic more appropriate (Mahar et al. 1997). Indeed many people are likely to show some degree of computer anxiety whereas levels meeting phobic disorder tend to be rare (Mahar et al. 1997), emphasising the inaccuracy of using pathological terminology to describe such a concept in the majority of cases. The lack of avoidance inferred from the definition is also likely to be more realistic in a largely IT focused environments such as HE (Kohrman 2003). Recent research has also shown that even experienced users of computer systems may hold an amount of anxious feelings towards computers (Beckers et al. 2006) suggesting that computer anxiety may again not necessarily lead to avoidance. This is not to say the negative emotions experienced cannot be significant, as shown by a quote from participant A.M. in research by Thorpe & Brosnan (2007):

“I hated computers but this year, as I have started to study for a degree I had to face the reality of the monsters, computers. I have been very stressed and often crying in front of my computer screen. I am learning to use them but I still hate them. Why does it have to be like that?” (p. 1261).

This case, although extreme, highlights the distress some users experience when interacting with IT systems.

2.1.2 The correlates and causes of IT anxieties

There are many popular beliefs about the causes of IT related anxieties. Aspects such as gender, age and experience are commonly thought to relate to IT anxiety levels. Such assumptions though are not borne out in the literature and findings on each are at best inconclusive.

Previous research observing the role of gender in computer anxiety have found differences between men and women on computer anxiety measures where

females tend to have higher levels of computer anxiety than males (Durnell & Hagg 2002; Farina et al. 1991; Beckers et al. 2006). Such differences have also been replicated in the Internet anxiety literature (Chou 2003). However gender differences in computer anxiety have been noted as statistically weak and inconsistent (McIlroy et al. 2001; Weil et al. 1990; Brosnan 1998). In fact a number of studies have highlighted that gender is not a significant predictor of anxiety towards computers (Heinssen et al. 1987; Todman & Monaghan 1994; Rosen & Weil 1994). A meta-analysis on the causes and correlates of computer anxiety identified that findings of the effects of gender on negative emotions towards computers are inconclusive (Chua et al. 1999). It is also assumed that younger individuals hold less computer anxiety than older people as they are part of a generation with unprecedented access to IT. However the reality is that many undergraduate students hold significant anxious feelings and that age has been demonstrated not to correlate with anxiety towards computers (Chua et al., 1999; Howard & Smith, 1986) or anxiety towards the Internet (Chou 2003). Recent research on undergraduate students also identified that present age and age when users first used a computer did not significantly predict computer anxiety (Beckers & Schmidt 2003). In fact some have found that younger students have higher computer anxiety than older participants (Kohrman 2003). Although correlations with age have been seen in earlier studies (Rosen et al. 1987) the general view from the literature is that age is not a significant predictor of anxiety towards computers (Chua et al. 1999).

Studies suggest that lack of experience may be important to the onset of computer anxiety as users who are more computer anxious tend to have less experience or exposure to computers (Farina et al. 1991; Heinssen et al. 1987; Weil

& Rosen 1995) and that computer anxiety can be reduced by increased exposure to computers (Chua et al. 1999). This argument is flawed if the increase in computer use over the past 20 years is taken into account. Computers are needed for a vast array of jobs and have become integral within university education. Yet recent research still discovers significant levels of computer anxiety within student samples (McIlroy et al. 2007; Thorpe & Brosnan 2007; McIlroy et al. 2001; Beckers et al. 2006) even in student samples with significant experience with computers (Beckers et al. 2006). Additionally findings from research observing the effect of experience saw no change in computer anxiety after further experience even though participants reported consistent computer use throughout a 10-week period (Rosen et al. 1987). More recently a study observing predictors to computer anxiety levels identified that regularity of access to computers was not a significant predictor to levels of computer anxiety in undergraduate students suggesting that more exposure to computers does not affect anxiety levels (McIlroy et al. 2001). It would seem therefore that the amount of experience people have with computers may not be influential in levels of computer anxiety. Indeed such conclusions on experience may be confounded as those with less experience may be minimising their use rather than the anxiety being due to lack of experience (Brosnan 1998).

It is more likely that qualitative factors in a user's first experience predict both the amount of experience sought (Beckers & Schmidt 2003) and computer anxiety experienced (McIlroy et al. 2007). Research using undergraduate students identified that students who had positive early experiences were less anxious about computer use (Todman & Drysdale 2004) and that the positive nature of a person's first experience significantly predicts levels of computer anxiety (McIlroy et al.

2001). Users whose first experience was rated as fun, relaxed and where they felt in control had low computer anxiety (Todman & Monaghan 1994). These findings give insight into the effects of early experience on the onset of computer anxiety. High quality satisfying initial experiences seem to have an effect on computer anxiety onset. Usability and user experience may therefore play an integral part in the onset of IT related anxieties.

2.1.3 Experimentally observing IT related anxieties: Conceptual Difficulties

Previous studies have therefore implied a link between user experience and levels of computer anxiety (Todman & Drysdale 2004; Wilson 1999; McIlroy et al. 2001). However most of these ask users to assess their first experience retrospectively and do not attempt to test this under experimental conditions. This may be due to the difficulty of recruiting people who are novices with computer systems. An additional problem in designing an experiment monitoring the effect of quality of experience on subsequent anxiety levels lies in the vagueness of the concept of computer and Internet anxiety when attempting to design experiments to observe user experience effects on these. The uses of computers have developed exponentially since the start of computer anxiety research. The advent of the Internet has seen a shift in how users interact with computers. Although the Internet anxiety concept was created due to this (Chou 2003), such overarching concepts tell us little about users actual emotions when interacting with computers or the Internet. As computers and the use of the Internet become so pervasive, it is likely that anxieties have developed and will continue to develop in terms of uses and experiences with specific systems rather than being generally computer or Internet related. It is fair to

suggest that aspects termed as computer and Internet anxiety are still present but the context of these anxieties need to be more specific for experimental observation to occur. In other words, the overarching nature of the concepts makes these difficult to observe under experimental conditions as specificity is needed in observing causal effects on dependent variables. This failing needs to be addressed if usability engineers are to engage with the subject area of anxiety towards IT systems in terms of designing and observing effects of initial user experiences on anxiety onset.

Additionally the development of Web 2.0 has seen computer use transformed to include collaborative systems and tasks. The concepts of Internet and computer anxiety are inadequate for the measurement of negative emotion towards Web 2.0 applications as they again focus on a general anxiety towards computers and do not include reference to the social, dynamic and collaborative nature of this development in computing. Moving from a generalised anxiety (such as computer anxiety) to developing more specific anxieties to reflect 21st century computer use, insight into the effect of different first experiences on more accurate and relevant anxiety constructs can be gained.

Controlled experiment methodology and usability engineering principles derived from the discipline of Human Computer Interaction (HCI) and experimental psychology can lead us to understand of how system interactions affect anxiety both in the role of initial experience for novice users and also the effect of the wiki user experience on anxiety when using specific IT systems. Especially in the context of wikis, which because they are not widely used as yet are more likely to have high numbers of users with no experience, this research has an opportunity to investigate the effect of quality of experience on anxiety towards a specific system

experimentally. It also concentrates on these effects on a system specific anxiety which is designed to observe anxiety felt in more contemporary uses of computer systems compared to the over-arching and vague concepts of either Internet of computer anxiety. The thesis presented aims to follow the observations made above by investigating the role of the user experience of a specific system (wikis) on anxiety towards that system using usability engineering principles and controlled experiment methodology.

2.2 Human Computer Interaction and Usability

HCI is now a well-established academic field of study. A recent definition of HCI was recently volunteered suggesting its focus as an academic discipline is in:

“..the study of situations involving people and technology...the design practices involved in such situations, and tools and techniques that are or can be used in either.” (Dix, 2010, p.16).

The study of the user and their emotional and behavioural responses to the use of technology is fundamental to the study of HCI. The focus on the user and their interaction with technological developments gives HCI a multidisciplinary core (Olson & Olson, 2003). It merges aspects of design and software engineering with human focused disciplines such as psychology and sociology, developing from the practices and methods in these fields. The need for HCI research has grown exponentially due to the wide proliferation of IT into wider society. Early computers and their respective interfaces were designed for specialist users. The gathering of popularity of personal and desktop computing in the 1980s and the birth of the Internet in the 1990s saw a shift in the user group to which computing and IT was to be designed. This shift led to the growth of usability research and an interest in the user in technological development of interfaces and interactions (Nielsen 1992;

Shackel 1990; Shackel 2009a). Usability is now an integral concept of the HCI field (Shackel 2009a). Early developments in the field concentrated specifically on the concept of usability (Dix 2010) and user roles in desktop and web based platforms of interaction. The field has since grown to a vast amount of areas and situations where humans and computers interact from traditional methods of interaction through computers to tabletop and multi-modal interfaces. All however have a unitary theme of focusing the research on the user and their experiences of different interaction methods and devices and usability is still a major component of HCI research. Yet recently the focus of the field seems to be shifting towards the observation of more emotional and subjective concepts and the wider user experience with systems rather than solely the usability of the interface they experience.

2.2.1 Usability, Engineering and Experiment Based Testing in HCI

As mentioned usability is still central to the field of HCI. It focuses on three elements related to users' performance and subjective judgements of the interface they experience. The users ability to interact with an interface efficiently, effectively and with satisfaction is at the ideological core of usability. These concepts are prominent in the recently revised ISO definition of the concept (ISO FDIS 9241-210) (in Bevan, 2009) which describes usability as the:

“Extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.”

Definitions volunteered by others highlight similar concepts as important to usability (Bevan & Macleod 1994). Other concepts not included in the ISO definition have also been noted as central to the achievement of usable interfaces and interactions such as learnability and memorability (being easy to learn for novice and

returning intermittent users) (Nielsen 1993; Shackel 2009b) as well as being flexible and adaptable to the user's environment and task needs (Shackel 2009b).

Both the concepts of effectiveness and efficiency are focused on user performance and objective quantifiable outcomes of interface interaction. Effectiveness implies tasks being completed using the interface to a certain level of completeness, accuracy or quality (Bevan & Macleod 1994; Shackel 2009b; Hornbaek 2006). The concept of efficiency refers to effort in terms of time or cognitive resources (Bevan & Macleod 1994; Hornbaek 2006). It is assumed by these concepts that a usable interface leads to accurate and quick interactions and this is key to the achievement of a high quality interaction. Authors do highlight though that these measures can be flawed. For instance interfaces that engage and please the user may not be the most efficient or effective to use (Hornbaek 2006). Additionally users may prefer to trade speed and error rate for an interface that is more pleasurable to use (Shackel 2009b). Indeed there are situations where such objective measures are not the best form of assessment such as in observation of the wider system experience rather than the interface being used to complete the task. Due to these difficulties the concept of satisfaction is of importance to the usability concept. Users' satisfaction measures the user attitude towards and perceptions of the system or interface (Bevan & Macleod 1994). Its significance in the evaluation of usability is affirmed by Shackel (2009b):

“We should note that attitude criteria are no less valid than any other; indeed in many respects they are more valid with regard to usability, because ultimately it is the human user who must express the judgement of this characteristic. Performance measures cannot be the sole criterion, because the human may readily achieve a given performance, but still not prefer to do the task or use the tool because it is very inconvenient and awkward, so that he may well prefer (i.e., find more usable) another similar tool which gives less speed or more errors but is easier or more convenient.” (p.345).

Satisfaction is therefore an integral element of usability and depending on the aims and goals of the study may be a more accurate indication of users' usability evaluation of the systems they use.

Users' performances (efficiency, effectiveness) and attitudes (satisfaction) toward their interaction with an interface are measurable concepts (Shackel 2009b). Such a fact allows for empirical and controlled study of users' experiences with these interfaces something which authors state is desirable in the assessment of usability (Nielsen 1993; Shackel 1990; Shackel 2009b; Nielsen 1992). The discipline of usability engineering relies on such a methodology. Usability engineering is a process where through design iterations systems can be demonstrated to reach a level of performance or user satisfaction (Faulkner 2000). Engineering disciplines concentrate on problems related to design (Long & Dowell 1989) and the effects certain solutions have on specific pre-defined variables so that an optimum solution can be devised. This philosophy is also applicable in the usability and HCI spheres (Long & Dowell 1989). By engineering specific interface design solutions HCI researchers can observe the quantifiable effects that these design changes have on specific outcomes and give guidelines to optimal design solutions for the interface. The ethos of design and empirical evaluation of different interface versions and prototypes is crucial to understanding the users' experiences of these designs (Shackel 2009b). Such methods can also be used in an exploratory context to give insight into how certain aspects of interaction with specific systems affect the user in terms of their emotions, behaviours and attitudes.

The use of controlled experiment evaluation is essential in the execution of such engineering goals. Controlled experiments aim to investigate hypotheses

referring to the effects of independent variables (variables controlled by the experimenter and that are predefined) on dependent variables (outcome measures being monitored by the experimenter such as performance, attitudes etc) controlling for factors which may influence the dependent variables (Blandford, Cox, & Cairns, 2008; Creswell, 2003; Preece, Sharp, & Rogers, 2007). An example of this in HCI research is assessing the effect of specific design changes (independent variable) on outcome metrics (dependent variables) such as efficiency, effectiveness or satisfaction towards the interaction (Blandford, Cox, & Cairns, 2008). When conducting such studies, representative users who are of interest to the experimenter (i.e. novice, intermediate or expert users) should be used as participants and these participants should be given realistic tasks representative of those that users would be expected to complete using the system being tested (Bevan & Macleod 1994; Nielsen 1992). Measures are then taken of their performance and subjective judgements of the system. These measures tend to be quantitative although qualitative data can also be gathered in terms of user interviews, comments and observations during experiment sessions. The quantitative nature of data gathered allows for parametric statistical analysis to be used (such as Pearson correlations, t-tests and ANOVA analyses) to assess whether the independent variable has a significant statistical effect on the dependent variables. These controlled experiments can vary in the type of experimental design they use. Participants can either experience all interface designs or conditions (within-subjects experiment designs) or only one of the interface options (between-subjects design). These experiment designs can also be mixed to give mixed factorial designs, where some of the variables included are

between-subjects (such as gender or age) and others (such as interface design) are within-subjects (Blandford et al. 2008).

The use of each type of experiment design is reliant on the aims of the study being conducted (Blandford et al. 2008) and each has their benefits and drawbacks. For instance between-subject designs minimise the potential effects of practice that may occur if users used all interfaces and can be advantageous if the tasks being completed are of considerable length thus keeping sessions to a reasonable time (Blandford et al. 2008; Preece et al. 2007). However they can be affected by individual differences in user ability, attitudes, personality and behaviour and need to use a large amount of participants to limit the effect of this on statistical inferences made from experiment data, although random allocation of participants to conditions can reduce this confound (Preece et al. 2007). Within-subject designs do not suffer from effects of individual differences as all users are measured after experiencing all conditions. This also means that in these designs there is a need for fewer participants to be tested as each participant supplies data for each condition. However the order of condition and task may affect measures as users become more familiar with the designs and tasks over the experiment experience (Blandford et al. 2008; Preece et al. 2007). For instance users' experiences of one interface may affect the evaluation of others simply due to the order they were presented and may improve as the experiment develops. To minimise these order confounds conditions and tasks are counterbalanced so that experience of the conditions and tasks differ across participants. This can be achieved through using Latin Squares or having each potential order of task and conditions represented in the experiment design (Blandford et al. 2008). The procedure of controlled experiments is also kept

constant throughout the study so as to reduce the potential effect of differences in procedure on the dependent variables. This also allows the experiment to be replicated by others using the same methodology (Blandford et al. 2008) and facilitates confirmation and comparison of findings using other samples. Experiments also tend to be run in a controlled, laboratory based environment (Preece et al. 2007) although effort is made to make these environments as “real world” as possible. The principles described are identical to experiment-based psychology methodology (Landauer 1990) where experiments are designed to observe the cause of specific conditions on psychology related variables (Dix 2010). Because of the high amount of control, causal inferences about the effects of certain design changes or interface elements on user related variables can be made compared to other possible HCI methods of study.

As inferred above, other methodologies are also available to study HCI issues. Field studies (such as ethnography and case studies) allow for insight into real word use of technology as they observe users, their behaviour and feelings towards technology in their natural settings (Preece et al. 2007). Due to the lack of large-scale recruitment and testing of users, they are cheaper and easier than controlled experiments. Also because of their wider scope they allow researchers to gather an insight into the real word use and potential opportunities and problems given when using devices or interface designs. The data gathered is however qualitative (such as user quotes, pictures and events when using the interface) and is gathered through interviews and observation, which are then interpreted by the researchers (Preece et al. 2007). The lack of systematic control in both data gathering and system exposure in addition to the interpretative nature of the data mean causal inference about effects

the design or the experience has on users is difficult to make (Dix 2010). The conclusions are dependent on the quality of the interpreter or assessor and are open to variations in interpretation. Such methods are therefore not desirable when looking to make causal conclusions about user experience characteristics.

Techniques such as heuristic evaluation, cognitive walkthroughs and predictive models (such as the GOMS and Keystroke Level Model) can also be used to assess interface usability. Heuristic evaluation evaluates the usability of an interface by comparing an interface to a set of pre-defined principles and is usually performed by usability experts. Such a process ensures that the interface meets best practice guidelines on interface design. Similarly cognitive walkthroughs see experts identifying the actions that users have to take to achieve a certain task using the interface. Experts “walk through” the task imagining the detailed actions needed from the user and evaluating the interface accordingly on any potential problems or difficulties that could arise. Predictive models attempt to predict user behaviour and to quantify the users’ performance with an interface. Models such as the Keystroke Level Model attempt to break down users actions and calculate the approximate performance of users by using predefined approximate times for actions such as key presses and mental preparation for physical actions which are needed to successfully complete a task with the interface (further details of these methods can be found in Preece et al., 2007). These methods are useful again because they are low cost in comparison to controlled studies and are relatively easy to implement (Olson & Olson, 2003; Preece et al., 2007). However crucially they do not involve users experiencing the interface and rely on experts evaluating and predicting how users would interact with the interface being evaluated (Preece et al. 2007). It has been

mentioned previously that inclusion of users in the evaluation process is important in HCI and the assessment of usability (Nielsen 1993; Shackel 1990; Shackel 2009b) so as to assess their true views and behaviours (Bevan & Macleod 1994). The user needs to be exposed to such interfaces so that their reactions can be explored, especially in terms of subjective reactions. Expert led measures lead to assessment of what could impede usability but not explorations of how the user reacts and interacts with an interface. Such an insight can only be gathered from user-focused studies such as field or controlled experiment studies. Users interacting with the system in controlled contexts however allow us to not only monitor user related variables from actual user experiences but again gather insight into the causal relationship of system characteristics on user related measures, a goal more appropriate to the research conducted in this thesis.

2.2.2 Usability and User Experience

Although usability is still a prominent concept in HCI, research has recently shifted towards the concept of user experience (UX) on users' interactions with technology. It is felt in the UX literature that a positive interaction in an HCI and usability context refers to those where problems are not encountered (Hassenzahl & Tractinsky 2006). Yet interaction with technology is more complex than solely an absence of errors. Users feel emotions about, during and after technology use and the influence of the interaction of these emotions are of interest to UX researchers. Recently the concept has developed in importance to the endeavour of understanding users' interaction with computers (Lindgaard 2009) as HCI moves towards consideration of the subjective aspect of users' experiences with interfaces and IT systems (Dix 2010). Recent research on users' experiences of social networking site

Facebook suggests usability alone cannot allow us to fully understand the quality of user interactions with computer systems (Hart, Ridley, Taher, Sas, & Dix, 2008). The term UX is now developing its own definition rather than being used, as it was previously, as an alternative term for usability. There is however a lack of consensus in definition between UX practitioners and HCI researchers on what UX is (Law et al. 2009). A recent ISO definition (part of the drafting of ISO FDIS 9241-210) in Bevan (2009) describes user experience as:

“A person’s perceptions and responses that result from the use and/or anticipated use of a product, system or service.”

The concept emphasises that the user is a dynamic and complex actor in the interaction where needs, resources, emotions and experiences affect the users’ interaction (Roto 2006). This definition does differentiate UX from usability and highlights the focus on subjectivity through the terms “perceptions”. Yet little is made of the heavy emotional component evident in much of the other definitions within the literature (Hassenzahl & Tractinsky 2006; Law et al. 2009).

As mentioned above there is still considerable debate over the definition and scope of the UX concept (Law et al. 2009). Some believe UX encompasses all contact with corporations, such as company products, services and IT based systems. This view is followed in the revised ISO definitions of both usability and user experience where their application to “products, services and systems” are specifically mentioned. Others however believe that UX should be system focused rather than defined by other non-system experiences (Law et al. 2009). This latter description is more of core interest to HCI researchers. The wide reaching nature of the definition incorporating other aspects of business contact makes the concept hard to measure and detracts from the core aims in HCI research, to investigate the

interaction between people and technology. What is clear though from other definitions of UX is that emotions and affect are crucial to the concept:

“UX takes a ‘human’ perspective. It is interested in understanding the role of affect as an antecedent, a consequence and a mediator of technology use” (Hassenzahl & Tractinsky, 2006, p.93).

It is seen as the measure of the subjective nature of technology interaction and moves away from the more objective measure of usability for quality of interaction. Yet the incorporation of satisfaction in the usability concept leads to a measurement of the subjective nature of interface interaction. UX researchers argue that satisfaction measures used in usability research are measures that focus on usability evaluations rather than measurement of the emotional consequences of interaction (Folstad & Rolfsen 2006). Traditional satisfaction measures in usability may therefore be inadequate for measuring emotional reactions to interaction.

Not all emotions that are experienced during interaction are also due to the interaction with the interface, which usability tends to focus. For instance users may be influenced by aspects of the system such as aesthetics that are not related to the process by which users complete their tasks. This is not to say that concepts related to usability are not integral to the concept of user experience. In fact some feel that usability is included in the concept of user experience (Bevan 2009; Law & van Schaik 2010) where the wider nature of the latter incorporates both the process of interaction with the interface and the experience of other system characteristics. What is clear is that UX as a research area focuses on more than just the usability of the interface and aims to identify other aspects of the users’ interaction with systems which lead to emotional responses.

One aspect of the UX concept is the focus on positive emotion. The literature suggests a wish to investigate aspects of interaction that bring positive reactions (Hassenzahl & Tractinsky 2006; Law et al. 2007; Hassenzahl et al. 2010; Law & van Schaik 2010). However investigating the effect of system characteristics on negative emotions is just as pertinent. The system eliciting negative reactions can, as seen in computer anxiety literature, affect users' anxiety towards further use and could lead to emotional discomfort during use and minimise interaction with the system. A focus on the positive is a narrowing of the potential development of UX and would omit exploration of the true spectrum of human emotion towards technology interaction.

UX is therefore a more holistic approach to users and their interactions with technology and computer systems. Although there is debate about its definition, there is no doubt that user experience encapsulates an aspect that is more than just interface usability. The challenge for usability engineering is to embrace this shift from the functional to the emotional and from the interface to the wider system experience. Tools from usability engineering and HCI can still be applied to UX and are in fact well placed to explore elements of system specific UX (Law & van Schaik 2010). There is a danger though that due to its subjective nature (Bevan 2009; Law et al. 2009; Roto 2006) empirical, controlled and well designed research may be overlooked in return for qualitative research methods such as field studies giving interview and/or observational data. Recent literature states that field rather than lab based research is more appropriate for the study of UX because the artificiality and control of lab based experiments would lead to unrealistic responses as situational factors can influence UX (Law & van Schaik 2010). This control is precisely the

reason why lab based experiments are valuable in UX study. A controlled environment allows for the control of situational confounds, allowing for a causal link to be made about aspects of system experience and their effects on emotions towards the system. People's emotions have also been of interest to psychologists for decades and have been successfully studied using methodologically rigorous and experiment-based techniques. The controlled methods of usability engineering, developed from experimental psychology would allow us to gain causal inference about aspects of the system experience eliciting specific emotions within users. The research presented here aims to demonstrate that such a method can be used to shed light on the user experience of negative emotions towards interaction of specific systems. It would be a grave mistake for UX academics to forget the tool of lab-based experiments as UX is developing methodologically.

The concept of UX is an interesting proposition in a Web 2.0 context, where social aspects of systems are core to the users' experiences with the system. Measuring users' reactions towards the interface is not adequate to fully investigate the complexity of user emotion when using such social systems and how experiences with the system affect this as recent research has demonstrated (Hart et al., 2008). Other users, their intentions, judgements and actions are significant attributes to consider when measuring the effects of user interaction with social systems such as wikis. For instance wikis have elements of the system that are core to their social and collaborative nature such as user identity saliency and system flexibility. These as well as the editing interface may influence user emotions and experiences with the system.

2.3 The Wiki User Experience

Wikis continue to grow in popularity in both HE and wider society. As these systems grow in popularity the need for research to understand the wiki user experience and users emotional reaction to wikis becomes more pronounced. To ensure that the system is studied effectively the wiki concept, their use in educational contexts and previous findings relating to their success must be described. The role of usability and user experience in their success will then be discussed and the elements of the wiki system experience that may lead to anxious feelings within users will be explored.

2.3.1 Wikis and their use in Higher Education

A wiki is a fully editable website. Users can view, add and alter the structure of content throughout the site. The flexibility of wikis allows for knowledge to be built collectively through group collaboration and mistakes or conceptual falsehoods to be amended easily (Wang & Turner, 2004). The term wiki comes from the Hawaiian for quick used to emphasise the speed and efficiency to which users can create knowledge resources using such sites (Wang & Turner, 2004). The wiki concept was created by Ward Cunningham in 1994 with the *WikiWikiWeb* (Curran, Doherty, & Power, 2004) and has been described as “*the simplest online database that could possibly work*” (Leuf & Cunningham 2001). This simplicity lies in the users’ ability to edit the wiki site using a standard web browser and without the knowledge of HTML. The concept gained prominence with the creation of the online encyclopedia *Wikipedia* in 2001, a collaboratively created online knowledge resource (Bryant et al. 2005).

Wikis operate on the principle of incremental free form content formation through open editing, relieving users of structural and publishing permission constraints when authoring content (Desilets et al. 2005; Glaser 2004). In their purest form their structure is not predefined (Jaksch et al. 2008) and anyone is able to create and modify content and pages (Wang & Turner, 2004). All pages that can be viewed are editable by users. This ethos leads to a democratic collaboratively created knowledge resource where all users are equal in their rights to both edit and read wiki content (Glaser 2004). Their flexibility and openness mean that wikis are also in a constant state of flux. Content can be quickly and consistently updated, changed and improved (Di Iorio & Zacchiroli 2006) which leads to highly up to date knowledge (Mader 2008; Ravid et al. 2008).

All wikis have both a read state and an edit state (Augar et al. 2004) both which are accessed using a web browser. When users interact with a wiki in the read state they can access and view content that has been included on the wiki by wiki editors (an example of a wiki in read state is presented in Figure 2.1). When in the edit state users are able to edit content available on the wiki. Users through an editing interface can add, delete and change content, structure and navigational elements on the wiki (An example of a wiki in edit state is included in Figure 2.2).

Figure 2. 1- An example of a wiki page (Uniwiki Homepage) in read state

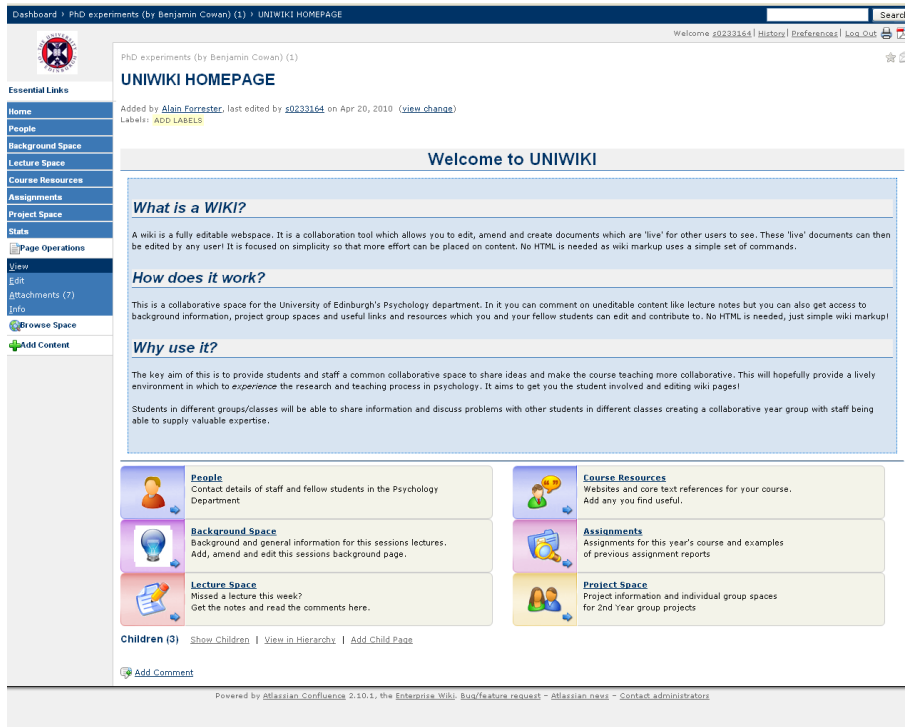
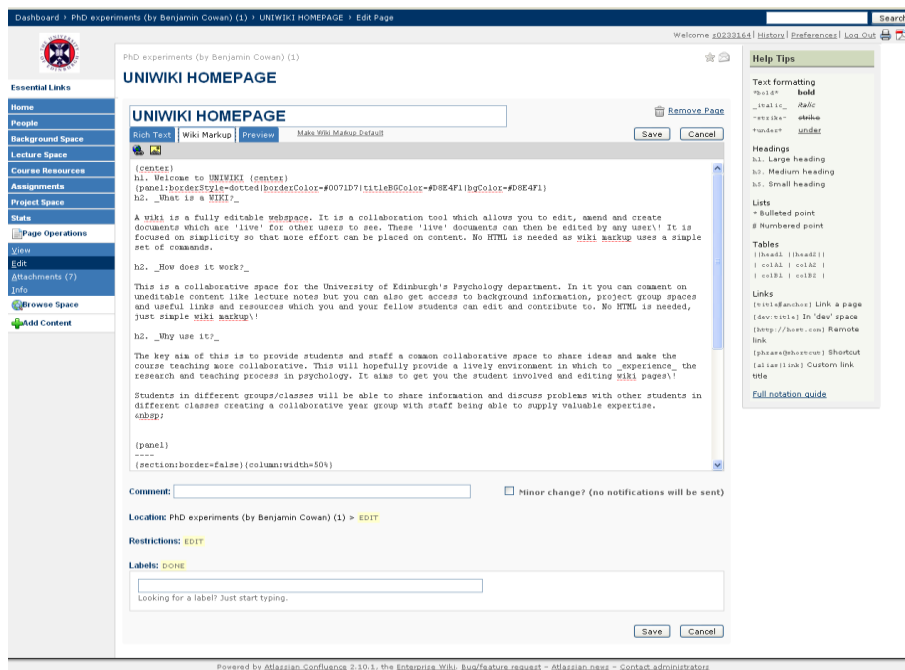
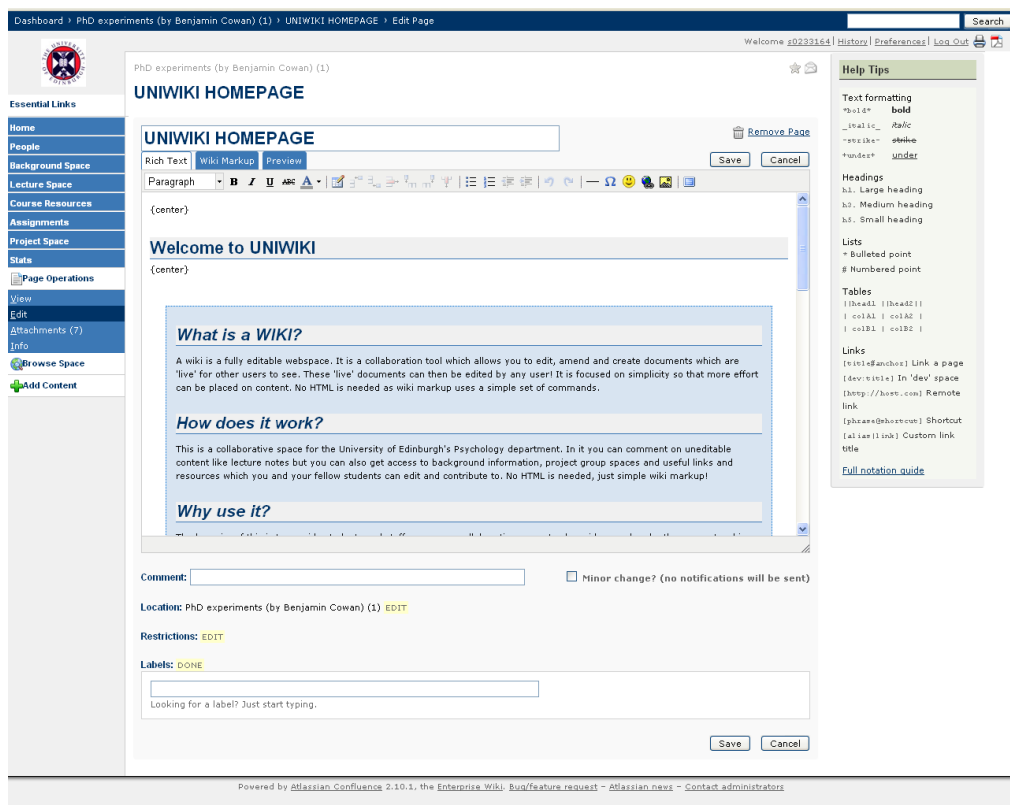


Figure 2. 2- An example of a wiki page (Uniwiki Homepage) in edit state



These changes then become viewable in the read state. Records of the edits that are made to pages are logged and can be traced to the contributing user through page history functionality (Mader 2008). Content is edited through an editor and can be formatted using Wiki Markup Language (WML) (the editing interface shown in Figure 2.2). This markup language allows users to specify text formatting, insert tables and graphs, create links and insert complex macros and viewing interface features into page structures. More recently wikis have been seen to add WYSIWYG interface editors termed Rich Text editors (Augar et al. 2004). Rich Text editors allow users to use a familiar word processing interface to add functionality and basic formatting to content (see Figure 2.3).

Figure 2. 3- An example of a wiki page (Uniwiki Homepage) in Rich Text Editor mode



Although Rich Text editors allow users to edit using a familiar interface they prevent users from accessing the full functionality of wiki systems (Mader 2008) and involve a large amount of design and scripting (Desilets et al. 2005). It is therefore important that users become familiar with WML early in their editing experiences. Wikis can also be tailored in terms of access. Wikis can be configured to allow any user to view and edit content included whereas administrators can also restrict editing and viewing to specific users through password access. Such restrictions may be desirable in business and education scenarios where information is sensitive or needs to be restricted from open editing.

Recently wikis have gained popularity as pedagogical tools in HE and much attention has been paid in the research literature on their use in educational contexts (Cole, 2009; Ebner, Zechner, & Holzinger, 2006; O'Neill, 2005; Parker & Chao, 2007; Wang & Turner, 2004). The collaborative nature of wikis brings benefits in an educational environment. They allow the opportunity for students to become co-creators of course resources and content (Wang & Turner, 2004) in partnership with other students and staff. They also allow for a shared space where students, staff and other stakeholders can collaborate and create knowledge resources (Carr, Morrison, Cox, & Deacon, 2007). It also exposes students to more collaborative work practices and gives teaching staff the opportunity to observe development of students work and learning as it is added to the wiki (Carr et al. 2007). Exposure to such systems is important as collaborative systems become more common in the economy (Bruns & Humphreys 2007) and the use of wikis in education mean students can gain transferable skills in using such collaborative software (Carr et al. 2007; Parker & Chao 2007). Wikis have been used in a variety of pedagogical scenarios such as

collaborative creation of lecture notes (O'Neill 2005), collaboration aids in group projects (Cowan, Vigentini, & Jack, 2009; Cowan, Vigentini, & Jack, 2008), formation of knowledge repositories (Ebner et al. 2006) and the collaborative development of course texts (Ravid et al. 2008).

Although wikis bring benefits in HE, case studies where wikis have been used in an educational context report that users tend to edit content very little (Carr et al. 2007; Ravid et al. 2008) if at all (Ebner et al. 2008; Ebner et al. 2006; Kickmeier-Rust et al. 2006; Cole 2009) yet many view available information on such systems (Carr et al. 2007; Ebner et al. 2008). Such factors as lack of time (Ebner et al. 2006), unwillingness to contribute outwith class hours (Viegas et al. 2004) and competitiveness in educational environments (Guzdial, Ludovice, Realff, Morley, & Carroll, 2002) are mentioned in the literature as reasons for this lack of contribution. Interestingly, usability and ease of use has also been noted as a significant barrier to contribution in wikis and a potential reason for lack of editing (Cole 2009; Ebner et al. 2008). Usability is seen as crucial to participation in online communities and the reduction of technological barriers is important in encouraging users to contribute to collaborative systems (Preece 2001; Preece et al. 2004). Such systems rely on user contributions so that the system can be useful tool for viewers so lack of contribution is a significant problem in this context. If the system by which users contribute is seen as difficult to use and leads to an unsatisfactory user experience it is unlikely that users will contribute frequently, especially if such contributions are voluntary rather than compulsory under course requirements. It is also possible that due to interface and wiki characteristics users hold anxiety towards wiki editing. Indeed having poor wiki editing experiences, as suggested in computer anxiety research

(McIlroy et al. 2001; Todman & Drysdale 2004; Todman & Monaghan 1994) may lead users become anxious about editing wikis further and potentially even minimise their contributions. This could have important ramifications for wiki success and disadvantage users academically if wiki editing were to become part of course pedagogy and assessment.

It is surprising then that with such a barrier being noted that little empirical research has focused on the wiki user experience and its effects on user emotion in a wiki context. Although there have been studies observing the use of wikis in a variety of scenarios and environments, most use qualitative methods such as semi structured interviews and observation methods (Cole 2009; Forte & Bruckman 2007; Guth 2007; White et al. 2009) to make conclusions about the wiki user experience. Adding quantitative experiment-based research would allow for causal inference to be made about the effects of system and interface characteristics on the wiki user experience.

2.3.2 Anxiety in the Wiki User Experience

This work focuses on three aspects of the interaction with wikis that may lead users to experience anxiety towards wiki editing and contribution. One of these is towards the use of wiki markup language, the main editing interface used in wiki editing. The simplicity of wiki markup language is noted by some authors (Goodwin-Jones 2003; Mader 2008) and is commonly mentioned as a benefit to wiki use. Yet research has also noted that users find markup language difficult (Desilets et al., 2005; Holtzblatt, Damianos, & Weiss, 2010) and that they dislike having to learn wiki markup (Da Lio et al. 2005). It may also be seen as confusing to novice users (Augar et al. 2004). Because of its syntax and command based nature, users are put

under intense cognitive burden when interacting with such interfaces (Davis & Bostrom, 1993). Users must understand the syntactic form of the language used and remember the specific commands rather than being able to infer functions and develop mental models of the system easily through use of graphical or menu orientated interfaces. Interacting with such an interface may be anxiety-inducing due to the wealth of commands and syntactic rules which make the success of the users' interaction uncertain. Users may be overwhelmed by the knowledge needed for a successful first interaction. Error recovery in this type of interface also requires knowledge of commands and syntax to identify where the error is and what is needed to recover from it. Ability to recover from errors and apprehension towards learning programming languages are factors common to the measures of other IT related anxieties (Chou 2003; Heinssen et al. 1987; Rosen et al. 1987). It is likely that such issues would also be anxiety-inducing in a wiki context too.

The element of social collaboration and judgement by peers when editing the wiki has also been seen to be a concern for users. Users may be anxious about their edits being accurate or valid in the eyes of the community of viewers using the wiki. Research has noted such lack of confidence in the worthiness of their contributions and that users are concerned that their contributions will be judged unfavourably (Holtzblatt et al. 2010; Guzdial et al. 2002) as they are saved to the wiki for other users to evaluate. This is a common concern of *lurkers* (users who view but do not contribute content to collaborative systems) in online communities. *Lurkers* state that they fear that they will be treated negatively by the community and therefore tend to want to contribute anonymously (Preece et al. 2004) or not at all. The collaborative nature of wiki content creation can be an exposing experience for editors as the

knowledge is a constant work in progress that can be viewed openly (Carr et al. 2007; Giordano 2007). Such openness and social evaluation may lead to anxiety towards contributing to wiki content.

The flexibility of the content may also lead to negative emotions towards editing. A wikis' content is in a constant state of flux. All users are able to add, amend and delete content as they choose. There has been concern raised about this openness and flexibility by educators using wikis in educational contexts (Wang & Turner, 2004; Forte & Bruckman, 2007). For the users there is a worry that their contribution can be amended and deleted (Raitman et al. 2005) without being informed of a reason (Glaser 2004). Users have mentioned concerns in previous research about the fact that "*someone can change what you have written, even when you know what you have written is correct*" (Lund & Smordal, 2006, p.41). This potential for anxiety when editing is also paired with difficulty users have of accepting the collaborative nature of content creation on wiki systems. The open nature means that the content is owned by the collective group rather than the individual. Recent qualitative research has highlighted this difficulty as users tend to feel a sense of individual ownership over the content they include to the wiki site (Guth 2007; Munson 2008) and only tend to add to or edit their own content (Glaser 2004; Jaksch et al. 2008). Anxiety may be felt on subsequent editing experiences after experiencing other users deleting or amending "their content" due to this. It may also lead to negative emotion as other users editing their content may affect users' confidence in the veracity and worthiness of their contributions in the future. Additionally users may be anxious due to the fact that their content can be changed

by others and may be cautious about the collaborative nature of wiki content creation.

The work will focus on these three potential areas for anxiety and explore the effects that aspects of the system have on anxiety and usability assessment in these situations. This research rather than engineering the editing interface (i.e. manipulating navigation bar placement or presentation as would be the case in more traditional usability engineering research), focuses on engineering the user experience with the system, observing the effects of inbuilt tutorial spaces, user identity salience and the experience of wiki flexibility on usability and anxiety towards editing. The work expounded here experimentally engineers the experience to observe firstly inbuilt tutorial effects on novice users' anxiety and usability towards using wiki markup language to edit the wiki. It moves focus from how system characteristics affect the experience of the editing interface (Chapter 3) towards more social elements of the wiki user experience such as user identity salience (Chapter 4) and flexibility (Chapter 5) and shifts towards previous users of wiki sites influenced by findings from the research in Chapter 3. All the research here focuses on wiki use in a Higher Education context using relevant scenarios.

2.4 Summary

This chapter has detailed the literature that has provided the motivations of this research. It highlights the concepts relevant to anxiety towards IT, most notably computer anxiety. The work presented in this chapter highlights that one of the main causes of computer anxiety may lie in poor initial first experience with computers. However this has not been experimentally investigated likely in part due to the lack of specificity of the concept of computer anxiety leading to a difficulty in

experimentally designing a relevant computer experience. Additionally concepts such as computer anxiety are not fit for purpose in investigating anxiety towards Web 2.0 applications (such as wikis). Their collaborative and social nature are not accounted for so movement from a generalised anxiety (such as computer anxiety) towards more specific anxieties which reflect 21st century computer use is needed to investigate anxieties with these systems. Specificity is also needed if HCI research is to engage with the problem of poor first experience on anxiety levels. Research in the field of HCI is explored in terms of usability and the growth of the concept of user experience, which is more emotional in focus and which this research is more naturally based. The experiment-based methods of study, which form the methodological basis for this thesis, are also described and discussed in reference to other HCI methodologies. The focus of this thesis, the wiki user experience, is then discussed and linked to the research explored on computer anxiety and HCI. Wikis are gaining popularity in Higher Education institutions yet there is little quantitative investigation of the wiki user experience and specifically anxiety towards wiki editing. Research has identified that there are problems mainly due to editing interface ease of use in terms of getting students to edit wiki systems in Higher Education. It may also be that due to the interface, the social nature of wikis and their flexibility users may hold anxiety towards editing. Additionally, initial poor experiences may lead users to be anxious about editing wikis, potentially limiting their contribution frequency. Three aspects of the wiki user interaction were identified as potentially leading users to experience anxiety towards editing; the use of wiki markup language, identity salience during editing and the flexibility of content and other user behaviour. The work expounded in this thesis aims to

experimentally engineer wikis to identify how wiki site characteristics may influence this anxiety towards wiki editing and users usability evaluation of the wiki editing experience.

CHAPTER 3- THE EFFECTS OF TRAINING SPACES ON NOVICE USER USABILITY AND ANXIETY TOWARDS WIKI EDITING

3.1 Introduction

This chapter discusses the results of experiment-based research investigating the effects of in-built training spaces on novice user usability and anxiety towards wiki editing. As mentioned in the previous chapter there is a dearth of literature focusing on how aspects of the wiki may affect usability evaluation of the editing interface and the wiki user experience although usability is a problem in wiki contribution (Ebner et al. 2008). Wiki content is predominantly edited and formatted using wiki markup language, a markup based interface. Although some feel that wiki markup is a simple interface to use (Goodwin-Jones 2003; Mader 2008), many have seen users finding this interface difficult to use and learn (Augar et al. 2004; Da Lio et al. 2005; Holtzblatt et al. 2010) and hold some anxiety towards it due to its technical connotations (Mader 2008). As it is markup orientated users may find it difficult to develop mental models with the wealth of commands and syntax needed to be known for successful use and error recovery, leading users to be uncertain in its use. Error recovery and negative emotions towards learning programming languages are aspects inherent in IT related anxiety measurement (Chou 2003; Heinssen et al. 1987; Rosen et al. 1987). Wiki systems commonly use in-built training spaces such as sandboxes and tutorials to allow users to gather knowledge and experience of this interface. Yet little is known about their effect on user evaluation of the interface and emotions experienced during the wiki user experience.

As discussed in Chapter 2, the effect of having a poor initial experience with an interface may be detrimental to the emotional relationship users develop with IT systems (McIlroy et al. 2001; Todman & Drysdale 2004). First time users introduced to interfaces which deliver a negative experience where they do not feel in control or relaxed may be more at risk of developing negative emotions towards that interface. Even though such a finding has been proposed, an attempt to engineer different system interactions for users' first experience and observe its effect on anxiety towards systems experimentally has been lacking. This may lie in part because of the lack of specificity in the concept of computer anxiety where it is used as an overarching term to encompass all anxiety towards IT systems. Such overarching concepts do not reflect the complexity and specificity of emotions towards certain systems and do not include references to social dynamics and collaborative aspects that are likely to affect emotions towards Web 2.0 systems such as wikis. The research reported in this chapter aims to demonstrate that the anxiety experienced when users edit wikis is wiki specific rather than being related to computer anxiety. The research also aims to observe the effects these training spaces mentioned have on users' usability rating and anxiety towards wiki editing. More specifically it aims to identify whether interactions where users rated usability as higher in their first editing experience also leads to less anxiety both during interaction and towards further wiki editing.

Training spaces may have an important impact on the quality of interaction with the editing interface and subsequent anxiety towards wikis. Wiki sandboxes and basic wiki markup tutorials are commonly used tools. Both however differ in the learning technique employed. A sandbox is an area away from live wiki content

where users can practice using wiki markup using trial and error (Glaser 2004). It allows the user to have a high amount of control over their learning experience, focus on task orientated learning and experiment through trial and error and play, similar to *exploratory learning* techniques used when teaching computer skills (Davis & Wiedenbeck, 1998). This flexibility lets users explore self-generated hypotheses about how the system functions and gives training control to the learner (Carroll, Mack, Lewis, Grischkowsky, & Robertson, 1985; Davis & Bostrom, 1993). The fact that they encourage users to practice away from live content means users can practice wiki markup without concerns that they may accidentally delete content on the wiki and that other users may judge their edits when practicing. They act as a free play area where users can experiment and become comfortable with the interface away from other users and live editable content. Learning without pressure and through play is noted as important in reducing the onset of computer anxiety (Rosen & Weil 1994). Yet some believe that including a sandbox within a site implies system complexity as it suggests users' need training to interact with the wiki (Mader 2008). Research has suggested users tend to use sandboxes when they are supplied (Carr et al. 2007) although little is known about whether they influence users' assessment of the usability of the editing interface. Wiki markup tutorials tend to focus on features of the editing interface and explain the markup language step by step. This type of training closely resembles *instructional based methods* of learning used in traditional computer training as it is more reliant on the information presented in training material (Davis & Wiedenbeck, 1998; Davis & Bostrom, 1993). Users are not encouraged to explore but are given step-by-step instructions on how to complete tasks using the interface (Davis & Wiedenbeck, 1998).

The literature makes it clear that training in general does impact positively on user satisfaction levels (Torkzadeh & Dwyer 1994) yet the effect of these different types of training on system satisfaction are mixed and no empirical research is present for their effectiveness in a wiki context. Exploratory learning methods have previously been shown to produce better system satisfaction than instruction based methods when training novice users on an MS-DOS related interface (Simon et al. 1996; Simon & Werner 1996). Research has also found no effect of learning technique on users' perceived ease of use when comparing exploratory learning to more instructional methods (Davis & Bostrom, 1993). In terms of anxiety towards systems, a direct instruction based approach has been found to significantly reduce child educators' computer anxiety compared to a more exploration based approach (Wood et al. 2002).

To measure the effect of these training spaces on the user experience two scales were created to measure anxiety felt towards editing the wiki (The Wiki Anxiety Inventory-Editing; WAI-E) and to measure users' usability rating of the editing interface (The Wiki Usability Inventory; WUI). The creation of these will be described in section 3.2.3.1 of this chapter. The scale reliability of wiki anxiety and wiki usability measures is also tested. Scale reliability ensures that a scale is consistent in the measurement of a specific construct. Internal consistency (Cronbach alpha) is a strong method for estimating psychometric test reliability (Kline 2000). An alpha value above 0.7 shows an acceptable level of reliability for psychometric self-report scales (Kline 2000). A note of caution with the value of alpha is that it increases with the number of items included in the scale and that reliability does not necessarily imply scale uni-dimensionality (Field 2005). It does

however identify whether items on the scale are measuring the same underlying variable (Kline 2000).

Reliability is a necessary prerequisite for psychometric test validity yet reliability alone cannot determine scale validity (Kline 2000). There needs to be demonstration that psychometric tests effectively measure the concept that is intended. This can be done by exploring whether measures correlate with other benchmark measures. This is evidence for a measure's concurrent validity. Concurrent validity of wiki anxiety is measured in this research by observing its correlation with psychological measurements of anxiety such as state anxiety and trait anxiety constructs. Wiki anxiety measures, if measuring anxiety effectively, should correlate with traditional psychological measures of anxiety such as state anxiety and trait anxiety. Additionally, the correlations with psychological measures of anxiety would indicate the psychometric properties of the wiki anxiety measures in terms of their anxiety construct. State anxiety is situation-based and temporary whereas trait anxiety is a more deep-seated predisposition to be anxious in potentially stressful situations (Beckers, Wicherts, & Smith, 2007; Endler, 2001; Leso & Peck, 1992). Relationships of wiki anxiety with these anxiety variables allow us to infer whether wiki anxiety is associated to a situational or deeper-seated anxiety concept. Although there are no benchmark tests in terms of usability in a wiki scenario, conclusions about the wiki usability measures' construct validity can be made from correlations with the anxiety concepts measured towards wiki use. It would be expected, as usability is a positive construct, to correlate negatively with concepts of anxiety such as state anxiety and wiki anxiety measures. Such a finding would also bolster the construct validity for the wiki anxiety questionnaires. When

assessing the correlations those with a coefficient above 0.3 and where significance levels are at the level of probability of the correlation being due to chance (as noted by the p value) of 0.01 or below rather than 0.05 are more robust when determining scale validity (Kline 2000). It is expected that such correlations will be achieved between the aforementioned measures.

The research also aims to understand the relationship between wiki anxiety and computer anxiety and how situational anxiety measured during the experiment relates to both variables. If wiki anxiety was a more accurate reflection of the anxiety experienced than computer anxiety it would be expected that computer anxiety would not to correlate with situational (state) anxiety even though using a computer is a major component of wiki interaction. Further, wiki anxiety would be expected to correlate positively with state anxiety. It is therefore hypothesised that computer anxiety will not significantly correlate with state anxiety but that all wiki anxiety measures will correlate with state anxiety measures administered throughout the session. This will make it clear that it is more appropriate to assess specific anxiety concepts when observing negative emotion towards technology rather than an overarching IT anxiety concept like computer anxiety.

However the main aim of this research is to explore the effect of different in-site training spaces on users' usability rating in first experience and whether these different experiences also affect anxiety during experience and anxiety about future wiki editing. The wiki sites used in this experiment are engineered to include four different training conditions. Each group of novice users were exposed to either a control condition (no training), sandbox area, tutorial or a combination of tutorial and sandbox before editing live content (content which other users can view and edit) on

the wiki site. It is hypothesised that there will be a significant difference in terms of usability rating depending on the training space. It is also hypothesised that the training spaces will affect anxiety levels both during and about future interaction.

3.2 Experiment Materials and Method

3.2.1 Sample Characteristics and Recruitment

81 undergraduate first year psychology students at the University of Edinburgh took part in the experiment. Participants were recruited via email using the first year psychology mailing list. They were asked to take part in research “involving a web based learning tool” and were told that they would received an £8 honorarium for participation. If students wished to take part they were asked to reply to the email with their name and contact details so that a time slot could be arranged for participation. Of the 81 participants 4 were excluded from the dataset because of their lack of completion of markup tasks and because of high amounts of missing data in their questionnaire responses. Of the 77 included in the dataset, 18 were male and 59 were female. The gender distribution of the sample is representative of that present in the population being tested. 76 of the participants were between ages 17 and 22 with one aged 38. The sample had a mean age of 18.78 years (S.D. = 2.38). All (77) were novices in terms of editing wikis as all had no previous experience editing a wiki, although most (75) had previously viewed information on a wiki. Participants were experienced in using computers with 76 stating that they had used computers for 5 years or more. All had used a computer for at least a year. Participants were also experienced with the Internet; 70 stated that they had used the Internet for 5 years or more. All participants had used the Internet for at least a year.

3.2.2 Experiment Design

To simulate realistic wiki use within a university course the experiment was based on a scenario relevant to the sample tested (i.e. psychology students) and the context of use (wikis in Higher Education). The research in this chapter, and indeed this thesis, focuses on psychology students because of previous wiki use within the psychology undergraduate course at the University of Edinburgh. This means that the sample is based in a relevant subject area where wikis have been previously implemented in a Higher Education context. Additionally the authors' knowledge of the psychology undergraduate course meant highly realistic and relevant wiki content and scenarios could be created to improve ecological validity and reduce potential confounding effects of content familiarity on wiki anxiety. It is important that the type of content is relevant to users' course and level of study so that potential effects of unfamiliarity and complexity of content being edited on anxiety towards editing are minimised. The use of psychology students facilitated the reduction of this confound. Further to this because of previous wiki use in the psychology curriculum, a sample can be recruited with experience of wiki editing in later experiments in this thesis (Chapter 4 and 5). The use of psychology students in this study allows for consistency in sample characteristics in terms of degree subject and consistency in wiki subject area throughout the thesis.

In the scenario for this study participants were told they were using a wiki (UNIWIKI) in their psychology degree and that their Differential Psychology lecturer had asked all students to collaborate to create a background page on the topic of personality (The *Personality Background* page) as a course assignment. This, they were told would be used as the basic class reading for a lecture series on Personality

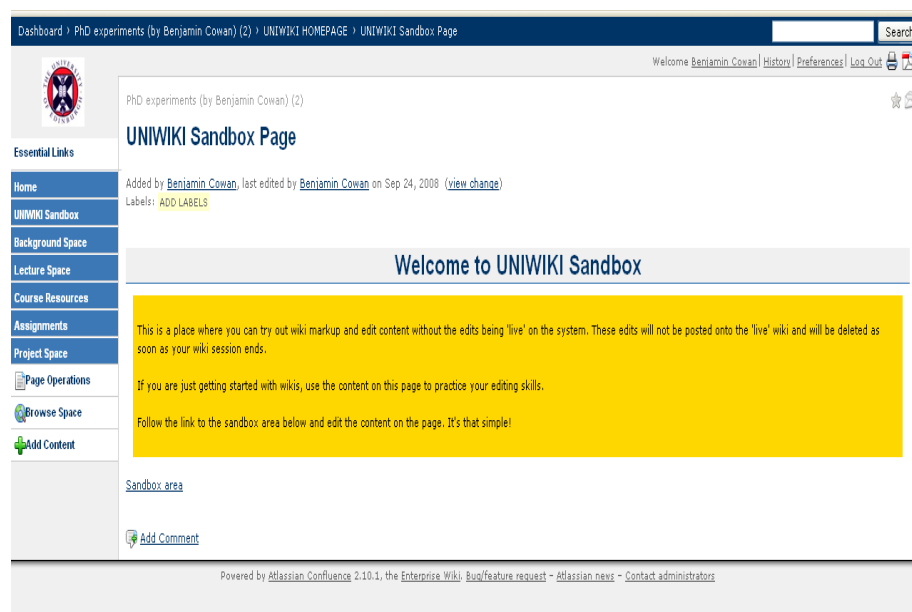
in the next semester. They were told other students had been adding to the page and that other students will be adding and editing information to this page over the coming days so as to highlight the collaborative nature of the wiki and imply the presence of other users. Participants were fully informed at the end of the experiment that this scenario was fictitious and that contributing to the background page was not a course requirement. A copy of the information given to participants about the scenario is included under the Experiment Scenario heading in Appendix 1.1.

Before interacting with the wiki all participants were asked to read a short description informing them about wikis. Because participants in this experiment were novice wiki users, this description was used to ensure they were familiar with the concept of the wiki and how editing occurred. The description included a brief explanation of the wiki concept and how content was edited. To reinforce the concept an example of a commonly used wiki (*Wikipedia*) was described with reference to how the wiki concepts are applied within that setting. A copy of this short description is presented in Appendix 1.2.

For the wiki interaction, each participant was randomly allocated to one of four conditions in a between-subjects design. Each condition varied in terms of the systems in-built training space participants experienced before editing live content on the wiki. The *Direct Editing* (DE) condition was used as a control condition to measure participants' usability and anxiety towards editing the wiki when no training was experienced. Participants were asked to attempt to complete the editing tasks given on the live wiki page without training or instruction. They were given instructions on how to navigate to the wiki editing screen to begin editing the live page information. In the *Sandbox* (SBX) condition participants were informed that

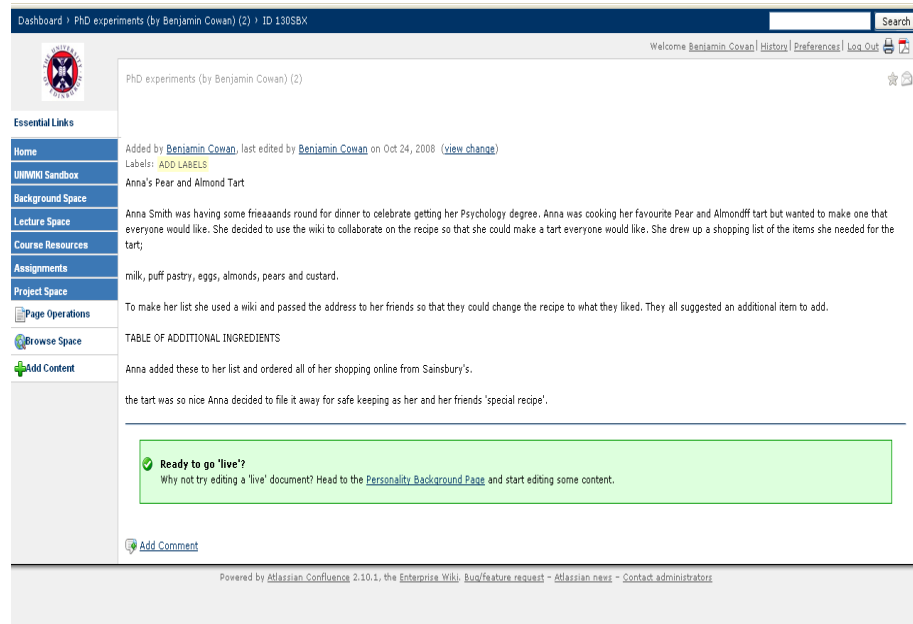
before editing the wiki they had been asked by their lecturer to practice using wiki markup language in the wiki sandbox provided before editing live content. The sandbox was a page within the wiki site that allowed participants to practice editing on pre-existing content away from live content on the wiki. Participants were told their lecturer had given them specific tasks to complete in the sandbox. These tasks were reflections of the tasks that were to be completed when editing the live wiki page. The list of tasks completed in the sandbox is included in Appendix 1.4. Examples of the introductory page to the sandbox and the content on the sandbox page are presented in Figure 3.1 and 3.2 respectively.

Figure 3. 1- UNIWIKI Sandbox Introduction page



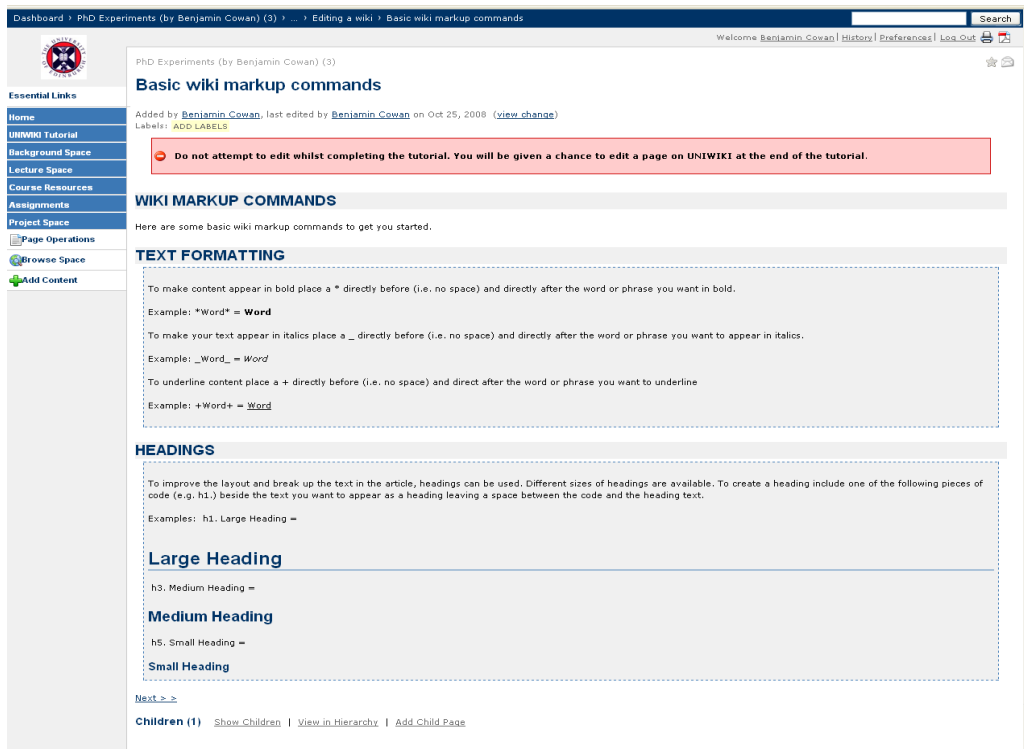
A link to the live content page was supplied so that participants did not need to exit the sandbox and re-navigate to the background space. Supplying such a link increased the efficiency of the experiment session. This link can be seen at the bottom of the sandbox page in Figure 3.2.

Figure 3. 2- UNIWIKI Sandbox page



In the *Tutorial* condition (TUT) participants were informed that their lecturer had asked them to complete a tutorial included on the wiki site before editing live content. The tutorial included general information about wiki use and specific wiki markup language commands needed for editing. The wiki markup language section covered all commands and syntax needed to complete the tasks in the live editing session. Participants were able to access the live wiki information by following a link at the end of the tutorial. They were not allowed to return to the tutorial when editing live wiki content. An example of the wiki markup content included in the tutorial is presented in Figure 3.3.

Figure 3. 3- UNIWIKI Tutorial page



The final condition designed for the experiment was the Tutorial and Sandbox condition (TUT+SBX). It is a combination of both condition 2 and 3 and involved participants experiencing the tutorial and then the sandbox condition (TUT+SBX). Participants were initially asked to complete the wiki editing tutorial. The tutorial was identical in content to the tutorial in the TUT condition.

Before editing the live content, participants were then informed that as an additional introduction to editing content their lecturer had asked them to practice using wiki markup language in the sandbox before editing the live content on the Personality Background page. The sandbox was identical in terms of tasks given and page information being edited as in the SBX condition. As the sandbox tasks directly reflected the live editing tasks to be completed, the content of the tutorial again included all that was needed to complete the tasks in the sandbox. Participants were then able to access the live wiki information page by following a link at the end of

each sandbox page. A copy of the information given to participants about the training spaces (Appendix 1.1) and the content within the training space pages (Appendix 1.3) are included in the Appendix. A summary of the conditions is presented in Table 3.1.

Table 3. 1- Summary of experiment conditions

Condition	Description	Practice Tasks	Live Content Tasks
1. Direct Edit (Control) (DE)	Directly editing live content without experiencing training space	No	Yes
2. Sandbox (SBX)	Practice area away from live content where participants were able to practice completing similar tasks to live content tasks	Yes	Yes
3. Tutorial (TUT)	Short non-interactive tutorial informing participants of wiki concept and wiki markup needed for tasks	No	Yes
4. Tutorial + Sandbox (TUT+SBX)	Combination of conditions 2 and 3 above	Yes	Yes

All participants when editing had access to a wiki markup language help-tips box, which was part of the Atlassian Confluence wiki editing page. This box is the wiki default help for editors when using wiki markup language and includes examples of wiki markup relevant to the tasks in the experiment. An example of the help tips box is included in Appendix 1.5. This was available to participants in all conditions. Each condition was also included on its own unique wiki site. All pages on these sites were identical in content, structure and appearance apart from the inclusion of the relevant pages for the tutorial and sandbox conditions. Each of the wikis used in the experiment were created using Atlassian Confluence (version

2.6.0). This wiki service was used because of its position as the main wiki service supplied at the university and is widely used across campus.

After experiencing one of the conditions participants were then asked to edit live wiki information on the Personality Background Page. The live content was included on the wiki by the experimenter prior to the experiment and focused on the topic of Personality. The seeding of the wiki with content by the experimenter served to add legitimacy to the claim that other users had been contributing previously to the site, which was stated in the scenario. It also gave participants content for which to perform the tasks on. The content on the live wiki page is included in Appendix 1.3. When editing the live wiki page (i.e. the Personality Background page) each participant was asked to complete 3 simple (Task 1, 2 and 3) and 3 complex (Task 4, 5, and 6) editing tasks. The simple tasks focused on simple addition and amendment of page content (adding text and correcting spelling mistakes) and use of simple wiki markup (changing existing text into a large heading). Complex tasks included using wiki markup to format text (changing existing text into bold and including a numbered list within the page) and the addition of formatted content (the insertion of a table with predetermined content). The tasks were categorised on level of difficulty based on feedback from the practice sessions of the experiment within the department. A full list of the tasks completed in live editing is included in Appendix 1.6. In the sandbox conditions participants completed the same tasks as in the live editing but on content in the sandbox area before editing live content. The order of the live tasks was randomised within each difficulty category using Latin squares creating 3 orders for each task difficulty categorisation (Simple- Order A, B, C; Complex- Order A, B, C). The possible 9 Simple-Complex order pairs were

randomly allocated to experiment ID's within each condition when designing the experiment to control for possible task order effects on the dependent variables. The possible orders are represented in Table 3.2 below. These orders were only used for the live wiki tasks where participants' usability rating and anxiety were being measured.

Table 3. 2- Live Task Randomisation Pairs for each condition

	Simple Order A (1,2,3)	Simple Order B (2,3,1)	Simple Order C (3,1,2)
Complex Order A (4,5,6)	AA	BA	CA
Complex Order B (5,6,4)	AB	BB	CB
Complex Order C (6,4,5)	AC	BC	CC

As the sandbox was a practice space the order of tasks was felt not to affect the dependent variables and so the order of tasks completed in the sandbox was kept constant throughout the experiment. All tasks used in both the sandbox and the live page edits referred to identical editing processes, although the context of the tasks changed to fit the relevant content on each page.

3.2.3 Questionnaire Measures

3.2.3.1 Development of the Wiki Anxiety and Wiki Usability Questionnaires

The Wiki Anxiety Inventory-Editing (WAI-E) was designed for this thesis to measure the anxiety participants felt about editing the wiki. An initial pool of items was developed using themes highlighted in previous measures of computer anxiety (Beckers et al. 2007; Heinssen et al. 1987). Although many measures are used, computer anxiety measures tend to focus on four main facets. These are peoples' low confidence in their abilities to interact with the stressor, negative emotions towards

the stressor, becoming emotionally aroused when thinking about or physically interacting with the stressor and negative beliefs about the position of computers in society (Beckers & Schmidt 2001). Anxiety towards learning computer skills is also a predominant element in the measurement of computer anxiety (Beckers & Schmidt 2001). These themes are reflected in the Computer Anxiety Rating Scale (CARS) (Heinssen et al. 1987), one of the most commonly used computer anxiety scales. The items in this scale refer to computer confidence, learning and anticipation of computer use as well as items referring apprehension towards interaction with computers.

The concepts of emotional arousal and confidence are also common to psychologically based measures of anxiety. The State-Trait Anxiety Inventory (STAI) (Spielberger et al. 1983) focuses on items referring to confidence (items such as “I feel like a failure”, “I lack self-confidence” and “I feel secure” in trait scale and items such as “I feel self-confident” and “I feel secure” in the state scale) and affective feeling (such as “I feel upset” and “I feel at ease” in the state scale and “I am happy” and “I feel inadequate” in the trait scale) when measuring general state and trait anxiety. What is doubtful from the observation of the STAI is the role of beliefs and attitudes in the accurate measurement of anxiety. Attitudes and beliefs about computers are seen to be negatively related to peoples’ computer anxiety (Popovich et al. 2008). They are however distinct. It is possible that a person who is anxious about interacting with a stressor can see the benefit of the stressor to the wider population. Alternatively it is possible that an individual who is comfortable with computers can hold negative beliefs about computers and their role in society. Including items referring to attitudes about a stressor therefore detracts from the

accurate measurement of the psychological construct of anxiety and it is arguable whether these items should be included in any measure of anxiety.

The Wiki Anxiety Inventory-Editing has therefore been created to reflect the themes mentioned excluding the concept of negative beliefs, in a wiki context. Even though themes that are applicable to wiki anxiety can be seen in the computer anxiety literature, because of their flexibility and social core other themes need to be included to effectively measure anxiety towards wiki editing. A wiki is completely modifiable in its content, structure and layout. Users may therefore not only be anxious about the fact that they can accidentally change content but that the content itself can be changed and thus the content they add may be amended. All such aspects lead to uncertainty in the permanence of information. Negative evaluation by others may also be of concern when users edit a wiki. Students may feel anxious about editing content for fear of their edits being judged by other users on the accuracy and quality of the edits made. Both these aspects are important to the concept of wiki anxiety in an editing context and are therefore included in the metric used.

When creating the scale a collection of anxiety related words were gathered from State and Trait anxiety measures (Marteau & Bekker 1992; Spielberger et al. 1983) and other anxiety measures not relevant to IT such as the Test Anxiety Inventory (Taylor & Deane 2002) to ensure accurate reflection of the emotion of anxiety. A pool of items was then generated from themes and items from computer anxiety questionnaires and computer anxiety items in computer attitude questionnaires (Barbeite & Weiss, 2004; Garland & Noyes, 2008; Heinssen et al., 1987; Nickell & Pinto, 1986; Venkatesh, 2000) and from measures of fear of

negative evaluation (Weeks et al. 2005) due to the wikis social core. Items in this pool were also created from insight gathered from informal discussions and interviews with wiki co-ordinators at the University of Edinburgh as well as the literature on wiki use. The co-ordinators included University of Edinburgh academics with experience using wikis in undergraduate course teaching as well as members of the central wiki service support team at the University. 60 initial items were then reviewed by a panel of experts. These experts were University staff with expertise in HCI and usability engineering, wiki technology use and questionnaire design. From this process were reduced to 35 items (the 35 items and reasons for exclusion of the other 25 items are displayed in Tables A.1 and A.2 respectively in Appendix 1.7). Because the anxiety measured in this experiment focuses on anxiety before editing, during editing and about future editing, three versions of these items were then created. A further round of review brought changes and additions to these items in improving the clarity of concepts and wording of items, bringing the item total to 39. These 39 items were then administered to a small group of 8 novice wiki users who were asked to take part in a small pilot study aiming to examine the quality of the items gathered. Participants were asked to edit a wiki page using WML and were asked to assess the item wording and concept clarity of each of the items in the anxiety measure. This aided the process of further item development, rewording and item removal. A final shortlist of 29 items was then defended in a meeting of a panel of experts with expertise in usability engineering, wiki use and HCI questionnaire design, which led to the final version of the Wiki Anxiety Inventory Editing. The full list of final items (Table A.3) along with the items excluded during the process after the development of the three versions of the scale and reasons for exclusion (Table

A.4) can be found in Appendix 1.7. The final 25 items included items about anxiety towards *learning*, anxiety of *interaction*, *confidence*, *fear of judgement* by other users and *flexibility concerns*.

As mentioned, three version (or iterations) of the WAI-E questionnaire were developed. This was so as to accurately assess anxiety before participants' interaction with the wiki (to measure their anxiety towards wiki use before they had experienced wiki editing; WAI-EP) after experiencing editing the wiki (to measure the anxiety felt during editing; WAI-EA) and anxiety at the thought of future editing of the system (their feelings if they had to edit the wiki again; WAI-EF). All 25 items (10 positive and 15 negative) in each of the versions were identical in subject and only differed in their tense. The full list of items in all three iterations is displayed in Table 3.3.

Table 3. 3- Iterations of the Wiki Anxiety Inventory- Editing (WAI-E)

Item	Grouping	WAI-EP	WAI-EA	WAI-EF	Polarity
1	Learning	I will enjoy learning about editing the wiki	I enjoyed learning about editing the wiki	I would enjoy learning more about editing the wiki	(+)
2		I will get distracted easily when learning about editing wikis	I got distracted easily when learning about editing the wiki	I would get distracted easily if I had to learn about editing wikis again	(-)
3		I am confident that I will be able to learn wiki markup language	I felt confident learning wiki markup language	I am confident that I will be able to learn more wiki markup language	(+)
4		With experience I think I will feel comfortable using wiki markup language	As I became more experienced I felt more comfortable using wiki markup language	With more experience I think I will feel even more comfortable using wiki markup language	(+)
5		I think learning wiki markup language will be stressful for me	Learning wiki markup language was stressful for me	I think learning more wiki markup language will be stressful for me	(-)

6	Interaction	I am apprehensive about editing the wiki	I felt apprehensive when editing the wiki	I am apprehensive about editing the wiki again	(-)	
7		I am anxious about editing the wiki for fear of making mistakes	When editing the wiki I felt anxious about making a mistake	I am anxious about editing the wiki again for fear of making mistakes	(-)	
8		I am excited about editing the wiki	I felt excited when editing the wiki	I am excited about editing the wiki again	(+)	
9		I feel uncomfortable about editing the wiki	I felt uncomfortable about editing the wiki	I feel uncomfortable about editing the wiki again	(-)	
10		I feel at ease about using wiki markup language	I felt at ease using wiki markup language	I feel at ease about using wiki markup language again	(+)	
11		Wiki markup language will confuse me	Wiki markup language confused me	Wiki markup language would confuse me	(-)	
12		I feel tense about editing the wiki	I felt tense whilst editing the wiki	I feel tense about editing the wiki again	(-)	
13		I feel intimidated about editing the wiki	I felt intimidated while editing the wiki	I feel intimidated about editing the wiki again	(-)	
14		I will find it hard to concentrate when editing the wiki	I found it hard to concentrate when editing the wiki	I would find it hard to concentrate if I edited the wiki again	(-)	
15		Confidence	I would feel secure in my ability to edit the wiki	I felt secure in my ability to edit the wiki	I would feel secure in my ability to edit the wiki again	(+)
16			I am certain that I can overcome any difficulties I may encounter when editing the wiki	I was certain I could overcome any difficulties I encountered in editing the wiki	I am certain I can overcome any difficulties I may encounter when editing the wiki	(+)
17			I am confident that I would be able to use wiki markup language	I felt confident when using wiki markup language	I am confident I would be able to use wiki markup language again	(+)
18			I am sure that I can make the wiki do what I want it to do	I felt sure that I could make the wiki do what I wanted it to do	I am sure that I could make the wiki do what I want it to do if I edited it again	(+)
19			I am worried about making mistakes that I cannot correct when editing the wiki	I was worried about making a mistake that I could not correct when editing the wiki	I am worried about making mistakes that I cannot correct.	(-)
20	I am afraid that I may do something wrong when editing the wiki		I was afraid that I might do something wrong when editing the wiki	I am afraid I may do something wrong if I edit the wiki again	(-)	

21	Fear of Judgement	I am happy with other users being able to see my changes to the wiki	I was happy with other users being able to see my changes to content on the wiki	I am happy with other users being able to see any further changes I make to the wiki	(+)
22		I am afraid that people will find faults with any edits I may make	I was afraid that people may find faults with any edits I made	I am afraid that people will find faults with any edits I make if I edit the wiki again	(-)
23	Flexibility Concerns	The fact that content can be changed makes me uneasy	The fact that content could be changed made me uneasy	The fact that content can be changed makes me uneasy	(-)
24		I am concerned that other users can change the edits I make	I was concerned that other users could change the edits I made	I am concerned that other users could change the edits I would make	(-)
25		It scares me to think that I could accidentally destroy someone else's content	It scared me to think that I could accidentally destroy somebody else's content	It scares me to think I could accidentally destroy someone else's content	(-)

All wiki anxiety measures used a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). All positive items were reverse scored so that a large score reflected high levels of anxiety.

A self-report questionnaire to measure usability (The Wiki Usability Inventory- WUI) was also created for this thesis. A pool of 66 items was created using concepts and items from the Generic User Interface Questionnaire (QUIS) (Chin et al. 1988), The Software Usability Measurement Inventory (SUMI) (Kirakowski & Corbett 1993) and the MINERVA usability self-report scales (Love et al. 1994; Dutton et al. 1993). The QUIS (Chin et al. 1988) is a 27 item semantic differential scale which holds 5 factors referring to users' ratings of the system being tested on overall reactions, screen characteristics, terminology and system information, learning and system capability factors. The SUMI (Kirakowski & Corbett 1993) is a 50 item 3-point Likert scale questionnaire used to measure software usability. It is constructed of 5 factors referring to users ratings of

efficiency, affect (i.e. their emotional reaction towards the software), helpfulness, control (extent to which the user feels in control when completing tasks) and learnability of the software. The MINERVA usability questionnaire was originally designed to measure usability of dialogue systems using a 7-point Likert scale with which users noted their level of agreement with each item. It has since been successfully used as a usability measure in research on web (Weir et al. 2009) and mobile interactions (Peevers et al. 2008) as well as dialogue system interactions (Davidson et al. 2004). The items focus around the factors of cognitive effort and stress, fluency of interaction, transparency (i.e. clarity of interaction and confusion during interaction), interface quality (i.e. efficiency, reliability) and engagement/enjoyment within the interaction. Items from perceived ease of use and usefulness scales used in the Technology Acceptance Model literature (Davis & Bostrom, 1993; Roca, Chiu, & Martinez, 2006; Saade & Kira, 2007; Venkatesh, 2000) were also used as the basis for items. From these sources an initial pool of 66 items were created from the items and themes mentioned in these measures. All items created were again focused specifically on the experience with the wiki editing interface. The pool was reduced to 22 items (11 positive and 11 negative) by discussions with a group of usability experts. These items were then given to 8 novice wiki users in a small pilot study. The items were then successfully defended in a further meeting of usability experts leading to the final version of the Wiki Usability Inventory included in Table 3.4. A full list of the item pool, sources of the items and reasons for exclusion are included in Tables A.5 and A.6 in Appendix 1.8.

Table 3. 4- The Wiki Usability Inventory (WUI)

Item	Grouping	WUI	Polarity
1	Ease of Use	It was clear how to edit the wiki	(+)
2		I found wiki markup easy to use	(+)
3		I thought editing the wiki was too complicated	(-)
4		The wiki was difficult to edit	(-)
5	Enjoyment	I got flustered when using wiki markup language	(-)
6		Editing the wiki was fun	(+)
7		I enjoyed editing the wiki	(+)
8		I felt under stress when editing the wiki	(-)
9		Editing the wiki made me feel nervous	(-)
10		I had to concentrate hard when editing the wiki	(-)
11		I found editing the wiki frustrating	(-)
12		Control	When editing the wiki I always knew what to do next
13	I felt in control when editing the wiki		(+)
14	I found it easy to get the wiki to do what I wanted it to do		(+)
15	Interface Quality	The layout of the wiki edit screen was clear	(+)
16		The wiki editing interface needs a lot of improvement	(-)
17	Intentions to Use	I would recommend using a wiki to others	(+)
18		I would not edit a wiki like this again	(-)
19	Learnability	There was too much to learn before I could edit the wiki	(-)
20		I often needed to use the on screen help to edit the wiki	(-)
21		Remembering wiki markup was easy	(+)
22		Wiki markup was easy to learn	(+)

The measure included items referring to *ease of use*, *enjoyment*, *control*, *interface quality*, *intentions to use* and *learnability*. All negative items were reverse scored so as a large total usability score reflected a positive evaluation of the

interface. The Wiki Usability Inventory used a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5).

3.2.3.2 Other Questionnaires Included in the Research

The other questionnaires included in the research measured concepts of State Anxiety (Marteau & Bekker 1992), Trait Anxiety (Spielberger et al. 1983) and Computer Anxiety (Beckers et al. 2007). A brief demographic questionnaire and post-interaction interview were also administered at the start and at the end of the experimental session respectively.

State anxiety was measured using a short form of the state anxiety scale included in the State-Trait Anxiety Inventory (STAI) (Marteau & Bekker 1992). This measure has previously shown high reliability (Cronbach $\alpha = .82$) and validity (Marteau & Bekker 1992). The measure includes 3 positive items (such as “I feel content”) and 3 negative items (such as “I feel tense”) referring to people’s emotions at that moment. Participants were asked to think about how they felt at that moment when completing each state anxiety measure. The short version of the measure was used so as to reduce the risk of questionnaire fatigue influencing the responses to other questionnaire measures in the experiment. State anxiety was measured before the experiment commenced (State-E), before interaction with the wiki site (State-P), directly after wiki interaction (State-A) and before the final wiki anxiety questionnaire referring to future wiki interaction (State-F) towards the end of the experimental session. State anxiety was measured using a 4-point Likert scale ranging from “Not at all” (1) to “Very Much” (4) referring to how they felt at that moment.

Trait anxiety was measured using the trait section of the State Trait Anxiety Inventory (Spielberger et al. 1983). The questionnaire contains 9 positive items and 11 negative items measuring participants' predisposition (trait) towards anxiety. Participants were asked to respond to the items thinking about how they *generally* feel (rather than how they felt at that moment). This measure has been used to measure trait anxiety extensively in a variety of psychological research (Beckers et al., 2007; Benetti & Kambouropoulos, 2006; Chambers, Power, & Durham, 2004; Eysenk & Van Berkum, 1992; Thorpe & Brosnan, 2007). It has also shown high reliability in research (Cronbach $\alpha= 0.93$) (Beckers et al. 2007). Trait Anxiety was measured using a 4-point Likert scale ranging from "Almost Never" (1) to "Almost Always" (4) referring to the frequency of feeling.

Computer anxiety was measured using the 32 item Beckers and Schmidt Computer Anxiety Scale (BSCAS) (Beckers et al. 2007). The measure includes items relevant to the factors of computer literacy, self-efficacy, affective feeling, physical arousal, negative beliefs and positive beliefs about computers. A general computer anxiety score was then calculated from the responses on these six factors. In terms of measuring general computer anxiety the scale has demonstrated high scale reliability ($\alpha= 0.91$) (Beckers et al. 2007). The questionnaire used a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5).

The items of each questionnaire in the research were randomised within the measures to create three order sets, which were randomly allocated to each experiment ID before the experiment and were balanced within the experiment. This was so as to reduce the possibility of effects due to item order and participants remembering the order of their responses. Additionally all questionnaires were

administered using paper versions so as to eliminate the potential inflation of anxiety levels on the measures due to the use of a computer for those with levels of computer anxiety.

A demographic questionnaire and post-interaction interview were also created for this research. For the demographic questionnaire participants were asked to give their age, gender, the length of time using a computer, the amount of hours per week on average they use a computer, length of time using the Internet and the amount of hours per week on average that they use the Internet. Participants were also asked about their previous wiki experiences and whether they had edited a wiki before. Those who had edited wikis previously were informed of their ineligibility to take part and were thanked for showing an interest in the study. The post-interaction interview contained questions relating to evaluation of general editing experience (likes, dislikes, suggestions for improvement), feedback specific to the effectiveness of the conditions, use of the help tips box when editing and questions aimed at gathering information for further experiments focused on wiki editability and identity when editing. This interview gave participants the opportunity to elaborate on their evaluations and discuss their experiences in the experiment in more detail. The findings of the post-interaction interview are discussed in section 3.3.8.2. All questionnaires administered to participants and interview questions are included in Appendix 1.9. The scale maximums and minimums of each questionnaire measure are included in Table 3.5 in section 3.3.2.

3.2.4 Procedure

Participants were randomly allocated to experiment conditions upon arrival so as to minimise the effect of non-attendance on the balance of participant numbers

within conditions. They were then informed that the experiment would involve completing tasks on the computer and that they could withdraw at any point in the experiment. Participants were then asked to give consent to taking part by completing a consent form. An example of the form is included in Appendix 1.10.

Before interacting with the wiki site, participants were asked to complete demographic, state anxiety (State-E), trait anxiety (Trait) and computer anxiety (BSCAS) questionnaires. They were then given the precondition introduction to wikis before completing a further state anxiety questionnaire (State-P) and the Wiki Anxiety measure (WAI-EP). A few minutes were then given for participants to read the experiment scenario and ask any questions they had about the experiment. Each participant commenced at the respective UNIWIKI homepage depending on the condition they were in. Each of the four wikis had identical homepages apart from the links to the related training spaces. Those in the Direct Edit (control) condition were directed to the *Personality Background* page (live wiki content page) where they were informed that the content on this page was live on the wiki and could be seen by other users. They were then given the six tasks to complete on the live wiki page in the order determined by prior randomisation. Participants in the training conditions (SBX, TUT and TUT+SBX conditions) were directed to the appropriate training space and told to complete the training condition before editing the *Personality Background* page. Although all were told that other users were able to access the page when editing live content, each participant had their own unique *Personality Background* page. Each was allocated a unique ID that corresponded to a link to their own sandbox and/or background page. This was to control for the possibility of other participant edits affecting the initial format of the page.

Whilst participants were interacting with the wiki the experimenter monitored the interaction noting data in terms of the completion of the tasks and whether the task was completed accurately. The completion and whether it was completed accurately were measured using a binary categorisation (Yes/No). This data is secondary to the main hypotheses of this research and is analysed in the further analysis section (section 3.3.8.1). The experimenter also noted any observations during the interaction, which were used to identify problematic or abnormal interactions. An example of the experimenter sheet is included in Appendix 1.11.

After completing all tasks on the *Personality Background* page, participants were then asked to complete the state anxiety questionnaire (State-A), the WAI-EA and the WUI. They were asked to think about the experiences with the wiki when completing the WAI-EA and the WUI. State anxiety (State-F) and WAI-EF measures were then administered. Participants were asked to think about how they feel about editing the wiki again when completing the WAI-EF. A short interview was then conducted to investigate each participant's interaction and their views of the effectiveness of their exposed training method in more detail.

Participants were then fully debriefed as to the nature and motivations of the experiment, thanked and paid for participation. Each experimental session lasted approximately one hour. The full experiment scripts for each condition are included in Appendix 1.12.

3.3 Experiment Results

3.3.1 Reliability of Measures

The measures of trait anxiety and computer anxiety held high reliability (*Trait Anxiety*: $\alpha = .90$; *BSCAS*: $\alpha = .83$). The reliability of the state anxiety scale used

overall was acceptable (*State-E*: $\alpha = .62$; *State-P*: $\alpha = .75$; *State-A*: $\alpha = .80$; *State-F*: $\alpha = .80$).

After initial analysis of the reliability of the wiki anxiety measures, item 24 was excluded (“I am concerned that other users can change the edits I make”) from all wiki anxiety inventories. This was because of its low item-total correlation on all wiki anxiety scales and all scales subsequent improvement in reliability after exclusion. Summated scores for each of the questionnaires were calculated using the 24 remaining items. Each wiki anxiety measure held high scale reliability (*WAI-EP*: $\alpha = .92$; *WAI-EA*: $\alpha = .93$; *WAI-EF*: $\alpha = .92$). The WUI was also high in reliability ($\alpha = .92$).

3.3.2 Sample Descriptives

From the means reported in Table 3.5 the sample is similar in terms of trait anxiety ($M = 37.77$, $S.D. = 8.39$) to the norms for college students (Males: $M = 38.30$, $S.D. = 9.18$; Females: $M = 38.76$, $S.D. = 11.95$)¹ (Spielberger et al. 1983).

Table 3. 5- Descriptive Statistics for all questionnaire variables

	N	Scale Min & Max	Mean	S.D.
State-E	77	6-24	9.78	2.30
Trait	77	20-80	37.77	8.39
Comp Anxiety	77	0-24	7.54	2.12
State-P	77	6-24	9.99	2.51
WAI-EP	77	24-120	62.42	13.95
State-A	77	6-24	10.31	3.05
WAI-EA	77	24-120	56.91	16.01
Usability	77	22-110	79.92	14.58
State-F	77	6-24	9.40	2.60
WAI-EF	77	24-120	48.55	13.48

¹ Norms within the manual for the Trait anxiety measure are reported separately by gender and are therefore reported as so.

State anxiety before being introduced to the wiki (State-E: $M= 9.78$, $S.D. = 2.30$) seems lower than the norm for nursing students on state anxiety reported in Marteau & Bekker (1992) ($M= 11.97$ $S.D. = 2.25$). On average the sample also seems slightly lower on computer anxiety ($M= 7.54$, $S.D. = 2.12$) compared to the means gathered from previous research on first year psychology students using the same measure ($M= 8.30$, $S.D. = 2.62$) (Beckers et al. 2007; Beckers 2010). Participants state anxiety is higher just before interaction (State-P: $M= 9.99$, $S.D. = 2.51$) but is at its highest point on average just after editing the wiki (State-A: $M= 10.31$, $S.D. = 3.05$) falling to a lower level towards the end of the experimental session (State-F: $M= 9.40$, $S.D. = 2.60$). The mean usability score suggests that on average participants rated their interactions positively ($M= 79.92$, $S.D. = 14.58$). In terms of wiki anxiety, participants on average were moderately anxious about wiki use before interacting with the wiki editing interface (WAI-EP: $M= 62.42$, $S.D. = 13.95$). The anxiety experienced when editing the wiki (WAI-EA: $M= 56.91$, $S.D. = 16.01$) was much lower than the anxiety before editing the wiki. Participants seemed to be less anxious about editing the wiki again (WAI-EF: $M= 48.55$, $S.D. = 13.48$) than before they edited the wiki for the first time.

3.3.3 Correlation Analysis

Before discussion the results of the correlation analysis it is worth noting that because of the amount of correlations performed, there is an increased probability of Type 1 error (a false positive) in the correlation analysis (Larzelere & Mulaik 1977) due to inflation of the familywise error rate. Therefore the reader should interpret correlations towards the 0.05 significance level in this chapter, and throughout this

thesis, with caution. Furthermore when assessing scale validity, correlation coefficients higher than 0.3 and with significance levels of 0.01 or below tend to be more clearly interpretable (Kline 2000). This should be borne in mind when determining scale validity in the analysis below and in other similar analyses in this thesis. The results of the bivariate correlation analysis are shown in Table 3.6.

In terms of concurrent validity for the anxiety measures, all wiki anxiety measures correlated with measures of state anxiety administered after the wiki introductory pre condition. The anxiety participants had about editing before interaction (WAI-EP), correlated with their state anxiety levels before interaction (State-P) [$r(75) = .404, p=0.000$] after interaction (State-A) [$r(75) = .458, p=0.000$] and towards the end of the experiment session (State-F) [$r(75) = .394, p=0.000$]. Participants' anxiety felt during the interaction (WAI-EA), correlated significantly with state anxiety measured before interaction (State-P) [$r(75) = .423, p=0.000$], after interaction (State-A) [$r(75) = .633, p=0.000$] and towards the end of the session (State-F) [$r(75) = .559, p=0.000$]. Participants' anxiety about future wiki editing (WAI-EF) was also correlated with state anxiety measured before interaction (State-P) [$r(75) = .304, p=0.007$], after interaction (State-A) [$r(75) = .468, p=0.000$] and towards the end of the experiment session (State-F) [$r(75) = .503, p=0.000$].

It is not surprising that all wiki anxiety measures correlated highly with most state anxiety measures administered after precondition as the state anxiety measures were also correlated significantly with each other [State-P & State-A: $r(75) = .680, p=0.000$; State-P & State-F: $r(75) = .735, p=0.000$; State-A & State-F: $r(75) = .762, p=0.000$]. The wiki anxiety measures also correlated significantly with each other [WAI-EP & WAI-EA: $r(75) = .628, p=0.000$; WAI-EP & WAI-EF: $r(75) = .636,$

p=0.000; WAI-EA & WAI-EF: $r(75) = .803, p=0.000$]. It would therefore be expected that all wiki anxiety measures correlated with the state anxiety measures after precondition if measuring anxiety towards wikis effectively. From the correlations, the measures of wiki anxiety have demonstrated high concurrent validity with measures of situational (state) anxiety.

Table 3. 6- Correlations between all questionnaire variables

	Trait	Computer Anxiety	State-P	WAI-EP	State-A	WAI-EA	Usability	State-F	WAI-EF
State-E	.507***	.040	.734***	.246*	.473***	.247*	-.179	.715***	.186
Sig.	.000	.730	.000	.031	.000	.030	.120	.000	.105
Trait		.275*	.550***	.378***	.466***	.284*	-.224	.650***	.326**
Sig.		.015	.000	.001	.000	.012	.051	.000	.004
Comp Anxiety			.146	.480***	.156	.479***	-.391***	.214	.624***
Sig.			.206	.000	.175	.000	.000	.062	.000
State-P				.404***	.680***	.423***	-.334**	.735***	.304**
Sig.				.000	.000	.000	.003	.000	.007
WAI-EP					.458***	.628***	-.479***	.394***	.636***
Sig.					.000	.000	.000	.000	.000
State-A						.633***	-.561***	.762***	.468***
Sig.						.000	.000	.000	.000
WAI-EA							-.824***	.559***	.803***
Sig.							.000	.000	.000
Usability								-	-.748***
Sig.								.558***	
State-F								.000	.000
Sig.									.503***
Sig.									.000

All correlations marked with *** are significant at the .001 level
 All correlations marked with ** are significant at the .01 level
 All correlations marked with * are significant at the .05 level

Trait anxiety correlated significantly with wiki anxiety before interaction (WAI-EP) [$r(75) = .378, p=0.001$] and after interaction (WAI-EF) [$r(75) = .326, p=0.004$]. Participants high in wiki anxiety before interaction and high in wiki anxiety about future interaction therefore also tended to be higher in trait anxiety. However, the strength of the relationship is weaker after interaction. This may be because participants' anxiety about future use is affected by the anxiety experienced with the system (a reference which previously they did not have) rather than solely their propensity towards anxious feeling. There was also a relationship between wiki

anxiety felt during system use (WAI-EA) and trait anxiety [$r(75) = .284, p=0.012$] but it was considerably weaker than the relationship trait anxiety holds with other wiki anxiety variables. It seems that the anxiety participants felt when editing the system has stronger association with state anxiety whereas the anxiety felt before and about future interaction are strongly related to both state and trait anxiety.

In terms of the construct validity of both wiki anxiety and wiki usability measures, usability rating was significantly negatively correlated with wiki anxiety before interaction (WAI-EP) [$r(75) = -.479, p=0.000$], anxiety during interaction (WAI-EA) [$r(75) = -.824, p=0.000$] and anxiety about future interaction (WAI-EF) [$r(75) = -.748, p=0.000$]. Additionally wiki usability also correlated negatively and significantly with state anxiety before interaction (State-P) [$r(75) = -.334, p=0.003$], state anxiety after interaction (State-A) [$r(75) = -.561, p=0.000$] and towards the end of the experiment session (State-F) [$r(75) = -.558, p=0.000$]. Due to the positive nature of the usability variable and the negative nature of the anxiety variables it is expected that a negative correlation would exist between these measures if both were valid measures of their respective constructs. Such findings provide evidence of the validity of the wiki usability measure created. They also further emphasise the validity of the wiki anxiety measure produced.

Computer anxiety correlated strongly with all wiki anxiety measures. Participants who recorded high computer anxiety were also high in wiki anxiety before editing (WAI-EP) [$r(75) = .480, p=0.000$], during editing (WAI-EA) [$r(75) = .479, p=0.000$] and anxiety about editing the wiki in the future (WAI-EF) [$r(75) = .624, p=0.000$]. However computer anxiety did not correlate with any of the state anxiety measures before [State-E: $r(75) = .040, p>0.05$; State-P: $r(75) = .146,$

$p > 0.05$] and after wiki interaction [State-A: $r(75) = .156$, $p > 0.05$; State-F: $r(75) = .214$, $p > 0.05$]. This is surprising as interaction with a computer is integral to interaction with a wiki. Participants who were high in computer anxiety would likely have high state anxiety due to the interaction involving computer use. Instead it is only wiki anxiety that correlates with state anxiety. This suggests that the state anxiety experienced is not related to computers but more wiki focused. It may be that those who are wiki anxious are also computer anxious but the lack of correlation with state anxiety suggests that it is not the computer that is producing the anxious reaction in this interaction. This supports the hypothesis that they are distinct in this experiment scenario. It also suggests that for more accurate measurement of computer related anxieties, more specific anxieties need to be measured especially with the advent of Web 2.0 and the increased applications and uses of computers.

3.3.4 Usability of first experience- Total Score Analysis

From the means presented in Table 3.7, participants in the control group with no training space (*DE*) rate their experience less positively ($M = 69.58$, $S.D. = 14.94$) than participants in the *SBX* ($M = 76.00$, $S.D. = 15.05$), *TUT* ($M = 87.39$, $S.D. = 10.75$) and *TUT+SBX* conditions ($M = 86.95$, $S.D. = 8.99$). Both the *TUT* and *TUT+SBX* condition do not differ largely in terms of their usability ratings. Although there are differences in usability rating, participants in each condition seem to rate their experiences as positive.

Table 3. 7- Mean Wiki Usability Inventory Scores by condition

Learning Aid	N	Mean	S.D.
Direct Edit (DE)	19	69.58	14.94
Sandbox (SBX)	20	76.00	15.05
Tutorial (TUT)	18	87.39	10.75
Tutorial & Sandbox (TUT+SBX)	20	86.95	8.99

A one-way unrelated ANOVA was conducted to observe whether the training conditions (between-subjects) affected usability rating of the interface. There was a significant difference between conditions in terms of usability rating [$F(3, 73) = 8.92, p=0.000$]. LSD Post hoc tests reveal that participants in the *DE* (Control) condition rated the interface as less usable than those in the *TUT* ($p=0.000$) and *TUT+SBX* conditions ($p=0.000$). Participants in the *SBX* condition also rated the system as less usable than participants in the *TUT* ($p=0.007$) and *TUT+SBX* conditions ($p=0.008$). Participants in the *DE* and *SBX* conditions did not significantly differ in their rating ($p>0.05$). Participants in the *TUT* and *TUT+SBX* conditions also did not significantly differ in their rating of the interface ($p>0.05$). Participants in the tutorial conditions therefore rated their first experiences with the interface as higher in terms of usability than those in the conditions without tutorials supporting the hypothesis that there would be a significant effect of training spaces on wiki usability scores.

3.3.5 Usability of first experience- Item Analysis

The analysis of items in the WUI suggest a similar effect to those highlighted in the total score analysis above. However it must be noted before interpreting the comparisons between the conditions that due to the amount of comparisons performed, there is a likelihood of Type 1 error due to inflation of the familywise error rate. Those comparisons significant towards the 0.05 level should be interpreted with caution. Before interpretation it is worth noting that due to reverse scoring of negative items higher scores in each of the items mean a more positive evaluation on that item.

There was a similar significant main effect of condition on the clarity of how to edit the wiki (item 1: $p=0.000$), the ease of use of wiki markup (item 2: $p=0.000$), how difficult participants found the wiki to edit (item 4-reverse scored: $p=0.000$) and how flustered participants felt when using wiki markup language (item 5-reverse scored: $p=0.000$). Scores in the DE (item 1: $M= 2.89$; item 2: $M= 3.10$; item 4: $M= 3.42$; item 5: $M= 2.68$) and SBX (item 1: $M= 3.00$; item 2: $M= 3.50$; item 4: $M= 3.70$; item 5: $M= 2.95$) conditions did not differ significantly ($p>0.05$). Similarly scores between the TUT (item 1: $M= 4.22$; item 2: $M= 4.11$; item 4: $M= 4.44$; item 5: $M= 3.89$) and TUT+SBX (item 1: $M= 4.40$; item 2: $M= 4.35$; item 4: $M= 4.55$; item 5: $M= 4.20$) conditions did not significantly differ ($p>0.05$). However, participants in the DE condition had lower scores than those in the TUT (item 1: $p=0.000$; item 2: $p=0.001$; item 4: $p=0.001$; item 5: $p=0.002$) and TUT+SBX conditions (item 1: $p=0.000$; item 2: $p=0.000$; item 4: $p=0.000$; item 5: $p=0.000$). Those in the SBX condition also had lower score than those in both TUT (item 1: $p=0.001$; item 2: $p=0.04$; item 4: $p=0.012$; item 5: $p=0.014$) and TUT+SBX (item 1: $p=0.000$; item 2: $p=0.004$; item 4: $p=0.004$; item 5: $p=0.001$) conditions. The presence of a tutorial seems to lead to higher clarity, higher ease of use, to participants finding it less difficult and feeling less flustered when editing the wiki.

A significant difference between the conditions in terms of the judgement of how complicated the wiki was to edit was also apparent (item 3-reverse scored) ($p=0.02$). There was no significant difference between DE ($M= 3.58$) and SBX ($M= 3.80$) conditions ($p>0.05$), the SBX and TUT ($M= 4.39$) conditions ($p>0.05$) and the SBX and TUT+SBX conditions ($M= 4.35$) ($p>0.05$). There was also no significant difference between the TUT and TUT+SBX conditions ($p>0.05$). The scores in the

DE condition were significantly smaller than those for the TUT condition ($p=0.011$) and TUT+SBX condition ($p=0.013$). Participants in the DE condition felt editing was more complicated than participants in the TUT and TUT+SBX condition.

There was also a significant difference in feeling under stress when editing the wiki (item 8-reverse scored) in each condition ($p=0.002$). Scores did not significantly differ between the DE ($M= 2.89$) and SBX conditions ($M= 3.45$) ($p>0.05$), TUT ($M= 3.78$) and TUT+SBX conditions ($M= 4.20$) ($p>0.05$) and the SBX and TUT conditions ($p>0.05$). Scores in the DE condition were significantly lower than those in the TUT ($p=0.013$) and TUT+SBX condition ($p=0.000$). Scores in the SBX condition were also significantly lower than those in the TUT+SBX condition ($p=0.027$). Those in the TUT+SBX conditions seemed to be less under stress when editing the wiki than those in the conditions without tutorials (i.e. DE and SBX conditions). Tutorials alone did not make participants feel under less stress in comparison to the other training conditions but they do bring less stress than the DE conditions.

Training method also affected how nervous participants felt when editing the wiki (item 9-reverse scored) ($p=0.016$). There were no significant differences between the DE ($M= 2.95$) and SBX ($M= 3.40$) conditions ($p>0.05$), the DE and TUT ($M= 3.50$) conditions ($p>0.05$), the SBX and TUT conditions ($p>0.05$) and the TUT and TUT+SBX ($M= 4.25$) conditions ($p>0.05$). Participants' scores in the DE condition were significantly smaller than those in the TUT+SBX condition ($p=0.002$). Participants in the SBX condition had significantly lower scores on this item compared to participants in the TUT+SBX condition ($p=0.035$). Those in the

TUT+SBX conditions were less nervous when editing the wiki than those in the conditions without tutorials (i.e. DE and SBX conditions).

A significant difference between the conditions also existed on the item rating feeling in control when editing the wiki (item 13) ($p=0.002$). Participants did not significant differ in their scores between the DE ($M= 3.00$) and SBX ($M= 3.55$) conditions ($p>0.05$), the TUT ($M= 4.17$) and TUT+SBX ($M= 3.75$) conditions ($p>0.05$) and the SBX and TUT+SBX conditions ($p>0.05$). Participants scores in the DE condition were significantly lower than those in the TUT ($p=0.000$) and TUT+SBX ($p=0.011$) conditions. Participants in the SBX condition also rated this item lower than those in the TUT conditions ($p=0.038$). Those in the DE condition felt less in control than those in both the conditions where tutorials were experienced. Experiencing the sandbox also led to less feeling in control compared to the tutorial condition.

The conditions also influenced how easy participants rated it was to get the wiki to do what they desired (item 14) ($p=0.007$). Participants did not significant differ in their scores between the DE ($M= 3.16$) and SBX ($M= 3.45$) conditions ($p>0.05$), the TUT ($M= 3.83$) and TUT+SBX ($M= 4.20$) conditions ($p>0.05$) and the SBX and TUT conditions ($p>0.05$). Participants scores in the DE condition were significantly lower than those in the TUT ($p=0.036$) and TUT+SBX ($p=0.000$) conditions. Participants in the SBX condition also rated this item lower than those in the TUT+SBX conditions ($p=0.016$). Those in the DE condition felt it less easy to get the wiki to do what they wanted than those who had experienced tutorials. Experiencing a tutorial and sandbox led participants to feel it was easier to get the wiki to do what they wanted compared to experiencing non tutorial conditions.

The evaluation of the edit screen being clear was also significantly different depending on the training experience before live editing (item 15) ($p=0.05$). There was no significant difference between scores gained on this item in the DE ($M= 3.53$) and SBX ($M= 3.40$) conditions ($p>0.05$), the TUT ($M= 4.28$) and TUT+SBX ($M= 3.95$) conditions ($p>0.05$), the DE and TUT+SBX conditions ($p>0.05$) and the SBX and TUT+SBX conditions ($p>0.05$). Participants in the DE condition had a significantly lower score than those in the TUT condition ($p=0.026$). Those in the SBX condition also had a significantly lower score than those in the TUT condition ($p=0.009$). Those in the conditions without tutorials rated the clarity of the editing screen lower than those in the tutorial condition.

A significant difference between conditions was also found on scores relating to the participants likelihood of recommending wiki use (item 17) ($p=0.029$). There was no significant difference between DE ($M= 3.26$) and SBX ($M= 3.65$) conditions ($p>0.05$), TUT ($M= 4.17$) and TUT+SBX ($M= 3.85$) conditions ($p>0.05$), SBX and TUT conditions ($p>0.05$) and SBX and TUT+SBX conditions ($p>0.05$). Participants in the DE condition rated their likelihood to recommend significantly lower than the TUT ($p=0.004$) and TUT+SBX conditions ($p=0.049$). Experience of the DE condition seems to significantly reduce the likelihood of recommending wiki use compared to those in tutorial condition.

There was also a significant effect of condition on participants rating of how often they needed to use the on screen help (item 20-reverse scored) ($p=0.000$). Those in the DE ($M= 1.63$) had significantly lower scores than those in the SBX ($M= 2.80$) condition ($p=0.006$). The TUT ($M= 4.11$) and TUT+SBX ($M= 3.35$) conditions did not differ significantly ($p>0.05$), as was the case between the SBX and

TUT+SBX conditions ($p>0.05$). Participants in the DE condition also had lower scores than participants in the TUT ($p=0.000$) and TUT+SBX ($p=0.000$) conditions. Those in the SBX condition also had significantly lower scores than those in the TUT condition ($p=0.014$). Those in DE condition felt they needed to use the on screen help more than those in all other conditions. Participants in the SBX condition needed to use the on screen help more than those in the TUT condition but not more than those in the TUT+SBX condition.

Participants' ease of learning of wiki markup (item 22) was also affected by the conditions ($p=0.039$). Scores in the DE ($M= 3.37$) condition were not significantly different to those in the SBX ($M= 3.70$) condition ($p>0.05$). Similarly those in the TUT ($M= 4.11$) condition did not significantly differ in scores on this item to the TUT+SBX ($M= 4.10$) condition ($p>0.05$) and SBX condition ($p>0.05$). The SBX condition also did not significantly differ to the TUT+SBX condition on scores on this item ($p>0.05$). Participants in the DE condition scored lower than those in both the TUT ($p=0.015$) and TUT+SBX conditions ($p=0.014$). Participants in the DE condition seem to have found wiki markup significantly harder to learn than those in both the TUT and TUT+SBX condition.

There were no significant differences in scores between the conditions in terms of participant rating on items related to fun (item 6) enjoyment (item 7), concentration (item 10-reverse scored), frustration (item 11-reverse scored), knowing what to do next (item 12), need for improvement (item 16-reverse scored), not editing a wiki again (item 18-reverse scored), having too much to learn before editing (item 19-reverse scored) and the ease of remembering wiki markup (item 21) (all items $p>0.05$).

3.3.6 First Experience and Wiki Anxiety- Total Score Analysis

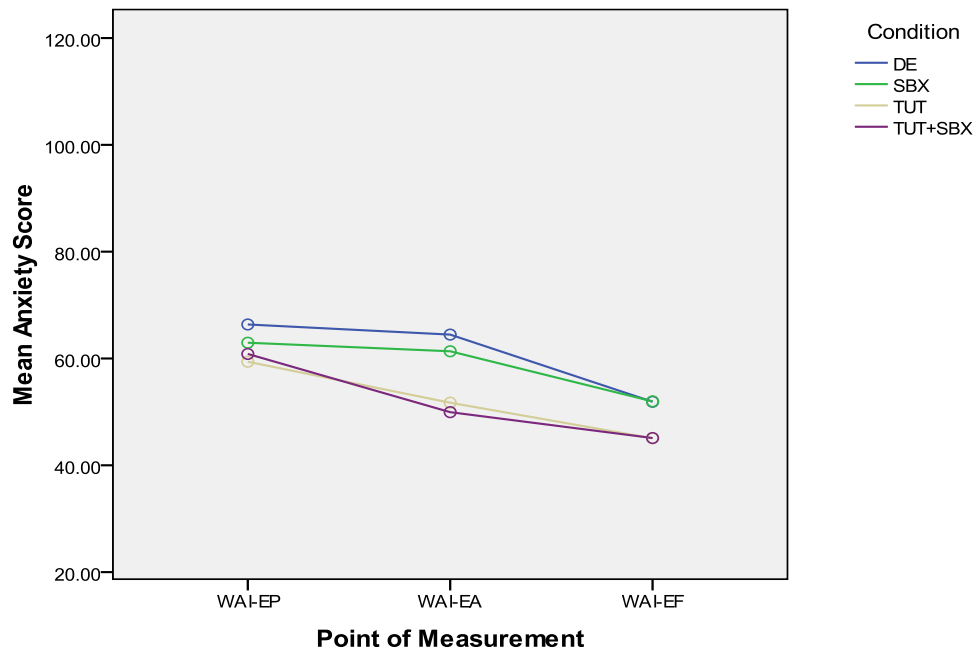
From the means presented in Table 3.8 it can be seen that participants experience less anxiety during interaction (WAI-EA: M= 56.91, S.D. = 16.01) than they do before interaction (WAI-EP: M= 62.42, S.D. = 13.95). Participants also hold less anxiety about future interaction (WAI-EF: M= 48.55, S.D. = 13.48) after interacting with the system than the amount of anxiety felt during and before editing the wiki. Also during wiki editing (WAI-EA) those in the conditions with tutorials (TUT: M= 51.72; S.D. = 14.18; TUT+SBX: M= 49.95; S.D. = 12.27) experience less anxiety than those in conditions without tutorial experience (DE: M= 64.47, S.D. = 16.74; SBX: M= 61.35, S.D. = 16.57). In terms of anxiety towards editing the wiki again participants in the tutorial conditions (TUT: M= 45.06, S.D. = 9.96; TUT+SBX: M= 45.11, S.D. = 8.21) seem to have less anxiety towards future editing than participants in the non-tutorial conditions (DE: M= 51.89, S.D. = 15.54; SBX: M= 51.97, S.D. = 17.16).

Table 3. 8- Mean Wiki Anxiety Scores by condition

Condition	Wiki Anxiety Measure	N	Mean	S.D.
Direct Edit (DE)	WAI-EP	19	66.37	13.98
	WAI-EA	19	64.47	16.74
	WAI-EF	19	51.89	15.54
Sandbox (SBX)	WAI-EP	20	62.95	14.90
	WAI-EA	20	61.35	16.57
	WAI-EF	20	51.97	17.16
Tutorial (TUT)	WAI-EP	18	59.39	14.44
	WAI-EA	18	51.72	14.18
	WAI-EF	18	45.06	9.96
Tutorial & Sandbox (TUT+SBX)	WAI-EP	20	60.85	12.57
	WAI-EA	20	49.95	12.27
	WAI-EF	20	45.11	8.21
Total	WAI-EP	77	62.42	13.95
	WAI-EA	77	56.91	16.01
	WAI-EF	77	48.55	13.48

A 4x3 mixed design ANOVA was conducted to observe the effect of the training conditions (between-subjects) on wiki anxiety at each point of measurement (within-subjects). The Greenhouse-Geisser corrected findings are reported for the within-subjects results due to the assumption of sphericity being violated ($p=0.01$). It was found that there was a significant main effect of time of measurement on wiki anxiety [$F(1.79, 130.48) = 58.29, p=0.000$]. LSD Post hoc tests reveal participants' anxiety about editing the wiki before interaction (WAI-EP) was significantly higher than their anxiety during the interaction (WAI-EA) ($p=0.000$) and their anxiety about future interaction (WAI-EF) ($p=0.000$). Participants' anxiety about future interaction (WAI-EF) was also significantly lower than anxiety experienced during interaction (WAI-EA) ($p=0.000$). A significant main effect of condition on wiki anxiety across the experiment was not found but approached significance [$F(3, 73) = 2.59, p=0.06$]. There was no significant interaction between the time of anxiety measurement and training conditions on anxiety levels [$F(5.36, 130.48) = 1.83, p=0.11$], although the graphical representation of the interaction in Figure 3.4 suggests that the pattern of reduction in anxiety over the measures differs depending on the presence of tutorials within the manipulation.

Figure 3. 4- Graphical representation of the interaction between condition and time of measurement on anxiety levels



Following the usability findings previously mentioned in section 3.3.4 and the trend inferred from the graph in Figure 3.4, conditions were further analysed using categorisation in terms of tutorial presence.

Table 3. 9- Mean Wiki Anxiety Scores by tutorial presence

Condition	Anxiety Measure	N	Mean	S.D.
No Tutorial	WAI-EP	39	64.62	14.37
	WAI-EA	39	62.87	16.51
	WAI-EF	39	51.93	16.17
Tutorial	WAI-EP	38	60.16	13.32
	WAI-EA	38	50.79	13.06
	WAI-EF	38	45.08	8.96
Total	WAI-EP	77	62.42	13.95
	WAI-EA	77	56.91	16.01
	WAI-EF	77	48.55	13.48

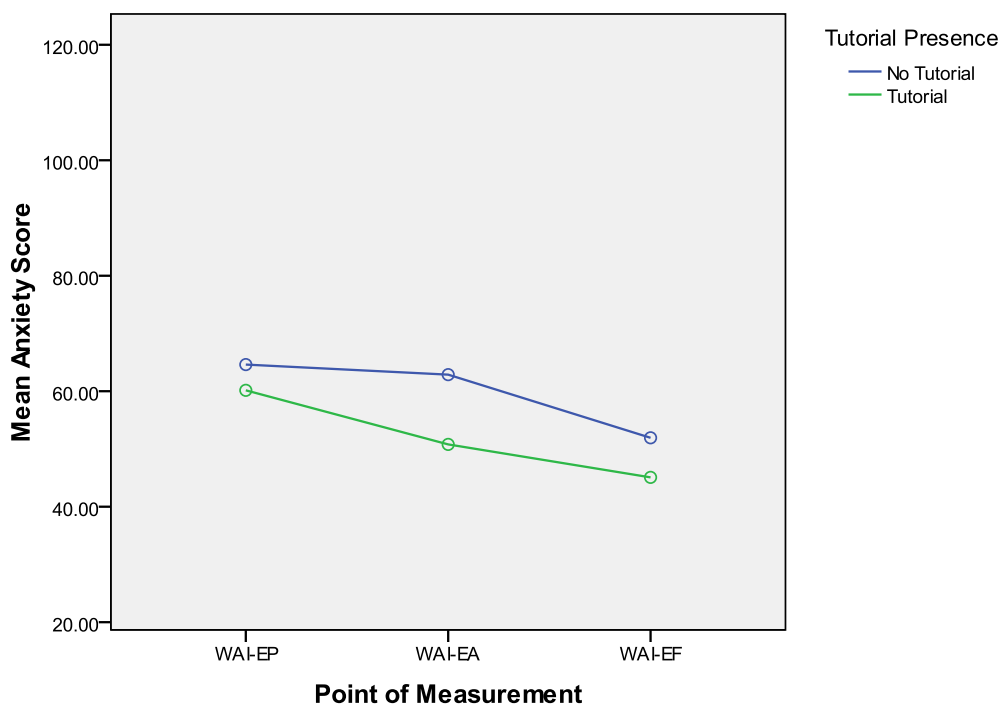
It can be observed from the means that participants' in the *No Tutorial conditions* experience more anxiety when editing the wiki (M= 62.87, S.D. = 16.51)

than those in the *Tutorial* conditions ($M= 50.79$, $S.D. = 13.06$). Participants in the *Tutorial* conditions also held less anxiety about future interaction ($M= 45.08$, $S.D. = 8.96$) than participants in the *No Tutorial* conditions ($M= 51.93$, $S.D. = 16.17$).

A 2x3 mixed design ANOVA was conducted to observe the effect of tutorial presence (between-subjects) on wiki anxiety at each point of measurement (within-subjects). The Greenhouse-Geisser corrected findings are reported for the within-subjects results due to the assumption of sphericity being violated ($p=0.011$). A significant main effect of tutorial presence on wiki anxiety was found [$F(1, 75) = 7.64$, $p=0.007$]. Participants in the *Tutorial* conditions ($M= 52.01$) held less wiki anxiety than participants in the *No Tutorial* ($M= 59.81$) conditions across the anxiety measures. Although this main effect is significant, it states little about the effect tutorial presence has on anxiety during and towards future wiki interaction.

A significant interaction between point of measurement and tutorial presence on anxiety levels was found [$F(1.79, 134.55) = 4.61$, $p=0.014$]. This is represented graphically in Figure 3.5. Tutorial presence therefore had a significant effect on anxiety towards editing the wiki however this effect is different depending on the time of wiki anxiety measurement.

Figure 3. 5- Graphical representation of the interaction between tutorial presence and period of measurement on anxiety levels



Simple Contrasts demonstrated that the effect of tutorial presence was significantly different on measures of anxiety during interaction (WAI-EA) and future interaction (WAI-EF) [$F(1, 75) = 6.15, p=0.015$]. The effect of tutorial presence on future interaction anxiety (WAI-EF) did not significantly differ to differences between conditions in wiki anxiety before interaction (WAI-EP) [$F(1, 75) = 0.80, p>0.05$]. Participants in the tutorial conditions experienced less anxiety during editing but the effect that tutorials had on future interaction anxiety was not statistically different than the difference before editing the wiki between the conditions. In other words participants' anxiety during editing was significantly affected by tutorial presence but tutorial presence did not affect anxiety about future interaction with the wiki. The hypothesis that higher quality first experiences will

affect wiki anxiety experienced during and anxiety about future wiki use was therefore only partially supported.

3.3.7 First Experience and Wiki Anxiety- Item Analysis

The analysis of items in the iterations of the WAI-E suggest similar effect to those highlighted in the total score analysis above. All positive items were reverse scored so that a high total score would reflect high anxiety. Therefore high item scores on positive items reflect a negative assessment of the item.

There was a significant difference between the scores on the measures in terms of the enjoyment of learning about editing (item 1-reverse scored) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.41$) were significantly higher than those in the item in anxiety during editing (WAI-EA: $M= 2.06$) ($p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA) were lower than those in the similar item in the measure of anxiety about future use (WAI-EF: $M= 2.52$) ($p=0.000$). The difference between the item scores on the WAI-EP and WAI-EF measures were not statistically significant ($p>0.05$). There was no main effect of tutorial presence on the item scores ($p>0.05$) and there was no interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants report significantly less enjoyment about the idea of learning how to edit the wiki than the enjoyment they experience when editing. The rating of enjoyment of learning editing the wiki if they had to edit the wiki again was less than their enjoyment when learning how to edit the wiki. There was no difference between the enjoyment they felt they would have when learning to edit the wiki and the enjoyment they had about learning how to edit the wiki in the future. Experiencing tutorials in the training conditions did not affect this.

A similar significant difference was found between measure scores on the items referring to being distracted easily when learning about wiki editing (item 2), difficulty in concentration when editing the wiki (item 14) and how afraid participants were about people finding faults with their edits (item 22) (all $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 2: $M= 2.30$; item 14: $M= 2.29$; item 22: $M= 3.14$) were significantly higher than those in the item in anxiety during editing (WAI-EA) (item 2: $M= 1.66$, $p=0.000$; item 14: $M= 1.65$, $p=0.000$; item 22: $M= 2.69$, $p=0.000$). Scores on the item measuring anxiety before editing (WAI-EP) were significantly higher than those in the anxiety about future use measure (WAI-EF) (item 2: $M= 1.79$, $p=0.000$; item 14: $M= 1.66$, $p=0.000$; item 22: $M= 2.64$, $p=0.000$). The difference between the item scores on the WAI-EA and WAI-EF measures were not statistically significant for all items ($p>0.05$). There was no significant main effect of tutorial presence on the item scores ($p>0.05$) and there was no statistically significant interaction between item scores on each measure and tutorial presence in each item ($p>0.05$). Participants seemed be concerned about distraction before interaction and ratings of being distracted during editing were lower than the concerns of distraction before editing. There was no difference between the distraction rated during editing and the feeling of being distracted if they had to learn about editing a wiki again. Experiencing conditions with tutorials did not affect this. Participants also felt they would find it hard to concentrate when editing before they had experienced editing the wiki compared to how they felt during and about future wiki editing. They also seemed more afraid of others finding faults with their edits before interaction than they were during and if they were to edit the wiki again.

The confidence participants had about being able to learn wiki markup language was significantly different depending on the anxiety measure (item 3-reverse scored) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.27$) were significantly higher than those in the item in anxiety about future interaction (WAI-EF: $M= 1.64$) ($p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA: $M= 2.23$) ($p=0.000$) were higher than those in the similar item in the measure of anxiety about future use (WAI-EF). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). There was a significant main effect of tutorial presence on the item scores ($p=0.006$) where those experiencing conditions with *No Tutorial* ($M= 2.26$) rated their confidence over the measures lower than those in the conditions with *Tutorials* ($M= 1.83$). There was also a significant interaction between item scores on each measure and tutorial presence ($p=0.001$). Simple Contrasts reveal that there was no difference between the effects of tutorials on the item scores on both WAI-EP (No Tutorial: $M= 2.36$; Tutorial: $M= 2.18$) and WAI-EF (No Tutorial: $M= 1.74$; Tutorial: $M= 1.53$) measures ($p>0.05$) but there was a significant difference between the effects of tutorial presence on the item scores on WAI-EA (No Tutorial: $M= 2.67$; Tutorial: $M= 1.79$) and WAI-EF measures ($p=0.002$). This interaction is represented graphically in Figure A.1 in Appendix 1.13. When editing, participants who experienced tutorials tended to feel more confident learning wiki markup than those in the non tutorial conditions. Participants felt more confident about learning wiki markup language in general in the future compared to how confident they felt before and during interacting with the wiki.

There were similar effects in terms of differences between the measures in items referring to feeling more comfortable with wiki markup language as they became more experienced (item 4-reverse scored: $p=0.000$) and scores on the rating of stress in learning wiki markup (item 5: $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 4: $M= 1.97$; item 5: $M= 2.49$) were significantly higher than those in the item in anxiety during editing (WAI-EA) (item 4: $M= 1.57$, $p=0.000$; item 5: $M= 2.22$, $p=0.034$). Scores on the item measuring anxiety before editing (WAI-EP) were also significantly higher than those in the similar item in the measure of anxiety about future use (WAI-EF) (item 4: $M= 1.32$, $p=0.000$; item 5: $M= 1.82$, $p=0.000$). Score on the item during interaction (WAI-EA) were also larger than scores on the item about future interaction (WAI-EF) (item 4: $p=0.004$, item 5: $p=0.000$). There was no main effect of tutorial presence on these item scores ($p>0.05$) and there was no interaction between item scores on each measure in each item and tutorial presence ($p>0.05$). Initially participants felt they would not feel more comfortable after more experience however they felt more comfortable after experience with wiki markup language and then felt it more likely that they would feel more comfortable with further experience in the future. Participants also seemed to feel that learning wiki markup would be stressful however this stress was lower during editing and lower still towards learning more wiki markup language.

Items referring to participants' apprehension towards editing the wiki (item 6), how intimidated participants felt towards wiki editing (item 13) and participants fear of doing something wrong whilst editing (item 20) all differed significantly across measures (item 6: $p=0.000$; item 13: $p=0.001$; item 20: $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 6: $M= 2.84$; item 13: $M= 2.31$;

item 20: $M= 3.09$) were significantly higher than those in the item in anxiety about future editing (WAI-EF) (item 6: $M= 1.99$, $p=0.000$; item 13: $M= 1.80$, $p=0.000$; item 20: $M= 2.23$, $p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA) (item 6: $M= 3.02$; item 13: $M= 2.09$, item 20: $M= 2.97$) were higher than those in the similar item in the measure of anxiety about future use (WAI-EF) (item 6: $p=0.000$; item 13: $p=0.015$; item 20: $p=0.000$). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). There was also a main effect of tutorial presence on the item scores (item 6: $p=0.005$, item 13: $p=0.041$, item 20: $p=0.006$) where those in the *No Tutorial* conditions (item 6: $M= 2.87$; item 13: $M= 2.26$; item 20: $M= 3.04$) had higher scores over the measures than those in the *Tutorial* conditions (item 6: $M= 2.36$, item 13: $M= 1.88$; item 20: $M= 2.48$). There was no significant interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants were therefore less apprehensive, less intimidated and less fearful about doing something wrong when thinking about editing the wiki again compared to before editing and levels of apprehension during editing. Participants in the tutorial conditions were less apprehensive, less intimidated and less fearful in general than those in the no tutorial conditions.

Participants' scores also significantly differed on the measures in terms of the anxiety about making a mistake (item 7) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.80$) were significantly higher than those in the item in anxiety about further editing (WAI-EF: $M= 2.14$) ($p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA: $M= 2.94$) were also higher than those in the similar item in the measure of anxiety about future use (WAI-EF)

($p=0.000$). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). There was no main effect of tutorial presence on the item scores ($p>0.05$) and there was no interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants after experiencing wiki editing were less concerned about making a mistake compared to before experience and during experience.

The scores on each wiki anxiety measure varied significantly in terms of participants rating of feeling uncomfortable editing the wiki (item 9) ($p=0.000$). Scores in the before interaction measure (WAI-EP: $M= 2.35$) were significantly higher than in that about future editing (WAI-EF: $M= 1.91$) ($p=0.002$). Scores on the item measuring anxiety during editing (WAI-EA: $M= 2.33$) were also higher than those in the measure of anxiety about future use (WAI-EF) ($p=0.003$). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). Those who experienced *No Tutorials* ($M= 2.41$) felt more uncomfortable overall than those who experienced *Tutorials* ($M= 1.98$) ($p<0.021$). Although the interaction was seen to be significant ($p=0.022$), Simple Contrasts reveal no interaction comparisons that reach levels of significance ($p>0.05$). This false positive is likely to be a due to the amount of analysis performed. Again after experiencing wiki editing, participants felt more comfortable at the thought of editing it again compared to before experiencing editing and the comfort experienced during editing. Participants in the tutorial conditions were more comfortable across the measures than those in the non tutorial conditions.

In terms of participants feeling at ease with wiki markup (item 10-reverse scored) and confusion participants felt when editing (item 11), there were similar

significant differences between the scores on the measures (item 10: $p=0.000$, item 11: $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 10: $M= 3.17$; item 11: $M= 3.14$) were significantly higher than those in the item in anxiety during editing (WAI-EA) (item 10: $M= 2.51$, $p=0.000$; item 11: $M= 2.37$, $p=0.000$) Scores on the item measuring anxiety during editing (WAI-EA) were higher than those in the similar item in the measure of anxiety about future use (WAI-EF) (item 10: $M= 1.92$, $p=0.000$; item 11: $M= 2.11$, $p=0.025$). Additionally scores on this item in the measure before interaction (WAI-EP) were significantly higher than those gained in the measure focused on future editing (WAI-EF) (item 10: $p=0.000$; item 11: $p=0.000$). Participants' scores on the items in the *No Tutorial* conditions (item 10: $M= 2.82$; item 11: $M= 2.93$) were also significantly higher than those in *Tutorial* (item 10: $M= 2.25$; item 11: $M= 2.15$) conditions (item 10: $p=0.001$; item 11: $p=0.000$). There was also a significant interaction between item scores on each measure and tutorial presence in both items (item 10: $p=0.006$; item 11: $p=0.000$). In terms of item 10, Simple Contrasts reveal that there was no significant difference between the effects of tutorials on the item scores on both WAI-EP (No Tutorial: $M= 3.26$; Tutorial: $M= 3.08$) and WAI-EF (No Tutorial: $M= 2.18$; Tutorial: $M= 1.66$) measures ($p>0.05$) but there was a significant difference between the effects of tutorial presence on the item scores on WAI-EA (No Tutorial: $M= 3.03$, Tutorial: $M= 2.00$) and WAI-EF measures ($p=0.04$). A graphical representation of this interaction is included as Figure A.2 in Appendix 1.13. With item 11, Simple Contrasts reveal that there was again no significant difference between the effects of tutorials on the item scores on both WAI-EP (No Tutorial: $M= 3.28$; Tutorial: $M= 3.00$) and WAI-EF (No Tutorial: $M= 2.49$; Tutorial: $M= 1.74$)

measures ($p>0.05$) but there was a significant difference between the effects of tutorial presence on the item scores on WAI-EA (No Tutorial: $M= 3.03$; Tutorial: $M= 1.71$) and WAI-EF measures ($p=0.014$). A graphical representation of this interaction is included as Figure A.3 in Appendix 1.13. Participants felt more at ease with wiki markup language and less confused during editing and towards further markup use than they did before editing. Participants in the *No Tutorial* conditions tended to feel less at ease with wiki markup language and more confused across the measures than those in the *Tutorial* conditions. In particular, participants in the non tutorial conditions tended to feel less at ease and more confused using wiki markup compared to those using tutorials during editing but this effect was not reflected in them feeling confused if they had to edit a wiki in the future.

Scores on the questionnaires also varied significantly in terms of participants' feelings of being tense towards editing the wiki (item 12) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.37$) were significantly lower than those in the item in anxiety during editing (WAI-EA: $M= 2.67$) ($p=0.04$). Scores on the item measuring anxiety during editing (WAI-EA) were higher than those in the similar item in the measure of anxiety about future use (WAI-EF: $M= 1.82$) ($p=0.000$). The difference between the item scores on the WAI-EP and WAI-EF measures was also statistically significant ($p=0.000$) where participants feeling of tension before editing the wiki were higher than their tension about editing the wiki again. There was also a main effect of tutorial presence ($p=0.001$) where participants in the *No Tutorial* conditions ($M= 2.60$) were more tense over the measures than those in the *Tutorial* conditions ($M= 1.97$). There was no significant interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants'

tension during editing seemed to significantly increase from their feeling of tension about editing yet their tension about editing the wiki in the future was lower than both their tension before and during editing. In general those in the tutorial conditions were less tense than those in the non tutorial conditions across the measures.

Participants also significantly differed in the scores on feeling secure editing the wiki in each of the measures (item 15-reverse scored) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.84$) were significantly higher than those in the item in anxiety about future editing (WAI-EF: $M= 2.03$) ($p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA: $M= 2.72$) were also higher than those in the measure of anxiety about future use (WAI-EF) ($p=0.000$). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). There was also a main effect of tutorial presence on the item scores ($p=0.004$) where those experiencing conditions without tutorials ($M= 2.79$) felt less secure in general when editing the wiki than those who experienced tutorials ($M= 2.27$). There was also a significant interaction between item scores on each measure and tutorial presence ($p=0.006$). The difference between the tutorial presence groups on the measures of being secure before editing (WAI-EP) (No Tutorial: $M= 2.90$, Tutorial: $M= 2.79$) and about future editing (WAI-EF) (No Tutorial: $M= 2.26$; Tutorial: $M= 1.79$) were not significant ($p>0.05$). There was a significant difference in the tutorial presence group scores on the measure of feeling secure during (WAI-EA) (No Tutorial: $M= 3.21$, Tutorial: $M= 2.24$) and about future editing (WAI-EF) ($p=0.042$). A graphical representation of this interaction is displayed in Figure A.4 in Appendix 1.13. Participants felt more

secure in their abilities to edit the wiki in the future compared to before and during wiki editing. Again those in the tutorial conditions felt more secure overall than those without tutorials. More specifically participants in the no tutorial conditions had higher scores than those in the tutorial conditions during editing but this difference was not apparent in the future editing measures.

The measures also differed significantly in how participants rated their certainty to overcome difficulties when editing the wiki (item 16-reverse scoring) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.48$) were significantly higher than those in the item in anxiety about future interaction (WAI-EF: $M= 1.80$) ($p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA: $M= 2.45$) were also higher than those in the similar item in the measure of anxiety about future use (WAI-EF) ($p=0.000$). The difference between the item scores on the WAI-EP and WAI-EA measures were not statistically significant ($p>0.05$). There was no main effect of tutorial presence on the item scores ($p>0.05$) and there was no interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants seemed to feel more certain that they could overcome problems they encountered when editing the wiki again compared to before and during editing.

Participants confidence in using wiki markup language (item 17-reverse scored) and their feeling of being sure they could make the wiki do what they wanted (item 18-reverse scored) also significantly varied in each of the measures (item 17: $p=0.000$; item 18: $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 17: $M= 2.61$; item 18: $M= 2.65$) were significantly higher than those in the item in anxiety about future editing (WAI-EF) (item17: $M= 1.78$,

$p=0.000$; item 18: $M= 1.84$, $p=0.000$). Scores on the item measuring anxiety during editing (WAI-EA) (item 17: $M= 2.57$; item 18: $M= 2.61$) were also higher than those in the measure of anxiety about future use (WAI-EF) (item 17: $p=0.000$; item 18: $p=0.000$). The difference between the item scores on the WAI-EP and WAI-EA measures in both were not statistically significant ($p>0.05$). There was no significant main effect of tutorial presence on the item scores in the items ($p>0.05$) but there was a significant interaction between item scores on each measure and tutorial presence for each item (item 17: $p=0.000$; item 18: $p=0.001$). In item 17, the difference between the tutorial presence groups on the measures of feeling confident before editing (WAI-EP) (No Tutorial: $M= 2.56$; Tutorial: $M= 2.66$) and about future editing (WAI-EF) (No Tutorial: $M= 1.90$; Tutorial: $M= 1.66$) were not significant ($p>0.05$). However the difference in the tutorial presence group scores on the measure of feeling confident using wiki markup language during (WAI-EA) (No Tutorial: $M= 3.03$; Tutorial: $M= 2.11$) and about future editing (WAI-EF) did differ significantly ($p=0.001$). A graphical representation of this interaction is displayed in Figure A.5 in Appendix 1.13. Similarly in item 18, the difference between the tutorial presence groups on the measures of feeling sure about getting the wiki to do what they wanted before editing (WAI-EP) (No Tutorial: $M= 2.64$; Tutorial: $M= 2.66$) and in future editing (WAI-EF) (No Tutorial: $M= 1.97$; Tutorial: $M= 1.71$) were not significant ($p>0.05$). However the difference in the tutorial presence group scores on the measure during (WAI-EA) (No Tutorial: $M= 2.97$; Tutorial: $M= 2.24$) and about future editing (WAI-EF) did differ significantly ($p=0.014$). This interaction is displayed graphically in Figure A.6 in Appendix 1.13. Participants in the no tutorial conditions had higher scores, and were thus less sure and less

confident, than those in the tutorial conditions during editing but this difference was not apparent in the future editing measure. Participants felt surer that they could make the wiki do what they wanted and more confident about wiki markup language if they were to edit it again compared to before and during interaction.

The measures also differed in similar ways in the items referring to how worried participants were about making a mistake that they could not correct (item 19) and the fact that content could be changed making participants uneasy (item 19: $p=0.020$; item 23: $p=0.000$). Scores in the anxiety before interaction measure (WAI-EP) (item 19: $M= 2.56$; item 23: $M= 2.30$) were significantly higher than those in the item in anxiety during editing (WAI-EA) (item 19: $M= 2.17$, $p=0.02$; item 23: $M= 1.82$, $p=0.000$). Scores on the item measuring anxiety before editing (WAI-EP) were also higher than those in the similar item in the measure of anxiety about future use (WAI-EF) (item 19: $M= 2.25$, $p=0.019$; item 23: $M= 1.95$, $p=0.002$). The difference between the item scores on the WAI-EA and WAI-EF measures were not statistically significant ($p>0.05$). There was no main effect of tutorial presence on the item scores ($p>0.05$) and there was no interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants were more worried about making a mistake they could not correct before interaction compared to during and in further wiki editing. Additionally they were more uneasy about content changing before editing compared to during and after interaction.

Being scared about destroying someone else's content also differed significantly across the measures (item 25) ($p=0.000$). Scores in the anxiety before interaction measure (WAI-EP: $M= 2.94$) were significantly higher than those in the item in anxiety during editing (WAI-EA: $M= 2.36$) ($p=0.000$). Scores on the item

measuring anxiety during editing (WAI-EA) were also lower than those in the similar item in the measure of anxiety about future use (WAI-EF: $M= 2.69$) ($p=0.002$). Item scores on the WAI-EP measure were also higher than those on the WAI-EF measure ($p=0.05$). There was no significant main effect of tutorial presence on the item scores ($p>0.05$) and there was no significant interaction between item scores on each measure and tutorial presence ($p>0.05$). Participants were most scared of destroying somebody's content before editing compared to during editing and in future editing. Participants were more scared about destroying someone's content if editing the wiki again compared to during editing.

There were no significant main effects and interactions on items referring to feelings of excitement (item 8-reverse scored) and happiness about other users being able to see their changes to content (item 21-reverse scored).

3.3.8 Further Analysis

3.3.8.1 Task Completion, Accuracy and Use of the Help Tips Box

Chi Square tests were run to investigate whether there was a difference between conditions in task completion and completion accuracy. Task completion and completion accuracy were measured by the experimenter in the session using a binary category variable of Yes/No. Participants were asked in the exit interview whether they noticed the help tips box during the experiment. Again this was coded in a binary categorisation. Due to the nature of the measure of the dependent variable (i.e. categorical rather than interval or ratio data) parametric analysis is inappropriate and non parametric analyses such as Chi Square are used.

There were no significant associations between condition and completion of the simple and complex tasks. All participants (100%) within the experiment

completed tasks 1 and 2. The majority of participants in each condition managed to complete task 3 (DE= 89.5%; SBX= 100%; TUT= 88.9%, TUT+SBX= 95.0%). There was no significant association between the conditions and completion rates on task 3 [χ^2 (3) = 2.60, p=0.457]. In terms of completion rates in the complex task category there were again no significant associations between the conditions and completion rates. Again the majority of participants in each condition completed task 4 (DE= 94.7%; SBX= 100%; TUT= 100%; TUT+SBX= 100%) and there was no significant association between condition and completion of task 4 [χ^2 (3) = 3.09, p=0.378]. Similarly in task 5 the majority completed the task (DE= 84.2%; SBX= 75.0%; TUT= 77.8%; TUT+SBX= 95.0%) and there was again no association between conditions and completion of the task [χ^2 (3) = 3.33, p=0.343]. Again in task 6 the majority of participants complete the task (DE= 94.7%; SBX= 100%; TUT= 100%; TUT+SBX= 100.0%) and there was no significant association between the condition and completion on task 6 [χ^2 (3) = 3.09, p=0.378].

Of those who completed the tasks, again there was no association between conditions and completion accuracy in any of the tasks given in the experiment. In terms of simple task performance all participants (100%) in task 1 and 2 completed the tasks accurately. In task 3 the majority of the participants who completed the task completed it accurately (DE= 94.1%; SBX= 100%; TUT= 87.5%; TUT+SBX= 94.7%) and there was no association between condition and completion accuracy for those who completed the task [χ^2 (3) = 2.65, p=0.448]. In the complex tasks (tasks 4, 5 and 6) participants again did not differ in their accuracy depending on condition. In task 4 and 5 again all participants in all conditions who completed the task completed it accurately (DE= 100%; SBX= 100%; TUT= 100%; TUT+SBX= 100%). In task 6

again the majority of participants in all conditions who completed the task completed the task accurately (DE= 83.3%; SBX= 90%; TUT= 83.3%; TUT+SBX= 95.0%) and there was no significant association between condition and completion accuracy [χ^2 (3) = 1.77, p=0.623].

Previous analysis of the WUI questionnaire items suggested that participants in the different conditions may have needed to use the on-screen help tips box more than others. A Chi Square analysis was run to identify whether participants in the conditions significantly differed in their noticing of the help tips box supplied by Atlassian when editing the wiki. The Chi Square test suggests there was a significant association between the conditions and the noticing of the help tips box [χ^2 (3) = 25.39, p=0.000]. All participants in the DE and SBX conditions (DE= 100%; SBX= 100%) noticed the help tips box, significantly larger than the amount of those who noticed the help tips box in conditions with tutorials (TUT= 44.4%; TUT+SBX= 60.0%). Almost all participants who noticed the help tips box (96.6%) used it during the sessions.

3.3.8.2 Interview Comments

The interview conducted at the end of the experiment allowed participants to express their opinions about the interaction and for them to go into their views and opinions in greater depth. They were asked questions about their general experience, the training spaces, aspects of the editing experience such as the presence of the help tips box on the editing interface and questions to collect their views about site characteristics of the wiki to develop ideas for the further experiments in this thesis. The interview data gives interesting insight into users experiences and on possible interpretations of the quantitative data gathered. However due to the nature of its

transcription (i.e. note-taking within experiment sessions rather than transcription from audio recording), lack of inter-rater analysis and its qualitative nature this data when viewed in isolation from the quantitative data analysis must be interpreted with caution throughout the thesis. The reader should note that the data gathered in the interviews is aimed to aid interpretation of findings in the statistical analysis conducted and to stimulate ideas for further study rather than be used in isolation.

In terms of their general experience most participants commented on the ease and simplicity of editing. These comments were common across all conditions and are also highlighted in the data gathered as usability ratings for each condition were quite positive. Participants stated they felt “*it was quick*” “*it’s quite fun doing it*” and “*it was pretty easy and straightforward*”. Many across the conditions felt that “*it was easier than I thought it was going to be*” suggesting some form of apprehension about the ease of editing before interaction, again something seen in the higher amount of anxiety before interaction compared to during and after experience. It tended to be the SBX condition participants rather than any other condition who mentioned the training area as one of the things they liked about editing the wiki in the session. Also participants in this condition also tended to qualify their comments about the ease of use by stating aspects such as “*once you learned how to do it, it was quite easy to work out*” suggesting that they did not find the interface as intuitive as other conditions with tutorials. Similarly in the DE condition although many felt the interface was usable there seems to be an uncertainty to the interaction not apparent in the comments made during the other conditions such as “*.....when I got the thing right I felt better*” and “*It’s good to press the edit thing and see if it comes out right*”. There seems to be no certainty as to the correct actions to take to achieve the task, in

contradiction to the tutorial conditions where participants are informed of the correct actions to achieve the desired outcome.

This uncertainty and ambiguity was common in comments from those in the DE and SBX conditions when asked about what they disliked about editing the wiki. Participants in the conditions without tutorials (i.e. DE and SBX conditions) generally commented that they found editing the wiki ambiguous and confusing and that they “*found it hard to know what to do*”. There was a clear dichotomy between the tutorial and non tutorial conditions in terms of this as those in conditions with tutorials made comparatively few comments about confusion or ambiguity when editing. This dichotomy of ambiguity may be represented in the pattern in the usability data where the DE and SBX conditions did not significantly differ on usability rating yet the TUT and TUT+SBX conditions were rated as more positive on the usability scale. Additionally in the anxiety data participants in non tutorial conditions felt more anxious during editing than those who experienced tutorial conditions.

In terms of improvements again there was a dichotomy between the suggestions by those exposed to tutorials and those not exposed to tutorials in the experiment. Participants in the DE and SBX conditions overwhelmingly suggested improvements to the help tips box present during editing in terms of making it more visible, making the instructions on it clearer, to stand out more and calls to “*make it idiot proof*”. Those in the tutorial condition rarely mentioned the help box or improvements to the training space in their comments for improvements instead focusing on suggestions such as using “*buttons rather than markup language*” and making the interface “*more enjoyable*”. Most in the tutorial conditions had no

comments about improvements. This stark division again further emphasises the difference in participants' notice of the DE and SBX on the help tips box, something highlighted in the Chi Square analysis in the Further Analysis section. When asked at what point in the interaction they used the help box there was again a clear dichotomy between those who had experienced tutorials and those who had not experienced tutorials. Many participants in the DE and SBX conditions stated they used it to help in practically all markup tasks, although in the sandbox condition many found they only used it in the sandbox training. Of those who noticed the help tips box in the tutorial (which was significantly fewer in the tutorial conditions than the non tutorial conditions as seen in the Chi Square analysis previously) conditions, most seemed to use it to "*double check*" and "*to make sure*" that they were using the markup correctly, although many of those who used it noted they used it for both the sandbox and live editing tasks.

When asked about their feelings about having to use wiki markup language to edit the wiki there were again patterns of differences depending on the conditions. In the DE conditions some stated it was quite straight forward but many stated they were "*Initially ...a bit apprehensive*". There were many that felt confused when using it. In the SBX condition, perhaps due to the practice element of the training space, participants comments tended to focus around initial confusion and uncertainty followed by a feeling of ease at which they used wiki markup. Comments such as "*at first I had no idea but after it was quite easy*" and "*Confused at first but confident afterwards*" were common. Those in the tutorial condition stated very little negative feelings towards wiki markup language. Most enforced the idea they were "*comfortable using it*" and that "*it was easy*". Those in the TUT +SBX condition

again stated their confidence using WML yet some comments were similar to the initial confusion comments in the SBX condition such as “*At first I was a wee bit confused but afterwards it was fine*”. Near unanimous positive comments were given when asked about whether participants found the training condition they experienced helpful. Some elaborated on these points stating that the training conditions gave them more confidence. When asked about how effective they felt the training conditions were in making them feel comfortable with wiki markup language, the majority stated that the training conditions were very effective. Common elaborations on this in the SBX condition were that it acted as a non evaluative practice space where participants could have the “*chance to make mistakes before going live*” and gave participants “*somewhere before being criticised by others who might have seen it*” and that if they had not used the SBX before editing live they would have not have “*known what (they) were doing*”. The elaborations in the TUT conditions tended to be about the quality of the tutorial such as “*it was easily explained with examples*” yet some still felt that it would have been more effective if they could return to the tutorial during editing. In TUT+SBX condition, participants liked the fact that they “*could test it (WML) out before*” going live and seemed to value the practice before editing the live content.

The majority of participants felt positive about the prospect with using such a system in their Higher Education course. Those who elaborated felt the wiki could be useful to “*share ideas*” and that it would “*benefit everyone*”. However apprehension and anxiety were also mentioned. The reasons for such negative feelings were due to possible evaluation of contribution by peers as they stated that they would be “*worried about getting content wrong or doing things that people could do better*”

and that they would be “*a little bit anxious in case (they) did something wrong and the information (they) wrote wasn't right*”. Participants also stated they would be “*a bit worried about writing down something*” and that they’d be a “*bit nervous if (they) had to write something themselves*” on the wiki. These comments highlight potential emotional reactions towards information contribution and content editing rather than due to the interface. Content contribution could therefore be an important aspect of the wiki user experience worth investigating further.

What was also apparent in the interview was that many were apprehensive about the editability of the wiki and perceived problems due to this with content accuracy. Many stated that it was a good thing that information could be added and edited yet many qualified such positive comments with concerns over the final accuracy of the information included on the wiki. Comments such as “*It's good but there would be problems with accuracy*”, “*It'd be good if everybody knew what they were talking about but some people could put on a load of rubbish*”, “*I guess I wouldn't feel (the information) was that reliable*” and “*I wouldn't use it (the information) directly cause it can be edited by anyone*” were common throughout the interview. There were also some who felt concern over their edits being changed stating that “*it could be quite annoying if someone deletes what you've put in*” and “*if someone changed something I put on then it would make me feel quite uneasy*”. Even though research has shown that wikis can lead to high levels of accuracy and that the ability to edit content for inaccuracies easily and quickly facilitates this process (Giles 2005) many are still sceptical about the benefits of this flexibility. There seems to be distrust of editing behaviour in terms of others including accurate information and also deleting correct information. Participants' comments about

changes to *“their content”* also show an idea of individual ownership of the information being supplied rather than a collective attitude conducive to information sharing, something mentioned in previous research (Raitman et al. 2005; Jaksch et al. 2008). As highlighted by the comments deletion of users’ content may also lead to negative emotions towards editing wikis.

Many participants stated that if they were to use the content they would *“double check it”* to *“make sure it was completely correct”* potentially making additional work on behalf of the student when using information on the wiki in Higher Education courses. Most stated that they would use it for *“background information”* or as a *“reference point”* so that they could gather ideas and sources for information. Some participants also made interesting comments about the motivation of the user when editing. They stated that they were happy to use the content because those who make the effort to include information would tend to *“only put up information that they think is true”* and that *“if someone has gone through the effort of editing they are going to know their stuff”*. This, although likely in a voluntary scenario, may not be the case if participation on the wiki is used as part of course assessment. In the same sentiment some were sceptical of their fellow students’ abilities stating *“it could be a student who doesn’t really know...it’s scary you have to take their words for granted”* and *“I’m not sure I would trust the people who are in my class”*. Again, the uncertainty of the other users’ expertise and knowledge seems to cause uncertainty over the accuracy of the content in a Higher Education scenario.

When asked for suggestions about what could make users feel more confident about the accuracy of information on the wiki and what could be done to make

people feel more comfortable about using a wiki in their course a large amount of participants suggested moderation of content by knowledgeable users in the specific research area. Comments such as “*Having a professor check it regularly*” or getting the content moderated by “*someone in the department*” were commonly mentioned by most participants. Additionally participants stated they would use the information on the wiki “*if it was being checked*” Some also suggested display of identity information or further information about the sources used so as to verify the veracity of content. Such suggestions fit the situation within a Higher Education context where if the wiki is to be used as a knowledge source veracity of information is paramount. Yet the suggestions are at juxtaposition with the ethos of egalitarian user status and open editing of content. This highlights the complexity in the acceptance and use of wiki in their natural open form in a Higher Education context.

As the wiki offers options for identity salience, participants were asked what identity they would prefer to use if they were editing the wiki for their course. There seemed to be a clear difference in the desires to be identified when editing the wiki, which can be done either through including identity information of editors on the wiki page or through the page history functionality. The majority of participants who selected *anonymity* as their choice mentioned that they feared negative evaluation of their edits and that they were afraid to get “*something wrong*” and being associated to that error. Those who preferred a *username* did so because their reputation could be preserved because “*people wouldn’t know exactly who I am*” and they could also be identified in some way for the edits they made and others “*would still be able to contact you about it*”. Participants who suggested they would like to edit using their *full name* stated reasons such as the ability to be identified allowed them to “*get*

credit” for edits and be contacted if other users disagreed with their changes. They also thought a system where all users had to edit a wiki using a full name would improve the quality of editing as “*you have more responsibility*”, “*people would think about what they put on*” and it would make people “*less inclined to put wrong information on it if it is their real names*”. It is interesting to note that participants in the anonymous condition mention a fear of negative evaluation when editing the wiki. The type of identity used when editing the wiki may therefore influence the feeling of anxiety users have when editing the wiki. Indeed this anxiety may be related to a user’s propensity to feel anxious about being negatively evaluated. This is explored in the research presented in Chapter 4.

3.4 Discussion

In summary, the findings show that the measures created for this research were reliable measures of each construct showing high levels of internal consistency. All wiki anxiety measures strongly correlated with state anxiety measures suggesting that the scales reflect anxiety experienced towards wikis. Initial anxiety about editing the wiki and anxiety about editing the wiki in the future also strongly correlated with trait anxiety suggesting they may be more influenced by a predisposition to be anxious. Such correlations reflect the psychological construct of wiki anxiety and its validity as a measure of anxiety. In terms of wiki usability, the measure correlated negatively with all measures of wiki anxiety and concurrent measures of state anxiety allowing us to infer an element of construct validity for the wiki usability inventory created and for the wiki anxiety measures. Additionally computer anxiety, although correlated with wiki anxiety at each level, did not correlate with any state anxiety measures included in the experiment. The anxiety experienced in this

experiment seems therefore to be solely related to wiki interaction rather than being computer related. Participants also differed in their usability rating of the editing interface depending on the training space experienced. First experiences with tutorials led to higher usability ratings for the interface than those without. The presence of a tutorial in the training space also led to less anxiety when editing the wiki. Yet the difference between these groups in terms of anxiety about editing the wiki in the future was not significantly different to differences in initial anxiety. Initial experience with the system also reduced anxiety as anxiety about future wiki editing was lower than anxiety before and during editing.

This research adds valuable experiment-based knowledge about the wiki user experience. At present very little is known about user reactions and emotions towards wikis above what is highlighted in observational or field based research (Cole 2009; Forte & Bruckman 2007; Guth 2007; White et al. 2009). Very little is also known about how in-built wiki training spaces (such as sandboxes and in built tutorials) affect users' evaluations of the interface and user emotions. Although usability of the editing interface has been mentioned as a problem for wiki contribution (Ebner et al. 2008), no experiment-based research to the authors' knowledge has attempted to study user evaluations of the system using controlled experiments. The work presented highlights that wiki characteristics such as in-built training spaces do affect wiki user experience variables such as usability and negative emotions towards wiki editing.

In terms of the psychometric properties of the measures, the results show that although all wiki anxiety measures have a relation to state anxiety, only wiki anxiety before interaction and about future interaction also correlated strongly with trait

anxiety. A measure that is not strongly associated with trait anxiety (such as wiki anxiety felt during interaction) would be expected to be more transitory than anxieties more related to trait anxiety. It is the state (situational) anxiety that would be more likely to change in terms of the quality of the interaction and situation change, as was the case in this research. It was also found that computer anxiety did not correlate with any measure of situational (state) anxiety and only correlated weakly with trait anxiety. This is surprising as previous research has found that the presence of a computer has clear effects on state anxiety for computer anxious users and that computer anxiety and trait anxiety are significantly related (Beckers et al. 2007). The findings highlight that the situational anxiety measured is wiki focused. This above all emphasises the need for refinement in the anxiety concepts used to observe users' anxiety towards IT systems. It is likely, as mentioned previously that users are not generally computer anxious but specific systems and situations within computer experiences elicit different anxious reactions and for different reasons. The term computer anxiety betrays this complexity and hinders efforts of usability engineers and IT anxiety researchers in understanding and reducing anxieties relating to IT. The anxiety experienced in this experiment seems to be wiki specific rather than representative of participants' computer anxiety and further research focused on anxiety towards technology should note the ineffective nature of computer anxiety in describing the anxiety felt in this scenario.

In this experiment, more instruction based training led to better usability ratings of the editing interface than more exploratory learning techniques. Getting participants to experience tutorials before editing led to more favourable usability ratings. This is contrary to the findings on training of computer system where

exploratory learning is seen to produce better system satisfaction than instruction-based methods (Simon et al. 1996; Simon & Werner 1996). These findings are however based on using MS-DOS based systems rather than markup language or code based interfaces and are based on traditional training rather than in-built training spaces. It may be that because of the markup based nature of the interface participants found instructional methods allowed them to create a more complete and accurate mental model of the function of the interface. This in turn is likely to have made their interaction with the interface when editing live wiki content better. This lack of ambiguity after experiencing tutorials in the training conditions was mentioned by participants in the post-interaction interview. Such ambiguity in the non-tutorial conditions may also be the reason for higher wiki anxiety when editing the wiki after experiencing these conditions. Interestingly the added use of the sandbox with the tutorial led to no significant increase in usability rating compared to tutorial alone. Indeed there was no significant difference found between the direct edit condition and sandbox condition on participants rating of the interface even though those in the sandbox conditions stated they liked the ability to practice and make mistakes before editing live content. The findings of this research suggest that sandboxes are ineffective as a way of improving users' usability rating of the wiki editing interface. Instruction based training spaces may be best suited for this endeavour.

The research also found that having a good quality first experience (such as those where tutorials were experienced) had a significant effect on the anxiety participants felt when editing the wiki, yet this difference did not transfer to anxiety felt about future interaction as predicted by previous computer anxiety research

(Todman & Drysdale 2004; Todman & Monaghan 1994; McIlroy et al. 2001). The effect during interaction seems plausible as users who experience a more satisfying experience with the editing interface are more likely to feel less anxious during that experience. The anxiety experienced during interaction, as mentioned previously, is also seen to be more state based (situational) so is more likely to be influenced by system related experiences than the wiki anxiety variables strongly related to trait anxiety levels.

The success of tutorials in increasing usability and reducing anxiety in comparison to experiences without tutorials may have important potential implications for wiki success. High user participation is crucial to the success of wiki sites. If users have negative first experiences in terms of poor usability and heightened anxiety when editing wikis they may be unlikely to contribute again. The rate of contribution by students when wikis are introduced into courses is often low (Carr et al. 2007; Cole 2009; Ebner et al. 2006) Ease of use and lack of confidence are highlighted as common reasons for lack of participation (Cole 2009; Ebner et al. 2008). The results of this research suggest that getting users to complete a simple in-built tutorial before editing may reduce these barriers to editing on initial interaction. This may make it more likely that users will also contribute further to the wiki, although further research into the effect of such training tools on future editing frequency is needed for these conclusions to be experimentally supported.

Although no effect of tutorials on anxiety about future editing of the wiki was found, the effect of training conditions on wiki anxiety may be future orientated. The effect each training condition has on wiki literacy, self-efficacy and command retention over time may influence the feeling of anxiety when having to interact with

the wiki in the future. In fact, research on the effect of training on computer anxiety suggests that training may have a delayed effect (Wood et al. 2002). Participants using more instruction based approaches (e.g. tutorial conditions) reduced in computer anxiety compared to more flexible, exploratory learning (e.g. non tutorial conditions) over time rather than directly after training (Wood et al. 2002). It may be that the benefits of positive experience are only evident when having to interact with a wiki again or after future use rather than directly after an experience. Additionally, a good first experience may have an “inoculation effect” on the negative impact of future bad experiences (Todman & Drysdale 2004). Future research should focus on experimenting with the effects of high quality initial experiences on anxiety over time and whether positive first experience does in fact inoculate against a bad experience in the future.

The fact that wiki anxiety reduced at each measure infers that anxiety novice users experience towards wiki editing may in fact reduce with experience. Anxiety about editing the wiki measured at each point after interaction was significantly lower than participants’ anxiety about editing the site before interaction. Exposure to the editing system seemed to reduce anxiety towards wiki editing, reflecting findings of previous computer anxiety research (Chua et al. 1999; Farina et al. 1991) that experience may reduce anxiety towards IT. However, because of the user group, wiki anxiety measured before interaction is likely to be because of lack of familiarity with the interface and the wiki concept, even though an introduction was given before editing. Such a claim about further experience reducing any anxiety towards wikis would therefore be premature. Recent research looking at the effect of experience on anxiety towards wiki use suggests that anxiety towards wikis did not change with

experience (Cowan et al. 2009), although these findings were not based on controlled exposure to the system and the anxiety measured was less specific than the anxiety towards editing measured in this thesis. The amount of experience with the system was controlled in this experiment but was only one experience with the system. Research observing the amount of experience after introduction may be more appropriate to make firm conclusions about the role of experience in wiki anxiety reduction above the reduction likely from lack of familiarity seen here.

As is the case with any technology, the way in which wikis are being edited is evolving. Although wiki markup language is the main interface for wiki editing, there is a rise in popularity of rich text editors for simple editing tasks. These editors resemble word processor interfaces in terms of using common GUI and WYSIWYG interface principles rather than command based language and syntax. The increasing use of such systems allows users with little technical knowledge to edit wiki content but only to complete basic editing tasks. Rich text editors may influence the anxiety experienced during interaction especially when the interaction involves simple editing and formatting tasks. It may also bring differences in future interaction anxiety as the difference between both interfaces is more extreme than the potential emotional difference when using markup language in all conditions. A point of interest in the wiki user experience may also be in user development where users reach the boundaries of the Rich Text editor functionality. Being introduced to wiki markup early in users' experiences is likely to lead to better usability and lower anxiety when completing complex tasks using this interface compared to users who need to switch interaction methods for more complex task completion. Research is

needed to observe the effect of Rich Text interfaces on wiki usability and editing anxiety.

The interviews conducted after the research highlight some of the concerns users have about the use of wiki information in a Higher Education context. Issues in terms of editability and the accuracy of information on the system because of this were common. At the core seems to be a distrust of the abilities of other contributors to supply accurate information. This distrust is understandable in a context where the accuracy of knowledge being supplied is paramount to the effectiveness of the system. This is an area where, as suggested by previous research, the involvement of lecturers and other members of the teaching team on courses could lead to improved trust in the accuracy of the information present on the wiki (Carr et al. 2007). Indeed similar improvements were suggested by participants in this research.

What was also of interest in the interviews was that many of the concerns participants had were more towards information contribution and potential amendment of their content rather than the use of the editing interface. Doubts about the accuracy of the content they may contribute, fear of negative evaluation by peers and concerns of their edits being amended or deleted were regularly mentioned concerns in the interviews conducted. Previous research has identified that users feel exposed when sharing information on the wiki (Carr et al. 2007) and have doubts on quality of their contributions which affect editing frequency (Cole 2009) which could lead to anxiety when contributing content to wiki systems. A users' level of anxiety about negative evaluation in general may relate to the levels of anxiety experienced when editing the wiki. Such anxiety towards editing may not only be experienced by novice users but users who have previous experience using wikis in Higher

Education contexts when contributing content. Wiki characteristics such as the options of editing anonymously, using a pseudonym or a full name identity could affect these anxiety levels during editing. This provides the motivation for the research presented in the next chapter in this thesis (Chapter 4).

At this point it is important to mention potential limitations to the generalisation of this research because of the sample's relative homogeneity in terms of age and gender. The participants tested in this research were mostly female and were undergraduate students. This was due to the characteristics of the user population for which the wiki was designed and the context of use being on wiki use in Higher Education. In this research the wiki was designed to be relevant to psychology students with information being edited on the wiki focusing on the topic of Personality. This academic area was chosen specifically because the author had knowledge of the first year psychology curriculum and could therefore create a relevant and realistic wiki scenario and context for use. The wiki could be seeded with relevant content from the course at the level to which the students were studying adding to the realism of the experimental scenario and ensuring that any anxiety experienced was not due to editing content from an unfamiliar subject area. The gender imbalance accurately reflects the characteristics of this population. With wikis proliferation in the wider public spheres of enterprise and government, wider age groups with different contexts of use need to be tested before such conclusions can be generalised to wiki user experience in other scenarios.

3.5 Summary

The research presented takes a step towards studying the wiki user experience using controlled experiments by looking at the effects of in-built training spaces on

novice user usability and anxiety towards wiki editing. Little research focusing on the user and wiki systems attempts to assess their user experience empirically and this research volunteers a methodology and example of this. This research has demonstrated the successful development and use of measures to assess users' usability and anxiety towards wiki editing. It also adds significant knowledge about the user experiences of the wiki editing interface and the effects in-built tutorials have on these experiences. Conditions with in-built tutorials led to higher usability ratings of the interface compared to those training spaces where tutorials were not experienced such as sandbox and direct editing conditions. The presence of tutorials led to less anxiety during editing but did not affect levels of anxiety about future editing. Initial anxiety towards editing in novice users also seems to dissipate after experiencing wiki editing. Importantly the wiki anxiety participants experienced was independent of computer anxiety which shows the difficulty in measuring affective negative reaction effectively using such an over arching anxiety concept in experimental conditions. What is certain is that site characteristics affect the wiki user experience and variables that may be key to the success of wiki sites. It is also clear from participant comments that further research on the wiki user experience is needed with specific focus on user emotions towards content contribution. Site characteristics that govern the saliency of identity when editing may affect editors' anxiety levels during editing. This is the main focus of further research in the following chapter.

CHAPTER 4- THE EFFECT OF EDITING IDENTITY ON WIKI ANXIETY AND WIKI USABILITY DURING EDITING

4.1 Introduction

This chapter reports findings of an experiment-based study into wiki users' anxiety towards editing when contributing content. It aims to investigate the effect of different levels of real world identity salience on anxiety experienced and whether the levels of identity also affect users' usability rating of the system. The chapter extends from the findings presented in the last chapter (Chapter 3-*The Training Spaces Experiment*) where site characteristics (in terms of in built training spaces) were seen to affect usability and wiki anxiety experienced during wiki editing. The previous chapter concentrated on novice users' experience and was very much focused on the use of wiki markup language in editing. The research presented in this chapter investigates negative emotions and usability ratings towards the wiki from users who have experience editing wikis and focuses on the contribution of content in a Higher Education context. The shift of user group is based on the desire to understand whether site characteristics influence student users' emotional relationship with wikis in contribution. Such users may not hold anxiety due to initial exposure as likely in Chapter 3 but may still be anxious when contributing to the wiki because of fear of negative evaluation by other users, the acceptance of their edits by the community and concerns over the perceived quality and veracity of their contributions. Editing using different identities may influence such feelings during editing. Indeed identities where users feel less restricted by identity concerns may also lead to positive usability rating of their editing experience.

There is a large amount of research on the effects of the anonymity of computer mediated communication (CMC) comparing online and face to face communication and subsequent effects on disclosure and behaviour. Yet there are few examples of experimental research assessing the effects of differing identity saliency on variables related to the user experience of collaboration systems such as wikis. This research aims to offer insight in this area.

The issue of identity salience when contributing to collaborative systems may be influential in the user experience of wiki systems. Previous qualitative research has identified that wiki users tend to fear the judgement of other users when contributing to wiki systems and lack confidence in the quality of their contributions (Giordano 2007; Guzdial et al. 2002; Ardichvilli et al. 2003). Furthermore users mention that they are concerned over the criticism their contributions might attract from other wiki users (Da Lio et al. 2005). The identity with which users edit the wiki could alleviate such concerns by reducing the saliency of the users' identity when contributing to the user community. For instance the ability to edit anonymously may lead users to be less concerned over such reputation effects compared to using identities which are attached to their real world identities when editing wiki systems.

Indeed the salience of user identity and its effects on the wiki user experience could have ramifications for wiki use in Higher Education where users may be expected to contribute as a course requirement. Reducing anxiety during editing is likely to encourage users to contribute. Yet anonymous editing is problematic in a Higher Education scenario. For the teaching team to mark contributions or to identify student development, the use of an identity is integral so that edits can be tracked in

the wikis page history. Moreover using some form of identity would allow development of a reputation for users who are seen as good contributors compared to anonymised situations where this cannot occur (Cress & Kimmerle 2006). A compromise between the benefits of anonymity and the need for identification would lie in the use of unique identifiers that are not commonly known throughout the peer group (such as users' university matriculation number). Contributors could be identified by the teaching team and develop status as a reputable contributor by their peers whilst their real world identity is anonymous to their peer group. Such levels of identity salience may affect user anxiety when contributing and usability rating of the system and the investigation of this form the motivation for this work.

The salience of real world identity may also influence how users feel when conducting different types of editing behaviour. Studies looking at wiki use in both business and educational context have highlighted user reluctance to edit other users contributions (Da Lio et al. 2005; Guth 2007; Lund & Smordal 2006; Munson 2008). Students have been seen to edit their own contributions rather than editing those made by others and find it difficult to embrace the collaborative nature of wiki content creation (Guth 2007). Users may feel concerned that they are editing others' content in which retribution may be sought or offence may be taken (Da Lio et al. 2005). Although users may be reluctant to edit others' contributions this action is a necessary process when creating knowledge resources on wikis. Content that is deemed as unnecessary or inaccurate must be deleted or amended so that the page reflects the interpretation of the user community. The identity used when editing may facilitate such behaviour by reducing anxiety when editing others content. Users may be less concerned about deleting content on the wiki page if they are anonymous or

using a pseudonym rather than editing using their full name. Indeed usability rating of the editing experience may also be affected as users may feel freer to explore the types of editing behaviour (such as addition and deletion) under more anonymous identities.

As inferred users' anxiety and usability rating when editing the wiki may be particularly affected by the ability to be anonymous when editing. Early research on comparisons of CMC (relatively anonymous) to face to face (non-anonymous) communication suggests that users behave and feel differently in both these scenarios. CMC leads to less inhibition, a reduction in self awareness and a dilution of the effects of social hierarchy on communication participation (Kiesler et al. 1984). This relatively anonymous communication form dampens social cues and differences leading to an equalisation of users in terms of communicating in decision tasks (Dubrovsky et al. 1991). Anonymity has also been demonstrated to lead to lower social anxiety and social desirability scores compared to when tests were named suggesting a trend towards disinhibition when anonymous (Joinson 1999). This supports the idea that *“under the protective cloak of anonymity users can express the way they truly feel and think”* (McKenna & Bargh, 2000, p.62). Self presentation concerns tend to be lower in anonymous situations. Being anonymous allows users the flexibility to express ideas without the fear of negative evaluation from peers and the constraints of other social forces (Christopherson 2007). The anonymity provided by CMC, when compared to face to face communication, has been shown to reduce anxiety in social situations and make socially anxious users feel more accepted and comfortable communicating (Rice & Markey 2009; McKenna 2008). Indeed those communicating in anonymous conditions have been

seen to make more self disclosed comments than those in non-anonymous communication conditions (Joinson 2001). The lack of concerns over self presentation and negative judgement may lead to lower anxiety towards contributing in a collaborative context. Anonymity may see users less anxious when volunteering ideas and interpretations of research compared to more identity salient conditions. In reference to system satisfaction recent research looking at user interaction in online chat scenarios found that users rated their experience as more satisfying when both they and the interlocutor were anonymous compared to when both were fully identifiable (Tanis & Postmes 2007). It was thought that the lack of flexibility in self representation in the full identity condition may have led to this effect. Such an effect may be evident in usability rating of wiki editing experience.

Self presentation and status effects present in face to face communication are also likely to be present in the use of non-anonymous identities in computer based social systems (McKenna & Bargh 2000). However the use of an identity benefits the user in terms of developing reputation and social capital (Donath 1998). In virtual communities the use of real names has been seen to increase trust between the users and accountability for the contributions made (Millen & Patterson 2003). Such identities also relate to identities, assumptions of ability and relationships in the real world (Millen & Patterson 2003) thus giving viewers of information an ability to assess the validity and accuracy of contribution. Yet this identification is socially costly if information is judged as poor or irrelevant by the community. This social risk may lead users to be more anxious when editing content using their real world named identity and lead to lower usability ratings because of this system characteristic. The use of a pseudonym in contribution to knowledge communities

reduces the ability for content to be traced to real world identities and also allows users to gain reputation benefits for content contribution (Donath 1998). They allow an element of anonymity whilst providing the opportunity to construct an identity that users (and teaching staff in a Higher Education context) can then use to assess quality of contribution through previous activity. It allows for reputation to be separate from the users' real world identity therefore meaning potential judgements by peers do not affect real world status or group standing. This is particularly important in wikis where social relationships and dynamics between the users exist outside of wiki use, such as those used to support Higher Education courses. A reduction in real world identity cues may therefore lead to less anxiety when contributing in this scenario.

The research presented in this chapter has four aims. Firstly it aims to ensure that the measures, which have been altered from those in Chapter 3 (the *Training Spaces Experiment*) to be relevant to the change in scenario in this research, retain reliability and validity. It is expected that the measures of wiki anxiety and wiki usability will reach acceptable levels of reliability for psychometric measures (Kline 2000). Additionally it is expected that all other measures included in the research reach acceptable levels of internal consistency. To demonstrate concurrent validity it is hypothesised that all wiki anxiety measures will correlate significantly and strongly with their concurrent state anxiety measure. Indeed if wiki anxiety across the measures correlated, each measure of wiki anxiety would be expected to correlate with other state anxiety measures across conditions. This would suggest that the anxiety measured using the wiki anxiety measure is related to the overall situational anxiety experienced. A measure of trait anxiety was also taken to observe the

relationship it may have with wiki anxiety experienced in this experiment. In terms of construct validity for the wiki usability measure it would be expected that wiki usability, due to its positive nature, would correlate negatively with both concurrent state and wiki anxiety measures taken in the experiment. This would also be evidence of the construct validity of the wiki anxiety measures used.

Additionally it is hypothesised that users tendency to experience fear of negative evaluation will significantly correlate with wiki anxiety experienced in each condition. A person's fear of negative evaluation is the feelings of apprehension about unfavourable evaluation by others in social situations (Weeks et al. 2005). This concept is widely used as an indicator of levels of social anxiety (Collins et al. 2005). Those who are higher in such fear therefore are hypothesised to hold higher levels of anxiety during editing, especially in conditions with identity cues.

The main purpose of this work is to identify whether wiki anxiety and wiki usability are significantly affected by the identity conditions experienced. It is hypothesised that there will be a significant difference between wiki anxiety experienced during editing depending on the identity conditions used. Similarly it is hypothesised that the identity conditions experienced will have a significant effect on wiki usability. Additionally it is hypothesised that there will be a significant effect of edit type on wiki anxiety and wiki usability. There will be a significant difference between the anxiety users experience when adding content compared to when users are deleting and replacing the content of other users. Similarly there will be a significant difference between users' usability ratings when adding content compared to when users delete and replace other users content with their own. Furthermore a significant interaction between the identity conditions and the type of edit is

hypothesised on both wiki anxiety and wiki usability variables. Users' anxiety during editing and usability rating in the different edit type scenarios will be significantly affected by the identity users are using when editing.

4.2 Experiment Materials and Method

4.2.1 Sample Characteristics and Recruitment

74 undergraduate psychology students at the University of Edinburgh took part in the experiment. 16 were male and 58 were female. The gender distribution of the sample is representative of that present in the population being tested. Participants were recruited via email using the psychology undergraduate mailing lists and were asked to take part in research investigating web based learning tools. In this email they were informed they would receive an £8 honorarium for participation and were asked to give their names and contact information so they could be contacted to arrange participation. As the experiment aimed to test participants with experience editing wikis, only those with previous editing experience were contacted to take part in the experiment. Participants' edit data was gathered from previous wiki use in psychology using a macro supplied by Atlassian Confluence to allow for monitoring of wiki user activity. Those who had shown interest in taking part in the study and had also edited the wiki previously in their psychology course (as identified by the data gathered using the Confluence macro) were contacted to arrange a time for participation. Participants who had not edited a University wiki previously but who had shown interest in participating in the study were contacted and asked if they had any previous experience with online collaborative systems. Those who replied they had used wikis previously were recruited for the experiment. Those who had no previous experience with wikis were

informed that there were already sufficient participants and were thanked for showing an interest in the study. To further ensure only those who had edited a wiki completed the experiment participants were asked if they had edited wikis previously in the demographic questionnaire. If they stated they had not then they were informed of their ineligibility to take part and were thanked for showing an interest in the study.

72 of the 74 participants were between ages 17 and 27 with one aged 38 and another aged 42. The sample had a mean age of 21.51 years (S.D. = 3.18). All (74) had previous experience editing a wiki. 71 participants had previously edited an Atlassian Confluence wiki at the University of Edinburgh with 3 participants having experience editing other wikis. A large proportion (35) of participants had last edited a wiki between 6 and 12 months prior to the experiment. 34 participants in the sample had not edited a wiki for over a year. The remainder of the participants had edited the wiki between 1 and 6 months prior (6) or between 1 and 4 weeks prior (1). Those in the sample who had edited a Confluence wiki were experienced editors on average (M= 18.76; S.D. = 15.44).

4.2.2 Experiment Design

To simulate the use of wikis in a relevant Higher Education context to the sample, the experiment scenario was focused towards the use of wikis in the psychology undergraduate course. As mentioned in Chapter 3 (*The Training Spaces Experiment*) psychology students were used because of their previous experience editing wikis in an educational context as well as the author having knowledge of the research areas covered in the undergraduate course. This made the recruitment of a sample with experience editing in an education context possible while also

facilitating the creation of ecologically valid tasks and wiki content for this sample. The experiment was based around a scenario of collaborating with other undergraduate psychology students in building an online knowledge repository for central theories in each area of psychology taught in the undergraduate course at the University of Edinburgh. Participants were informed that the wiki page edited took the form of describing a major theory in psychology and then describing findings from a relevant recent paper that have influenced thoughts on that theory. The scenario given to participants is included in Appendix 2.1. The theory used was Levelt's model of language production (Levelt et al. 1999). It was chosen because of its position as a major theory in psycholinguistics and is taught throughout the undergraduate course at the University of Edinburgh. A summary of the theory was created by the experimenter and posted on the wiki so that the wiki was seeded with content before participants edited the wiki. This content can be seen in Figure 4.1. This was so as to reduce the possibility of anxiety during editing being confounded with anxiety due to being the first contributor. The seeding of content served to add legitimacy to the claim that other users had been contributing previously to the site, which was stated in the scenario. The pages also included pre-designed sections that were used as references for areas of the page where participants were to include content as part of the tasks. Full-page examples of the wiki pages are included in Appendix 2.2.

Figure 4. 1- Levelt's Model PSYCHWIKI page content

PsychWiki(1)

Levelt's model of language production

last edited by s0667902 on Sep 30, 2009 (view change)

Labels: [ADD LABELS](#)

✓ This page was last modified by s0667902 on Sep 30, 2009 18:03

Levelt's (1999) model of language production involves 3 levels; the conceptual stratum, lemma stratum and Word form stratum.

- The **Conceptual stratum** holds representations of semantic (meaning) information about words. Each node in this level represents one concept.
- The **Lemma stratum** contains syntactic features of words represented in the conceptual stratum.
- The **Word-Form stratum** contains phonological information for the production of the word into speech.

The activation feeds down the levels of the model. When someone wants to utter the word SHEEP for example, the relevant conceptual node gets activated. Activation of the conceptual nodes of semantically related words is also increased (such as the word ANIMAL or GOAT).

The activation of the conceptual node SHEEP spreads activation to the relevant lemma node for that word. Other conceptual nodes activated also spread activation to their relevant nodes but the activation is spread in proportion to their activation at the conceptual stratum level (SHEEP thus receiving more activation than GOAT). A lemma node activates other nodes in the level linking to the words syntactic properties i.e. gender and noun.

The activation is then spread to the Word Form stratum. Only one lemma is selected before the activation is passed to Word Form stratum. This suggests there would be no activation of words such as GOAT as their lemma activation is not passed to the Word Form level. Also importantly, the model predicts that no feedback can be passed from the Word Form level to the Lemma level.

Figure 1: Graphical representation of Levelt et al. (1999)'s language production model (Taken from Cleland & Pickering, 2003).

RECENT RESEARCH ON THE MODEL

Cleland, A., & Pickering, M.J. (2003). *The use of lexical and syntactic information in language production: Evidence from the priming of noun phrase structure*. Journal of Memory and Language, 49, p. 214-230.

The paper looks at Levelt's model in the production of complex sentence structures.

All participants experienced editing the wiki using three identity conditions in a within-subjects design. Each of the conditions varied in their levels of anonymity. In the *Anonymous* condition no identity information was attached to their contributions in the wiki page editing history. Participants were informed that the edit they made would be labelled as *Anonymous* on the system. Directly before editing wiki content participants were reminded that they were editing anonymously and that no identity information would be attached to their edits. When editing in the *Matric* condition participants were given a student number created by the experimenter (s0686784). They were informed that this matriculation number would be recorded in the wiki page edit history along with the edit they made. Before being

able to edit the wiki participants in this condition were asked to login using the username and password details attached to this identity. This reflected the real world processes that would take place if such an identity was being used to edit the wiki in their course. Before participants edited the wiki in this condition they were informed that they were editing the wiki with their matriculation number attached to the edits they made. In the *Name* condition participants were told that they would be editing the wiki using the name Sam Smith. In the *Name* condition they were told that their name would be attached to the edit they made in the pages edit history. Again to access the wiki page being edited participants needed to login to the wiki site using login details provided. This again is reflective of the processes when editing using a named identity on the wiki. Directly before editing participants were reminded that they were editing the wiki with their full name attached to the edits they made. The identities and related login information are included in Appendix 2.3.

In all identity conditions they were reminded that other users can access the wiki and the page edit history and that they were editing live content that other users could access and see on the wiki. All participants were informed that the relevant identity would also appear at the top of the page to inform other users that they were the last editor of that page. The order of condition experience was randomised creating six possible condition orders so as to control for potential order effects on anxiety and usability measures within the experiment. These orders are represented in the analysis as the between-subjects variable Condition Order and are displayed in Table 4.1.

The editing tasks in the experiment concentrated on contributing information to the wiki page. The information to be contributed came from three experiments

published in a paper written by University of Edinburgh academics that had influenced thoughts on Levelt's model of language production (Cleland & Pickering 2003). Each of the three tasks completed were related to a specific experiment in the source paper. Participants were given excerpts from the paper where the findings of these experiments were described. Each excerpt sheet given to participants also had a related summary where the findings of the relevant experiment were clearly denoted and described. These were created by the experimenter to ensure that the findings were clearly communicated to the participant before contributing the information or in case of unfamiliarity with the theory. The clarity and ease of understanding of these excerpt sheets was tested in practice sessions where individuals who had no experience with the theory or the material used completed the tasks successfully. Each task focused on a specific excerpt from the paper describing findings from the research on the model mentioned above. In these tasks each participant was asked to contribute the content to the page sections relevant to the excerpt they had just read. Participants were also asked to complete these tasks in their own words to increase personal engagement in the task and facilitate ecological validity. The task included the title of the area to which the content in the excerpt referred. All participants received all three excerpts and each excerpt had a matching relevant task. The order in which the excerpts were presented to participants (and thus the tasks) was randomised. This was so as to control for any effects of differences in difficulty of the excerpts on the dependent variables and possible confounds this may bring when editing using the different identities. The tasks were randomised into three orders using Latin Squares. These different orders are the source of the between-subjects variable Task Order and are displayed in Table 4.1. The excerpts used in the

experiment and the tasks are included in Appendix 2.4. During each task participants edited the wiki using the rich text editor so as to ensure that the potential affect of the independent variables on the dependent variables in the research was not confounded by the effects of using wiki markup language.

The experiment varied in the type of edit participants were asked to perform. Half of the participants were asked to add content to the wiki (*Addition* condition) and the other to delete previous users' content and replace it with content from the excerpt (*Delete and Replace* condition) creating the between-subjects variable Edit Type. Due to this variation between participants the wiki pages edited in each of these conditions varied in terms of the content present. The varying structure of the wiki pages for the different edit type conditions can be seen in Figure 4.2 and Figure 4.3 as well as Appendix 2.2.

Figure 4. 2- Structure of Levelt's Model PSYCHWIKI page in addition editing condition

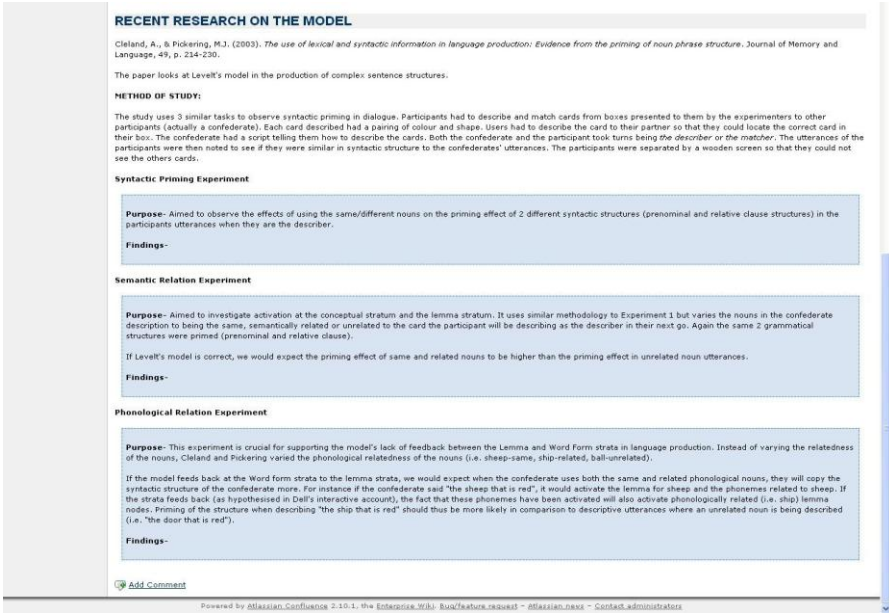
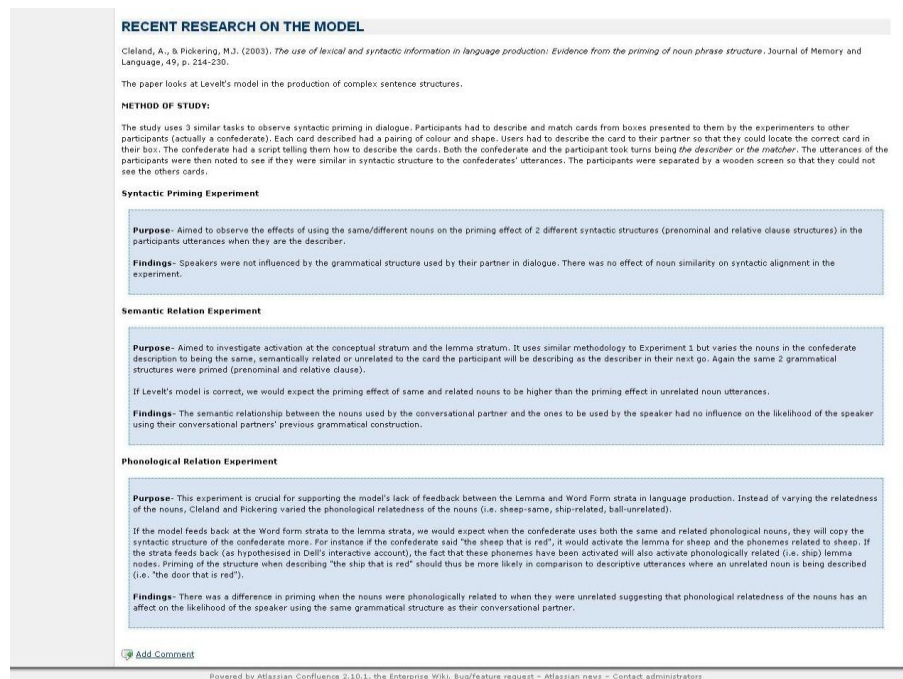


Figure 4. 3- Structure of Levelt's Model PSYCHWIKI page in delete and replace condition



Participants in the *Addition* condition were greeted with blank sections on the page beside where they were asked to include the information from relevant excerpts. In the tasks they were explicitly asked to include the information from the excerpt beside the Findings heading in each relevant experiment area of the page. In contrast for participants in the *Delete and Replace* condition the findings sections have been completed with content. They were informed that previous contributors had inaccurately quoted the findings of the experiment and that they were to delete this content and replace it with the correct findings from the excerpt. The content deleted was relevant to the content with which it was being replaced as both referred to the findings in the source paper. However the findings that the participant was to delete stated the opposite to what the excerpt used by the participant stated. Within each of these edit type conditions, the experiment was balanced for condition order and task order producing 18 condition order-task order pairs. These are shown in Table 4.1.

Table 4. 1- Condition and Task Order pairings in each edit type condition level

Orders	Condition Order	Task Order
1	ABC	123
2	ABC	231
3	ABC	312
4	ACB	123
5	ACB	231
6	ACB	312
7	BAC	123
8	BAC	231
9	BAC	312
10	BCA	123
11	BCA	231
12	BCA	312
13	CAB	123
14	CAB	231
15	CAB	312
16	CBA	123
17	CBA	231
18	CBA	312

Condition A= Anonymous
Condition B= Matric
Condition C= Name

4.2.3 Questionnaire Measures

4.2.3.1 Wiki Anxiety and Wiki Usability Questionnaires

Both wiki anxiety (The Wiki Anxiety Inventory-Editing) and wiki usability (The Wiki Usability Inventory) questionnaires designed for this thesis were revised due to the change in editing context for this study. The research in the previous chapter (*The Training Spaces Experiment*) focused on users editing using wiki markup language and items in the measures made reference to this. As participants were being asked to contribute content rather than use a specific editing interface the items with specific mention of wiki markup in both measures were changed to refer to editing in general. Additionally the participants in the previous research were novice users likely to have some form of anxiety towards learning wiki markup

language and editing processes. Indeed the focus of the experiment lay in training aids rather than contribution of content. In this study the participants have previously edited wikis and items focused on learning are unlikely to be valid in this context. Therefore the items referring to learning in both previous wiki anxiety and usability measures were excluded from these measures.

Items were added to the measure from further analysis of the wiki and usability literature and from themes gathered in the participant interviews conducted in the *Training Spaces Experiment*. Specifically in the case of usability, the major usability self-report measures (i.e. SUMI, QUIS and MINERVA scales) were also re-reviewed to identify whether further items could be included in the scale. The items in both measures were then defended in a meeting of experts. The items included in the wiki anxiety and wiki usability measures in this study are presented in Table 4.2 and 4.3 respectively.

Table 4. 2- Items for the Wiki Anxiety Inventory- Editing included in this study

Item	Grouping	WAI-E-Pre	WAI-E	Polarity
1	Interaction	I am apprehensive about editing the wiki	I felt apprehensive when editing the wiki	(-)
2		I am anxious about editing the wiki for fear of making mistakes	When editing the wiki I felt anxious about making a mistake	(-)
3		I am excited about editing the wiki	I felt excited when editing the wiki	(+)
4		I feel comfortable about editing the wiki*	I felt comfortable about editing the wiki*	(+)
5		I feel at ease about editing the wiki*	I felt at ease editing the wiki*	(+)
6		I feel relaxed about editing the wiki*	I felt relaxed whilst editing the wiki*	(+)
7		I feel intimidated about editing the wiki	I felt intimidated while editing the wiki	(-)
8		I will find it hard to concentrate when editing the wiki	I found it hard to concentrate when editing the wiki	(-)
9	Confidence	I will feel secure when editing	I felt secure when editing the	(+)

		the wiki*	wiki*	
10		I am certain that I can overcome any difficulties I may encounter when editing the wiki	I was certain I could overcome any difficulties I encountered in editing the wiki	(+)
11		I am confident that I would be able to contribute to the wiki*	I felt confident when contributing to the wiki*	(+)
12		I am happy to contribute content to the wiki◇	I was happy to contribute content to the wiki◇	(+)
13		I am worried about making mistakes that I cannot correct when editing the wiki	I was worried about making a mistake that I could not correct when editing the wiki	(-)
14		I am afraid that I may do something wrong when editing the wiki	I was afraid that I might do something wrong when editing the wiki	(-)
15		I am confident that the information I contribute will be correct◇	I was confident that the information I was contributing was correct◇	(+)
16	Fear of Judgement	I am afraid that people will find faults with any edits I may make	I was afraid that people may find faults with any edits I made	(-)
17		I am nervous about what other users will think of my edits◇	I was nervous of what other users might think of my edits◇	(-)
18		I am concerned that people will know it was me that was contributing to the wiki◇	I was concerned that people would know it was me that was contributing to the wiki◇	(-)
19		Thoughts of being judged by other users make me feel tense◇	Thoughts of being judged by other users made me feel tense◇	(-)
20	Flexibility Concerns	The fact that content can be changed makes me uneasy	The fact that content could be changed made me uneasy	(-)
21		I am nervous about changing existing content on the wiki◇	I was nervous about changing existing content on the wiki◇	(-)
22		It scares me to think that I could accidentally destroy someone else's content	It scared me to think that I could accidentally destroy somebody else's content	(-)

* Refers to rewording of items from WAI-E in Chapter 3

◇ Refers to items added to the measure

The WAI-E-Pre was administered before interaction with the wiki to measure anxiety towards wiki editing before interaction. The WAI-E measure was administered after each editing experience to measure participants' anxiety during wiki editing in each of the identity conditions. The new version of the scale was made up of 9 positive and 13 negatively worded items. Wiki anxiety was measured using a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree

(5). All positively worded items were reverse scored so that a high score reflected high anxiety levels.

Table 4. 3- Items for the Wiki Usability Inventory (WUI) included in this study

Item	Grouping	WUI	Polarity
1	Ease of Use	It was clear how to edit the wiki	(+)
2		I found the wiki easy to use*	(+)
3		I thought editing the wiki was complicated*	(-)
4		I thought editing the wiki was confusing◇	(-)
5		The wiki was difficult to edit	(-)
6	Enjoyment	I got flustered when editing the wiki*	(-)
7		Editing the wiki was fun	(+)
8		I enjoyed editing the wiki	(+)
9		I found editing the wiki satisfying◇	(+)
10		I felt under stress when editing the wiki	(-)
11		Editing the wiki made me feel nervous	(-)
12		I had to concentrate hard when editing the wiki	(-)
13		I found editing the wiki frustrating	(-)
14	Control	When editing the wiki I always knew what to do next	(+)
15		I felt in control when editing the wiki	(+)
16		I found it easy to get the wiki to do what I wanted it to do	(+)
17	Interface Quality	I thought the interaction with the wiki was efficient◇	(+)
18		I felt that editing the wiki took too long◇	(-)
19		The layout of the wiki edit screen was clear	(+)
20		The wiki editing interface needs improvement*	(-)
21	Intentions to Use	I would recommend editing a wiki to others	(+)
22		I would not edit a wiki like this again	(-)

* Refers to rewording of items from WUI in Chapter 3

◇ Refers to items added to the measure

The WUI was administered after each editing experience to measure participants' usability rating after experiencing each identity condition. The scale used a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) referring to how much each participant agreed with each item. The scale was made up of 11 positively worded items and 11 negatively worded items. Negative items were reverse scored so that a high score on the WUI reflected a positive usability rating.

4.2.3.2 Other Questionnaires included in the research

Other questionnaires included in the research measured concepts of State Anxiety (Marteau & Bekker 1992), Trait Anxiety (Spielberger et al. 1983) and Fear of Negative Evaluation (Collins et al. 2005). A demographic questionnaire administered before the experiment session and an interview at the end of the experiment were also administered.

State anxiety was measured using the same short form as in the research presented in the *Training Spaces Experiment* in Chapter 3 (Marteau & Bekker 1992). The measure includes 3 positive items and 3 negative items that refer to people's anxiety at the moment of measurement. Participants were asked to think about how they felt at that moment when completing each state anxiety measure. The short version of the measure was used so as to reduce the risk of questionnaire fatigue influencing the completion of the other questionnaires. State anxiety was measured before interaction with the wiki and after each edit experience. State anxiety was measured using a 4-point Likert scale ranging from "Not at all" (1) to "Very Much" (4) referring to how they felt at that moment. Positive items were reverse scored so that the total score reflected the negative concept of anxiety.

A measure of trait anxiety was also included using the trait section of the State Trait Anxiety Inventory (Spielberger et al. 1983). The questionnaire contains 9 positive items and 11 negative items measuring people's predisposition towards anxious feeling. Participants were asked to respond to the items thinking about how they *generally* feel (rather than how they felt at that moment as in the state anxiety measures). Trait Anxiety was measured using a 4-point Likert scale ranging from "Almost Never" (1) to "Almost Always" (4) referring to frequency of feeling. Positively worded items were reverse scored so that the total score reflected the negative concept of anxiety.

The brief version of the Fear of Negative Evaluation scale (Fear of Negative Evaluation Brief- FNEB) (Collins et al. 2005) was also included in the experiment. The measure contains 12 negatively worded items measuring people's discomfort and apprehension about social evaluation. It was measured using a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Previous research measuring fear of negative evaluation using brief versions of the scale have noted poor validity of the positively worded items included with participants finding the interpretation of these difficult (Carleton et al. 2006; Duke et al. 2006; Weeks et al. 2005). The research therefore advocates the use of negatively worded versions of these original items to preserve scale sensitivity (Carleton et al. 2006; Collins et al. 2005) creating a fully negatively worded scale. Therefore no reverse scoring was necessary in calculating the total score of the scale. The measure included in this research has previously shown high validity and internal reliability ($\alpha = 0.97$) (Collins et al. 2005).

The items of each questionnaire in the research were randomised within the measures to create 4 order sets that were randomly allocated to each experiment ID before the experiment. This was so as to control for possible effects due to item order and participants remembering the order of their responses between each of the questionnaire iterations. Additionally all questionnaires were administered using paper versions so as to eliminate any potential inflation of anxiety levels on the measures due to the use of a computer. All measures used in the experiment, demographic and interview questions are included in Appendix 2.5. The scale maximums and minimums of each measure are included in Table 4.4 in section 4.3.2.

4.2.4 Procedure

As stated in section 4.2.1 participants' edit data was gathered from previous wiki use in psychology using a macro supplied by Atlassian Confluence to allow for monitoring of wiki user activity. The amount of edits participants had previously made when using a Confluence wiki at the University was matched to their name when being booked in for the experiment. An experiment ID was given to them when they arrived to take part and the edit data attached to the relevant ID so as to preserve the anonymity of the data.

Participants were randomly allocated to an experiment ID upon arrival. The ID had predefined edit type, condition orders, task orders and questionnaire orders related to them. Participants were welcomed by the experimenter and were told that they were to contribute information to a wiki aimed at psychology undergraduate students called PSYCHWIKI. They were reminded that they were able to stop the session at any point and were asked to give consent to taking part in the experiment through completing a consent form. This is included in Appendix 2.6. The

experimenter then completed the demographic questionnaire with the participant, asking questions about previous courses taken in their psychology degree, gender, age and experience with wikis. After completing the demographic questionnaire they were also asked to complete State anxiety (State-Pre), Trait anxiety (Trait) and Fear of Negative Evaluation (FNEB) scales. After completion of these questionnaires participants were informed they would be editing the wiki soon but before they edit the wiki they were to complete a questionnaire about their feelings towards editing the wiki soon (WAI-E-Pre). Whilst participants were completing these questionnaires the experimenter navigated to the relevant page on PSYCHWIKI. To minimise the time this took, an HTML page with predefined links to the wiki page being edited was created. This also removed any potential influence extra interaction with the wiki may have on participants' anxiety and usability assessments during the experiment.

Participants were then asked to read the experiment scenario and were informed that during their interactions with the wiki they would be editing live content. They were told that although they were contributing for the first time other users had already been using and contributing to the site. In reality each participant edited their own personal version of the wiki page. This was so as to ensure that the content for each participant was the same upon starting editing and free from edits already made by other participants. Participants were informed that before editing the wiki they would be given an excerpt from a paper being used on the wiki page they were to contribute to. They were asked to take as long as they needed to read each of the excerpts and use the information from the excerpt to complete the tasks of contributing to the wiki during the experiment.

Participants were then informed of the identity condition that they were using in their first editing task. This determined which page they viewed when starting their interaction. When editing using the *Anonymous* condition participants commenced at the relevant wiki page. When editing in the *Matric* and *Name* conditions participants commenced their interaction at the University's EASE login screen to gain access to the wiki. Participants were given identity specific login details to access the wiki page that needed to be edited. With each link to the wiki page EASE login had to be completed, although in the *Anonymous* condition this was completed by the experimenter using login details for an *Anonymous* identity whilst participants completed questionnaires. This created the illusion to participants that no login details were needed for the *Anonymous* condition (which would be the case if they were editing anonymously). This illusion was created to keep all wiki pages in the experiment away from open editing by third parties. Making a wiki on the Edinburgh University Central Wiki Service open to editing by all (and thus open to anonymous editing) risked others editing the pages and potentially damaging the experiment wiki sites. Additionally setting multiple identity permission levels on each participant's wiki page was not possible. So as they did not notice the experimenter completing the login details for the *Anonymous* condition, the room was laid out so that participants had their back to the experiment set up between editing experiences when they were completing the questionnaires.

Participants were then asked to read the paper excerpt needed to complete the task given. Although those in each edit type condition received the same excerpts, the type of edit asked to be made was dependent on the edit type condition participants were allocated to. Participants were allowed to keep the excerpts for

reference throughout the completion of their task to ensure that anxiety during editing was not influenced by concerns over not being able to remember the information in the excerpt. Before they started editing participants were reminded of the identity they were editing with and that they were editing live content that other users could access and see. After completing the first task participants were asked to complete state anxiety, wiki anxiety and wiki usability questionnaires.

During this time the experimenter navigated using the HTML page to the EASE page and gave the participant the relevant login details for the identity condition (for the *Matric* and *Name* conditions) or completed the detail fields using the login information for the *Anonymous* identity taking participants directly to the wiki page being edited (in the *Anonymous* identity condition). Participants were then informed that they were ready to edit the page again and were asked to read another excerpt from the paper used on the wiki page. They were then asked to complete the task given. Again before starting they were reminded of the identity condition they were editing with, that they were editing live content that other users could access and see and that they were to use their own words to complete the task. They then completed state, wiki anxiety and wiki usability questionnaires.

Again during this time the experimenter navigated using the HTML page to the relevant opening pages (EASE login for *Matric* and *Name* conditions and the wiki page for the *Anonymous* condition). They were then asked to edit the wiki again, complete the login detail fields (if the identity condition required) and given a further excerpt from the paper used on the wiki page. They were then given the relevant task and before commencing reminded of the identity they were editing with, that they were editing live content that other users could access and see and that

they were to complete the task in their own words. The participants then completed state, wiki anxiety and wiki usability questionnaires. During all interactions the experimenter completed the experimenter sheet related to the participants' ID to note successful task completion, use of their own words, the amount of attempts made and any observations during the tasks. An example of this experimenter sheet is included in Appendix 2.7. A post-interaction interview was then conducted. Upon completion of this participants were thanked for participation and debriefed as to the motivations of the research. The scripts used in this experiment are included in Appendix 2.8.

4.3 Experiment Results

4.3.1 Reliability of Measures

The measures of state anxiety in the experiment held good internal reliability (*State-P*: $\alpha = .76$; *State-Anon*: $\alpha = .86$; *State-Matric*: $\alpha = .84$; *State-Name*: $\alpha = .0.88$) and were similar to reliability coefficients gathered in previous research ($\alpha = .82$) (Marteau & Bekker 1992). The scale reliability of the trait anxiety and brief fear of negative evaluation scales were high (*Trait Anxiety*: $\alpha = .91$; *FNEB*: $\alpha = .91$) and again similar to those mentioned in previous research (*Trait Anxiety*: $\alpha = .93$; *FNEB*: $\alpha = .97$) (Collins et al. 2005; Beckers et al. 2007). In terms of the internal consistency of the wiki anxiety measures all showed high Cronbach alpha values (*WAI-E-Pre*: $\alpha = .93$; *WAI-E-Anonymous*: $\alpha = .95$; *WAI-E-Matric Number*: $\alpha = .95$; *WAI-E-Name*: $\alpha = .96$). The wiki usability measures in each condition also held high reliability (*WUI-Anonymous*: $\alpha = .94$; *WUI-Matric Number*: $\alpha = .94$; *WUI-Name*: $\alpha = .95$).

4.3.2 Sample Descriptives

From the means reported in Table 4.4 the sample is similar in terms of trait anxiety (M= 38.26, S.D. = 8.92) to the norms for college students on trait anxiety (Male: M= 36.47, S.D. = 10.02; Female: M= 38.76, S.D. = 11.95) (Spielberger et al. 1983). State anxiety before editing the wiki (*State-Pre*: M= 9.68, S.D. = 2.75) is lower than the norm for nursing students on state anxiety reported in Marteau & Bekker (1992) (M= 11.97 S.D. = 2.25). With reference to fear of negative evaluation (FNEB) the sample (M= 36.09, S.D. = 10.16) is higher on fear of negative evaluation than the norms of the community sample reported in Collins et al. (2005) (M= 29.2, S.D. = 8.2).

Table 4. 4- Descriptive statistics for continuous variables in experiment by condition

	Condition	N	Scale Min & Max	Mean	S.D.
State	Pre	74	6-24	9.68	2.75
Trait		74	20-80	38.26	8.92
FNEB		74	12-60	36.09	10.16
WAI-E	Anonymous	74	22-110	54.74	15.03
State		74	6-24	11.12	3.60
WAI-E		74	22-110	52.04	17.02
WUI	Matric	74	22-110	83.24	14.77
State		74	6-24	11.04	3.10
WAI-E		74	22-110	55.50	16.92
WUI	Name	74	22-110	83.00	15.14
State		74	6-24	11.20	3.61
WAI-E		74	22-110	56.24	19.21
WUI		74	22-110	82.58	16.87

In terms of wiki anxiety, participants on average were moderately anxious about wiki editing before conducting the tasks (*WAI-E-Pre*: M= 54.74, S.D. = 15.03). The anxiety experienced when editing the wiki using the *Anonymous* condition (*WAI-E-Anonymous*: M= 52.04, S.D. = 17.02) was lower than the anxiety before

editing the wiki and also lower than the anxiety experienced when editing the wiki using both the *Matriculation Number* (*WAI-E-Matric*: M= 55.50, S.D. = 16.92) and the *Name* (*WAI-E-Name*: M= 56.24, S.D. = 19.21) identities. Participants did not differ greatly in terms of the usability ratings after each identity condition with all experiences gaining high usability scores (*WUI-Anonymous*: M= 83.24, S.D. = 14.77; *WUI-Matric*: M= 83.00, S.D. = 15.14; *WUI-Name*: M= 82.58, S.D. = 16.87)

4.3.3 Correlation Analysis

A bivariate correlation analysis was conducted to identify the relationships between the questionnaire variables included in this study. The results of the bivariate correlation analysis are shown in Table 4.5. In terms of concurrent validity for the wiki anxiety measures, all measurements of wiki anxiety correlated with state anxiety measurements after experiences with the wiki. Participants wiki anxiety in the *Anonymous* condition correlated strongest with the state anxiety recorded in the *Anonymous* condition [$r(72) = .754, p=0.000$] but also correlated with state anxiety in the *Matric* [$r(72) = .545, p=0.000$] and *Name* conditions [$r(72) = .467, p=0.000$]. Anxiety experienced during the *Matric* condition correlated the strongest with state anxiety in the *Matric* condition [$r(72) = .660, p=0.000$] but also correlated significantly with state anxiety in the *Anonymous* [$r(72) = .424, p=0.000$] and *Name* [$r(72) = .535, p=0.000$] conditions. Wiki anxiety in the *Name* condition again correlates strongest with the concurrent measure of state anxiety [$r(72) = .770, p=0.000$]. Similarly the wiki anxiety experienced during editing in the *Name* condition correlated significantly with state anxieties measures in both *Anonymous* [$r(72) = .415, p=0.000$] and *Matric* [$r(72) = .597, p=0.000$] conditions. Therefore the anxiety during editing measured in each condition related significantly to their

concurrent measures of state anxiety suggesting good concurrent validity for the wiki anxiety measure used. Wiki anxiety during each condition also correlated with state anxiety in other conditions.

This correlation with all other measures of state anxiety after conditions would be expected seeing as though wiki anxiety in each condition correlates significantly. Wiki anxiety experienced in the *Anonymous* condition correlates significantly with both wiki anxiety experienced in the *Matric* [$r(72) = .678, p=0.000$] and *Name* [$r(72) = .583, p=0.000$] conditions. Similarly wiki anxiety in the *Matric* condition correlated significantly with wiki anxiety in the *Name* condition [$r(72) = .779, p=0.000$]. Therefore those with higher scores in each condition tended to have higher scores in all other conditions. This finding is also replicated in the correlations between state anxiety measures within the wiki interaction. Participants state anxiety in the *Anonymous* condition correlated significantly with the state anxiety in the *Matric* [$r(72) = .639, p=0.000$] and *Name* [$r(72) = .578, p=0.000$] conditions. State anxiety in the *Matric* condition also correlates with state anxiety in the *Name* condition [$r(72) = .762, p=0.000$]. The strong significant correlations between the wiki anxiety and state anxiety measured within the interaction context and the reflection of the correlations between wiki anxiety variables in state anxiety variables suggests that the measure of wiki anxiety show validity in measuring anxiety experienced within wiki interaction. Interestingly the measure of anxiety towards wiki editing before interaction (WAI-E-Pre) did not correlate with participants' state anxiety before experience (State-Pre) [$r(72) = .185, p>0.05$] or trait anxiety [$r(72) = .227, p>0.05$].

Table 4. 5- Correlation matrix of questionnaire variables in the study

	N	Trait	BFNES	WAI-E-Pre	State-Anon	WAI-E-Anon	WUI-Anon	State-Matric	WAI-E-Matric	WUI-Matric	State-Name	WAI-E-Name	WUI-Name
State-Pre	74	.442***	.240*	.185	.550***	.253*	-.228	.463***	.074	-.125	.412***	.187	-.202
<i>Sig.</i>		.000	.040	.115	.000	.030	.051	.000	.531	.288	.000	.111	.084
Trait	74		.595***	.227	.360**	.249*	-.202	.352**	.127	-.142	.384***	.260*	-.242*
<i>Sig.</i>			.000	.051	.002	.032	.084	.002	.282	.228	.001	.025	.038
BFNES	74			.321**	.323**	.324**	-.221	.255*	.359**	-.223	.311**	.393***	-.261*
<i>Sig.</i>				.005	.005	.005	.059	.029	.002	.056	.007	.001	.025
WAI-E-Pre	74				.458***	.598***	-.469***	.553***	.690***	-.543***	.559***	.715***	-.569***
<i>Sig.</i>					.000	.000	.000	.000	.000	.000	.000	.000	.000
State-Anon	74					.754***	-.654***	.639***	.424***	-.439***	.578***	.415***	-.481***
<i>Sig.</i>						.000	.000	.000	.000	.000	.000	.000	.000
WAI-E-Anon	74						-.800***	.545***	.678***	-.624***	.467***	.583***	-.600***
<i>Sig.</i>							.000	.000	.000	.000	.000	.000	.000
WUI-Anon	74							-.573***	-.544***	.836***	-.586***	-.511***	.829***
<i>Sig.</i>								.000	.000	.000	.000	.000	.000
State-Matric	74								.660***	-.618***	.762***	.597***	-.618***
<i>Sig.</i>									.000	.000	.000	.000	.000
WAI-E-Matric	74									-.696***	.535***	.779***	-.570***
<i>Sig.</i>										.000	.000	.000	.000
WUI-Matric	74										-.598***	-.591***	.864***
<i>Sig.</i>											.000	.000	.000
State-Name	74											.770***	-.813***
<i>Sig.</i>												.000	.000
WAI-E-Name	74												-.727***
<i>Sig.</i>													.000
WUI-Name	74												
<i>Sig.</i>													

All correlations marked with *** are significant at the .001 level

All correlations marked with ** are significant at the .01 level

All correlations marked with * are significant at the .05 level

It did however correlate strongly and significantly with all other measures of wiki anxiety during wiki interaction [WAI-E-Anon: $r(72) = .598, p=0.000$; WAI-E-Matric: $r(72) = .690, p=0.000$; WAI-E-Name: $r(72) = .715, p=0.000$]. Additionally it correlated with all other measures of state anxiety measured during interactions with the wiki [State-Anon: $r(72) = .458, p=0.000$; State-Matric: $r(72) = .553, p=0.000$; State-Name: $r(72) = .559, p=0.000$]. Furthermore there were no significant correlations between state anxiety measured before interaction and wiki anxiety measured in both the *Matric* [$r(72) = .074, p>0.05$] and *Name* [$r(72) = .187, p>0.05$] conditions and its relationship with wiki anxiety in the *Anonymous* condition [$r(72) = .253, p=0.030$] is statistically weak. This may be because participants' state anxiety before editing was not wiki focused but more general. There was no frame of reference in terms of wiki interaction to the state anxiety in this case as participants had not experienced interaction in the experiment scenario yet. Its correlation with other anxiety variables during wiki interaction seems to support this interpretation. Therefore the hypothesis that all wiki anxiety measures will correlate with their concurrent state anxiety measures (and other state and wiki anxiety measures) is supported apart from in the wiki anxiety measure before interaction. Although it correlates with other measures of wiki anxiety and state anxiety during interaction it does not correlate with its concurrent measure of state anxiety. This as mentioned may be due to the frame of reference in the measures and the lack of interaction with wikis at the time of measurement.

Levels of trait anxiety were shown to correlate positively with levels of state anxiety throughout the experiment [State- Pre: $r(72) = .442, p=0.000$; State-Anon- $r(72) = .360, p=0.002$; State-Matric: $r(72) = .352, p=0.002$; State-Name: $r(72) =$

.384, $p=0.000$]. Participants high in trait anxiety therefore reported high levels of state anxiety when measured. Interestingly trait anxiety correlated weakly with wiki anxiety in the *Anonymous* [$r(72) = .249$, $p=0.032$] and *Name* [$r(72) = .260$, $p=0.025$] conditions and did not correlate with anxiety in the *Matric* condition [$r(72) = .127$, $p>0.05$]. This suggests that those high in wiki anxiety in both the *Anonymous* and *Name* conditions held higher trait anxiety than those in the *Matric* condition, although the coefficients are below the 0.3 and significance value above 0.01 limits set by Kline (2000). Their use in assessing the psychometric structure of anxiety experienced is therefore questionable and may be an artefact of the high amount of correlation analysis performed. It does seem then that wiki anxiety measures are more state related than related to trait anxiety levels.

With reference to the usability measure used in the experiment, the construct of usability correlated negatively with anxiety experienced in the conditions suggesting validity of concept measurement. Usability rating in the *Anonymous* condition correlated the strongest with state anxiety [$r(72) = -.654$, $p=0.000$] and wiki anxiety [$r(72) = -.800$, $p=0.000$] in the *Anonymous* condition. It also correlated negatively with state anxiety and wiki anxiety in the *Matric* [State-Matric: $r(72) = -.573$, $p=0.000$; WAI-E-Matric: $r(72) = -.544$, $p=0.000$] and *Name* [State-Name: $r(72) = -.586$, $p=0.000$; WAI-E-Name: $r(72) = -.511$, $p=0.000$] conditions. Participants' usability rating in the *Matric* condition also correlated negatively and most strongly with state [$r(72) = -.618$, $p=0.000$] and wiki anxiety [$r(72) = -.696$, $p=0.000$] measured in the *Matric* condition. It also correlated negatively with the measures of anxiety in the *Anonymous* [State-Anon: $r(72) = -.493$, $p=0.000$; WAI-E-Anon: $r(72) = -.624$, $p=0.000$] and *Name* conditions [State-Matric: $r(72) = -.598$,

$p=0.000$; WAI-E-Matric: $r(72) = -.591, p=0.000$]. Similarly usability rating in the *Name* condition was strongly negatively correlated with state anxiety [$r(72) = -.813, p=0.000$] and wiki anxiety [$r(72) = -.727, p=0.000$] in the *Name* condition. It also correlated negatively with state and wiki anxiety measures in the *Anonymous* [State-Anon: $r(72) = -.481, p=0.000$; WAI-E-Anon: $r(72) = -.600, p=0.000$] and *Matric* [State-Matric: $r(72) = -.618, p=0.000$; WAI-E-Matric: $r(72) = -.570, p=0.000$] conditions. Additionally each measure of wiki usability also correlated negatively and significantly with wiki anxiety measured before interaction (WAI-E-Pre) [WUI-Anon: $r(72) = -.469, p=0.000$; WUI-Matric: $r(72) = -.543, p=0.000$; WUI-Name: $r(72) = -.569, p=0.000$]. The usability scores did not correlate significantly with state anxiety before interaction (State-Pre) [WUI-Anon: $r(72) = -.228, p>0.05$; WUI-Matric: $r(72) = -.125, p>0.05$; WUI-Name: $r(72) = -.202, p>0.05$]. This is likely to be because of the lack of interaction with the wiki affecting state anxiety measured at this point as mentioned in relation to State-Pre and WAI-E-Pre's lack of correlation previously.

The usability scores in each of the condition also held significant positive correlations with each other [WUI-Anonymous & WUI- Matric; $r(72) = .836, p=0.000$; WUI-Anonymous & WUI-Name; $r(72) = .829, p=0.000$; WUI-Matric & WUI-Name: $r(72) = .864, p=0.000$]. Usability's (a positive construct) negative correlations with anxiety related variables (a negative construct) therefore suggest an element of validity in the measurement of usability in this experiment and confirms our hypothesis. It also adds further evidence to the validity of the wiki anxiety measures.

As predicted in the hypothesis mentioned fear of negative evaluation (FNEB) correlated positively with the wiki anxiety experienced when editing the wiki in each condition. Participants fear of negative evaluation was correlated most strongly with the anxiety experienced in the *Name* condition [$r(72) = .393, p=0.001$] and also correlated with wiki anxiety in the *Matric* [$r(72) = .359, p=0.002$] and *Anonymous* [$r(72) = .324, p=0.005$] conditions. Therefore participants who fear being negatively evaluated also tended to have higher wiki anxiety during editing. This relationship was stronger in identity conditions where being identified was more likely thus confirming the hypothesis

4.3.4 Identity and Wiki Anxiety –Total Score Analysis

A 4x2x6x3 mixed design ANOVA was conducted to investigate the effects of identity condition (within-subjects) and edit type (between-subjects) on wiki anxiety levels during editing. A table of means for these variables is included in Table 4.6.

Table 4. 6- Means for wiki anxiety during each identity condition by edit type

	Condition	N	Mean	S.D.
WAE-Pre	Addition	37	55.78	14.35
	Delete and Replace	37	53.70	15.80
	Total	74	54.74	15.03
WAE-Anon	Addition	37	52.19	17.22
	Delete and Replace	37	51.89	17.07
	Total	74	52.04	17.02
WAE-Matric	Addition	37	57.17	17.06
	Delete and Replace	37	53.84	16.86
	Total	74	55.50	16.92
WAE-Name	Addition	37	57.62	19.54
	Delete and Replace	37	54.86	19.04
	Total	74	56.24	19.21

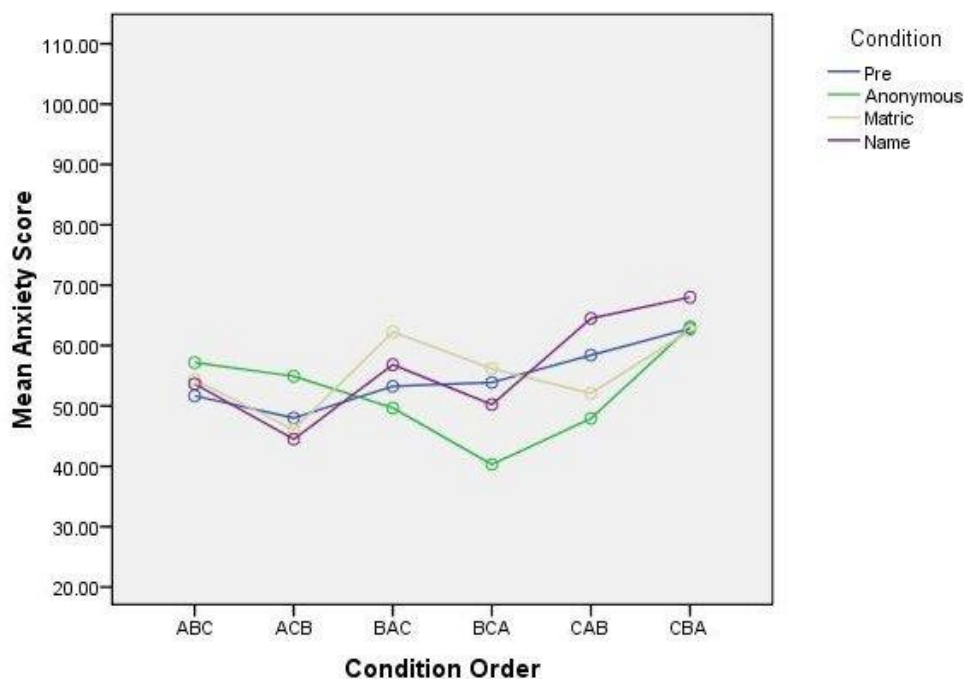
The between-subject variables of condition and task order were included to explore the effects that these may have on anxiety measured during editing. There was a significant main effect of identity condition on wiki anxiety during editing [$F(3,$

114) = 2.97, $p=0.035$]. LSD Post Hoc tests showed that participants experienced less anxiety during editing when in the *Anonymous* ($M= 52.04$) condition compared to when editing in the *Matric* ($M= 55.50$) ($p=0.016$) and *Name* ($M= 56.24$) conditions ($p=0.023$). Participants anxiety when editing in the *Matric* and *Name* conditions did not significantly differ ($p>0.05$). The anxiety participants felt about editing the wiki before interaction (as measured by the WAI-E-Pre measure) ($M= 54.74$) did not significantly differ from the anxiety experienced in any of the identity conditions ($p>0.05$). Therefore the hypothesis that there would be a significant difference between the identity conditions on wiki anxiety during editing is supported. There was no main effect of edit type on wiki anxiety during editing [$F(1, 38) = 0.229$, $p>0.05$]. Participants did not significantly differ in anxiety during editing in the addition and delete and replace conditions, thus this hypothesis was not statistically supported. There was no significant interaction between the anxiety experienced during editing in each of the identity conditions and the edit type [$F(3, 114) = 0.450$, $p>0.05$]. Therefore participants' anxiety during editing in the identity conditions was not affected by the edit type when editing the wiki. This suggests the hypothesis that users' wiki anxiety during different editing types would be significantly affected by the identity used was not statistically supported. The lack of effect of the edit type conditions may be due to participants being told as part of the task to delete the previous contribution rather than being left to deduce the inaccuracy of the content and act on this accordingly. Such an effect would likely leave users less anxious in conducting this behaviour and thus may have led to the lack of significant effect for this variable. This is discussed further in the Discussion section of this chapter (section 4.4).

Main effects of condition [$F(5, 38) = 1.680, p > 0.05$] and task order [$F(2, 38) = 1.588, p > 0.05$] were also not significant. There were therefore no significant differences between the conditions and task orders on wiki anxiety across the experiment. No significant interaction was also apparent between identity conditions and task order [$F(6, 114) = 0.245, p > 0.05$]. The anxiety experienced during each condition was not significantly affected by each of the task order conditions.

In terms of order effects on wiki anxiety, there was a significant interaction between the identity conditions and condition order [$F(15, 114) = 4.443, p = 0.000$]. The interaction is shown graphically in Figure 4.4. This suggests that the anxiety experienced in each condition was significantly affected by the order of conditions experienced. From the interaction graph presented it seems that higher anxiety was achieved in each of the identities when they were used in the first edit in comparison to when they appeared later in the condition orders.

Figure 4. 4- Graphical representation of the interaction between condition order and identity conditions on wiki editing anxiety



There also seems to be an effect where the identities experienced previously are influencing the anxiety in other identity measures. For instance anxiety experienced when editing using the *Anonymous* identity is at its lowest after being experienced in the final edit and after the *Name* condition (BCA). However anxiety during *Anonymous* editing was high when *Name* and *Matric* have been experienced before (i.e. order CBA) even though it is being experienced in the third edit. In other words participants' anxiety is likely to be affected by a comparison effect when judging their anxiety towards the interactions in terms of the experiences of the identities they have already used in the experiment. This seems to have operated in unison with the first order effect mentioned to create such an interaction. Differences across the condition orders in terms of anxiety before interaction (WAI-E-Pre) are also likely to be contributing to the interaction effect.

There was no significant 3- way interaction effect between identity condition, edit type and task order [$F(6, 114) = 1.052, p > 0.05$]. The interaction between identity, edit type and condition order [$F(15, 114) = 0.993, p > 0.05$], identity, condition order and task order [$F(30, 114) = 0.953, p > 0.05$] as well as the interaction between identity, edit type, condition order and task order [$F(15, 114) = 0.992, p > 0.05$] on anxiety during editing cannot be interpreted due to the low amount of participants in each cell at this level of comparison although the comparisons are not statistically significant ($p > 0.05$). When comparisons are made using groups with small amounts of participants in each cell, such comparisons do not have the statistical power to identify likely significant effects. They are also prone to high sampling error (i.e. potential deviation of the sample from the population from which it is taken).

There was no significant interaction between edit type and task order [$F(2, 38) = 0.360, p > 0.05$] on anxiety across the experiment. The interactions between edit type and condition order [$F(5, 38) = 1.014, p > 0.05$], condition order and task order [$F(10, 38) = 0.954, p > 0.05$] on edit type, condition order and task order [$F(10, 38) = 0.611, p > 0.05$] cannot be interpreted due to the low amount of participants in each cell at this level of comparison although the interactions were not statistically significant.

4.3.5 Identity and Wiki Anxiety–Item Analysis

Similar analysis as to that presented above was conducted on data from each of the questionnaire items to observe the effect of the independent variables on each item score. It must be noted that the positive items in this measure were reverse scored so that the total score reflected the level of anxiety. Therefore larger scores on positively worded items mean less positive assessments of these items. Only the interpretable interactions (i.e. those with sufficient participants within each cell) will be described.

There was a significant main effect of condition order on the ratings of feeling at ease when editing the wiki (item 5-reverse scored) ($p = 0.038$). Scores on this item throughout the questionnaires seem to be significantly larger in the CBA condition order ($M = 3.28$) compared to ABC ($M = 2.50$) ($p = 0.028$), ACB ($M = 2.21$) ($p = 0.003$), BCA ($M = 2.45$) ($p = 0.018$) and CAB ($M = 2.38$) ($p = 0.012$) conditions. There was no significant difference between CBA and BAC ($M = 2.85$) conditions ($p > 0.05$). There was also a significant interaction between the identity and condition order ($p = 0.001$). This interaction is similar to the interaction seen in the total score analysis above and is displayed graphically in Figure A.7 in Appendix 2.9. There

were no other significant main effects for this item and no other significant interactions ($p>0.05$).

There was a significant interaction between the identity and condition order conditions in items referring to participants comfort about editing the wiki (item 4-reverse scored) ($p=0.000$), feeling relaxed whilst editing (item 6-reverse scored) ($p=0.000$), feeling apprehensive when editing (item 1) ($p=0.000$), feeling anxious about making a mistake (item 2) ($p=0.006$), feeling intimidated while editing the wiki (item 7) ($p=0.000$), feeling secure when editing the wiki (item 9-reverse scored) ($p=0.004$) and being afraid of doing something wrong when editing the wiki (item 14) ($p=0.000$). These are displayed graphically in Figures A.8-A.14 in Appendix 2.9. In this final item there was also an interaction between identity, edit type and task order conditions ($p=0.05$) but due the amount of analysis conducted it is likely to be due to chance. In general the interactions between identity and condition order in these items were similar to the interaction in the main analysis. There were no significant main effects on these items and no other significant interactions ($p>0.05$).

There was a main effect of identity on how hard participants found it to concentrate when editing the wiki (item 8) ($p=0.021$). Scores on this item were significantly lower in the measure before interaction (*Pre*) ($M= 2.14$) than after experiencing the *Anonymous* ($M= 2.57$) ($p=0.015$) and *Name* ($M= 2.55$) conditions ($p=0.021$). There was no significant difference between *Matric* ($M= 2.47$) and *Pre* measures ($p>0.05$). There were also no significant differences between the identity conditions ($p>0.05$). There was a significant interaction between identity condition and condition order ($p=0.011$). Again this interaction shows a similar effect to that described in the total score analysis. This is displayed graphically in Figure A.15 in

Appendix 2.9. There were no significant task order, condition order or edit type main effects and no other significant interactions ($p>0.05$).

A main effect of the identity variable was also present in the item referring to confidence when contributing to the wiki (item 11-reverse scored) ($p=0.011$). Participants had lower scores when measuring anxiety before interaction (*Pre*) ($M=2.51$) to when they were editing in the *Matric* ($M=2.82$) ($p=0.002$) and *Name* ($M=2.89$) ($p=0.004$) conditions. There were no significant differences between the scores on the *Anonymous* ($M=2.69$), *Matric* and *Name* conditions or between wiki anxiety before editing (*Pre*) and wiki anxiety during the *Anonymous* condition ($p>0.05$). Participants were therefore more confident about contribution before editing the wiki than during both the *Name* and *Matric* conditions. A significant interaction between identity condition and condition order was also found ($p=0.001$). First order and comparison effects were again evident in this interaction with differences in this item on anxiety before editing between condition orders contributing also. This interaction is displayed graphically in Figure A.16 in Appendix 2.9. There were no significant main effects of task order, condition order or edit type and no other significant interactions ($p>0.05$).

Participants' happiness to contribute content also significantly differed depending on identity (item 12-reverse scored) ($p=0.000$). Participants had significantly lower scores on this item in the measure before interaction (*Pre*) ($M=1.98$) than in both the *Anonymous* ($M=2.37$) ($p=0.001$) and *Matric* ($M=2.40$) ($p=0.000$) conditions. There was no significant difference between the measure before interaction and the *Name* condition ($M=2.18$) ($p>0.05$). Participants however scored higher on the item in the *Matric* condition than in the *Name* condition

($p=0.024$). Other comparisons between the identity conditions were not significant ($p>0.05$). There were no significant main effects of task, condition order and edit type and no significant interactions ($p>0.05$). It seems that participants were happier to contribute content before interaction than in the *Anonymous* and *Matric* conditions. Participants were also happier to contribute content in the *Name* condition than the *Matric* condition.

Participants' worries about making a mistake were higher before interaction than during interaction in all of the identity conditions (item 13) ($p=0.000$). Score in the *Pre* interaction measure ($M= 2.40$) were higher than those in the *Anonymous* ($M= 1.86$) ($p=0.000$), *Matric* ($M= 1.95$) ($p=0.000$) and *Name* ($M= 1.89$) ($p=0.000$) conditions. There were no significant differences between the identity conditions on this item ($p>0.05$). A significant main effect of task order was also found ($p=0.023$). Participants experiencing tasks in the order 312 ($M= 2.48$) were higher overall on this item than those who experienced task order 123 ($M= 1.89$) ($p=0.041$) and 231 ($M= 1.72$) ($p=0.009$). All other comparisons between task orders were not significant ($p>0.05$). There were no significant main effects condition order or edit type and there were no significant interactions ($p>0.05$).

Again there were significant differences between the scores gained on wiki anxiety before interaction compared to those measuring anxiety during interaction with the identity conditions on how afraid participants were that people would find faults with their edits (item 16) ($p=0.006$). Participants were less afraid before interaction (*Pre*) ($M= 2.38$) than they were during both the *Matric* ($M= 2.82$) ($p=0.003$) and *Name* ($M= 2.85$) conditions ($p=0.002$). No significant difference existed between the score before interaction and those gained in the *Anonymous*

condition (M= 2.60) ($p>0.05$). The editing identities also do not significantly differ on this item ($p>0.05$). There were no significant task order, condition or edit type main effects and no significant interactions ($p>0.05$)

In terms of participants' being nervous about what others may think of their edits (item 17), there was a significant main effect of identity on the scores ($p=0.006$). There were no significant differences between the scores on this item before interaction (Pre) (M= 2.42) and during the *Anonymous* (M= 2.32) and *Name* (M= 2.63) conditions ($p>0.05$). However participants were lower on the item before interaction than during editing with the *Matric* (M= 2.78) identity ($p=0.008$). Their nervousness was also significantly lower in the *Anonymous* condition compared to both the *Matric* ($p=0.004$) and *Name* ($p=0.038$) conditions. There was no significant difference between the *Matric* and *Name* conditions ($p>0.05$). There was also a significant interaction between the levels in the identity variable and condition order ($p=0.01$) that showed a similar effects to those mentioned in the description of the interaction in the main total score analysis. This interaction is displayed graphically in Figure A.17 in Appendix 2.9. There were no significant main effects of task, edit type or condition order and no other significant interactions ($p>0.05$).

A significant main effect of the identity variable was also found between the scores observing participants' concern that others would know it was them contributing (item 18) ($p=0.000$). Participants' scores in the item before interaction (Pre) (M= 1.80) was significantly higher than in the *Anonymous* condition (M= 1.30) ($p=0.000$) and was significantly lower than the scores when editing in the *Matric* (M= 2.10) ($p=0.026$) and *Name* (M= 2.23) ($p=0.007$) conditions. They were also less concerned in the *Anonymous* condition compared to the *Matric* ($p=0.000$) and *Name*

($p=0.000$) conditions. There was no significant difference in scores between the *Matric* and *Name* conditions ($p>0.05$). A significant main effect between the task orders was also found ($p=0.041$). Participants experiencing the tasks in order 231 ($M= 1.61$) were significantly lower in their scores overall in this item compared to those who experienced the 312 order ($M= 2.11$) ($p=0.013$). The other comparisons between the task orders were not significant ($p>0.05$). There were no significant main effects of condition order or edit type and there were no significant interactions on this item ($p>0.05$).

Participants' tension at the thought of being judged (item 19) was also dependent on the identity conditions experienced. Their tension about judgement was significantly lower in the *Anonymous* condition ($M= 1.82$) than the scores in the *Matric* ($M= 2.45$) ($p=0.000$) and *Name* conditions ($M= 2.59$) ($p=0.000$). The scores in the *Matric* and *Name* conditions did not significantly differ ($p>0.05$). There were also significant differences between the tension about judgement before interaction (*Pre*) ($M= 2.27$) and the tension during the *Anonymous* ($p=0.003$) and *Name* ($p=0.024$) conditions. There was no significant difference between the *Matric* and *Pre* interaction scores on this item ($p>0.05$). Other main effects of condition order, edit type and task order were not significant and there were no significant interactions ($p>0.05$).

There was again a significant difference between how scared participants were at the thought of accidentally destroying someone else's content (item 22) before the interaction and during the identity conditions ($p=0.000$). Participants' scores in the measure before interaction ($M= 2.81$) were significantly higher than those during the *Anonymous* ($M= 2.03$) ($p=0.000$), *Matric* ($M= 2.11$) ($p=0.000$) and

Name (M= 2.19) ($p=0.000$) conditions. There were no significant differences between the identity conditions ($p>0.05$). There was also a main effect of task order ($p=0.032$) where participants in the 231 order condition (M= 1.90) were significantly lower overall on this item than those in the 312 order condition (M= 2.72) ($p=0.01$). The other comparisons between the task orders were not significant ($p>0.05$). There were no significant main effects of condition order and edit type and the interactions were not statistically significant on this item ($p>0.05$).

Participants scores on the pre-interaction measure were also significantly different to those in the identity conditions on the item referring to nerves about changing existing content on the wiki (item 21) ($p=0.000$). Participants were more nervous before interaction (*Pre*) (M= 2.78) than during the *Anonymous* (M= 2.08) ($p=0.000$), *Matric* (M= 2.32) ($p=0.001$) and *Name* conditions (M= 2.37) ($p=0.012$). They were also significantly more nervous in the *Name* condition when compared to the *Anonymous* condition ($p=0.045$). *Matric*, *Anonymous* and *Name* scores did not differ significantly ($p>0.05$). A significant interaction between identity and condition order variables was also apparent ($p=0.038$). Similar effects to the total score interaction seem to be acting here. This interaction is displayed graphically in Figure A.18 in Appendix 2.9. There were no significant main effects of condition order, task order or edit type and no other significant interactions ($p>0.05$).

A significant task order effect was seen when analysing participants' responses to their uneasiness about the fact that content could change (item 20) ($p=0.021$). Participants in the 231 task order (M= 1.48) were less uneasy about content changeability than those in the 312 order (M= 2.02) ($p=0.006$). The other

comparisons within task order were not significant ($p>0.05$) and there were no other significant main effects or interaction effects ($p>0.05$).

There were no significant main effects or interactions in the items referring to being excited when editing the wiki (item 3-reverse scored), being certain of the ability to overcome difficulties (item 10-reverse scored) and being confident that the information they were contributing was correct (item 15-reverse scored).

From this item analysis it seems there are no large number of items which may have brought such significant differences between the identity conditions seen in the total score analysis, although the items referring to the fear of judgement tend to reflect the findings. The effect seen in the total item analysis is likely to occur because of cumulative differences across items with social judgement items contributing more to this effect. In terms of the interaction, a significant proportion of the items in this measure reflect similar effects of the total score analysis.

4.3.6 Identity and Wiki Usability – Total Score Analysis

A 3x2x6x3 mixed design ANOVA was conducted to explore the effects of identity (within-subjects) and edit type (between-subjects) on usability rating of the editing experience. A table of means for these variables is included in Table 4.7.

Table 4. 7- Means for wiki usability rating during each identity condition by edit type

	Condition	N	Mean	S.D.
WUI-Anon	Addition	37	83.08	14.87
	Delete and Replace	37	83.41	14.87
	Total	74	83.24	14.77
WUI-Matric	Addition	37	82.65	15.75
	Delete and Replace	37	83.35	14.72
	Total	74	83.00	15.14
WUI-Name	Addition	37	83.32	17.17
	Delete and Replace	37	81.84	16.77
	Total	74	82.58	16.87

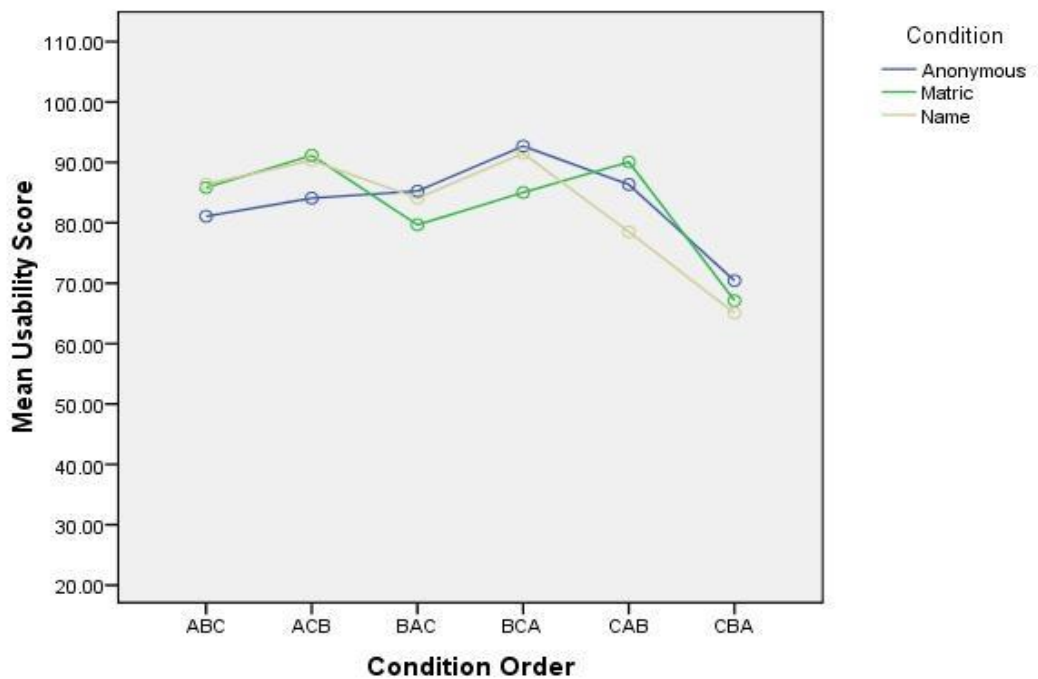
Again the between-subjects variables of condition order and task order were included to analyse the potential effects of the orders on participants' usability rating. The Greenhouse-Geisser corrected findings for the within-subjects comparisons are used due to the usability data violating the assumption of sphericity important to within-subject comparisons ($p=0.014$). There was no main effect of identity on participants' usability rating of the editing experience [$F(1.66, 63.02) = 0.311, p>0.05$]. The identity participants used when editing the wiki did not have a significant effect on usability rating of their editing experience. Therefore the hypothesis that there would be a significant effect of identity conditions on usability rating was not statistically supported. There was also no main effect of edit type on wiki usability [$F(1, 38) = 0.051, p>0.05$]. The type of edit participants had to make when editing the wiki did not significantly affect usability rating again meaning this hypothesis was not statistically supported. There was no significant interaction between usability rating in each of the identity conditions and edit type [$F(1.66, 63.02) = 1.114, p>0.05$]. The edit type when editing the wiki did not affect participants' usability rating in the identity conditions. The hypothesis that the type of edit would significantly affect the usability rating in each identity condition was not statistically supported.

In terms of order effects on wiki usability the main effect of condition order [$F(5, 38) = 4.80, p=0.002$] was significant. Participants in the CBA order ($M=67.52$) rated the wiki less usable overall compared to those in the ABC ($M=84.44$) ($p=0.003$), ACB ($M=88.53$) ($p=0.000$), BAC ($M=83.00$) ($p=0.005$), BCA ($M=89.74$) ($p=0.000$) and CAB ($M=84.97$) ($p=0.002$) condition orders. The main effect of task order [$F(2, 38) = 3.223, p>0.05$] was not significant. There was therefore no significant difference between the task orders on usability across the experiment.

There was no significant interaction between identity conditions and task order on usability [F (3.32, 63.02) = 0.418, p>0.05]. Therefore the usability rating gathered for each identity condition was not significantly affected by the task orders completed. Similar to the anxiety analysis above, there was a significant interaction between the identity conditions and condition order [F (8.29, 63.02) = 7.865, p= 0.000] on usability. Usability rating gained for each identity condition was significantly affected by the order of conditions. The interaction graph for this is displayed in Figure 4.5.

From the interaction graph presented it seems that lower usability was achieved in each of the identities when they were used in the first edit in comparison to when they appeared later in the condition orders. The effect leading to the interaction seems predominantly to be a first order effect as usability ratings between the conditions after the first condition experienced seem similar.

Figure 4. 5- Graphical representation of the interaction between condition order and identity conditions on usability score



However in the conditions where participants' experienced the *Name* condition first (CAB and CBA conditions) there seems to be a comparison effect similar to the one identified in the anxiety interaction between the same variables. Also it seems usability when the *Name* condition is first is lower compared to when *Anonymous* and *Matric* are first in the orders however the difference comes mainly from the CBA order. The interaction between identity conditions, edit type and task order [$F(3.317, 63.02) = 1.620, p > 0.05$] on usability was not significant. The interactions between identity, edit type and condition order [$F(8.29, 63.02) = 1.308, p > 0.05$], identity conditions, condition order and task order [$F(16.59, 63.02) = 0.868, p > 0.05$] as well as the interaction between identity condition, edit type, condition order and task order [$F(16.59, 63.02) = 0.449, p > 0.05$] on usability rating cannot be interpreted due to the low amount of participants in each cell at this level of comparison although the comparisons were not statistically significant.

In terms of the interactions between the between-subject effects there was no significant interaction between edit type and task order [$F(2, 38) = 0.175, p > 0.05$] on usability across the experiment. The interactions between edit type and condition order [$F(5, 38) = 1.445, p > 0.05$], between condition order and task order [$F(10, 38) = 0.640, p > 0.05$], between edit type, condition order and task order [$F(10, 38) = 1.215, p > 0.05$] on usability across the experiment cannot be interpreted due to the low amount of participants in each cell at this level of comparison although the interactions were not statistically significant.

4.3.7 Identity and Wiki Usability –Item Analysis

Similar analysis as to that conducted on the total usability scores above was conducted on data from each of the questionnaire items to observe the effect of the independent variables on each item score. In this case the negative items in this measure were reverse scored so that a higher score reflects more positive evaluation of usability on these items. Only the interpretable interactions (i.e. those with sufficient participants within each cell) will be described.

Many of the items showed similar interaction between identity conditions and condition order seen in the main analysis. Items referring to participants getting flustered editing the wiki ($p=0.000$) (item 6-reverse scored), feeling under stress ($p=0.000$) (item 10-reverse scored), being nervous when editing ($p=0.003$) (item 11-reverse scored) and feeling in control ($p=0.000$) (item 15). In general these interactions seem to demonstrate a first order and subsequent order effect where scores increase over the experiment experience. The first order effect mentioned in the total score analysis is however prominently evident in these interactions. There is also evidence of some comparison effects in some of the condition orders. These interactions are displayed graphically in Figure A.19-A.22 in Appendix 2.9. There were no significant main effects evident in the analysis of these items and no other significant interactions ($p>0.05$).

In terms of how clear it was to edit the wiki (item 1), there was a significant main effect of condition order ($p=0.037$). Those who experienced the condition order CBA ($M= 3.39$) felt the wiki was less clear to edit over the measures than those in the ABC ($M= 4.08$) ($p=0.031$), ACB ($M= 4.22$) ($p=0.011$), BCA ($M= 4.44$) ($p=0.002$), and CAB ($M= 4.14$) ($p=0.021$) condition orders. There were no

significant differences between the other condition orders ($p>0.05$). There was also a significant interaction between the identity conditions and condition order ($p=0.003$) that seems to demonstrate a first order effect of the identities on the item scores and comparison effects. This is displayed graphically in Figure A.23 in Appendix 2.9. There were no significant identity, edit type or task order main effects and no other significant interactions ($p>0.05$).

A main effect of condition order was also apparent on item scores referring to how easy participants felt the wiki was to use (item 2) ($p=0.016$). Participants in the CBA condition order ($M= 3.36$) rated the wiki as less easy to use than those in all other condition orders (ABC: $M= 4.17$, $p=0.013$; ACB: $M= 4.33$, $p=0.003$; BAC: $M= 4.22$, $p=0.008$; BCA: $M= 4.44$, $p=0.001$; CAB: $M= 4.25$, $p=0.007$). The comparisons between the other condition orders were not significant ($p>0.05$). There was also a significant interaction between identity conditions and condition order ($p=0.004$) where scores on this item do not tend to differ between the condition when in ABC and ACB conditions, yet in the other conditions the effect is similar to that in the total score analysis. This interaction is displayed graphically in Figure A.24 in Appendix 2.9. There were no significant main effects of identity, edit type or task order and no other significant interactions ($p>0.05$).

Similar effects were also seen in whether participants felt they knew what to do next when editing the wiki (item 14) ($p=0.001$). Again those in the CBA condition order ($M= 2.57$) were lower in scores throughout the measures on this item than those in all other condition orders (ABC: $M= 3.81$, $p=0.000$; ACB: $M= 3.64$, $p=0.002$; BAC: $M= 3.44$, $p=0.009$; BCA: $M= 3.91$, $p=0.000$; CAB: $M= 3.92$, $p=0.000$). The other comparisons between condition orders were not significant

($p>0.05$). Additionally there was a significant interaction between the identity conditions and condition order ($p=0.000$). The first order effects of the main analysis are apparent as well as a comparison effect between the conditions. This is displayed graphically in Figure A.25 in Appendix 2.9. There were no significant main order effects of task order, edit type and identity on the item score and no further significant interactions ($p>0.05$).

In finding the wiki difficult to edit (item 5-reverse scored) participants in the condition orders significantly differed ($p=0.02$). The CBA condition order ($M= 3.68$) was again significantly lower in scores throughout the measures on this item than those in all other condition orders (ABC: $M= 4.44$, $p=0.015$; ACB: $M= 4.56$, $p=0.006$; BAC: $M= 4.36$, $p=0.029$; BCA: $M= 4.77$, $p=0.001$; CAB: $M= 4.42$, $p=0.019$). Again the other comparisons between condition orders were not significant ($p>0.05$). Participants in the CBA condition therefore found it more difficult to edit the wiki overall than those in the other condition orders. There were no significant main effects of task order, edit type or identity ($p>0.05$) and no significant interactions ($p>0.05$) for this item.

The condition orders also significantly differed in the amount of frustration they felt when editing the wiki (item 13-reverse scored) ($p=0.01$). The CBA condition order ($M= 3.49$) was significantly lower in scores throughout the measures on this item than those in all other condition orders (ABC: $M= 4.31$, $p=0.012$; ACB: $M= 4.64$, $p=0.001$; BAC: $M= 4.39$, $p=0.006$; BCA: $M= 4.52$, $p=0.002$; CAB: $M= 4.36$, $p=0.007$) whereas all other comparisons were not significant ($p>0.05$). Participants in the CBA condition therefore felt more frustrated editing the wiki throughout all the usability measures compared to other condition orders. There were

no significant main effects of identity, edit type and task order and no significant interactions for this item ($p>0.05$).

The condition orders also differed in the amount they would recommend using a wiki to others (item 21) ($p=0.006$). The CBA condition order ($M= 2.63$) was significantly lower in scores on this item throughout the measures than those in all other condition orders (ABC: $M= 3.64$, $p=0.003$; ACB: $M= 3.81$, $p=0.001$; BAC: $M= 3.39$, $p=0.022$; BCA: $M= 3.76$, $p=0.001$; CAB: $M= 3.69$, $p=0.002$). Again there were no significant differences between the other condition orders ($p>0.05$). No significant main effects in terms of task order, edit type and identity or interactions were found ($p>0.05$).

There were significant main effects of task order ($p=0.013$) and condition order ($p=0.005$) in participants rating of the clarity of the layout of the wiki edit screen (item 19). Participants in the 231 task order ($M= 4.31$) rated this item consistently significantly higher than those in both the 123 ($M= 3.74$) ($p=0.014$) and 312 ($M= 3.69$) ($p=0.007$) task orders. There was no significant difference between the 123 and 312 task orders ($p>0.05$). Again those in the CBA condition order ($M= 3.07$) were significantly lower in their ratings than those in all other condition orders (ABC: $M= 3.94$, $p=0.007$; ACB: $M= 4.17$, $p=0.001$; BAC: $M= 3.89$, $p=0.011$; BCA: $M= 4.22$, $p=0.001$; CAB: $M= 4.17$, $p=0.001$). There were no significant differences between the other condition order levels ($p>0.05$). There was also no significant main effects of identity or edit type or any significant interactions between the variables on the item score ($p>0.05$).

Main effects of task order ($p=0.013$) and condition order ($p=0.005$) were also apparent on items scores referring to the wiki editing interface needing improvement

(item 20-reverse scored). Again those in the 231 task order condition (M= 4.20) had higher scores on this item than those in both the 123 (M= 3.46) ($p=0.008$) and 312 (M= 3.52) ($p=0.013$) task order conditions and there was no significant difference between 123 and 312 task orders ($p>0.05$). Those in the 231 condition therefore felt the interface needed less improvement throughout the measures than those in the other task order conditions. In terms of condition order those in the CBA order (M= 2.59) scored consistently lower on this item than participants in the other condition orders (ABC: M= 3.64, $p=0.008$; ACB: M= 4.14, $p=0.000$; BAC: M= 3.94, $p=0.001$; BCA: M= 4.20, $p=0.000$; CAB: M= 3.72, $p=0.004$). Again the other comparisons were not significant ($p>0.05$). Those in the CBA order therefore felt the interface needed more improvement than those in the other condition orders. There were no significant main effects of identity, edit type or interactions between the variables on this item ($p>0.05$).

A significant main effect of identity ($p=0.044$) and condition order ($p=0.044$) were apparent in terms of participants satisfaction when editing the wiki (item 9). Satisfaction in the *Anonymous* condition (M= 3.15) was significantly lower than that in the *Name* condition (M= 3.39) ($p=0.038$). There was no significant difference between *Name* and *Matric* (M= 3.37) ($p>0.05$) as well as *Anonymous* and *Matric* conditions ($p>0.05$). Participants in the CBA condition (M= 2.63) were also consistently lower in terms of their satisfaction when editing the wiki compared to most other condition orders (ACB: M= 3.42, $p=0.018$; BAC: M= 3.61, $p=0.004$; BCA: M= 3.52, $p=0.008$; CAB: M= 3.44, $p=0.015$), although there was no significant difference between CBA and ABC (M= 3.19) orders ($p>0.05$) and all other condition order comparisons were not significant ($p>0.05$). There were no

significant main effects of task order, edit type or identity and there were no significant interactions for this item ($p>0.05$).

Participants scores in terms of thinking editing the wiki was complicated (item 3-reverse scored) were also significantly different depending on the condition order ($p=0.008$). Those in the CBA condition ($M= 3.49$) consistently thought editing the wiki was more complicated than those in other condition orders (ABC: $M= 4.42$, $p=0.005$; ACB: $M= 4.61$, $p=0.001$; BAC: $M= 4.25$, $p=0.021$; BCA: $M= 4.59$, $p=0.001$; CAB: $M= 4.53$, $p=0.002$). The other levels in the condition order did not significantly differ from one another ($p>0.05$). There was also a significant interaction between the identity conditions and condition order ($p=0.01$). The interaction shows a similar effect to that present in the total score analysis and comparison effects are also evident. This is displayed graphically in Figure A.26 in Appendix 2.9. A significant three way interaction between identity, task order and edit type conditions was also apparent ($p=0.028$). Participants' scores on this item in the different identity conditions were therefore dependent on the task order and the type of edit they were asked to complete. This interaction, although significant, holds little relevance when interpreted in the context of the experiment. There were no significant main effects of task order, edit type and identity on this item and no other significant interactions ($p>0.05$).

Main effects of condition order ($p=0.002$) and task order ($p=0.028$) were also evident on scores relating to editing the wiki being confusing (item 4-reverse scored). The CBA condition ($M= 3.29$) held lower scores than those in other condition orders (ABC: $M= 4.25$, $p=0.005$; ACB: $M= 4.53$, $p=0.000$; BAC: $M= 4.28$, $p=0.004$; BCA: $M= 4.65$, $p=0.000$; CAB: $M= 4.42$, $p=0.001$). The other comparisons between the

levels of this variable were not found to be significant ($p>0.05$). Participants in the CBA order therefore found editing the wiki more confusing overall than those in the other order conditions. Those experiencing the tasks in the order 231 ($M= 4.60$) felt the wiki was less confusing to edit than those experiencing the tasks in order 123 ($M= 4.10$) ($p=0.035$) and order 312 ($M= 4.01$) ($p=0.013$) with no significant difference between 123 and 312 task orders. There was also a significant interaction between the identity conditions and condition order ($p=0.031$). Again the interaction is similar to that in the total score analysis in terms of first order effects and comparison effects are also evident. This is displayed graphically in Figure A.27 in Appendix 2.9. There was also a significant interaction between the identity, task order and the edit type conditions ($p=0.042$). Participants' scores in the identity conditions on this item were therefore affected by task order and the type of edit they were asked to complete. Again as mentioned above this interaction, although significant, holds little relevance in the context of the experiment. There were no main effects of identity or edit type for this item no other significant interactions ($p>0.05$).

Similarly on participants scores on the efficiency of interaction (item 17) there were significant main effects of condition ($p=0.017$) and task order ($p=0.008$). Participants in the CBA condition ($M= 3.57$) felt the interaction was less efficient than those in most other conditions orders (ABC: $M= 4.08$, $p=0.02$; ACB: $M= 4.17$, $p=0.008$; BCA: $M= 4.35$, $p=0.001$; CAB: $M= 4.11$, $p=0.015$), although it did not significantly differ from the BAC order ($M= 3.97$) ($p>0.05$). All other condition order comparisons were also not found to be statistically significant ($p>0.05$). Those in the task order 231 ($M= 4.33$) felt the interaction significantly more efficient than

those in the order conditions 123 ($M= 3.90$) ($p=0.007$) and 312 ($M= 3.90$) ($p=0.006$). There were no significant differences between 123 and 312 task orders ($p>0.05$). An interaction also occurred between the identity conditions and condition order on this item ($p=0.013$). Although first order effects seem to occur there are also comparison effects evident in the interaction. This is displayed graphically in Figure A.28 in Appendix 2.9. A significant interaction was also found between identity, task order and edit type conditions ($p=0.03$). Participants rating of efficiency of interaction would therefore seem to be affected by the task order and edit type that they were asked to complete. Again this interaction holds little theoretical relevance when interpreted in the context of the experiment. There were no significant main effects of identity condition or edit type on the item score and no other significant interactions ($p>0.05$).

Main effects of condition order ($p=0.005$) and task order ($p=0.049$) were also found on item scores relating to participants feelings about whether they would not use a wiki like this again (item 22-reverse scored). Those who edited in the CBA condition order ($M= 3.26$) consistently felt they would use the wiki again less than those in most other condition orders (ACB: $M= 4.61$, $p=0.000$; BAC: $M= 3.97$, $p=0.027$; BCA: $M= 4.10$, $p=0.009$; CAB: $M= 4.14$, $p=0.007$) although there was no significant difference between it and the ABC condition order ($M= 3.86$, $p>0.05$). ACB condition order also differed significantly on item score from the ABC ($p=0.022$) and BAC conditions ($p=0.049$) although because of the amount of analysis, this comparison is likely to be significant due to chance. All other comparisons of levels of condition order were not statistically significant ($p>0.05$). In terms of the task main effect, participants in the task order 231 ($M= 4.26$) rated

their likelihood to edit a wiki like this again higher than those in the 312 ($M= 3.70$) task order condition ($p=0.015$). There was no significant difference between scores in the other task order conditions ($p>0.05$). There was also a significant interaction between identity conditions and task order ($p=0.04$). In task order 123 the *Anonymous* condition saw participants more likely to use the wiki again whereas those in the 231 condition were more likely to edit the wiki again after editing with the *Name* condition. However in the 312 task order condition participants after the *Matric* condition felt they would more likely edit a wiki like this again. It is unlikely that this finding holds any clear theoretical relevance. The closeness to 0.05 suggests this interaction may have occurred due to chance. There were no significant main effects of identity or edit type on the item score and no other significant interactions ($p>0.05$)

Participants' scores on finding it easy to get the wiki to do what I wanted it to do (item 16) were also significantly different depending on the condition order they were in. The CBA condition ($M= 3.46$) held lower scores than those in other condition orders (ABC: $M= 4.39$, $p=0.004$; ACB: $M= 4.36$, $p=0.005$; BAC: $M= 4.28$, $p=0.011$; BCA: $M= 4.27$, $p=0.011$; CAB: $M= 4.25$, $p=0.014$). There were no significant differences in score between the other condition order levels ($p>0.05$). There was also a significant interaction between the identity conditions and edit type ($p=0.036$). The interaction suggests that participants in the addition condition felt it less easy to get the wiki to do what they wanted when using the *Matric* identity compared to when using the *Matric* identity in the in the *Delete and Replace* condition. This is displayed graphically in Figure A.29 in Appendix 2.9. There were

no main effects of task order, identity or edit type and no other significant interactions ($p>0.05$).

There were no significant effects in terms of participants feeling editing took too long (item 18-reverse scored), on their assessment of concentrating hard when editing the wiki (item 12-reverse scored), enjoyment editing the wiki (item 8) and finding the wiki fun to edit (item 7).

The items therefore seem to suggest a consistent interaction effect between the identity conditions and condition order, in general reflecting the interpretation present in the total score analysis above. Throughout the items there also seems to be a consistent condition order main effect where participants in the CBA condition differed in their ratings overall in the usability measures. Those in this CBA condition had consistently significantly lower scores than the other condition orders. This may be due to the order of conditions and the comparison effect highlighted in the interactions between condition order and identity where participants evaluate the usability in comparison to the conditions previously experienced. This could limit this condition order to low scores as they experience the *Name* condition first. Alternatively it may be that participants in this condition consistently rated the identities lower than in other conditions because of a tendency for individuals in that sample to do so. Even though participants were randomly allocated to experiment IDs, this could still have occurred by chance.

4.3.8 Further Analysis

4.3.8.1 Editing Order, Wiki Anxiety and Wiki Usability

To analyse the effect of editing order on wiki anxiety and wiki usability two repeated measures ANOVAs were conducted. The table of means relating to these analyses are included in Table 4.8 below.

Table 4. 8- Means for wiki anxiety and wiki usability by order of experience

	Order	N	Mean	S.D.
Wiki Anxiety	Pre	74	54.74	15.03
	1 st Edit	74	60.40	16.01
	2 nd Edit	74	51.51	17.20
	3 rd Edit	74	51.88	18.76
Wiki Usability	1 st Edit	74	78.87	14.88
	2 nd Edit	74	84.28	15.97
	3 rd Edit	74	85.68	15.03

Due to violation of sphericity (Wiki Anxiety: $p=0.030$; Wiki Usability: $p=0.019$) the Greenhouse-Geisser corrected findings are reported in both analyses. There was a significant effect on the order of edits on anxiety experienced [$F(2.707, 197.634) = 14.951, p=0.000$]. LSD Post Hoc comparisons show that participants anxiety before interaction ($M= 54.74$) was significantly lower than the anxiety experienced in the first editing experience ($M= 60.40$) ($p=0.000$) and was significantly higher than the anxiety experienced in their second editing experience ($M= 51.51$) ($p=0.027$). It did not differ significantly from the anxiety experienced in their third editing experience ($M= 51.88$) ($p>0.05$). Participants' wiki anxiety during their first edit was significantly higher than the anxiety experienced in both edit 2 ($p=0.000$) and edit 3 ($p=0.000$). There was no significant difference between participants' wiki anxiety in edit 2 and edit 3 ($p>0.05$).

In terms of the effect of editing order on wiki usability rating, a significant difference was found [$F(1.811, 132.233) = 36.580, p=0.000$]. Participants rating of usability in the first edit ($M= 78.87$) was significantly lower than usability rating in both the second ($M= 84.28$) and third ($M= 85.68$) editing interactions ($p=0.000$). There was a weak significant difference between usability in the second and third editing experiences ($p=0.049$) where in the second edit participants rated the usability of the editing experience lower than when they completed the third edit. From the analyses conducted there seems to be a significant effect of editing order on wiki anxiety and wiki usability levels throughout the experiment.

Further analysis was also conducted to explore whether there was a significant effect of identity conditions in this first edit in the experiment. This was to explore whether the identities significantly affected wiki anxiety and wiki usability in the first edit experience. The table of means for this analysis is in Table 4.9 below.

Table 4. 9- Means for wiki anxiety and wiki usability by identity condition in first edit

	Condition	N	Mean	S.D.
Wiki Anxiety	Anonymous	24	56.04	16.33
	Matric	25	58.77	16.41
	Name	25	66.20	16.01
Wiki Usability	Anonymous	24	82.58	12.71
	Matric	25	82.52	13.48
	Name	25	71.64	14.88

Two One Way ANOVAs were conducted on both wiki anxiety and wiki usability data from the first edit using identity condition as a between-subjects independent variable. The analysis suggests there is a difference approaching significance between the conditions on the wiki anxiety in the first edit [$F(2, 71) = 2.789, p=0.068$]. LSD Post Hoc tests suggests that wiki anxiety during the first edit when

editing using the *Anonymous* (M= 56.04) identity is significantly lower than anxiety experienced when editing using the *Name* condition (M= 66.20) ($p=0.026$). There were no significant differences between the *Anonymous* and *Matric* (M= 58.77) conditions ($p>0.05$) and the *Matric* and *Name* conditions ($p>0.05$) in the first edit.

With reference to usability, there was a significant effect of identity conditions on wiki usability rating in the first edit [$F(2, 71) = 4.929, p=0.010$]. LSD Post Hoc tests revealed that usability in the *Anonymous* condition (M= 82.58) was higher than usability in the *Name* condition (M= 71.64) ($p=0.008$) in the first edit. There was no significant difference between the *Anonymous* and *Matric* conditions (M= 82.52) ($p>0.05$). There was a significant difference between the usability scores in the *Matric* and *Name* conditions ($p=0.008$) in the first edit where the rating in the *Matric* condition was significantly higher than that in the *Name* condition. Therefore experiencing the *Name* condition first led to lower usability scores compared to when experiencing the other identity conditions first.

4.3.8.2 Relationship between experience, wiki anxiety and wiki usability

Of those whose previous editing experience data was available (N= 71) the amount of edits made was correlated with each of the dependent variables in the experiment. This was so as to identify if there was any relationship between the amount of previous experience editing the wiki, wiki anxiety and wiki usability. Amount of previous editing experience did not relate significantly to any of the continuous variables measured in this experiment. Specifically, there were no significant correlation between previous amount of experience and measures of wiki anxiety before interaction [$r(69) = -.142, p>0.05$] and wiki anxiety measured during the interaction conditions [WAI-E-Anon: $r(69) = -.165, p>0.05$; WAI-E-Matric: r

(69) = $-.170$, $p > 0.05$; WAI-E-Name: $r(69) = -.176$, $p > 0.05$]. Moreover previous editing experience was not significantly related to usability rating in the interaction conditions [WUI-Anon: $r(69) = -.086$, $p > 0.05$; WUI-Matric: $r(69) = -.139$, $p > 0.05$; WUI-Name: $r(69) = .160$, $p > 0.05$]. Therefore previous editing experience is not significantly related to the anxiety experienced or usability ratings given in this experiment. It seems that the anxiety levels and usability ratings are therefore not influenced by a users' amount of editing experience.

4.3.8.3 Interview Comments

In the post-interaction interviews participants were given the opportunity to voice their opinions about the conditions and expand upon their experiment experiences. Preference for the anonymous editing condition was one of the main themes in the post-interaction interview. Participants noted that anonymity was “*quite comforting*” and they were “*less worried about getting things wrong*”. Many seemed to find editing anonymously “*the least stressful*” option, that it was “*less scary*” when editing and that it gave them “*much more freedom*” when editing. A negative side to anonymous editing was also mentioned where participants felt they “*didn't care about what (they were) contributing and about accuracy*”, that they “*had less responsibility*” and that they “*almost didn't care when....anonymous*”. This highlights a dual edge to anonymity where users may be less anxious when editing but may also care less about the quality of edits they are contributing. Additionally some also seemed concerned that their “*hard work would go unnoticed*” and that “*if I'd spent some effort over it, I would want to be recognised for the work*”. The participants therefore also saw the negative side of anonymity in terms of lack of accountability and recognition although they seemed to feel less anxiety when

editing in this condition. Some also mentioned that the anonymity condition made them concerned over the accuracy of the content on the page. Comments such as “*People could put in anything and not care about it*” and “*the anonymous approach enables people to add some strange information which is not correct...they can write anything*” summarise the sentiment of the participants who disliked the anonymity condition. These dislikes however are not related to editing experiences with such an identity. They focus on the consequences of anonymous editing in this educational scenario rather than the experience of editing.

In terms of the matriculation number condition those who had positive views tended to state that the condition gave them “*...a certain amount of anonymity*”, that it “*...wasn't as personal as the name*” and that they “*...had a bit more anonymity*” than the name condition. Some of the participants felt that this condition was “*in between ...the two*” other conditions and that it wasn't “*as outright as the name*” and acted as a “*happy medium*”. Many also focused on the lack of difference between the matriculation number and name identities. Participants stated “*I don't see the difference between the name*” and that they felt “*equally worried as when (they) had the name attached*” when editing with the matriculation number. This comment about the lack of perceived difference between the *Name* and *Matric* conditions is borne out in the wiki anxiety findings where *Matric* and *Name* conditions did not significantly differ.

In comparison the name condition tended to be disliked. Participants stated that the name was “*a bit more intimidating...a bit much*”, that they “*didn't like them knowing it was (them)*” and that they felt “*...a bit uncomfortable having (their) name up there*”. Comments such as “*I'm a bit more apprehensive*” and “*...more stressful. I*

was worried about making a mistake” were common throughout when questioning about the name conditions. However there seemed to be a benefit to named editing. Participants stated that they *“paid a bit more attention to what (they) wrote”* that they felt they *“had to do it right”*, *“...wanted to make it read better”* and were *“...more careful”* when editing as their name was associated with the edit. Although there seems to be a negative emotional reaction to editing using a named identity, users attention and involvement in the task looks to increase compared to the lack of involvement in the anonymous conditions.

From the participant interviews, the lack of difference between the usability scores may be due to there being no real difference in the editing process in terms of interaction with the interface. Participants mentioned that *“the processes were quite similar”* and that *“the mechanics were straightforward”*. It may be then that the measure of usability was measuring the users’ experience of the editing interface, which did not differ in the tasks, as opposed to the user experience, which was experimentally manipulated in this experiment.

There was a generally positive reaction to editing when adding content to the wiki. Participants described adding content as *“...quite satisfying”*, *“it felt like you were helping but you weren’t burdened with the whole task”* and that they felt it was *“being helpful”*. Of those who didn’t find the adding experience positive comments such as *“I was worried I might destroy their content”* and *“I felt I was treading on someone else’s toes”* were made although these were in the minority. These negative comments highlight an element of difficulty with the concept of collaborative content creation that some users may have. Some also qualified their positive statements by mentioning that *“...because I was adding to it I felt ok. If it was deleting then I’d feel*

more (sic) odd” and that *“because I didn’t have to get rid of anything as it was just adding content...it was ok”*. Participants comments in the delete and replace condition were sometimes quite negative about this action. Some felt *“nervous”*, *“a bit apprehensive”*, *“it was a lot of responsibility”* and felt *“...a little bit guilty”* deleting others content. This however was not evident in differences in either wiki anxiety or usability measures. The comments of most other participants highlight a potential reason for this. Many stated that that *“because it was wrong (they) felt fine”* deleting it, they felt *“safe in the knowledge that what was there was incorrect”* and that *“the task said the content was wrong”*. The definitiveness of the task may have influenced the anxiety experienced in the edit type condition. Some participants also qualified their statements saying *“...normally I wouldn’t delete content unless I feel the content is wrong”*, *“if it was more ambiguous I wouldn’t have felt comfortable”* and *“if it had been a little less obvious I would have been more apprehensive”* suggesting that users may, if they were not informed of the inaccuracy of the content, differ in anxiety during these different editing tasks. The reason for the definitiveness of the task is discussed in the discussion section.

Comments were also made about the effects of editing experience order on their feelings when editing. Some participants mentioned that they were nervous *“...as it was the first one”* and that *“they got more used to it”* as the experiment progressed. This was explored in the edit order analysis conducted, which found that participants felt more anxious in the first edit they conducted compared to other edits during the experiment session.

Participants were positive about the democratisation of knowledge creation facilitated by the wiki in principle. Most were positive about the fact it was flexible

and editable stating “*in theory it’s a great idea*”, “*I think that’s a really good thing*” and “*it’s kind of the point*”. A variety of benefits were identified such as “*any views that are outdated can be changed quickly so in theory you should have accurate information there*”, “*in a positive sense you can share the workload and bring information back to a central point*” and that the wiki is good at getting “*loads of different perspectives*” in one source. It was clear though that the flexibility of the wiki brought concerns. Participants worried that “*things could chop and change*” and “*there could be loads of inaccurate information*”. Many mentioned they felt the quality of the wiki was dependent on the “*competency of the people editing*” where “*people’s views of reliable information are different from others*”. There were also concerns over whether their edits were to be deleted. Participants commented that “*you might be a little concerned if what you put up gets changed*” and that “*it would be a bit annoying if someone changed what you wrote*”. Although the openness of the wiki is seen as a positive attribute, there are still concerns over the effects this editability may have on the quality of information included on the wiki. Comments also seem to suggest that an emotional reaction may be apparent in users if their content is removed or altered. Again the idea of individual content being changed and the scepticism of wiki flexibility are reminiscent of similar findings from the interviews in the *Training Spaces Experiment* (Chapter 3).

When asked what they felt could be done to make people feel less concerned about the flexibility many again suggested (as in Chapter 3) the use of a moderator. Many stated that “*if it was reviewed then that would be quite positive*” and to “*police it by the teaching staff*”. Although editing using the matriculation number and name identities was more anxiety-inducing during editing, participants felt that “*having a*

matriculation number would realise you were being held accountable” and being named when editing would *“make people think a bit more about what they were writing”*. Interestingly even though participants felt more anxious in these scenarios they feel that the ability to identify the editor is necessary for a high quality wiki system. Pressing the need for referencing on the wiki pages was also a common suggestion in the interviews to make people less concerned over the flexibility of information.

In terms of using a wiki during their studies many of the participants were positive stating it *“would be quite helpful”* and that they’d *“be fine with it”*. Some questioned the need for wikis in Higher Education commenting that *“...it’s nothing you can’t do by email”* and *“I can’t see where it’s applicable”* although these types of comments were in the minority. Many showed an apprehension to rely on the content mentioning that they would likely *“compare it with other sources”* and *“wouldn’t rely on it”*. These types of comments were especially evident when asked about whether they would use the content for coursework or revision purposes. Participants were keener to use the wiki in revision rather than coursework scenarios. They felt the wiki would *“give (them) a starting point”* and that they would *“use it as a base”*. There were still elements of trust in the veracity of information included as participants commented that *“the danger of using wikis is that the information is not necessarily accurate”* and *“I wouldn’t rely on it to be correct”* or *“take it as gospel”*. The benefits that participants see about using a wiki in a course scenario is that it *“would be good to get a general understanding”*, to see if they are *“on the right track”*, to *“give (them) ideas”* and to *“stimulate a literature search”*. Therefore the information created on the wiki could be seen as a starting point for users where they

can gain ideas, references and assess their understanding of the area that they are revising or investigating for coursework purposes. However the information is seen as inherently suspect, likely due to the flexibility of the system.

Participants were also asked in the interview how they would feel if their edits were to be amended or deleted on the wiki. The majority stated that they would feel negatively if this was to occur. They would feel “*upset*”, “*like they’d wasted their time*”, “*annoyed*” and that they would feel “*judged*” by other users. Many stated that they would want to know why other users had edited their content. Some commented that other users editing their contributions is positive if “*they had made it more accurate*” and that they hoped the edits “*would improve it*”. Even so statements of annoyance were still common in participants who made these comments. Interestingly participants mentioned that it would depend on the severity of the edit. For instance it was seen that “*if they amended ok but if they deleted it would be weird*” and “*if they completely deleted everything I wrote I’d feel slightly upset but if it was just adding then fine*”. The emotional reaction to other users amending content therefore seems to depend on the type of edit made by the other user. What is also clear from the comments is that users feelings in this are dependent on the amount of effort users felt they had put into the original edit where if they’d “*taken a while to type it*” and they’d “*done a lot of research and someone deleted it (they)’d be annoyed*”. From the comments there also seems to be concern over users changing content as it questions the correctness of the users’ contribution and potentially influence their confidence about the quality of the contributions they are making. Participants stated “*it would bother me that I’d written something that was viewed to be completely incorrect*” and “*in cases I was convinced I was right I’d feel pretty*

bad". Other user editing is an important element of the user experience and may hold significant emotional arousal for users.

Indeed other users' behaviour may affect participants' feelings towards contributing further content. When asked about how they would feel about future wiki editing if someone deleted or amended their content many mentioned they would not edit again as they would wonder "*what is the point?*" and that "*if it happened on a regular basis it would be pointless*" although this was dependent on whether "*it was necessary to my course*". Others mentioned that they would "*be more careful*" and "*research more before writing something*". However many responses focused on potential emotional effects other user behaviour may have when editing the wiki in the future. Participants thought other users editing their content would "*lower (their) self esteem*", would make them "*a bit more cautious*", would "*affect (their) confidence*" and that they "*would be intimidated*" when editing the wiki again. From these remarks, potential editing behaviour of other users could have ramifications for user emotions during editing on subsequent editing experiences. This is the main focus of the next chapter (Chapter 5).

4.4. Discussion

In summary the findings of this research suggest that the wiki anxiety and wiki usability scales show an element of validity and reliability. As hypothesised, our measures of wiki anxiety in the identity conditions correlated significantly with concurrent state anxiety measures. Additionally it was seen that all wiki anxiety measures correlated positively, and similarly all state anxiety measures during interaction correlated positively with each wiki anxiety measure. All wiki anxiety measures during interaction either correlated weakly or not at all with trait anxiety

suggesting the measures are likely measuring situational anxiety due to wiki editing. Interestingly wiki anxiety before interaction did not significantly correlate with state anxiety before interaction or trait anxiety yet correlated significantly with state and wiki anxiety variables during interaction. This may be because state anxiety measured was not influenced by the thought of wiki editing as there was no frame of reference to affect this before interaction. The wiki anxiety measures have specific focus on wikis in their items, making them salient in the assessment of anxiety in a wiki scenario. State anxiety focuses on general anxiety and does not make reference to a specific stressor and was measured before interaction leading to no influence from the system related stressor on anxiety measured. This is likely to have caused the lack of correlation.

With reference to evidence towards wiki usability measure validity, the positive construct was shown to correlate negatively with anxiety measures during interaction supporting the hypothesis towards the negative relationship between wiki usability and anxiety constructs. The results also support the hypothesis that users tendency to experience fear of negative evaluation will significantly correlate with wiki anxiety experienced during the conditions and that this relationship will be stronger in identity salient scenarios. Participants high in fear of negative evaluation were also seen to be high in wiki anxiety. The relationship between these variables was strongest when participants edited the wiki using the *Name* identity i.e. where identifiability was easiest. Additionally the research found that participants were less anxious when editing the wiki anonymously compared to when they edited the wiki using a pseudonym like a matriculation number or a full name identity, supporting the hypothesis that there would be a significant effect of the identity conditions on

wiki anxiety during editing. Participants however did not differ in their anxiety when editing using a matriculation number or full name identity. There was also no significant difference between the identity conditions in terms of participants' usability rating of their editing experience disconfirming the hypothesis that there would be a significant difference between usability ratings depending on editing identity. The type of edit participants completed also did not have significant effect on participant wiki anxiety or wiki usability levels disconfirming this hypothesis. Indeed the wiki anxiety and usability ratings when editing using each identity were not affected by the type of edit being conducted which disconfirmed the hypothesis.

The findings suggest that contributing content to a wiki anonymously reduces the anxiety experienced during wiki editing. It highlights that the "*protective cloak of anonymity*" (McKenna & Bargh 2000) (p.62) also seems to be in operation in a wiki editing context. To understand the implications of this finding it is important to put wikis as a social system in context compared to other forms of CMC and collaborative knowledge sharing systems. Much of the CMC research focuses on using Instant Messaging (IM) and computer based text communication (Joinson 2001; Kiesler et al. 1984; Rice & Markey 2009; Tanis & Postmes 2007), video conferencing (Joinson 2001) or emailing (Dubrovsky et al. 1991) in communicative contexts. Users exchange messages that are directly attributable to their identity and social interaction (in IM and video conferencing) tends to occur in real time. Similarly in blogs and bulleting boards users contribute information where identities are directly attached to the content included (Arazy et al. 2010). Wikis, although comparable in terms of contributing information in a social space, differ in the way that information is constructed. It is not constructed individually but collectively

where users' contributions are not directly referenced to the contributor within the presented content (Arazy et al. 2010). Some therefore argue that wikis are by virtue relatively anonymous in that it is hard to discern which user contributed which piece of information. Although this may be true in high use dynamic wikis such as *Wikipedia*, this may not be the case in scenarios where there are not a high amount of editors on each page, such as in Higher Education scenarios. The ability to assess each user's contribution through page history functionality is easier in such wikis. From this viewpoint users may be concerned over their contributions being judged by others. This concern may however be justified in a wiki where edits are not regularly contributed and contribution can be more easily monitored and attributed. Interestingly even editors on *Wikipedia* report a sense of ownership to their edits even though it is difficult to identify which of the content on the wiki page is specific to them (Bryant et al. 2005). It may be then that even though users' edits cannot be identified from the combination of information, users still attach ownership to their contribution. Further research on the effect of wiki page dynamism may support these conclusions in this context.

The relative anonymity of wiki editing also depends on the openness of the wiki in terms of who is allowed to edit content. In Higher Education scenarios it may not be desirable to have a wiki that is editable by any potential user. Restricting editing access to a certain community of users has been mentioned to enhance security and user confidence in the wiki (Raitman et al. 2005). It also reduces the anonymity of users as there is a reflection of identity in a real world grouping (such as a work team or a class or year). Users can communicate outwith the wiki on content included and all are familiar with group members' abilities and knowledge

(Guth 2007), whereas on open wikis a users real world abilities and group standing are unknown and relative anonymity is facilitated. The repercussions in an open wiki on reputation are preserved in the online space rather than affecting real world reputation. It may be then that lack of user identity is more important to users when editing in a closed group wiki (such as those in Higher Education) rather than in an open wiki scenario (such as *Wikipedia*). Alternatively users may be more anxious about contributing to an open wiki. In contributing in such wikis users are writing for a wider audience and they may be concerned about writing for this audience and a responsibility for quality of their contributions (Guth 2007). It is debateable whether such responsibility is higher in either an open or closed wikispace however what is certain is that the effect of openness of the wikispace and the reflection of editor identity to real world groupings on wiki user experience is an important question to explore in any further wiki research.

The findings presented also suggest that there was a significant correlation between the wiki anxiety felt during interaction and participants' predisposition to be fearful of negative evaluation and the relationship was stronger in conditions with identities. This is interesting as this concept has been shown to have links with social anxiety (Collins et al. 2005). It may be that a user's level of social anxiety influences the anxiety towards wiki contribution. This would make sense as wikis are social systems. These users may therefore be hypersensitive to contributing to social systems. The anonymity allows them to contribute without such social concerns likely leading to less anxiety than in more named situations. This fear will therefore have an effect on the wiki user experience and the anxiety experienced during

editing. Further research should explore the role of social anxiety in wiki contribution and emotional reaction.

The findings propose that the use of anonymity in editing in Higher Education wikis would reduce anxiety compared to using other forms of identity. Using anonymous identities may encourage participation from *lurkers* who tend to be shy and want to remain anonymous when contributing to knowledge communities (Preece et al. 2004). However identity is needed in wiki use in Higher Education if contribution to wiki content becomes a part of course assessment. For purposes of allocating rewards in terms of grades for wiki contribution pseudonym or full name editing identities are necessary. A potential solution to this may lie in the use of a more anonymous pseudonym as opposed to students' university matriculation number. As the matriculation number is used throughout students' interactions with the university it tends to have a high degree of connection with the user's real world identity. Indeed some participants mentioned in the post-interaction interview they felt a lack of difference between the *Matric* and *Name* conditions in this research. The leaking of information about the user by the pseudonym affects the quality of the pseudonym in preserving the privacy of real world identity (Borcea-Pfitzmann et al. 2005). *Person pseudonyms* which are those that act as full name substitutions in a multitude of situations (such as a matriculation number) are not as anonymous as other forms of pseudonyms such as a *transaction* (identity given only for a specific individual transaction) or *role pseudonym* (identity given for the undertaking of a specified role) (Borcea-Pfitzmann et al. 2005). This would explain the lack of difference between both the *Name* and *Matric* conditions in the research. Participants perhaps did not feel that editing using a matriculation number gave them a significant

amount of anonymity. Although the use of a transaction pseudonym would be impractical a role pseudonym for wiki editing could alleviate the problem of being identifiable in this context and may lead to similar levels of anxiety in comparison to the anonymous condition. It may also encourage *lurkers* to contribute, although further research is needed to test such claims.

Interestingly although there was an effect of editing identity on wiki anxiety, there was no such effect on wiki usability score. Previous UX research has mentioned that usability questionnaires tend to measure interface usability rather than emotionality during interaction (Folstad & Rolfsen 2006). This seems to be the case in this research. Although both measures are highly correlated, each is measuring different aspects of the user experience in terms of emotionality and interface experience. In this case it is more likely that emotionality would be affected by the manipulations rather than the interface evaluation as participants consistently used the same interface when editing. Further experiment-based testing with these measures is needed to ascertain whether this difference between the measures is evident in other wider system experience contexts.

Even though it was expected that edit type would influence anxiety and usability when editing this was not the case. Participants did not differ in their anxiety or usability when adding or deleting and replacing content. This is surprising as wiki editors have previously described their reluctance to edit other users content (Guth 2007; Lund & Smordal 2006). Indeed from the participant comments in the post-interaction interview, such a finding was expected. The lack of effect may be because participants were told as part of the task to delete the previous contribution rather than it being left to the individual to deduce whether their edit was superior to

the existing content and delete whether they felt it necessary. Such a task, although high in ecological validity, would be impractical in an experiment scenario. Participants may have been uncertain about what to do in the situation, leading to some adding content rather than deleting. Also participants may then only change a small amount of the previous content thus making for a weak and inconsistent manipulation within the experiment. It is realised however that informing participants to delete this content may have given the action legitimacy thus reducing the ecological validity of the manipulation. In real world wiki use, before deletion users have to firstly assess whether the existing content is inaccurate, whether their information is more accurate and then act on this by deleting the content. All of these aspects were controlled by giving participants specific tasks and information to use. This is a limitation of using experimental design and trying to limit confounding effects which no doubt had an effect on the dependent variables in this action. Real world users may be more anxious about deleting other users content but it is difficult to experimentally assess this without inducing consistency confounds in the manipulation itself. The findings do however suggest that the action of deleting other users content has no significant effect on the anxiety experienced when editing the wiki or the usability of the edit experience.

There were some significant findings in terms of experiment structure effects with the dependent variables that warrant further discussion. It was found that there was a significant interaction between condition order and the identity conditions used when measuring both wiki anxiety and wiki usability. The interactions tend to suggest a first order effect where participants rated each of the identity conditions they experienced higher in wiki anxiety and lower in wiki usability when in their first

experience. Especially with reference to wiki anxiety there also seems to be a comparison effect where participants anxiety in each identity condition was influenced by the experience they had previously in the experiment. Analysis in the Further Analysis section also highlights that first edits led to higher wiki anxiety and lower usability compared to other edits in the experiment. As many had not edited a wiki for a considerable amount of time, this effect is likely a reflection of this fact and the regaining of familiarity with the wiki (further discussion of this is included in the discussion section of Chapter 5). These findings are further emphasised in the interview comments made by participants. Although these findings are interesting, they are the very reason why randomisation during within-subjects experiment is essential to the validity of any main effect on the dependent variables being observed. Randomising using each possible order of identity condition controls for this and allows such effects to be spread across the conditions when being compared. Therefore although the interaction was significant the main effect found in this experiment is still valid.

A further finding that warrants discussion is the lack of correlation between users' previous editing experience and any of the continuous variables included in the research. It highlights that there is no significant link between people's previous editing experience, wiki anxiety and wiki usability. In wiki anxieties case, taking the findings on the relationship between computer anxiety and user experience of computers (Chua et al. 1999; Farina et al. 1991; Heinszen et al. 1987; Weil & Rosen 1995) it would be expected that users who have had less wiki editing experience would have higher wiki anxiety when editing throughout the experiment. This was not the case. Previous experience therefore seems not to be a significant correlate of

the anxiety towards wikis measured in this experiment. Users' previous experience does not influence the levels at which users feel anxious during editing in this context of contribution. Therefore it seems that both usability and wiki anxiety are not influenced by previous editing experience and are rather based on the evaluations of the experiences with the wiki at that point.

There is a growth in the desire to develop interface attributes to highlight user wiki contribution and editing activity (Arazy et al. 2010; Viegas et al. 2004). The developers of these tools argue that these attributes would increase accountability and the motivation to edit wikis (Arazy et al. 2010). However the research presented here offers a note of caution. Tools that increase the saliency of user identities (thus reducing anonymity) could potential lead to an increase in anxiety when contributing. Users may feel more identifiable and responsible for their content. Although the display of contribution activity may increase user motivation to contribute, especially in environments where contribution is rewarded (with grades for instance) the growth in contribution may be curbed by higher anxiety when contributing to a wiki site focused on identifying its contributors. Indeed participants evaluating one of these characteristics mentioned it added to concerns about judgement and competition in education scenarios (Arazy et al. 2010). Further research looking at the effect of anxiety on motivations to contribute and the effect of such interface attributes is needed before such a conclusion can be made. What is for sure is that these attributes may have implications for the wiki user experience when editing if used and further research on this is needed.

In this experiment the wiki was seeded with content prior to editing so as to simulate a realistic and active wiki community and reduce the possibility of anxiety

because of being the first editor affecting anxiety levels measured. Students have demonstrated different reactions if they are editing new pages compared to an existing page (Guth 2007). They feel like they need to give authoritative and accurate information but not to worry about collective authoring but in existing page edits decisions have to be made on how to intervene, where and when (Guth 2007). This brings interesting possibilities for the role of the identities used in the research presented in their effect in such a situation. If first editors tend to set the tone of the page the anxiety experienced whilst editing in this case may vary compared to the anxiety experienced when editing content to an already populated wiki page. Being the first editor of a page may be quite exposing to the user as the page does not include any other editors and makes the user more identifiable and connected to the information displayed. The motivation to start a new page also shows intent and desire to contribute something that to that point has not been included on the wikispace. It involves evaluation of the information available and judgement as to whether such an addition is valid. This pressure and the high identifiability could lead to higher anxiety than when users are to add to an existing page (as in this research). Further research should aim to change the context of editing towards this first editor situation and see whether that has an effect on anxiety experienced when contributing in different identity scenarios.

At this point it is important to discuss some limitations to the research. Although the *Anonymity* condition accurately reflects real life anonymous editing the use of identities developed by the experimenter for both the *Matric* and *Name* conditions is likely to have affected the anxiety experienced. Due to practical complications in setting multiple identity editing permissions on individual pages,

setting specific user access to pages prior to experimental participation and data protection concerns the use of participants real identities was not possible. Although the use of experiment specific details may have affected wiki anxiety in these conditions, such an aspect would likely underestimate the anxiety levels reported. Anxiety scores would be expected to not differ statistically from those achieved in the anonymous condition if the identities were seen as unrealistic. In fact significant differences were found between the anonymous condition when compared to both pseudonym and name conditions respectively. Such differences are therefore likely to be a conservative estimation of the true anxiety experienced in these conditions if real user details were used. What may be more salient if using real world identities is the granularity between the pseudonym and name conditions. In this case the lack of significant difference may be a conservative estimate of the effects that the real world version of these identities may have on wiki anxiety. Again as in the *Training Spaces Experiment* (Chapter 3) the sample used in the research is relatively homogeneous in age and holds more females than males. Again this reflects the characteristics of the user population for which the wiki was designed in this experiment. Again psychology students were used because they held previous experience using wikis in an educational context as well as the author having knowledge of the research areas covered in the undergraduate course. This meant a relevant sample could be gathered for the research question being addressed but also that the tasks and the seeded wiki content could reflect relevant knowledge to the sample thus creating a more realistic scenario. There was also a limitation in terms of the assessment of the type of experience participants had before editing the wiki. Although data was gathered about amount of previous edits with Confluence wikis,

the form that these edits took could not be gathered. These edits may have been minor edits to wiki pages or major contributions of content. Even though such information cannot be gathered the findings towards experience indicate a potential lack of influence of experience on wiki anxiety felt during editing and usability rating.

4.5 Summary

In sum, this chapter details results on the effect of identity saliency on wiki anxiety during wiki editing and wiki usability and whether such variables are influenced by the type of edit made by users. The research confirmed the validity and reliability of the measures designed for this research. It also found that participants have lower anxiety when editing anonymously compared to when editing with a pseudonym (in this case a matriculation number) or a full name. This effect however was not replicated in the ratings of wiki usability. Additionally this anxiety was related to users predisposed fear of negative judgement and the relationship with this concept is stronger in wiki anxiety during editing with high identity salience. The findings were discussed with reference to the relative anonymity of wikis as a medium for content sharing. The importance of the context of use in the assessment of these findings cannot be over emphasised. The user experience of wikis in Higher Education, although similar to large wiki systems such as *Wikipedia*, will not be identical. The specific nuances of each in term of edit rates, relative access to real world identity of the community and desire for openness are all aspects that need to be considered when assessing these findings. Challenges in terms of the balance for the need for identification in this Higher Education context and the positive effect on anxiety seen by anonymity provide a challenge for educators wanting to create an

optimum user experience. What is for certain is that anonymity has an influence on wiki anxiety and that the “*protective cloak*” is likely to be in operation in a wiki context in Higher Education.

An integral further aspect of the wiki user experience was also highlighted in the participant interviews conducted in this study. Participants mentioned that the flexibility of the wiki and users actions towards the content they had included may influence their emotions when editing the wiki in the future. This provides the focus of the next chapter (Chapter 5) in this thesis.

CHAPTER 5- THE EFFECT OF CONTENT FLEXIBILITY AND OTHER USER EDITING BEHAVIOUR ON WIKI ANXIETY AND WIKI USABILITY DURING EDITING

5.1 Introduction

This chapter reports findings of an experiment-based study into the effect of wiki content flexibility and other user editing behaviour on wiki anxiety and usability rating during subsequent editing experiences. As in the *Editing Identity Experiment* (Chapter 4), it focuses on user experience of contributing wiki content. It aims to identify whether other users' editing behaviour towards a user's edit, in terms of deleting and replacing content or adding content, affects that user's anxiety during editing and their usability rating of the wiki system. Wikis are inherently flexible with any user being able to edit content if they wish to do so, be it adding, deleting or amending content. Their flexibility is a crucial aspect of the wiki user experience yet little is known about the effect this flexibility has on the user editing experience. Interview comments in previous research (Chapter 4) suggest that an emotional reaction may exist to others editing a user's content and that this reaction may be negative. Indeed the flexibility of the wiki itself may lead some users to rate the wiki unfavourably in terms of usability. The emotions experienced however are likely to be dependent on the type of behaviour elicited by other users (i.e. the user community) in terms of their edit acceptance or rejection. This research aims to explore such emotions and the effects this wiki characteristic has on variables related to the wiki user experience. The research described in earlier chapters of this thesis (The *Training Spaces* and *Editing Identity Experiments* in Chapters 3 and 4) have implied the existence of other users in the experience by mentioning that other users

can access and see the content participants include on the wiki and by seeding the page with content. This research develops on previous chapters by experimentally simulating the existence of other users on the wiki rather than implying their existence.

Little research has directly been conducted observing the effects of such flexibility on the wiki user experience. Recent qualitative research observing wiki use in business, public (i.e. *Wikipedia*) and education contexts has identified that users feel a sense of individual ownership over their contributions (Munson 2008; Guth 2007; Bryant et al. 2005) and that many users work on wikis individually rather than collectively authoring content (Guth 2007; Jaksch et al. 2008). In recent research observing the use of wikis in US schools, users were seen to add content to their own contributions and found it difficult to embrace the idea of collective ownership of information (Lund & Smordal 2006). Others have also noted that editors tend to feel negative about the possibility of having their contributions deleted or edited by others and that students have a protectionist attitude in terms of their work (Wheeler, Yeomans, & Wheeler, 2008). The sense of ownership of contribution has also been demonstrated to be more pronounced in more private wikis (more common in Higher Education) than more public wikis (Guth 2007). Discontent when users' edits are amended or deleted has also been noted (Glaser 2004). Users fear that others could "change what you have written, even though you know what you have written is correct" (Lund & Smordal 2006) and some complained that their contributions were deleted. In fact in an educational context much resistance has been shown towards wikis because of their openness and editability (Forte & Bruckman 2007).

Although these findings suggest a concern over the flexibility of the system little research has been conducted to see how such experiences relate to the wiki user experience in terms of wiki anxiety and usability in subsequent editing experiences. Such an issue is important if the wiki is to be used in a pedagogical context where users are expected to contribute as a course requirement. Indeed constant contribution to wikis is integral to the success of such collaborative systems. If users have a negative user experience when editing a wiki due to previous experiences of flexibility further contribution may be limited or may stop entirely.

User experience of editing may be affected by the flexibility of the system in two ways. Firstly users may become anxious due to the fact that the content that they are about to add can be changed by others. Users may feel negative about the collaborative element of wiki interaction, as mentioned in research above leading to low ratings of usability and the manifestation of anxiety towards contribution. For instance users may be more concerned about reputation and correctness of their edits when editing the wiki further in a fully fluid system, reflecting a concern over evaluation from other users. Such concerns have been previously noted by users of virtual knowledge communities (Ardichvilli et al. 2003). This is due to the function of the system and would be independent of the type of edit made (i.e. deletion or addition of content) by the other user. Secondly, users may be emotionally influenced by their own contributions being edited, which may affect their anxiety upon further editing. A user's confidence in the veracity and worthiness of their contributions may be damaged by their contribution being edited or deleted creating anxiety towards further contribution. This could however be affected by the type of edit experienced. Deletion of previous content they had included is more likely to

affect the confidence in the veracity of their knowledge and lead to more concern about reputation in later edit experiences compared to the addition of content from other users to their edits. The addition of content may act as a sign of positive evaluation by the user community towards information included, giving the user more confidence about their contributions and making them feel less anxious about contributing further content. Moreover in terms of usability, after experiencing the collaborative element of wiki interaction (such as addition of content) users may rate the system more positively than in editing experiences after deletion occurs. The wiki may therefore be seen as more supportive of collaboration in an experience where content is accepted rather than rejected by the community. These factors have not been observed in previous studies but are integral to gaining an insight into the influence of flexibility and other user behaviour on the wiki editing experience.

This research aimed, firstly, to ensure the reliability and validity of the wiki anxiety and wiki usability measures included were acceptable. Although there are only minor changes to the wiki anxiety measure from the previous research in Chapter 4 (*The Editing Identity Experiment*) it is still important to monitor the relationship that the wiki anxiety measure has with other measures of anxiety during interaction to ensure its validity is consistent across studies. It is expected that all questionnaire measures used in this research will have high internal reliability (i.e. high Cronbach alpha). Secondly the work aims to demonstrate concurrent validity of the wiki anxiety measures used in the research and infer psychometric properties of the wiki anxiety measures included. From findings gathered in other research presented in this thesis, it is hypothesised that wiki anxiety measures will correlate significantly and positively with measures of state anxiety measured during wiki

interaction. Also in light of findings from previous research in this thesis the null hypothesis is expected to be supported in terms of correlation between trait and wiki anxiety where no significant relationship between wiki anxiety and trait anxiety is predicted to be found. This would further add to the evidence that wiki anxiety measured throughout this thesis is more state (situational) based than influenced by a predisposition (trait) towards anxious feelings. Additionally in terms of validity of the wiki usability measurement (which in this research is unchanged from the item content in Chapter 4) it is hypothesised that wiki usability throughout the experiment will significantly correlate negatively with wiki anxiety and state anxiety measures thus demonstrating construct validity. Furthermore users' fear of negative evaluation was also measured to identify whether, as in Chapter 4, wiki anxiety in this research relates to a users' fear of being evaluated negatively by others. It is hypothesised that there will be a significant positive correlation between users' fear of negative evaluation and wiki anxiety experienced during wiki editing throughout the experiment. If such a finding was discovered it would suggest that a user's fear of negative evaluation may be influential in the levels of wiki anxiety experienced.

The main aim of this research is however to experimentally observe the effects of content flexibility and types of other user behaviour on wiki anxiety experienced during editing by exposing users to three contrasting manipulations. All manipulations will involve users initially editing wiki content. Users will then experience their edits being left unchanged, added to or being deleted and replaced by other content by another wiki user before having to edit again after each manipulation. It is hypothesised that there will be a significant difference in terms of wiki anxiety when editing depending on the previous flexibility condition

experienced. Additionally it is hypothesised that there will be a significant effect of the flexibility conditions on usability ratings when editing the wiki subsequent to experience of these conditions.

5.2 Experiment Materials and Method

5.2.1 Sample Characteristics and Recruitment

74 undergraduate psychology students at the University of Edinburgh took part in the experiment. 18 were male and 56 were female. The gender distribution of the sample was representative of the population being tested. Participants were recruited via email using the psychology undergraduate mailing lists and were asked to take part in research looking at the use of web-based tools. In this email they were told that they would receive a £15 honorarium for participation. Participants were asked to supply their name and contact details so that they could be contacted upon checking their previous editing experience as in the *Editing Identity Experiment* (Chapter 4). Participants who had not edited a University wiki previously were contacted further and asked if they had any experience with online collaborative systems. Those who had edited wikis previously were recruited for the experiment. Those who had no previous experience with wikis were informed that there were already sufficient participants and were thanked for showing an interest in the study.

72 of the participants were between ages 19 and 27 with the remaining 2 aged 30 and 42. The mean age of the sample was 21.86 years (S.D. = 3.00). The majority (72) had previous experience editing a wiki, although 2 participants had no previous experience editing wikis. The data supplied by these 2 participants were not found to be sample outliers so were included in the analysis to preserve the balancing of task and condition orders. The majority of participants (47) had last edited a wiki 1-6

months prior to the experiment. 17 participants in the sample had last edited a wiki over a year before. The remainder of the participants had edited the wiki between 1-7 days prior (3), 1-4 weeks prior (3) and between 6-12 months prior (2). 2 participants had not edited a wiki before. 68 of the 74 participants had previous experience editing a Confluence wiki at the University of Edinburgh.

5.2.2 Experiment Design

To simulate the use of wikis in a relevant Higher Education context for the sample tested, the experiment scenario was focused towards the use of wikis in the psychology undergraduate course. As mentioned in Chapter 3 (*The Training Spaces Experiment*) psychology students were used because of their previous experience editing wikis in an educational context as well as the author having knowledge of the research areas covered in the undergraduate course. This made the recruitment of a sample with experience editing in an education context possible while also facilitating the creation of ecologically valid tasks and wiki content for this sample. The experiment was based around a scenario of collaborating with other undergraduate psychology students in building an online knowledge repository for core areas of psychology taught in the undergraduate course at the University of Edinburgh. The content on this page was to be a synopsis of the area of Genetics and Personality. The wiki was seeded with content to simulate an active wiki site with other students already contributing. This added legitimacy to the claim made that other users had been contributing to the site and added to the realism of the scenario. It also served to imply the existence of other users who contributed to the wiki system. This content can be seen in Figure 5.1 below. The scenario information given to participants is included in Appendix 3.1.

Figure 5. 1- Genetics and Personality PSYCHWIKI page content

The screenshot shows a wiki page with a left-hand navigation menu and a main content area. The navigation menu includes links for Home, Research Synopses, Theories & Debates, Lecture Space, Course Resources, Assignments & Past Papers, Student Project Space, Usage Statistics, Page Operations, Browse Space, and Add Content. The main content area features a metadata box at the top stating it was added and last edited by Benjamin Cowan on Feb 22, 2010. Below this is a green notification box indicating the page was last modified on the same date. The content is organized into four sections: Introduction, Methods in Personality Heritability Research, Studies of Personality Heritability, Molecular Genetics and Personality, and Personality Change and Genetics. Each section contains text discussing twin studies, heritability, and genetic influences on personality.

The Genetics and Personality wiki page was divided into 4 sections (Methods in Personality Heritability Research, Studies of Personality Heritability, Molecular Genetics and Personality and Personality Change and Genetics) each referring to different aspects of the topic. These sections acted as a reference point in the tasks where participants were asked to contribute content to specific sections of the wiki page. Page sections were used so as to facilitate task randomisation. The amount of content seeded in each was kept as equal as possible so that the editing popularity of each section was seen as similar. The wiki used in the experiment (PSYCHWIKI) was created using Atlassian Confluence (Version 2.10.1). Confluence was used as it is the main wiki service supplied by the university and is the wiki service used by

most schools at the university. A full page example of the wiki page is included in Appendix 3.2.

Participants were given four tasks within the experiment. Each task involved contributing content onto the Genetics and Personality page. For each task, before being asked to contribute, participants were given an excerpt from a course text on Personality used in the undergraduate course relevant to the field of Genetics and Personality. The excerpts included a brief summary so as to ensure that participants understood the excerpt content if they were unfamiliar with the source material. Each excerpt was tested in pilot tests of the experiment. The pilot tests involved members of the research group who had no involvement in the research being conducted and no background in psychology completing an experimental session. They were then asked to give feedback on the tasks and structure of the experiment. No difficulties were reported in understanding the content of each excerpt in these pilot tests.

Participants were then asked to add the information to the section of the wiki page specified in the task. In these tasks they were asked to contribute the content from the excerpts in their own words so as to include ecological validity in the experiment design. As in the *Editing Identity Experiment* (Chapter 4), participants edited the wiki page using the Rich Text Editor to ensure any effect on the dependent variable was due to the conditions rather than the use of Wiki Markup Language (which uses the Wiki Markup Editor) when editing the wiki. The excerpts and tasks are included in Appendix 3.3.

The experiment conditions varied in terms of the content flexibility experienced after editing the wiki. Participants experienced their previous edit being left unchanged (*Unchanged*), being added to (*Addition*) and being deleted and

replaced by other information (*Delete and Replace*) in a within-subjects design. A (hidden) confederate who edited the wiki after participants finished each task was used to administer the different flexibility conditions. The confederate included pre-prepared paragraphs of text relevant to the excerpt just added by the experiment participant. These paragraphs were either added below the participants' content (in the *Addition* condition) or replaced the participants' content (in the *Delete and Replace* condition). The confederate only acted on the page information when a change was needed on the page to administer the condition (i.e. *Addition & Delete and Replace* conditions). Each excerpt had a relevant paragraph of text for the confederate to use and the same paragraph was used in both the *Addition* and *Delete and Replace* conditions. This was to ensure consistency in the confederate edits and eliminate potential confounds of varying confederate content across manipulations on the dependent variables. These paragraphs were designed so that they were relevant to the content being contributed by the participant but qualified and disputed some of their content. This facilitated their use in both the *Addition* and *Delete and Replace* conditions as they were designed to fit in the wider context of the page section as well as with (or indeed without) the presence of the participants' edit. The confederate paragraphs relevant to each excerpt and task are included in Appendix 3.3.

An important part of the design was to ensure that the participants had noticed the flexibility condition whilst also giving them the opportunity to notice this without experimenter intervention. Before each edit participants were asked to read either all of the sections (in the first edit) or the section they had edited previously (in all subsequent edits). After completing their reading participants were then asked "At

this point can I ask you to give me your observations about the section?”. The question was asked before the 1st edit to be consistent with other edits in the experiment. After answering this question in subsequent edits, the experimenter confirmed the condition they had just experienced. The experimenter stated “*The content you added when you edited the wiki last has been added to the page*” in the *Unchanged* condition, “*Since you edited the wiki last another user has added content*” in the *Addition* condition and “*Since you edited the wiki last another user has removed the content you added and has added their own content*” in the *Delete and Replace* condition. This was so as to minimise the effect of participants not noticing the manipulation on data collection and ensured the conditions were noticed before continuing. The majority noticed the manipulations that had occurred when asked before commencing their subsequent edit (Before Edit 2: 79.7%; Before Edit 3: 97.3%; Before Edit 4: 100%)

To control possible confounds of condition and task order all six possible condition orders were used in the experiment. Furthermore twelve unique task orders were generated using Latin Squares. The condition orders and task orders are shown in Table 5.1 and 5.2 respectively.

Table 5. 1- Condition Orders used in the research

Orders	Condition Order
1	ABC
2	BCA
3	CAB
4	ACB
5	BAC
6	CBA

Condition A= Unchanged
Condition B= Addition
Condition C= Deleted and Replaced

This controlled for the potential impact of task difficulty and condition order interactions affecting the dependent variables. There were therefore 72 unique condition order-task order pairs used in the experiment.

Table 5. 2- Task Orders used in the research

Orders	Condition Order
1	1234
2	2341
3	3412
4	4123
5	4321
6	3214
7	2143
8	1432
9	1342
10	3421
11	4213
12	2134

5.2.3 Questionnaire Measures

5.2.3.1 Wiki Anxiety and Wiki Usability Questionnaires

Both of the wiki anxiety and wiki usability questionnaires were similar to those developed for the *Editing Identity Experiment* (Chapter 4). In terms of the wiki anxiety measure, only one item was added to the measure. The item “I was concerned that other users would change the edits I made” was reintroduced after being excluded from the measure in the *Training Spaces Experiment* (Chapter 3). It was felt that this item, although excluded due to the improvement in reliability, may be more relevant in this type of experimental scenario. The wiki usability measure was identical to the one used in Chapter 4. The items included in the wiki anxiety and wiki usability measures in this study are presented in Table 5.3 and 5.4 respectively.

Table 5. 3- Items for the Wiki Anxiety Inventory- Editing included in this study

Item	Grouping	WAI-E-Pre	WAI-E	Polarity
1	Interaction	I am apprehensive about editing the wiki	I felt apprehensive when editing the wiki	(-)
2		I am anxious about editing the wiki for fear of making mistakes	When editing the wiki I felt anxious about making a mistake	(-)
3		I am excited about editing the wiki	I felt excited when editing the wiki	(+)
4		I feel comfortable about editing the wiki	I felt comfortable about editing the wiki	(+)
5		I feel at ease about editing the wiki	I felt at ease editing the wiki	(+)
6		I feel relaxed about editing the wiki	I felt relaxed whilst editing the wiki	(+)
7		I feel intimidated about editing the wiki	I felt intimidated while editing the wiki	(-)
8		I will find it hard to concentrate when editing the wiki	I found it hard to concentrate when editing the wiki	(-)
9	Confidence	I will feel secure when editing the wiki	I felt secure when editing the wiki	(+)
10		I am certain that I can overcome any difficulties I may encounter when editing the wiki	I was certain I could overcome any difficulties I encountered in editing the wiki	(+)
11		I am confident that I would be able to contribute to the wiki	I felt confident when contributing to the wiki	(+)
12		I am happy to contribute content to the wiki	I was happy to contribute content to the wiki	(+)
13		I am worried about making mistakes that I cannot correct when editing the wiki	I was worried about making a mistake that I could not correct when editing the wiki	(-)
14		I am afraid that I may do something wrong when editing the wiki	I was afraid that I might do something wrong when editing the wiki	(-)
15		I am confident that the information I contribute will be correct	I was confident that the information I was contributing was correct	(+)
16	Fear of Judgement	I am afraid that people will find faults with any edits I may make	I was afraid that people may find faults with any edits I made	(-)
17		I am nervous about what other users will think of my edits	I was nervous of what other users might think of my edits	(-)
18		I am concerned that people will know it was me that was contributing to the wiki	I was concerned that people would know it was me that was contributing to the wiki	(-)
19		Thoughts of being judged by other users make me feel tense	Thoughts of being judged by other users made me feel tense	(-)
20	Flexibility Concerns	The fact that content can be changed makes me uneasy	The fact that content could be changed made me uneasy	(-)

21	I am nervous about changing existing content on the wiki	I was nervous about changing existing content on the wiki	(-)
22	It scares me to think that I could accidentally destroy someone else's content	It scared me to think that I could accidentally destroy somebody else's content	(-)
23	I am concerned that other users can change the edits I make◊	I was concerned that other users could change the edits I made◊	(-)

◊ Refers to items added to the measure

The WAI-E-Pre was administered before interaction with the wiki to measure anxiety towards wiki editing before interaction. The WAI-E measure was administered after each editing experience to measure participants' anxiety during wiki editing after experiencing the flexibility conditions. The new version of the scale was made up of 9 positive and 14 negatively worded items. Wiki anxiety was measured using a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). All positively worded items were reverse scored so that a high score reflected high anxiety levels.

Table 5. 4- Items for the Wiki Usability Inventory (WUI) included in this study

Item	Grouping	WUI	Polarity
1	Ease of Use	It was clear how to edit the wiki	(+)
2		I found the wiki easy to use	(+)
3		I thought editing the wiki was complicated	(-)
4		I thought editing the wiki was confusing	(-)
5		The wiki was difficult to edit	(-)
6	Enjoyment	I got flustered when editing the wiki	(-)
7		Editing the wiki was fun	(+)
8		I enjoyed editing the wiki	(+)
9		I found editing the wiki satisfying	(+)
10		I felt under stress when editing the wiki	(-)
11		Editing the wiki made me feel nervous	(-)

12		I had to concentrate hard when editing the wiki	(-)
13		I found editing the wiki frustrating	(-)
14	Control	When editing the wiki I always knew what to do next	(+)
15		I felt in control when editing the wiki	(+)
16		I found it easy to get the wiki to do what I wanted it to do	(+)
17	Interface Quality	I thought the interaction with the wiki was efficient	(+)
18		I felt that editing the wiki took too long	(-)
19		The layout of the wiki edit screen was clear	(+)
20		The wiki editing interface needs improvement	(-)
21	Intentions to Use	I would recommend editing a wiki to others	(+)
22		I would not edit a wiki like this again	(-)

The WUI was administered after each editing experience to measure participants' usability rating after experiencing each flexibility condition. The inventory used a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) referring to how much participants' agreed with each item. The inventory was made up of 11 positively worded items and 11 negatively worded items. Negative items were reverse scored so that a high score reflected a positive usability rating.

5.2.3.2 Other Questionnaires included in the research

State Anxiety (Marteau & Bekker 1992), Trait Anxiety (Spielberger et al. 1983) and Fear of Negative Evaluation (FNEB) (Collins et al. 2005) were also measured in this research. These self-report questionnaires were again used to observe the concurrent and construct validity of the wiki anxiety and wiki usability measures created and to observe the relationship wiki anxiety holds with the concept of fear of negative evaluation. A demographic questionnaire administered before the

experiment session and an interview at the end of the experiment were also administered.

State anxiety was measured using the same short form as in the research presented in Chapter 3 and 4 (The *Training Spaces* and *Editing Identity* Experiments) (Marteau & Bekker 1992). The measure holds 3 positive items and 3 negative items and measures people's anxiety at the moment of measurement. Participants were asked to think about how they felt at that moment when completing each state anxiety measure. The short version of the measure was used so as to reduce the risk of questionnaire fatigue during the experiment. State anxiety was measured before interaction with the wiki and after each edit experience. State anxiety was measured using a 4-point Likert scale ranging from "Not at all" (1) to "Very Much" (4) referring to how they felt at that moment. Positive items were reverse scored so that a total score reflected the concept of anxiety.

The Trait measure of the State Trait Anxiety Inventory (Spielberger et al. 1983) was also administered to measure participants' predisposition towards anxiety. The questionnaire includes 9 positive items and 11 negative items measuring people's trait (i.e. predisposition) towards anxious feeling. Participants were asked to think about how they *generally* feel when completing the measure. Trait anxiety was measured using a 4-point Likert scale ranging from "Almost Never" (1) to "Almost Always" (4) referring to frequency of feeling. Again positive items were reverse scored.

The brief version of the Fear of Negative Evaluation scale (FNEB) (Collins et al. 2005) was also included in the experiment to measure peoples' fear towards evaluation and the relationship this may have with wiki anxiety experienced. The

measure contains 12 negatively worded items measuring people's discomfort and apprehension about social evaluation. It was measured using a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

The items of each questionnaire in the research were randomised within the measures to create four order sets that were randomly allocated to each experiment ID before the experiment. This was so as to control for possible effects due to item order and participants remembering the order of their responses between each of the questionnaire iterations. All questionnaires were administered using paper versions so as to eliminate the potential inflation of anxiety levels on the measures due to the use of a computer in the measurement process. All measures used in the experiment, demographic and interview questions are included in Appendix 3.4. The scale maximums and minimums of each measure are included in Table 5.5 in section 5.3.2.

5.2.4 Procedure

Upon arrival participants were allocated randomly to an experiment ID that had predefined condition orders, task orders and questionnaire orders. They were informed that the experiment involved contributing to content on a wiki called PSYCHWIKI which was a wiki aimed at psychology students and that they could withdraw at any point during the experimental session. Before commencing the session participants were asked to give consent to taking part in the experiment through completing a consent form. The consent form is included in Appendix 3.5. Again the amount of edits that participants had made on Confluence wikis previously were recorded and attached to the unique experiment ID as in Chapter 4. Additionally participants were asked if they had taken part in the previous

experiment. If so then the amount of edits experienced in the previous experiment (i.e. three edits) were added to the amount gained from the Confluence wiki data.

Before commencing the session the experimenter completed a demographic questionnaire with the participant, asking questions about previous courses taken in their psychology degree, gender, age and experience with wikis. State anxiety (State-Pre), trait anxiety (Trait) and fear of negative evaluation (FNEB) questionnaires were then completed. They were then informed that they would be editing a wiki soon and asked to complete a questionnaire about their feelings on editing the wiki soon (WAI-E-Pre). During the completion of these questionnaires the experimenter navigated to the relevant page on PSYCHWIKI by using an HTML page with predefined links to the wiki page being edited. This removed any potential influence this extra interaction with the wiki may have on participants' anxiety and usability assessments during the experiment and made the session more efficient. As in the other chapters participants edited their own version of the wiki page so as to ensure that other participants' edits would not affect the initial formatting and content of the page.

Users were then given a few minutes to read the experiment scenario. Participants were informed that they were going to edit one of the pages on PSYCHWIKI and that before editing they would be given an excerpt which needed to be used when editing the wiki. The experimenter stressed to take time to read the excerpt given and after reading the excerpt they would be given a task to contribute to live information on the wiki. As in Chapter 4 participants were allowed to keep the excerpts for reference throughout the completion of their task to ensure that anxiety during editing was not influenced by concerns over not being able to remember the

information in the excerpt. They were then informed of the identity they were using when editing (s0621423) and asked to take a few minutes to read the information on the page they were about to edit. A matriculation number was used as the editing identity as it added a sense of realism to the scenario compared to a fictitious name or anonymous identity.

Before being given the excerpt they were asked to give any observations about the page. This was also asked before starting each new edit in the experiment session to see if the participants were aware of the experiment manipulation as mentioned in the Experiment Design section previously. After asking for observations before each edit the experimenter would inform them of what had occurred in terms of experiment manipulations. As mentioned this was so as to minimise the effects of participants not noticing the conditions on data collection.

After giving their initial observations about the page participants were then given an excerpt. After, they were given the task of including the information from the excerpt on the wiki at the end of the section defined in the task (*Edit 1-Initial Edit*). Before editing they were told that they were editing live content that other users could access and see and to please use their own words when completing the task. Participants were given as long as they needed to complete the task. After saving their edits participants were asked to check to see if their edit had been saved to the page. They were then asked to complete state anxiety, and wiki anxiety and wiki usability questionnaires.

Whilst participants were completing the questionnaires the experimenter alerted the confederate that they had completed their edit and to administer the relevant experiment condition. The confederate was alerted using an LED button-

operated intercom placed out of view of the participant. The confederate was logged on to the relevant wiki page in an adjacent room. The experimenter pressed the button as soon as the participant finished editing. The LEDs in the adjacent room would alert the confederate to edit the page according to the manipulations defined in the confederate task sheet given to the confederate whilst participants were completing the initial set of questionnaires before further wiki interaction. The confederate sheet is included in Appendix 3.6. The confederate was only alerted when a change was needed on the page (i.e. in *Addition & Delete and Replace* conditions).

After completing the questionnaires the wiki page was refreshed and participants were then asked to imagine that sometime has passed and that they were ready to edit the wiki again. They were asked to read the section they had edited previously and were asked for any observations about the section. They were then made aware of the manipulation by the experimenter. The participants were then given another excerpt from the same text and were again given as much time as they needed to read the excerpt and complete the task of contributing to the wiki (*Edit 2*). They were again informed before commencing their edit that they were editing live information that other users could access and see and that they were to use their own words when editing the wiki. After saving the edit the participant was asked to check to see if their edit had been saved onto the page content. As they completed state anxiety, wiki anxiety and wiki usability questionnaires the experimenter alerted the confederate to the need for any change by using the intercom.

Again after completing the questionnaires the wiki page was refreshed and participants were again asked to imagine that sometime had passed and they were

ready to edit the wiki again. Again they were asked to read the section of the page they had edited previously and were asked for any observations about the section. They were then made aware of the experiment manipulation after giving any observations. Participants were then asked to read a further excerpt from the same text and asked to contribute this information to the wiki (*Edit 3*). Again they were asked to complete this in their own words and made aware that they were contributing to live content that others users could access and see. After completion participants were again asked to check if the edit had been saved to the page. Again as they completed state, wiki anxiety and wiki usability questionnaires the experimenter alerted the confederate to the need for any change by using the intercom.

Again in the final task (*Edit 4*) after completing the questionnaires the wiki page was refreshed and participants were again asked to imagine that sometime had passed and they were ready to edit the wiki again. Again they were asked to read the section of the page they had edited previously and were asked for any observations about the section. They were then made aware of the experiment manipulation after giving any observations. Participants were then asked to read a further excerpt from the same text and asked to contribute this information to the wiki. Again they were asked to complete this in their own words and made aware that they were contributing to live content that other users could access and see. After completing the task participants were again asked to check if their edit had been saved on the wiki page and to complete state, wiki anxiety and wiki usability questionnaires. During the edits the experimenter completed the experimenter sheet to note information about the interactions such as successful task completion, use of own

words, whether multiple attempts were needed, whether the manipulation was noticed initially and any comments and observations during the interaction. A copy of the experimenter sheet is included in Appendix 3.7.

Participants were then thanked for participation and the experimenter conducted a short interview about their experiences. They were then debriefed as to the motivations of the research and were given the option to be contacted with further information of the study. The participants were then paid and again thanked for participation. The experiment sessions lasted approximately 90 minutes.

5.3 Experiment Results

5.3.1 Reliability of Measures

Good internal reliability was evident in all state anxiety measures in the experiment (*State-Pre*: $\alpha = .73$; *State-Initial*: $\alpha = .82$; *State-Unchanged*: $\alpha = .84$; *State-Addition*: $\alpha = .082$; *State-Delete*: $\alpha = .81$) and were similar to reliability coefficients gathered in previous research (Marteau & Bekker 1992). The scale reliability of the trait anxiety and brief fear of negative evaluation scales were also high (*Trait Anxiety*: $\alpha = .89$; *FNEB*: $\alpha = .93$) and also similar to previous research (*Trait*: $\alpha = .93$; *FNEB*: $\alpha = .97$) (Collins et al. 2005; Beckers et al. 2007). Internal consistency of the wiki anxiety measures was high throughout the experiment with high Cronbach alpha values gained (*WAI-E-Pre*: $\alpha = .94$; *WAI-E-Initial*: $\alpha = .93$; *WAI-E-Unchanged*: $\alpha = .94$; *WAI-E-Addition*: $\alpha = .94$; *WAI-E-Delete*: $\alpha = .94$). The wiki usability measures also held high reliability throughout the experiment (*WUI-Initial*: $\alpha = .93$; *WUI-Unchanged*: $\alpha = .92$; *WUI-Addition*: $\alpha = .93$; *WUI-Delete*: $\alpha = .93$).

5.3.2 Sample Descriptives

From the means reported in Table 5.5 the sample is similar in terms of trait anxiety ($M= 37.81$, $S.D. = 7.91$) to the norms reported for college students (Male: $M= 36.47$, $S.D. = 10.02$; Female: $M= 38.76$, $S.D. = 11.95$) (Spielberger et al. 1983) and was similar to those gained from previous measures of trait anxiety in this thesis. State anxiety measured before interacting with the wiki (*State-Pre*: $M= 9.18$, $S.D. = 2.22$) was lower than the norm for nursing students on state anxiety reported in Marteau & Bekker (1992) ($M= 11.97$ $S.D. = 2.25$) but similar to those gained in previous research in this thesis. Scores on the Fear of Negative Evaluation Scale were higher than those gained in the community sample in Collins et al. (2005) ($M= 29.2$, $S.D. = 8.2$) although it was similar to the sample mean in the previous research in this thesis.

Table 5. 5- Descriptive statistics for continuous variables in experiment by condition

	Condition	N	Scale Min & Max	Mean	S.D.
State	Pre	74	6-24	9.18	2.22
Trait		74	20-80	37.81	7.91
FNEB		74	12-60	36.21	11.16
WAI-E	Initial	74	23-115	58.29	16.66
State		74	6-24	11.07	3.12
WAI-E		74	23-115	57.69	16.55
WUI	Unchanged	74	22-110	84.40	12.86
State		74	6-24	9.51	2.79
WAI-E		74	23-115	50.26	16.73
WUI	Addition	74	22-110	89.62	11.91
State		74	6-24	9.99	2.90
WAI-E		74	23-115	50.05	17.01
WUI	Delete	74	22-110	89.02	12.63
State		74	6-24	10.12	2.78
WAI-E		74	23-115	52.07	17.24
WUI		74	22-110	88.39	12.52

In terms of wiki anxiety, participants on average were moderately anxious about wiki editing before interaction (*WAI-E-Pre*: $M= 58.29$, $S.D. = 16.66$). Wiki anxiety during initial editing (*WAI-E-Initial*: $M= 57.69$, $S.D. = 16.55$) seems similar

to the anxiety about wiki editing before wiki interaction. It also seems higher than wiki anxiety during editing after experiencing no change (*WAI-E-Unchanged*: $M=50.26$, $S.D. = 16.73$), addition (*WAI-E-Addition*: $M= 50.05$ $S.D. = 17.01$) and deletion and replacement of their previous content (*WAI-E-Delete*: $M= 52.07$, $S.D. = 17.24$), although wiki anxiety after the conditions did not seem to differ greatly from each other. Similarly participants' initial usability rating is lower (*WUI-Initial*: $M= 84.40$, $S.D. = 12.86$) than those when editing after experiencing other users not changing the content (*WUI-Unchanged*: $M= 89.62$, $S.D. = 11.91$), adding to content (*WUI-Addition*: $M= 89.02$, $S.D. = 12.63$) and deleting and replacing the participants' content (*WUI-Delete*: $M= 88.39$, $S.D. = 12.52$). The usability ratings after experiencing the conditions did not seem to differ to a large extent.

5.3.3 Correlation Analysis

A bivariate correlation analysis was conducted to identify the relationships between the questionnaire variables included in this study. The results of the bivariate correlation analysis are shown in Table 5.6. All measurements of wiki anxiety correlated strongly with state anxiety measurements after experiences with the wiki suggesting high concurrent validity. Participants scores on wiki anxiety during editing in the *Initial Edit* (*WAI-E-Initial*) was significantly positively correlated with state anxiety measured in the *Initial Edit* [State-Initial: $r(72) = .691$, $p=0.000$] as well as being correlated with state anxiety measured in edits after experiencing *Unchanged* (*State-Unchanged*) [$r(72) = .569$, $p=0.000$] *Addition* [State-Addition: $r(72) = .536$, $p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = .640$, $p=0.000$] flexibility conditions. The strongest correlation was with the state measure taken in the concurrent condition to which the wiki anxiety was measured

(i.e. *State- Initial*). Wiki anxiety during editing after experiencing the *Unchanged* condition (*WAI-E-Unchanged*) correlated the most strongly and positively with state anxiety measured in the edit after experiencing the *Unchanged* condition [State-Unchanged: $r(72) = .709, p=0.000$]. It also correlated with state anxiety measured in the *Initial Edit* condition [State-Initial: $r(72) = .541, p=0.000$] and in edits after experiencing the *Addition* [State-Addition: $r(72) = .578, p=0.000$] and the *Delete and Replace* conditions [State-Delete: $r(72) = .620, p=0.000$]. Wiki anxiety experienced during editing after experiencing the *Addition* condition (*WAI-E-Addition*) correlated positively and most strongly with state anxiety in the edit after experiencing the *Addition* condition [State-Addition: $r(72) = .716, p=0.000$] but also correlated significantly with state anxiety measured in the *Initial Edit* [State-Initial: $r(72) = .449, p=0.000$] and in the edits after the *Unchanged* [State-Unchanged: $r(72) = .574, p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = .649, p=0.000$] conditions . Wiki anxiety in the edit after experiencing the *Delete and Replace* (*WAI-E-Delete*) flexibility condition correlated positively and most strongly with the concurrent measure of state anxiety [State-Delete: $r(72) = .719, p=0.000$] as well as with measures of state anxiety in the *Initial Edit* condition [State-Initial: $r(72) = .478, p=0.000$] and those in edits after experiencing the *Unchanged* [State-Unchanged: $r(72) = .491, p=0.000$] and *Addition* [State-Addition: $r(72) = .480, p=0.000$] flexibility conditions.

Therefore wiki anxiety during editing measured in each edit related significantly and most strongly to their concurrent measures of state anxiety suggesting good concurrent validity for the wiki anxiety measure used. Wiki anxiety during each condition also correlated with state anxiety in edits after experiencing

the other conditions. This correlation with all other measures of state anxiety after conditions is not surprising seeing as wiki anxiety measured throughout the experiment correlated significantly. Wiki anxiety measured in the *Initial Edit* (WAI-E-Initial) correlated significantly and positively with wiki anxiety measured in edits after the *Unchanged* [WAI-E-Unchanged: $r(72) = .787, p=0.000$], *Addition* [WAI-E-Addition: $r(72) = .769, p=0.000$] and *Delete and Replace* [WAI-E-Delete: $r(72) = .787, p=0.000$] flexibility conditions were experienced. Similarly wiki anxiety during editing after experiencing the *Unchanged* (WAI-E-Unchanged) condition correlated significantly and positively with wiki anxiety in edits after the *Addition* [WAI-E-Addition: $r(72) = .851, p=0.000$] and *Delete and Replace* [WAI-E-Delete: $r(72) = .778, p=0.000$] conditions. Additionally wiki anxiety after the *Addition* (WAI-E-Addition) condition correlated significantly and positively with wiki anxiety experienced when editing after the *Delete and Replace* condition [WAI-E-Delete: $r(72) = .864, p=0.000$]. These correlations are replicated in the correlations between state anxiety measures during the experiment. Participants state anxiety in the *Initial Edit* (State-Initial) condition correlated significantly with the state anxiety after experiencing *Unchanged* [State-Unchanged: $r(72) = .697, p=0.000$], *Addition* [State-Addition: $r(72) = .560, p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = .710, p=0.000$] conditions. State anxiety after the *Unchanged* (State-Unchanged) experience also correlated with state anxiety after experiencing the *Addition* [State-Addition: $r(72) = .711, p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = .748, p=0.000$] flexibility conditions.

Table 5. 6- Correlation matrix of questionnaire variables included in the study

Trait	FNEB	WAI-E-Pre	State-Initial	WAI-E-Initial	WUI-Initial	State-Unchanged	WAI-E-Unchanged	WUI-Unchanged	State-Addition	WAI-E-Addition	WUI-Addition	State-Delete	WAI-E-Delete	WUI-Delete	
State-Pre	.107	.034	.218	.556***	.287**	-.240*	.434***	.264*	-.215	.400***	.202	-.230*	.368***	.187	-.192
<i>Sig.</i>	.363	.771	.062	.000	.013	.040	.000	.023	.065	.000	.084	.049	.001	.111	.102
Trait		.542***	.247*	.215	.139	-.015	.129	.222	-.126	.289*	.226	-.148	.081	.169	-.126
<i>Sig.</i>		.000	.034	.066	.236	.896	.273	.057	.284	.012	.053	.208	.492	.150	.286
BFNES			.260*	.293*	.291*	-.007	.228*	.339**	-.100	.254*	.241*	-.068	.263*	.292*	-.132
<i>Sig.</i>			.025	.011	.012	.950	.050	.003	.396	.029	.039	.563	.023	.012	.263
WAI-E-Pre				.452***	.766***	-.553***	.437***	.635***	-.478***	.395***	.645***	-.486***	.513***	.710***	-.550***
<i>Sig.</i>				.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
State-Initial					.691***	-.455***	.697***	.541***	-.414***	.560***	.449***	-.432***	.710***	.478***	-.435***
<i>Sig.</i>					.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
WAI-E-Initial						-.738***	.569***	.787***	-.644***	.536***	.769***	-.638***	.640***	.787***	-.676***
<i>Sig.</i>						.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
WUI-Initial							-.479***	-.653***	.843***	-.480***	-.691***	-.849***	-.522***	-.622***	.841***
<i>Sig.</i>							.000	.000	.000	.000	.000	.000	.000	.000	.000
State-Unchanged								.709***	-.632***	.711***	.574***	-.596***	.748***	.491***	-.531***
<i>Sig.</i>								.000	.000	.000	.000	.000	.000	.000	.000
WAI-E-Unchanged									-.800***	.578***	.851***	-.678***	.620***	.778***	-.711***
<i>Sig.</i>									.000	.000	.000	.000	.000	.000	.000
WUI-Unchanged										-.548***	-.755***	.887***	-.551***	-.620***	.864***
<i>Sig.</i>										.000	.000	.000	.000	.000	.000
State-Addition											.716***	-.693***	.621***	.480***	-.585***
<i>Sig.</i>											.000	.000	.000	.000	.000
WAI-E-Addition												-.822***	.649***	.864***	-.816***
<i>Sig.</i>												.000	.000	.000	.000
WUI-Addition													-.633***	-.663***	.896***
<i>Sig.</i>													.000	.000	.000
State-Delete														.719***	-.683***
<i>Sig.</i>														.000	.000
WAI-E-Delete															-.797***
<i>Sig.</i>															.000

All correlations marked with *** are significant at the .001 level

All correlations marked with ** are significant at the .01 level

All correlations marked with * are significant at the .05 level

Additionally state anxiety after experiencing the *Addition* (State-Addition) condition also correlated with state anxiety after experiencing the *Delete and Replace* condition [State-Delete: $r(72) = .621, p=0.000$]. Such strong significant correlations between the wiki anxiety and state anxiety measured within wiki interaction and the reflection of the highly significant correlations between wiki anxiety variables in state anxiety variables infer that the measure of wiki anxiety show validity in measuring anxiety experienced within wiki interaction. This supports the hypothesis that measures of wiki anxiety will correlate positively and strongly with state anxiety measures suggesting concurrent validity.

However as in Chapter 4 (The *Editing Identity Experiment*), anxiety towards wiki editing before interaction (*WAI-E-Pre*) did not correlate with state anxiety measured before interaction [State-Pre: $r(72) = .218, p>0.05$] and correlated weakly with trait anxiety [Trait: $r(72) = .247, p=0.034$]. It did however correlate strongly and significantly with all other measures of wiki anxiety during wiki interaction [WAI-E-Initial: $r(72) = .766, p=0.000$; WAI-E-Unchanged: $r(72) = .635, p=0.000$; WAI-E-Addition: $r(72) = .645, p=0.000$; WAI-E-Delete: $r(72) = .710, p=0.000$]. Furthermore it significantly correlated with all measures of state anxiety measured during the experiment interaction with the wiki [State-Initial: $r(72) = .452, p=0.000$; State-Unchanged: $r(72) = .437, p=0.000$; State-Addition: $r(72) = .395, p=0.000$; State-Delete: $r(72) = .513, p=0.000$]. The correlations between state anxiety before interaction (State-Pre) and other wiki anxiety measures were inconsistent and either weak or not statistically significant [WAI-E-Initial: $r(72) = .287, p=0.013$; WAI-E-Unchanged: $r(72) = .264, p=0.023$; WAI-E-Addition: $r(72) = .202, p>0.05$; WAI-E-Delete: $r(72) = .187, p>0.05$]. This combined suggests that the lack of correlation

between state anxiety before interaction and wiki anxiety towards interaction is again (as in the *Editing Identity Experiment*) likely to be because participants' state anxiety before editing is more general rather than wiki specific. Participants had not experienced interaction in the experiment scenario yet so their state anxiety is unlikely to be affected by wiki interaction. As the wiki anxiety measure focuses on wikis as the stressor in items there is likely to be assessment of anxiety towards that specific stressor in the measure. Its correlation with other anxiety variables during wiki interaction seems to support this interpretation.

Interestingly levels of trait anxiety did not to correlate significantly with levels of state anxiety throughout most of the experiment [State-Pre: $r(72) = .107$, $p > 0.05$; State-Initial: $r(72) = .215$, $p > 0.05$; State-Unchanged: $r(72) = .129$, $p > 0.05$; State-Delete: $r(72) = .081$, $p > 0.05$] apart from with state anxiety after experiencing the *Addition* condition [State-Addition: $r(72) = .289$, $p = 0.012$]. There was therefore no relationship with trait anxiety with state anxiety experienced in the experiment apart from after experiencing the *Addition* condition, although the coefficient is low for the amount of correlation analysis performed. Trait anxiety did not correlated significantly with any of the wiki anxiety measurements taken during wiki interaction [WAI-E-Initial: $r(72) = .139$, $p > 0.05$; WAI-E-Unchanged: $r(72) = .222$, $p > 0.05$; WAI-E-Addition: $r(72) = .226$, $p > 0.05$; WAI-E-Delete: $r(72) = .169$, $p > 0.05$]. It therefore seems that wiki anxiety measured is more state focused than influenced by trait anxiety. Therefore the prediction that the null hypothesis would be supported in terms of wiki anxiety correlation with trait anxiety was confirmed.

In terms of the usability measure used in the experiment, the construct of usability correlated negatively with anxiety experienced in the conditions suggesting

construct validity. Usability rating in the *Initial Edit* condition (*WUI-Initial*) correlated significantly with state anxiety [State-Initial: $r(72) = -.455, p=0.000$] and wiki anxiety [WAI-E-Initial: $r(72) = -.738, p=0.000$] in the *Initial Edit* condition. It also correlated negatively with state anxiety and wiki anxiety after experiencing *Unchanged* [State-Unchanged: $r(72) = -.479, p=0.000$; WAI-E-Unchanged: $r(72) = -.653, p=0.000$], *Addition* [State-Addition: $r(72) = -.480, p=0.000$; WAI-E-Addition: $r(72) = -.691, p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = -.522, p=0.000$; WAI-E-Delete: $r(72) = -.622, p=0.000$] conditions. Participants' usability rating after experiencing the *Unchanged* condition (*WUI-Unchanged*) also correlated negatively with state [State-Unchanged: $r(72) = -.632, p=0.000$] and wiki anxiety [WAI-E-Unchanged: $r(72) = -.800, p=0.000$] measured after experiencing the *Unchanged* condition. It also correlated negatively with both state and wiki anxiety in the *Initial Edit* condition [State-Initial: $r(72) = -.414, p=0.000$; WAI-E-Initial: $r(72) = -.644, p=0.000$] and when editing after experiencing the *Addition* [State-Addition: $r(72) = -.548, p=0.000$; WAI-E-Addition: $r(72) = -.755, p=0.000$] and *Delete and Replace* [State-Delete: $r(72) = -.551, p=0.000$; WAI-E-Delete: $r(72) = -.620, p=0.000$] conditions. Participants' usability rating of editing after experiencing the *Addition* condition (*WUI-Addition*) again correlated significantly and negatively with both state [State-Addition: $r(72) = -.693, p=0.000$] and wiki anxiety [WAI-E-Addition: $r(72) = -.822, p=0.000$] measures after experiencing the *Addition* condition. Usability score also negatively correlated with state and wiki anxiety measured in the *Initial Edit* [State-Initial: $r(72) = -.432, p=0.000$; WAI-E-Initial: $r(72) = -.638, p=0.000$] as well as in edits after the experience of *Unchanged* [State-Unchanged: $r(72) = -.596, p=0.000$; WAI-E-Unchanged: $r(72) = -.678, p=0.000$]

and *Delete and Replace* [State-Delete: $r(72) = -.633, p=0.000$; WAI-E-Delete: $r(72) = -.663, p=0.000$] conditions. When measured after experiencing the *Delete and Replace* condition (*WUI-Delete*), usability also correlated negatively and strongly with state anxiety [State-Delete: $r(72) = -.683, p=0.000$] and wiki anxiety [WAI-E-Delete: $r(72) = -.797, p=0.000$] during editing. It also correlated negatively with state and wiki anxiety measured in the *Initial Edit* [State-Initial: $r(72) = -.435, p=0.000$; WAI-E-Initial: $r(72) = -.676, p=0.000$] as well as when editing after experiencing both the *Unchanged* [State-Unchanged: $r(72) = -.531, p=0.000$; WAI-E-Unchanged: $r(72) = -.711, p=0.000$] and *Addition* [State-Addition: $r(72) = -.585, p=0.000$; WAI-E-Addition: $r(72) = -.816, p=0.000$] conditions. Additionally each measure of wiki usability correlated negatively with wiki anxiety measured before interaction (*WAI-E-Pre*) [WUI-Initial: $r(72) = -.553, p=0.000$; WUI-Unchanged: $r(72) = -.478, p=0.000$; WUI-Addition: $r(72) = -.486, p=0.000$; WUI-Delete: $r(72) = -.550, p=0.000$]. The usability scores either correlated weakly [WUI-Initial: $r(72) = -.240, p=0.040$; WUI-Addition: $r(72) = -.230, p=0.049$] or did not correlate significantly with state anxiety before interaction [WUI-Unchanged: $r(72) = -.215, p>0.05$; WUI-Delete: $r(72) = -.192, p>0.05$]. This is again likely due to state anxiety not being affected by wiki interaction at this stage of the experiment.

Usability scores measured throughout the experiment also held significant positive correlations with each other [*WUI-Initial & WUI-Unchanged*: $r(72) = .843, p=0.000$; *WUI-Initial & WUI-Addition*: $r(72) = .849, p=0.000$; *WUI-Initial & WUI-Delete*: $r(72) = .841, p=0.000$; *WUI-Unchanged & WUI-Addition*: $r(72) = .887, p=0.000$; *WUI-Unchanged & WUI-Delete*: $r(72) = .864, p=0.000$; *WUI-Addition & WUI-Delete*: $r(72) = .896, p=0.000$]. The positive construct of usability's negative

correlation with the negative construct of anxiety experienced during the experiment (in both state and wiki anxiety) therefore suggest an element of validity in the measurement of usability in this experiment and confirms our hypothesis.

In this research participants' level of fear of negative evaluation (FNEB) correlated positively with the wiki anxiety experienced during the experiment. Fear of negative evaluation correlated weakly with wiki anxiety experienced before interaction [WAI-E-Pre: $r(72) = .260, p=0.025$] and in the *Initial Edit* condition [WAI-E-Initial: $r(72) = .291, p=0.012$] and with wiki anxiety measured in the edit after experiencing *Unchanged* [WAI-E-Unchanged: $r(72) = .339, p=0.003$], *Addition* [WAI-E-Addition: $r(72) = .241, p=0.039$] and *Delete and Replace* [WAI-E-Delete: $r(72) = .292, p=0.012$] flexibility conditions. Therefore participants who fear being negatively evaluated also tended to have higher wiki anxiety during editing yet these relationships in general are statistically weak for the amount of correlation analysis conducted apart from that with the wiki anxiety after experiencing the *Unchanged* condition. The hypothesis that there would be a significant relationship between wiki anxiety and users fear of negative evaluation was supported but the correlations were quite weak and inconsistent in terms of correlation co-efficient and statistical significance.

5.3.4 Wiki Flexibility and Wiki Anxiety –Total Score Analysis

A 5x6 mixed design ANOVA was conducted to investigate the effects of wiki flexibility (within-subjects) on wiki anxiety levels during editing. The between-subject variables of condition order was included to observe any effects that these may have on wiki anxiety. The twelve task orders were not included in the analysis

due to the amount of participants in each order being too small to give meaningful statistics. Due to the amount of orders used, it is assumed that task order is unlikely to affect the dependent variables significantly. Greenhouse-Geisser corrected within-subjects findings for the ANOVA are reported due to the violation of sphericity within the data ($p=0.000$). There was a significant main effect of flexibility condition on wiki anxiety during editing [$F(3.08, 209.70) = 17.618, p=0.000$]. LSD Post Hoc tests showed that wiki anxiety before interaction was significantly higher (*WAI-E-Pre*: $M= 58.29$) than that experienced when editing after no change to their previous edit (*WAI-E-Unchanged*: $M= 50.26$), addition to their previous edit (*WAI-E-Addition*: $M= 50.05$) and when their previous edit was deleted and replaced (*WAI-E-Delete*: $M= 52.07$) ($p=0.000$). Additionally participants anxiety during editing in their *Initial Edit* (*WAI-E-Initial*: $M= 57.69$) was higher than the anxiety experienced when editing after experiencing *no change, addition and deletion and replacement* of their previous content ($p=0.000$). There was no significant difference between wiki anxiety experienced after the *Unchanged, Addition and Delete and Replace* conditions ($p>0.05$). There was also no significant difference between wiki anxiety before interaction and wiki anxiety during their *Initial Edit* ($p>0.05$). There was no significant main effect of condition order on anxiety throughout the experiment [$F(5, 68) = 0.070, p>0.05$]. There was also no significant interaction between wiki anxiety experienced during editing in each measure and condition order [$F(15.42, 209.70) = 0.920, p>0.05$]. Condition order therefore did not have a significant effect on wiki anxiety experienced at each point of measure. The hypothesis that there would be a significant difference in terms of wiki anxiety when editing depending on the previous flexibility conditions experienced was therefore not statistically supported.

5.3.5 Wiki Flexibility and Wiki Anxiety–Item Analysis

The same analysis as to that presented above was run on data from each of the questionnaire items to observe the effect of the independent variables on each item score within the wiki anxiety measures. The positive items in this measure were reverse scored so that the total score reflected the level of anxiety. Therefore larger scores on positively worded items mean more negative evaluations of those items.

Similar findings as to those in the main analysis were found in terms differences between wiki anxiety measured referring to feeling comfortable about editing the wiki (item 4-reverse scored-Means: *WAI-E-Pre*= 2.56; *WAI-E-Initial*= 2.64; *WAI-E-Unchanged*= 2.09; *WAI-E-Addition*= 2.08; *WAI-E-Delete*= 2.10), feeling intimidated while editing the wiki (item 7-Means: *WAI-E-Pre*= 2.40; *WAI-E-Initial*= 2.41; *WAI-E-Unchanged*= 1.92; *WAI-E-Addition*= 1.87; *WAI-E-Delete*= 2.05), afraid of doing something wrong when editing the wiki (item 14- Means: *WAI-E-Pre*= 2.79; *WAI-E-Initial*= 2.54; *WAI-E-Unchanged*= 1.95; *WAI-E-Addition*= 1.97; *WAI-E-Delete*= 2.09), being nervous of what others might think of their edits (item 17- Means: *WAI-E-Pre*= 2.95; *WAI-E-Initial*= 2.80; *WAI-E-Unchanged*= 2.32; *WAI-E-Addition*= 2.39; *WAI-E-Delete*= 2.53) and thoughts of other users judging their edits making them tense (item 19- Means: *WAI-E-Pre*= 2.58; *WAI-E-Initial*= 2.56; *WAI-E-Unchanged*= 2.27; *WAI-E-Addition*= 2.22; *WAI-E-Delete*= 2.23). In all of these items there was a significant main effect of flexibility condition on the items scores (item 4: $p=0.000$; item 7: $p=0.000$; item 14: $p=0.000$; item 17: $p=0.000$; item 19: $p=0.003$). The items scores before interaction (*WAI-E-Pre*) were significantly higher than those in the item measured after experiencing the *Unchanged* (item 4: $p=0.001$; item 7: $p=0.000$; item 4: $p=0.000$; item 17: $p=0.000$; item 19: $p=0.022$),

Addition (item 4: $p=0.001$; item 7: $p=0.000$; item 14: $p=0.000$; item 17: $p=0.001$; item 19: $p=0.018$) and *Delete and Replace* conditions (item 4: $p=0.000$; item 7: $p=0.013$; item 14: $p=0.000$; item 17: $p=0.005$; item 19: $p=0.017$). Participants scores when measuring anxiety during *Initial Edit* were also significantly higher than when measured after the *Unchanged* (item 4- $p=0.000$; item 7- $p=0.000$; item-14 $p=0.000$; item-17 $p=0.000$; item 19- $p=0.014$), *Addition* (item 4: $p=0.000$; item 7: $p=0.000$; item 14: $p=0.000$; item 17: $p=0.001$; item 19: $p=0.006$) and *Delete and Replace conditions* (item 4: $p=0.000$; item 7: $p=0.007$; item 14: $p=0.000$; item 17: $p=0.036$; item 19: $p=0.006$). There were no significant differences between the scores in the items before interaction (*WAI-E-Pre*) and during *Initial Edit* ($p>0.05$). Similarly no significant differences existed between the item scores in the *Unchanged*, *Addition* and *Delete and Replace* conditions in each item ($p>0.05$).

Scores on the item referring to feeling at ease when editing the wiki (item 5- reverse scored) as well as feeling relaxed about editing the wiki (item 6- reverse scored) varied similarly depending on the wiki anxiety measures ($p=0.000$). Scores on the measure before interaction (*WAI-E-Pre*) (item 5: $M= 2.51$; item 6: $M= 2.61$) were lower than those in the *Initial Edit* measure (item 5: $M= 2.81$, $p=0.037$; item 6: $M= 2.90$, $p=0.019$) for both items. The item scores in wiki anxiety before interaction (*WAI-E-Pre*) were however significantly higher than those attained in wiki anxiety measures administered after the flexibility conditions for both item 5 (*WAI-E-Unchanged*: $M= 2.11$, $p=0.004$; *WAI-E-Addition*: $M= 2.01$, $p=0.000$; *WAI-E-Delete*: $M= 2.19$, $p=0.007$) and item 6 (*WAI-E-Unchanged*: $M= 2.27$, $p=0.02$; *WAI-E-Addition*: $M= 2.19$, $p=0.003$; *WAI-E-Delete*: $M= 2.31$, $p=0.018$). Scores in the *Initial Edit* measure were also higher than those after experiencing the *Unchanged*, *Addition*

and *Delete and Replace* measures ($p=0.000$) for both items. There were no significant differences between the scores gained after experiencing each flexibility condition ($p>0.05$).

Both items referring to being nervous about changing existing content on the wiki (item 21) and being scared to think that users could destroy someone else's content (item 22) has similar effects in the main effect of flexibility ($p=0.000$). Scores in the *Pre* measure on these items (item 21: $M= 2.88$; item 22: $M= 2.95$) were significantly higher than those measured in the *Initial Edit* measure (item 21: $M= 2.27$, $p=0.000$; item 22: $M= 2.13$, $p=0.000$), after experiencing the *Unchanged* (item 21: $M= 2.16$, $p=0.000$; item 22: $M= 2.06$, $p=0.000$), *Addition* (item 21: $M= 2.14$, $p=0.000$; item 22: $M= 2.15$, $p=0.000$) and *Delete and Replace* (item 21: $M= 2.15$, $p=0.000$; item 22: $M= 2.03$, $p=0.000$) conditions. All the comparisons between Initial Edit, Unchanged, Addition and Delete and Replace conditions on the item scores were found not to be statistically significant ($p>0.05$).

In reference to participants feeling anxious about making a mistake (item 2) there was again a significant main effect of flexibility ($p=0.000$). The item score before interaction (*WAI-E-Pre*: $M= 2.75$) was significantly higher than that when editing after experiencing the *Unchanged* ($M= 2.45$, $p=0.022$), *Addition* ($M= 2.41$, $p=0.039$) and *Delete and Replace* conditions ($M= 2.32$, $p=0.001$). Similarly the item score in the *Initial Edit* ($M= 3.06$) was also significantly higher than those after the *Unchanged* ($p=0.000$), *Addition* ($p=0.000$) and *Delete and Replace* conditions ($p=0.000$). There was no significant difference between item scores in the *Initial Edit* and the *Pre* measure ($p>0.05$) or between scores after experiencing the different flexibility conditions ($p>0.05$). There was a significant interaction between condition

order and flexibility variables on this item ($p=0.036$). The interaction suggests that in ABC, ACB, BAC, BCA and CAB conditions, those conditions experienced last in the order held lower scores than the other conditions, although those in CBA condition order held lowest score after experiencing the Addition (B) condition. In the ABC condition there seems to be an effect of condition order where participants' scores reduce as they experience the conditions. Those in ACB order seem to increase slightly in score after experiencing the Delete and Replace condition (C) from the score gained from after the Unchanged condition (A) and record the lowest score after experiencing the Addition (B) condition. There also seems to be an effect of condition order on the scores in the BAC condition. In the BCA condition participants seem to reduce in score on the item after experiencing the Delete and Replace condition (C) compared to the Addition condition (B) and remain at this score after experiencing the Unchanged (A) condition. The CAB condition demonstrates a slight increase between experiencing the first flexibility condition (C) and the second (B) although the score reduces after experiencing the Addition (A) condition. There is a large reduction in score between experiencing the first condition (C) and the second condition (B) in the CBA condition order. However there is an increase in score after experiencing the Unchanged condition (A). These varying effects are likely to be contributing to the interaction although due to the weak significance and the fact that no other item holds this relationship, it may be due to chance. This interaction is displayed graphically in Figure A.30 in Appendix 3.9.

A main effect of flexibility was also found on the item referring to feeling apprehensive when editing the wiki ($p=0.000$) (item 1). Participants' score in the item before interaction (*WAI-E-Pre*) ($M= 2.74$) was significantly smaller than

participant's scores on the item in the *Initial Edit* (M= 3.02) ($p=0.031$). The *Pre* score was also significantly higher than those after experiencing the *Addition* (M= 2.27) ($p=0.002$) and *Delete and Replace* (M= 2.45) ($p=0.028$) conditions but not those after the *Unchanged* (M= 2.51) condition ($p>0.05$). *Initial Edit* scores also were significantly higher than those after the *Unchanged* ($p=0.000$), *Addition* ($p=0.000$) and *Delete and Replace* conditions ($p=0.000$). Item scores after the *Unchanged* condition were also significantly higher than those after the *Addition condition* ($p=0.015$) although scores after the *Addition* and *Delete and Replace* as well as the *Unchanged* and *Delete and Replace* item scores did not differ significantly.

Participants' scores of feeling excited when editing the wiki (item 3-reverse scored) were also different depending on the wiki anxiety measures in the experiment ($p=0.000$). Scores in the *Initial Edit* interaction (M= 3.62) were significantly higher than in all other measures of wiki anxiety (*WAI-E-Pre*: M= 3.19; *WAI-E-Unchanged*: M= 3.11; *WAI-E-Addition*: M= 3.15; *WAI-E-Delete*: M= 3.27) ($p=0.000$). Furthermore item score in the *Unchanged* condition was significantly lower than the item score after experiencing the *Delete and Replace* condition ($p=0.028$). All other comparisons between the conditions led to no significant differences being found ($p>0.05$).

There was a significant main effect of flexibility on item scores referring to feeling secure when editing the wiki (item 9-reverse scored) ($p=0.000$). Scores in the *Pre* measure (M= 2.68) were significantly higher than those after experiencing the *Unchanged* (M= 2.33, $p=0.005$), *Addition* (M= 2.20, $p=0.000$) and *Delete and Replace* conditions (M= 2.37, $p=0.005$). Scores in the *Initial Edit* (M= 2.61) were

also higher than those after the *Unchanged* ($p=0.022$) and *Addition* ($p=0.000$) conditions but not the *Delete and Replace* condition ($p>0.05$). There was also no significant difference between the *Pre* and *Initial Edit* item scores ($p>0.05$). Scores after experiencing *Addition* to content was also significantly lower than the item score when editing after experiencing the *Delete and Replace* condition ($p=0.039$). Comparisons of the *Unchanged* condition scores with the *Addition* and *Delete and Replace* condition scores were not significant ($p>0.05$).

Participants feeling of confidence when contributing to the wiki (item 11-reverse scored) were also dependent on the point of wiki anxiety measurement ($p=0.000$). Scores in the *Initial Edit* ($M= 2.89$) were significantly higher than those in all other wiki anxiety measures during the experiment (*WAI-E-Pre*: $M= 2.34$; *WAI-E-Unchanged*: $M= 2.38$; *WAI-E-Addition*: $M= 2.35$; *WAI-E-Delete*: $M= 2.43$) (all $p=0.000$). All other comparisons were not statistically significant ($p>0.05$).

Being happy about contributing content (item 12-reverse scored) scores also had a main effect of flexibility ($p=0.037$). The mean for the item in the *Pre* measure ($M= 2.03$) was significantly lower than that for the item when editing in the *Initial Edit* ($M= 2.24$, $p=0.028$) and when editing after experiencing the *Delete and Replace* condition ($M= 2.20$, $p=0.049$) but there was no significant difference between the *Pre* measure and scores on the item after the *Unchanged* ($M= 2.18$) and *Addition* ($M= 2.01$) condition. The *Initial Edit* score was also higher than the score after the *Addition* condition ($M= 2.01$, $p=0.018$) but did not significantly differ from scores gained after the *Unchanged* and *Delete and Replace* conditions ($p>0.05$). Moreover, the score in the *Delete and Replace* condition was higher than that gained after experiencing the *Addition* condition ($p=0.022$) but was not significantly different

from the score after the *Unchanged* condition ($p>0.05$). The scores after experiencing the *Unchanged* and *Addition* conditions did not significantly differ ($p>0.05$).

There was also a significant difference in item scores between the measures on participants worry about making a mistake when editing the wiki (item 13) ($p=0.000$). Item score on the *Pre* measure ($M= 2.36$) was significantly higher than that on all other measures of wiki anxiety within the experiment (*WAI-E-Initial*: $M= 1.94$, $p=0.001$; *WAI-E-Unchanged*: $M= 1.73$, $p=0.000$; *WAI-E-Addition*: $M= 1.74$, $p=0.000$; *WAI-E-Delete*: $M= 1.79$, $p=0.000$). The score on this item in the *Initial Edit* measure was also significantly higher than that after experiencing the *Unchanged* condition ($p=0.029$) but not after the other flexibility conditions ($p>0.05$). The scores after each flexibility condition also did not significantly differ ($p>0.05$).

A main effect of flexibility was also found in the item referring to participants' confidence that the information they were contributing was correct (item 15-reverse scored) ($p=0.005$). It was the *Pre* measure ($M= 2.83$) that was significantly higher on this item when compared to items scores after experiencing the *Initial Edit* ($M= 2.38$, $p=0.002$), *Unchanged* ($M= 2.35$, $p=0.000$) and *Delete and Replace* conditions ($M= 2.54$, $p=0.041$) but not the *Addition* ($M= 2.56$, $p>0.05$) condition. All other comparisons were not statistically significant ($p>0.05$).

The scores on being afraid that people would find faults with any edits they made (item 16) also held a significant main effect of flexibility ($p=0.022$). The wiki anxiety before interaction item score (*WAI-E-Pre*: $M= 2.82$) was significantly higher than that gained after experiencing the *Unchanged* condition ($M= 2.47$, $p=0.033$) but not after the *Addition* ($M= 2.60$, $p>0.05$) and *Delete and Replace* conditions ($M= 2.75$, $p>0.05$). *Initial Edit* item ($M= 2.92$) was also seen to be significantly larger

than after the *Unchanged* ($p=0.005$) and *Addition* ($p=0.031$) conditions but there was no significant difference between it and the score after the *Delete and Replace* condition ($p>0.05$) and those gained in the *Pre* measure ($p>0.05$). Item score after experiencing the *Unchanged* condition was also significantly lower than that after the *Delete and Replace* condition ($M= 2.75$, $p=0.05$) yet there was no significant difference between scores after the *Unchanged* and *Addition* ($p>0.05$) and the *Addition* and *Delete and Replace* conditions ($p>0.05$).

Participants concern that people would know it was them who were contributing to the wiki (item 18) was also seen to have significantly different scores across the wiki anxiety measures ($p=0.002$). The score on this item was significantly larger in the *Pre* measure ($M= 2.14$) compared to the score after experiencing the *Unchanged* ($M=1.68$, $p=0.000$), *Addition* ($M= 1.82$, $p=0.017$) and *Delete and Replace* ($M= 1.87$, $p=0.036$) conditions but there was no difference between the *Pre* and the *Initial Edit* ($M= 1.94$) item scores ($p>0.05$). Item score in the *Initial Edit* measure was also significantly higher than that seen in the *Unchanged* condition ($p=0.003$) but there were no significant differences between it and scores after the other flexibility conditions ($p>0.05$). The score in the *Unchanged* condition was significantly lower than that after both the *Addition* ($p=0.022$) and *Delete and Replace* ($p=0.008$) conditions. There were no significant differences between the scores after the *Addition* and *Delete and Replace* conditions ($p>0.05$).

A main effect of flexibility was also found in the analysis of items scores from the item referring to participants' uneasiness at the fact content could change (item 20) ($p=0.035$). The score in the *Pre* measure ($M= 1.96$) was not statistically different from any of the scores in the other measures ($p>0.05$). The score in the

Initial Edit (M= 1.78) was significantly lower than that after experiencing the *Delete and Replace* condition (M= 2.10, $p=0.000$) but were not different from those after the *Unchanged* (M= 1.89) and *Addition* (M= 1.75) conditions. Additionally mean item score gained in the *Addition* condition was significantly lower than that after the *Delete and Replace* condition ($p=0.008$). All other comparisons between the flexibility conditions were not statistically significant ($p>0.05$).

In terms of concern over other users changing the edits participants made (item 23), there was again a significant main effect of flexibility ($p=0.001$). In this case the items score in the *Pre* measure (M= 1.82) was significantly lower compared to the item score after the *Delete and Replace* condition (M= 2.17, $p=0.021$). Furthermore the item score in the *Initial Edit* (M= 1.65) measure was significantly lower than that after the *Unchanged* (M= 1.87, $p=0.011$), *Addition* (M= 1.91, $p=0.019$) and *Delete and Replace* ($p=0.000$) conditions. The score in the *Delete and Replace* condition was also significantly higher than that after both the *Unchanged* ($p=0.019$) and *Addition* ($p=0.008$) conditions. All other comparisons were not statistically significant ($p>0.05$).

There were no significant differences between the wiki anxiety measures in terms of findings hard to concentrate when editing the wiki (item 8) and being certain of overcoming any difficulties encountered when editing the wiki (item 10) ($p>0.05$).

There was also no significant main effect of condition order for any of the items (all $p>0.05$). None of the items (apart from item 2) showed a significant interaction effect between flexibility and condition order variables on the item scores ($p>0.05$).

5.3.6 Wiki Flexibility and Wiki Usability –Total Score Analysis

A 4x6 mixed design ANOVA was conducted to explore the effects of wiki flexibility (within-subjects) on usability rating of the editing experience. The between-subjects variable of condition order was included to monitor the potential effects of the orders on participants' usability rating. Again the twelve task orders were not included in the analysis due to the amount of participants in each order being too small to give meaningful statistics. Due to the amount of orders used, it is assumed that task order is unlikely to affect the dependent variables significantly. There was a main effect of flexibility on participants' usability rating of the editing experience [$F(3, 204) = 19.850, p=0.000$]. LSD Post Hoc comparisons show that participants usability rating in their *Initial Edit* experience (*WUI-Initial*: $M= 84.40$) is significantly lower than those gained when editing after experiencing *Unchanged* (*WUI-Unchanged*: $M= 89.62$), *Addition* (*WUI-Addition*: $M= 89.03$) and *Delete and Replace* flexibility conditions (*WUI-Delete*: $M= 88.39$) ($p=0.000$). There were no significant difference between the usability rating gained in edits after experiencing *Unchanged*, *Addition* and *Delete and Replace* conditions ($p>0.05$). There was no main effect of condition order on usability rating throughout the experiment [$F(5, 68) = 0.444, p>0.05$]. There was also no significant interaction between the flexibility conditions and condition order on wiki anxiety experienced [$F(3,204) = 1.506, p>0.05$]. The condition order therefore did not seem to significantly influence usability experienced. Therefore, the hypothesis that there would be a significant effect of flexibility conditions on usability ratings when edit the wiki subsequent to experience of these conditions was not supported statistically.

5.3.7 Wiki Flexibility and Wiki Usability –Item Analysis

Analysis conducted on the total scores above was replicated on data from each of the questionnaire items to observe the effect of the independent variables on each wiki usability item score. The negative items in this measure were reverse scored so that the total score reflected the positive concept of usability. Therefore larger scores on negatively worded items mean more positive scores on that item.

Similar findings as to those in the main analysis were found on items referring to finding the wiki easy to use (item 2- Means: *WUI-Initial*= 4.29; *WUI-Unchanged*= 4.52; *WUI-Addition*= 4.46; *WUI-Delete*= 4.43), getting flustered while editing the wiki (item 6-reverse scored- Means: *WUI-Initial*= 3.76; *WUI-Unchanged*= 4.22; *WUI-Addition*= 4.12; *WUI-Delete*= 4.03), feeling nervous when editing the wiki (item 11-reverse scored- Means: *WUI-Initial*= 3.24; *WUI-Unchanged*= 3.83; *WUI-Addition*= 3.70; *WUI-Delete*= 3.73) and feeling in control when editing the wiki (item 15- Means: *WUI-Initial*= 3.91; *WUI-Unchanged*= 4.13; *WUI-Addition*= 4.23; *WUI-Delete*= 4.09). In all of these items there was a significant main effect of flexibility condition on the item scores (item 2: $p=0.002$; item 6: $p=0.000$; item 11: $p=0.000$; item 15: $p=0.001$). The items scores in the *Initial Edit* usability measure (*WUI-Initial*) were significantly lower than those in the item scores measured after experiencing the *Unchanged* (item 2: $p=0.002$; item 6: $p=0.000$; item 11: $p=0.000$; item 15: $p=0.024$), *Addition* (item 2: $p=0.01$; item 6: $p=0.000$; item 11: $p=0.001$; item 15: $p=0.000$) and *Delete and Replace* conditions (item 2: $p=0.025$; item 6: $p=0.000$; item 11: $p=0.000$; item 15 $p=0.024$). There were no significant differences between the item scores after experiencing the different flexibility conditions ($p>0.05$).

Scores on the item referring to it being clear how to edit the wiki (item 1) as well as editing the wiki being fun (item 7) had similar flexibility main effects (item 1: $p=0.034$; item 7: $p=0.044$). Scores on the *Initial Edit* usability measure (item 1: $M= 4.32$; item 7: $M= 2.81$) were lower than those attained after experiencing the *Unchanged* (item 1: $M= 4.53$, $p=0.008$; item 7: $M= 3.01$, $p=0.022$) and *Addition* (item 1: $M= 4.47$, $p=0.042$; item 7: $M= 3 .00$, $p=0.021$) conditions in both items. The *Initial Edit* score did not significantly differ from that gained after experiencing the *Delete and Replace condition* (item 1: $M= 4.41$; item 7: $M= 2.92$) ($p>0.05$). Again there were no significant differences between the items scores after experiencing the different flexibility conditions ($p>0.05$).

Similar main effects of flexibility were also found in items measuring participants' ease of getting the wiki to do what they wanted it to do (item 16) and their view of the wiki interface needing improvement (item 20-reverse scored) (item 16: $p=0.013$; item 20: $p=0.03$). Item scores on the *Initial Edit* usability measure (item 16: $M= 4.21$; item 20: $M= 3.85$) were significantly lower than those in the measures after experiencing the *Unchanged* (item 16: $M= 4.44$, $p=0.002$; item 20: $M= 4.10$, $p=0.007$) and *Delete and Replace* (item 16: $M= 4.50$, $p=0.005$; item 20: $M= 4.03$, $p=0.048$) conditions. The *Initial Edit* score however did not significantly differ from those after the *Addition* (item 16: $M= 4.34$, $p>0.05$; item 20: $M= 4.03$, $p>0.05$). The scores after each flexibility condition did not significantly differ ($p>0.05$).

Similar analysis results were also apparent for items referring to participants feeling under stress when editing the wiki (item 10-reverse scored) and participants always knowing what to do next when editing the wiki (item 14). In both items there was a main effect of flexibility (both items: $p=0.000$). Scores in the *Initial Edit*

measure (item 10: $M= 3.12$; item 14: $M= 3.49$) were lower than when usability was measured in edits after experiencing the *Unchanged* (item 10: $M= 3.78$, $p= 0.000$; item 14: $M= 4.15$, $p= 0.000$), *Addition* (item 10: $M= 3.70$, $p= 0.001$; item 14: $M= 4.18$, $p=0.000$) and *Delete and Replace* (item 10: $M= 3.57$, $p= 0.005$; item 14: $M= 4.11$, $p=0.000$) conditions. There were no significant differences between scores after each flexibility condition ($p>0.05$). Additionally both items also had significant interactions between flexibility and condition order variables (item 10: $p=0.032$; item 14: $p=0.012$). With the interaction in the item 10 scores, there seems to be differences in scores depending on the condition order experienced. In the ABC order scores after experiencing the *Unchanged* condition was the lowest score compared to *Initial Edit* for all other conditions. There seemed to be no difference in scores after experiencing the conditions in the ACB conditions. In all other condition orders there seems to be a comparison effect affecting the scores after experiencing each condition. In terms of item 14 the interaction reflected the impact of condition order on the score in this item where participants felt that they knew what to do next more as they progress through the experiment rather than being influenced by the conditions. It has to be noted though that these interactions are not reflected in any of the other items or the total score analysis and are statistically weak (although the significance for item 14 is stronger than that in item 10). These interactions are displayed graphically in Figures A.31 and A.32 in Appendix 3.9.

How much participants found editing the wiki satisfying (item 9) also had a main effect of flexibility ($p=0.001$). Item scores in the *Initial Edit* ($M= 3.23$) were significantly lower than those in the edits after experiencing the *Unchanged* ($M= 3.47$, $p=0.01$) and *Addition* ($M= 3.50$, $p=0.001$) conditions. Scores in both the

Unchanged ($p=0.018$) and *Addition* ($p=0.003$) condition were however significantly higher than those gained after the *Delete and Replace* ($M= 3.27$) condition. All other comparisons were not found to be significant ($p>0.05$).

The item referring to participants recommending using a wiki to others (item 21-reverse scored) also held a significant main effect of flexibility ($p=0.023$). Participants' scores in the *Initial Edit* measure ($M= 3.31$) were lower than those measured in the usability questionnaire administered after the *Unchanged* flexibility condition ($M= 3.55$, $p =0.006$) but did not significantly differ from those gained after the *Addition* ($M= 3.48$, $p>0.05$) and *Delete and Replace* ($M= 3.43$, $p>0.05$) conditions. Comparisons between the flexibility conditions were not statistically significant ($p>0.05$).

There were no significant main effects of flexibility ($p>0.05$) or interactions (all $p>0.05$) on items referring to thinking editing the wiki was complicated (item 3-reverse scored), thinking editing the wiki was confusing (item 4-reverse scored), the wiki being difficult to edit (item 5-reverse scored), enjoying editing the wiki (item 8), having to concentrate hard when editing the wiki (item 12-reverse scored), finding editing the wiki frustrating (item 13-reverse scored), thinking the interaction was efficient (item 17), feeling that it took too long to edit the wiki (item 18-reverse scored), the layout of the wiki edit screen being clear (item 19) and not editing a wiki like this again (item 22-reverse scored).

There were also no main effects of condition order in any of the analyses of the usability questionnaire items ($p>0.05$) and no significant flexibility and condition order interactions apart from those mentioned in items 10 and 14.

5.3.8 Further Analysis

5.3.8.1 Editing Order, Wiki Anxiety and Wiki Usability

To analyse the effect of editing order on wiki anxiety and wiki usability two repeated measures ANOVAs were conducted. The table of means relating to these analyses are included in Table 5.7 below.

Table 5. 7- Means for wiki anxiety and wiki usability by order of experience

	Order	N	Mean	S.D.
Wiki Anxiety	Pre	74	58.30	16.66
	1 st Edit	74	57.69	16.55
	2 nd Edit	74	52.67	15.63
	3 rd Edit	74	51.11	17.60
	4 th Edit	74	48.61	17.49
Wiki Usability	1 st Edit	74	84.40	12.86
	2 nd Edit	74	87.50	11.61
	3 rd Edit	74	89.27	12.81
	4 th Edit	74	90.27	12.50

Due to violation of sphericity (Wiki Anxiety: $p=0.000$; Wiki Usability: $p=0.001$) the Greenhouse-Geisser corrected findings are reported for the within-subjects effects in both analyses. There was a significant effect on the order of edits on anxiety experienced [$F(2.94, 214.64) = 19.601, p=0.000$]. LSD Post Hoc comparisons show that, as seen in the main wiki anxiety total score analysis before, participants anxiety before interaction ($M= 58.30$) did not significantly differ from the anxiety experienced in the first edit in the experiment ($M= 57.69$) ($p>0.05$). It was however significantly higher than the wiki anxiety experienced in the second ($M= 52.67$), third ($M= 51.11$) and fourth ($M= 48.61$) editing experience ($p=0.000$). Wiki anxiety during the first edit was also significantly higher than that experienced in other subsequent edits ($p=0.000$). There was no significant difference between the second and third edits ($p>0.05$). Interestingly the wiki anxiety experienced in the

fourth edit was significantly lower than that experienced both in the second ($p=0.002$) and third edits ($p=0.016$).

In terms of the effect of editing order on wiki usability rating, a significant difference was found [$F(2.55, 186.27) = 24.146, p=0.000$]. Participants rating of usability in the first edit ($M= 84.40$) was significantly lower than usability rating in both the second ($M= 87.50$), third ($M= 89.27$) and fourth ($M= 90.27$) editing interactions ($p=0.000$). Usability rating in the second edit experience was also significantly lower than those in both the third ($p=0.004$) and fourth ($p=0.000$) edits in the experiment. There was no significant difference between wiki usability scores in the third and fourth edits ($p>0.05$). From the analyses conducted there seems to be a significant effect of editing order on wiki anxiety and wiki usability levels throughout the experiment. The effects on both concepts are however different. Wiki anxiety in the first edit was higher than that in all other subsequent edits. When editing in the fourth edit there was also a significant fall in anxiety during wiki editing. In terms of wiki usability, rating in the first edit was lower than those in subsequent edits. Additionally rating in the 2nd edit was lower than those in the third and fourth edit experiences with no difference between the 3rd and 4th. Participants felt the wiki system was less usable in the first and second edits than in the third and fourth edits in the experiment.

Further analysis was also conducted to explore whether users behaviour and flexibility experience significantly affected wiki anxiety and wiki usability between the *Initial Edit* (first edit) and second edit experiences within the experiment. The table of means for this analysis is in Table 5.8 below.

Table 5. 8- Means for wiki anxiety and wiki usability by identity condition in first and second edit experiences

	Edit	Condition	N	Mean	S.D.
Wiki Anxiety	1 st	Unchanged	25	58.60	17.32
		Addition	24	55.29	15.73
		Delete and Replace	25	59.08	16.95
	2 nd	Unchanged	25	53.30	16.81
		Addition	24	50.58	14.59
		Delete and Replace	25	54.04	15.82
Wiki Usability	1 st	Unchanged	25	82.73	13.45
		Addition	24	87.50	11.59
		Delete and Replace	25	83.08	13.38
	2 nd	Unchanged	25	86.68	11.76
		Addition	24	90.29	9.67
		Delete and Replace	25	85.64	13.03

Two 2x3 mixed design ANOVAs were conducted on both wiki anxiety and wiki usability scores from the first and second edit data (as within-subjects) and using the flexibility condition experienced between these edits as a between-subjects variable for comparison. There was a significant main effect between wiki anxiety experienced in the first and second edit [$F(1, 71) = 22.69, p=0.000$] already described in the post hoc analysis of edit experience order above. Importantly there was no significant interaction between the wiki anxiety experienced during the edits and the flexibility condition experienced [$F(2, 71) = 0.026, p>0.05$]. Therefore the difference experienced between edits 1 and 2 in wiki anxiety was not significantly dependent on the flexibility conditions experienced between edits. Additionally there was no main effect of flexibility condition on wiki anxiety [$F(2, 71) = 0.376, p>0.05$].

With reference to usability, again there was a significant main effect of edit order [$F(1, 71) = 18.568, p=0.001$] where usability in the second edit was higher than that in the first edit in the experiment, as found in the order of edit analysis above. As in the case of wiki anxiety, there was no interaction between wiki usability

in the edits and flexibility condition [$F(2, 71) = 0.360, p > 0.05$], suggesting that the flexibility conditions experienced between edits did not influence the usability scores. There was also no significant main effect of flexibility condition on usability across the measures [$F(2, 71) = 1.106, p > 0.05$]. In sum the initial flexibility condition experienced did not lead to a significant change in wiki anxiety and wiki usability from edit 1 to edit 2.

5.3.8.2 Relationship between experience, wiki anxiety and wiki usability

Of those whose previous editing experience data was available ($N=68$) the amount of edits made was correlated with the wiki anxiety and wiki usability measures taken in the experiment. This was so as to identify if there was any relationship between the amount of previous experience editing the wiki, wiki anxiety and wiki usability. Amount of previous editing experience did not relate consistently and significantly to any of the wiki anxiety and wiki usability measures in this experiment. In terms of correlations between previous edit amount and wiki anxiety measures within the experiment there were no significant correlation between previous amount of experience and wiki anxiety before interaction [WAI-E-Pre: $r(66) = -.156, p > 0.05$] and wiki anxiety after experiencing the *Unchanged* [WAI-E-Unchanged: $r(66) = -.122, p > 0.05$] and *Addition* [WAI-E-Addition: $r(66) = -.142, p > 0.05$] flexibility conditions although previous editing experience did correlate weakly with wiki anxiety in the *Initial Edit* [WAI-E-Initial: $r(66) = -.254, p = 0.036$] and that measured during editing after experiencing the *Delete and Replace* [WAI-E-Delete: $r(66) = -.243, p = 0.046$] condition. These correlations are statistically weak and likely to be an artefact of the volume of correlation analysis performed. Moreover previous editing experience was not significantly related to any

of the usability ratings taken during the experiment [WUI-Initial Edit: $r(66) = .169$, $p > 0.05$; WUI-Unchanged: $r(66) = .121$, $p > 0.05$; WUI-Addition: $r(69) = .157$, $p > 0.05$; WUI-Delete: $r(66) = .199$, $p > 0.05$]. The relationship of previous editing experiences relationship with wiki anxiety measures across the experiment seems to be inconsistent. Due to the weakness of the significance the significant findings are likely to be due to chance and so it can be interpreted that previous experience has little relationship with wiki anxiety experienced during editing. Similarly the amount of previous experience editing wikis does not significantly relate to any of the usability ratings measured in this experiment. It seems that the anxiety levels and usability ratings are therefore not significantly related to the participants' amount of editing experience.

5.3.8.3 Interview Comments

In the post-interaction interviews participants were given the opportunity to voice their opinions about the conditions and expand upon their experiment experiences. It was clear when asked about what they liked about editing the wiki that most felt "*it was clear*" and "*easy to use*". Some stated that they liked feeling that they were "*making a valuable contribution*" and that "*it felt good to put knowledge out there and hope others get use out of it*". Interestingly when participants were asked what they disliked about their editing experiences many said that they disliked "*when their post got deleted*" stating "*it was a bit like...What's going on?*" and that "*it's really easy to change someone else's content*" suggesting a dislike of the flexibility mostly aimed at the experience of deletion of their content by other users. Some also mentioned the fact that others could read the content

mentioning that “*the fact that other people can read what you said*” as a dislike of their experiences.

When asked about how they felt when editing after each flexibility experience there seemed to be differences in the way participants answered about each condition. About editing after the *Unchanged* condition common comments were that they “*felt fine*” and “*were a bit more confident*” or that they felt “*the same as I did the first time I edited it*”. When asked about their experiences after the *Addition* condition many stated they felt “*fine*” about editing after it and “*pretty much the same as before*”. Some also felt that it was “*positive*” and that they felt like they were “*collaborating with someone*”. However participants also seemed to answer commenting on their feelings about the flexibility experience rather than their feelings when editing after it. For instance when asked about how they felt editing after experiencing the *Addition* condition many commented they “*liked the fact that others were editing it as well as me*”, “*I thought it was good that people were adding more*” and “*it was reassuring that people had read it and found it was acceptable*”. These are more reactions to the flexibility condition rather than reflections on feelings when editing after. This was again apparent when asked about editing after the *Delete and Replace* condition. Comments such as “*annoyed that someone had deleted it*”, “*a little disappointed*” and concerned that they’d written something “*not quite right*” before seem to refer to the experience of the flexibility or the previous edit experience rather than their feelings towards the edit after the experience. When commenting about the edit after this experience some stated that they felt they had to “*compensate cause (they) didn’t want it to be deleted again*”, they felt “*more aware*” of what they were including and also felt “*more cautious*” and “*more apprehensive*”

when editing after experiencing their content deletion. However, positive comments such as “*it was ok*”, “*it didn’t upset me*”, “*really confident...If it was wrong then it would be corrected*” and “*it’s part of the wiki*” were also common. It seems participants felt that their editing experiences throughout were quite positive explaining why there may not have been a significant difference in either wiki anxiety or usability in the experiment.

This was further emphasised when asked if they felt the conditions had an effect on their subsequent editing experiences. Many of the comments focused on the experience of deletion of content but focused mainly on the change in editing behaviour that this experience led to rather than any change in emotionality. Participants mentioned that “*when content got deleted I wanted to make my next one better*” and that that it influenced “*how much I checked it*”. Participants tended to feel that they paid more attention to the edits they made after experiencing the deletion of their previous edits. Participants stated they “*...paid more attention when things got deleted*” that they “*...focused more*” and “*...looked through everything a bit closer*” compared to edits before they experienced deletion. However some also felt a “*bit freer*” to edit, “*it took the pressure off*” and they were “*less inclined to write a lot as people may just delete it*”. Some did feel “*less confident about editing it again*” but many more participants stated they felt no real effect after the conditions or that they felt “*more comfortable after each one*”, which is borne out in the order analysis.

In fact participants in general seemed quite positive to the fact that content could be changed. Many felt that such a characteristic “*maintains a quality in the wiki*”, led to “*a more accurate source of knowledge*”, that it kept things “*up to date*” and allowed users to “*introduce new evidence*” to the content. However trepidation

towards flexibility was also evident. Concerns were that “*people could delete something that is relevant*” and the fact information could be “*replaced by rubbish*” were noted as concerns. These comments echo some of the concerns seen in the interviews in the *Training Spaces* and *Editing Identity Experiments* (Chapters 3 and 4).

Interesting comments were also made when asked about the effect flexibility experiences would have on their intentions to edit again. Many stated that if they experienced deleting they would be less likely to edit again however it seemed this was only if “*it kept on happening*” and was dependent on the amount of effort placed in the edit. Additionally participants stated that if others added to their content it would give them “*the motivation to add more*”. Even in deleting scenarios some felt that this would “*push (them) to do it better*” and “*be a bit more thorough and take more time...make sure what I was writing was correct*”. Deletion of content may also open users to reflect the behaviour they experience as some said that experiencing deletion would make them “*more confident changing other people’s*” and it would make them “*more open to deleting*” content. The experience of the flexibility conditions may therefore lead to changes in future editing behaviour rather than affecting the wiki user experience in terms of wiki anxiety and usability during future interaction.

Similar to the previous chapters, participants felt that the collaborative nature of wikis in principle was a positive pedagogical force stating that “*it’s a good way to share ideas*”, “*it’s good that everyone gets their say*” and that it can be used as “*a launch pad to get other ideas*”. The use of content on the wiki as a base of knowledge for further research was core to many participants’ views of wikis use in

a Higher Education scenario. Comments such as “*I would use it as hints on which avenues to pursue*” and “*I would use it as a guide so that I can see what studies to take a deeper look at*” were almost ubiquitously made. Yet within their use in Higher Education their flexibility brings reliability concerns over the information source created in terms of “*you don’t know if it’s definitely reliable*”, that “*.....anyone can write on it...it’s not a text book*” and that “*there is nothing concrete*” on the wiki. It seems that although users are aware of the benefits and see a use for them in Higher Education, there is still major concern over the veracity of information that can be viewed from such systems. This is again something that has been stated in interviews across the research.

Again as in Chapters 3 and 4, when asked for solutions to this flexibility concern one of the most common suggestions was the use of a moderator or involving the teaching staff in the maintenance of the wiki information. Although against the core wiki ethos of open collaboration many stated that “*have a tutor or lecturer in control of the wiki*” and “*have a monitor who can edit and even lock edits*” would be ways of solving the flexibility concern. Some also mentioned the use of citations on pages so that the sources could be checked and the use of a mediator so that edits could be “*cross checked by someone else....They wouldn’t put the information up until someone had seen it*”. Additionally the use of an identity such as “*editing with a student number*” or having to “*put your name up when putting content on*” were suggested. The effect of these on wiki editing experience were explored in the *Editing Identity Experiment* (Chapter 4) and were found to lead to higher anxiety when editing compared to anonymous editing. It is interesting that although these suggestions may affect the wiki editing experience negatively (such as

increasing the accountability of edits and reducing the openness of wiki content contribution) users feel that these would increase the wiki viewing experience. Evidently further work is needed on the dichotomy between the editing and viewing experience and the effects wiki characteristics have on this interaction.

5.4 Discussion

In summary the findings showed the measures used in this research held high internal reliability. All wiki anxiety measures also correlated highly with state anxiety measures suggesting a significant relationship between wiki anxiety being measured and state anxiety experienced. This supports the hypothesis that wiki anxiety will correlate positively with state anxiety measures. Importantly trait anxiety did not correlate with wiki anxiety measured at any point during interaction suggesting that wiki anxiety during editing is system initiated (situational) rather than due to a predetermined trait to be anxious in potentially stressful situations and also supports the prediction of the null hypothesis being supported. Additionally, wiki usability measures were seen to correlate negatively with both state and wiki anxieties measured during the experiment suggesting an element of construct validity for the wiki usability measure and supporting the hypothesis made. Wiki anxiety was also seen to correlate with users predisposed fear of negative evaluation yet the correlations were statistically weak at points. Although the hypothesis that wiki anxiety measures would correlate significantly and positively with a user's fear of negative evaluation is technically supported, there is only weak and inconsistent evidence for this. This may be due to the potential for judgement lacking saliency in this experiment scenario and thus may not have led to as much of a consistent relationship between wiki anxiety during editing and fear of negative evaluation.

This is supported by the lack of significant differences between the flexibility conditions where it was expected that anxiety during editing would be significantly different after experiencing the conditions due to varying judgement and veracity of content concerns. It may be that the role of negative evaluation, although still significantly related to wiki anxiety, was not influential in the wiki anxiety elicited when editing in this experiment. In terms of the effect of flexibility on wiki anxiety during editing, the findings suggest that participants were more anxious when editing the wiki for the first time than in all other subsequent edits. Participants did not vary significantly in terms of wiki anxiety when editing the wiki after experiencing no change, addition or deletion and replacement of their content thus disconfirming our hypothesis. Interestingly wiki anxiety during their initial edit did not differ significantly from their anxiety towards wiki editing before interaction. Similar findings were identified in terms of the effect of flexibility and other user edit behaviour on usability. Participants rated the system lower on usability in their initial edit compared to when they edited after experiencing unchanged, addition and deleting and replacement of their content. Participants' ratings of usability after experiencing these conditions did not significantly differ thus disconfirming the hypothesis proposed.

Findings from this research suggest that a participant's initial edit was the most anxiety-inducing and least usable experience when compared to the other edits conducted. This may be explained by the period of time for which participants in the experiment had not edited a wiki. The majority had edited a wiki previously yet 63% of the sample noted that the last time they had edited a wiki was between 1 and 6 months ago. 23% of the sample stated that they had edited a wiki over a year ago. It

may be that due to infrequent editing participants' experienced higher anxiety when editing for the first time than other times in this experiment. In other words, participants reduced in their anxiety after regaining familiarity with the wiki. Participants on entry were also likely to be unfamiliar with the tasks and experimental procedure, which may have influenced their anxiety levels during editing. A similar effect was seen in the order of edit analysis in the *Editing Identity Experiment* in Chapter 4. After editing the wiki this first time participants' apprehension when editing the wiki would likely be reduced. Additionally in terms of usability, participants may have found the experience of editing less easy and less efficient than after practice had been gained. As participants re-familiarised themselves with the editing process and interface they became more comfortable and found the system more usable and satisfying to use as a consequence. This is interesting as it suggests that user experience related variables may be influenced by amount of time spent away from the system, which may be a crucial element to consider when running usability experiments and quantitatively measuring user experience related variables. Longitudinal research controlling various time lengths away from interaction could shed light on this conclusion.

Findings in terms of the validity of the measure of wiki anxiety before interaction were also of interest in the experiment. As found in the previous chapter, wiki anxiety before interaction correlated with other wiki anxiety measures and state anxiety measures during the experiment yet did not correlate with state anxiety measured concurrently i.e. before interaction. It is likely again that this is due to the lack of specificity of the stressor in state anxiety measurement and the fact that users had not started interacting with the wiki at this point. What was also found was that

there was no significant difference between wiki anxiety measured before interaction and that measured during editing in participants initial edits. This suggests that the wiki anxiety measured before interaction did not differ from the wiki anxiety measured during editing before the conditions were experienced. Therefore, in this research at least, wiki anxiety before interaction may be an effective baseline measure of wiki anxiety before experiencing experimental conditions. This conclusion is tentatively made as further replication of this lack of difference would have to be made in a variety of experiment scenarios to ensure the measure of wiki anxiety before interaction is a robust wiki anxiety baseline measure. It does suggest thought that it may be valid to use this measure in this way.

Participants' wiki anxiety or usability rating did not significantly differ depending on the flexibility condition they experienced before editing the wiki further. Such findings suggest that the flexibility of the system does not have a significant effect on users' anxiety or usability rating when editing the wiki. Although this may be the case for users with some experience of wiki editing, novice users may react differently to this type of experience. Users who are unfamiliar with the concept of wikis and their flexible nature may find the experience of such behaviour from other users more disconcerting than those who are likely to be familiar with such behaviour and function. In terms of usability, positive views of the wiki may be damaged if in their first experiences users have their content deleted. Experiencing negative collaboration rather than positive collaboration from the user community may reduce users' usability rating subsequently if it is their first experience of the system.

Indeed, as discussed in Chapter 2, initial negative experiences for novice users, such as edits being deleted may lead to further anxious feeling when editing the wiki again. Computer anxiety research (Todman & Drysdale 2004) identified that poor first user experience may significantly affect development of anxiety about computer use. Findings from the research in Chapter 3 (*The Training Spaces Experiment*) on wiki anxiety suggest that differences in anxiety during editing in the novice wiki user experience tended not to transfer to future editing anxiety. The aforementioned research focused more on the use of wiki markup language and the effect of in-built training spaces on anxiety during and anxiety towards wiki editing rather than the anxiety due to contribution of content. It may be that contribution of content is a more personal type of experience as it involves contributing relevant content which the community values. A negative experience in this context may be more easily related to ones abilities outwith wiki interaction (in terms of reflection on abilities to cognitively comprehend, appraise and disseminate relevant information) compared to the use of an interface in a wiki context alone. Future studies should identify whether novice users find flexibility of content anxiety-inducing and whether this experience has an effect on subsequent editing anxiety in a contribution context.

As in the previous chapter, there were again no consistent and strong correlations between previous editing experience and the measurements of wiki anxiety and wiki usability throughout the experiment. This adds further support for the conclusion that previous editing experience does not relate to wiki usability and wiki anxiety levels. Again this is contrary to findings in the computer anxiety literature (Chua et al. 1999; Farina et al. 1991; Heinssen et al. 1987; Weil & Rosen

1995) which state that experience with computers is negatively related to anxiety towards computers. It highlights that in contribution of wiki content users' amount of previous experience did not influence the anxiety experienced during wiki editing. The anxiety experienced is therefore more likely to be based in the specific user experience rather than affected by volume of prior experience.

Although the findings highlight that flexibility does not significantly affect negative emotions or usability when editing the wiki subsequently comments in participant interviews suggest it may affect users' behaviour when editing the wiki. During the interviews held after the experiment many participants mentioned that if other users consistently deleted their edits they would feel like there was little point in contributing to the wiki. Users' confidence in their knowledge sharing may be damaged by such prolonged negative behaviour by other users. The volume and quality of information included by each editor may also be affected. Participants mentioned that they would be less inclined to put a large amount of effort into editing and would be less worried about the accuracy of the information they were including as others could correct or delete their input if it was seen as inaccurate. The conditions used in the experiment may therefore have brought significant behavioural rather than emotional effects when editing the wiki after exposure.

While this experiment focused on flexibility over a short time period further studies could research effects of exposure to wiki flexibility over a longer period of time. The experiment saw participants editing over a short space of time and experiencing different flexibility conditions. Such an experience is unlikely to occur over the simulated time (90 minutes) unless a wiki has high levels of contributors, something that previous research has highlighted as an issue in university wiki use

(Cole 2009; Ebner et al. 2006). Further research using a longitudinal design may therefore allow for a more ecologically valid insight into the experience of flexibility. Research of this nature could also manipulate the period of time before the next edit is conducted and observe whether the initial anxiety and usability measured when editing the wiki for the first time would vary depending on length of time between editing experiences and what type of flexibility is experienced between the editing experiences.

Although the experiment-based approach used holds limitations in terms of the ecological validity of the editing timeframe (as mentioned above), conducting experiment-based research allows for causal insight under controlled conditions. Longitudinal studies have difficulties in terms of the measurement of the amount of experience and control of the type of further experiences the user may have between experiment sessions. This affects the ability to make casual conclusions on the effects of aspects of the experiment-based experience on the dependent variables being measured. This research suggests flexibility does not affect anxiety or usability levels when editing wikis. These findings could help in terms of the interpretation of any further studies using less controlled conditions such as field or longitudinal research on wiki flexibility and the wiki user experience.

The type of wiki used may also be an important factor in the emotional experiences during editing. Closed or semi-public group wikis are common in Higher Education settings. A selected group of users are allowed to edit such wikis and users are more likely to be familiar with each other and are able to discuss edits and contributions outside of class (Guth 2007). Previous research has found that users prefer such wikis to open wikis as they are more familiar with the abilities and

identity of other editors (Guth 2007). In this experiment it was made clear that other psychology students were using the wiki and through the use of matriculation numbers as editing identities for both the confederate and participant the shared identity of *student* was further emphasised. In these systems users can make conclusions about the characteristics of other users in terms of the shared group identity highlighting shared group norms and abilities (Tajfel & Turner, 1986) and minimum quality levels in contributions (Nielsen 2007). Experiencing other students editing their content may be less anxiety-inducing than if other users were to delete or amend such edits in an open wiki scenario (such as *Wikipedia*) where norms, knowledge and motivations for editing are unknown. Furthermore writing for the audience of other students (an in-group) may be less anxiety-inducing than editing a wiki with a public audience as suggested by previous qualitative studies (Guth 2007). Research on the social dynamics of wiki use in relation to social psychological phenomena and its effects on emotions and behaviours is thus an area of research crucial to the understanding the complexities of the wiki user experience.

5.5 Summary

In conclusion, the findings reinforce the reliability and validity of the wiki anxiety and wiki usability measures created to evaluate such concepts in the research and indeed throughout this thesis. However as in the *Editing Identity Experiment* in Chapter 4, the measure before interaction did not reflect state anxiety before interaction, likely due to the lack of interaction with a wiki at that time and the measures focuses. Interestingly there was no significant difference between wiki anxiety measured before interaction and wiki anxiety during participant's first edit. This finding indicates that the measure of wiki anxiety before interaction may act as

a valid wiki anxiety benchmark in situations where measurement of initial edit anxiety is undesirable or difficult to conduct, although further replication is needed to ensure such a conclusion is justified. The research also found a significant relationship between wiki anxiety and participants' fear of negative evaluation but the correlations were inconsistent and statistically weak compared to those gained in previous research in this thesis.

Most importantly the above research demonstrates that the flexibility of the wiki system did not significantly affect participants' wiki anxiety or usability rating when editing the wiki subsequently. Participants' anxiety and usability in the first edit was strongly and significantly different from that in other subsequent edits. In terms of wiki anxiety, participants had higher anxiety during editing in their initial edits than in the edits conducted subsequently. With wiki usability, scores gained in the initial edit were lower than those in any of the other edits. The reason for the lack of difference between edits after experiencing the flexibility conditions may lie in the short amount of time between the completion of the edit and the other user editing the participants' content affecting the ecological validity of the research. Although this may be the case, the controlled nature of this interaction allows us to observe these emotions and evaluations under controlled conditions and assess effects of variables whilst controlling for potential confounds. Longitudinal methods, although higher in ecological validity, lack such control of confounds such as type of experience between measurements. The findings suggest that other users editing behaviour does not affect users wiki usability rating and wiki anxiety during editing and these findings should be used to help interpret any conclusions from more ecologically valid, yet less controlled, research.

CHAPTER 6- CONCLUSIONS, IMPLICATIONS AND FURTHER WORK

The research presented here has examined the effect wiki characteristics have on the wiki user experience. Its main contribution lies in the empirical evaluation of the wiki user editing experience that to this point has relied on inference from qualitative rather than quantitative experiment-based research. However the work also highlights the need for specificity in terms of anxiety concepts towards IT systems. It also contributes valuable insight to those who wish to use wikis in a Higher Education context in identifying aspects of the site design that can lead to the reduction of anxiety towards editing during interaction and influence usability rating towards wiki editing.

The work was motivated by a fusion of the areas of Cyberpsychology, HCI and the growing use of wikis in Higher Education. Previous computer anxiety research had identified that qualitative factors in users' first experience predicted their anxiety towards computers (Todman & Drysdale 2004; McIlroy et al. 2001; Todman & Monaghan 1994). Yet this has not been tested experimentally likely in part due to the lack of specificity of computer anxiety as a concept leading to a difficulty in designing relevant experiences. In terms of this research the concept of computer anxiety is also inadequate in describing the complexity of emotions in Web 2.0 technology developments (such as wikis) due to their social and collaborative cores.

Concurrently the field of HCI has grown from focusing mainly on usability towards more subjective experiences of interactions in concentrating on user experience (Dix 2010). However user experience research focuses on positive

emotional reactions towards technology (Hassenzahl & Tractinsky 2006; Law et al. 2007) and ignores negative reactions, which as evident in computer anxiety research can have consequences for user comfort and amount of interaction with the system.

Investigation into user experience has yet to gather pace in terms of wiki systems. Yet wikis are gathering popularity as pedagogical tools in a variety of educational scenarios (Cowan et al. 2009; Ebner et al. 2006; O'Neill 2005; Ravid et al. 2008). One of the problems encountered in these scenarios is the lack of editing of such wiki systems. Research suggests this may be due to poor usability in the editing interface and poor experience (Cole 2009; Ebner et al. 2008). This poor experience may lead to the development of anxiety towards editing, as suggested in the computer anxiety literature above. Because of their editing interface, social and flexible nature users may hold anxiety towards editing these systems. Although the user experience has been mentioned in wiki research the lack of quantitative research in terms of wiki usability and user emotions towards wikis is stark. The work in this thesis offers a more robust understanding of causal effects of the wiki system experience on user experience variables and aimed to identify what aspects of the wikis affect users and how wikis can be engineered to affect anxiety and negative user experience.

6.1 Conclusions

Throughout all the studies conducted the measures created for this research, namely the *Wiki Anxiety Inventory- Editing* and the *Wiki Usability Inventory*, showed high reliability and validity. The wiki anxiety measures taken during all experimental interactions with the wiki consistently and strongly correlated with measures of state anxiety administered during wiki interactions suggesting concurrent validity of the

wiki anxiety measure. There were inconsistent and weak correlations between trait anxiety and wiki anxiety measures assessing anxiety during interaction suggesting that wiki anxiety during interaction was more situational (state based) rather than a reflection of a predisposition to be anxious (trait). However in the *Training Spaces Experiment* (Chapter 3) the measures of wiki anxiety before interaction and anxiety towards further wiki editing did correlate significantly and strongly with trait anxiety. Interestingly in terms of wiki anxiety before interaction in each experiment only the measure before interaction in the *Training Spaces Experiment* correlated with state anxiety measured at that point. The reason for this may lie in the difference between the experimental experiences in the studies. In the *Training Spaces Experiment* users were novices who had no experience of editing wikis. They were therefore given a short description of wikis so that that each participant was familiar with the concept before completing the questionnaires. This is likely to have elicited a reaction in state anxiety which because of the description was more wiki focused than those in the other experiments conducted. Wiki usability also showed high construct validity throughout the studies consistently correlating negatively with state and wiki anxiety measures taken within wiki interaction.

The focus of the *Training Spaces Experiment* was on the usability evaluation of the wiki markup interface and anxiety novice users may hold towards editing using this interface. It also aimed to identify how initial user experience affected development of anxiety towards wiki editing through the experience of different in-built training spaces. It was found that first experiences with tutorials led users to rating the wiki markup interface as higher in usability than when experiencing training spaces without tutorials (such as sandboxes or no training space). Users are

likely to have found the instructional method in the tutorial spaces better in terms of their ability to create a mental model of the functional aspects of the interface thus creating a more positive experience. These findings suggest in-built tutorials may be better in achieving satisfying user editing experiences than sandbox focused training tools commonly used on wiki sites. Importantly the research also found that the experience of tutorials significantly affected wiki anxiety during interaction. Yet this difference during interaction did not lead to a significant difference in wiki anxiety about future editing expected from findings in computer anxiety research (Todman & Drysdale 2004; Todman & Monaghan 1994; McIlroy et al. 2001). The findings focused on usability and wiki anxiety during interaction seems likely as those who experience a more satisfying interaction when using the editing interface are likely to be less anxious during the experience. However the fact that the effect was not replicated on wiki anxiety towards further interaction suggests that such differences in experience do not affect anxiety towards further experience in this context.

The findings of the *Training Spaces Experiment* have important implications for the introduction of the wiki editing interface and potential wiki success. High participation rates are crucial to the success of wiki systems as a lack of contributors and contributions leads to an inactive wiki site akin to a “digital ghost town” (Preece et al. 2004). The findings that the completion of an in-built tutorial increases usability and reduces anxiety during interaction highlights that this simple solution could reduce barriers to contribution and increase the dynamism of wiki communities. Further research is needed to specifically identify whether such an inclusion would increase frequency of edits and empirically support this inference.

An important finding in the research was also that the state anxiety measured was related solely to wiki anxiety rather than computer anxiety suggesting wiki anxiety is a more valid reflection of the anxiety experienced in the experiment. This has important implications for the concept of computer anxiety and the Cyberpsychology community. The use of a computer is core to wiki editing. Previous computer anxiety research has found clear effects of computer presence on state anxiety (Beckers et al. 2007). The lack of relationship highlights the need for refinement of computer anxiety as a concept as only wiki anxiety was significantly related to the state anxiety measured during the experiment. This should be a note of caution for researchers who wish to conduct experiments using the computer anxiety concept.

The measures of wiki anxiety taken in the experiment were also seen to significantly reduce between measures. Novice users' wiki anxiety was highest before interaction, was lower during interaction and was lower still when asked about anxiety towards future interaction. Exposure to the system seemed to reduce anxiety yet this may be an artefact of the type of users (i.e. novice wiki users) in the experiment. The wiki anxiety measured initially is likely to have been due to lack of familiarity therefore a conclusion about the effects of experience on the reduction of wiki anxiety are premature. Findings from other research in this thesis can shed light on this relationship. Findings in both the *Editing Identity Experiment* (Chapter 4) and the *Content Flexibility Experiment* (Chapter 5) highlight that the wiki anxiety measured during editing at any point either did not correlate significantly with the amount of previous edits users had conducted (in Chapter 4) or the correlations were inconsistent and weak (as in Chapter 5). It can therefore be inferred that there is no

relationship between the amount of previous editing experience and wiki anxiety during editing. The anxiety may therefore more likely be situational and due to the current experience rather than previous experience of wiki editing. However cautionary interpretation of these findings is advised as information about the type of experiences could not be gathered.

The research in Chapter 4 (*The Editing Identity Experiment*) focused on identity used during editing, type of edit made and the effect this may have on wiki anxiety and user usability evaluations of their editing experience. The research extends from the findings in the *Training Spaces Experiment* (Chapter 3) in that it concentrates on the wiki anxiety during interaction, which in previous research was seen to be affected by the wiki site experience. However unlike the *Training Spaces Experiment* the task during interaction is focused on content contribution rather than specific interface interaction. It also shifts user focus from novice users to users with some experience editing wikis. These users may not hold anxiety due to initial exposure (as in the case of novice users) but may be anxious due to concern over negative evaluation when contributing, over perceived quality and veracity of the content they are adding to the wiki in addition to the acceptance of their edits by the wiki user community. The aim was to explore these users' anxieties and the effect the site characteristic of editing identity had on wiki anxiety and wiki usability.

The research found that when users contributed content anonymously they held less anxiety during editing than when they edited the wiki using both a pseudonym (a matriculation number) and a full name identity, which did not differ significantly. In terms of usability rating there was no significant difference between any of the identity conditions. The type of edit users made in terms of adding or

deleting and replacing others content did not significantly affect wiki anxiety and usability rating of the editing experience.

The finding that users find editing using an anonymous identity less anxiety-inducing implies that the *protective cloak of anonymity* (McKenna & Bargh 2000) is affecting users' emotions during wiki contribution. However to fully understand the finding the difference between wiki editing and computer mediated communication systems (where most of the research on identity and contribution has been conducted) needs to be stated. Systems such as instant messaging, email and video conferencing exchange messages and content which are directly attributable to users and the social interactions, more so in instant messaging and video conferencing, occur in real time. Blogs and bulletin board users also have identities directly attached to their posts. The information on a wiki however is constructed collectively in one page and references to the contributors are not made in the information viewable in the viewing state. This has led some to state that wiki are by virtue relatively anonymous (Arazy et al. 2010). This is where the context of the wiki is important. Wikispaces where there is low editing frequency and a real world network reflection in the user group (such as a tutorial group or lecture group), both characteristics which are common in HE wikis, are not as anonymous as highly dynamic and impersonal network orientated wikis such as *Wikipedia*. Wiki context is likely to be important in the emotions experienced during wiki interaction. Further work should aim to explore the wiki user experience within these different contexts.

Although the research found that anonymity leads to less wiki anxiety during editing, using such an identity in an educational context may be impractical especially in situations where wiki contribution is part of course assessment. The use

of anonymity may however increase participation among *lurkers* who tend to want to remain anonymous when contributing to online knowledge communities (Preece et al. 2004). A potential solution may lie in the use of a more anonymous pseudonym as a user's matriculation number (a *Person* pseudonym) is much less anonymous than a *Role* pseudonym (an identity consistently used when undertaking a specific action) (Borcea-Pfitzmann et al. 2005). Further studies should aim to explore the influence of this pseudonym granularity on user experience variables during contribution.

The study interestingly did not find a significant influence of the type of edit on wiki anxiety as predicted from previous research noting editors' reluctance to edit other users' content (Guth 2007; Lund & Smordal 2006). This finding is explained by the experimental scenario and the legitimacy given to the action of editing from including it in the task. For instance in real world wiki use editors would have to evaluate the accuracy of content on the wiki, whether the content they were about to include was more accurate and then act by deleting the content on the wiki and replacing with their own. It is difficult to induce this in an experimental context without introducing consistency confounds in the manipulation in terms of the amount of content users delete and indeed whether they delete content at all. This is one of the limitations of the use of experiment-based studies in this context, something that is discussed in more detail in the limitations and further research section below.

In both of the studies forming the focus of Chapter 4 and 5 (The *Editing Identity* and *Content Flexibility Experiments* respectively), a measure of fear of negative evaluation was included to identify whether wiki anxiety was significantly related to such a fear. This relationship would seem sensible as users are contributing

content in a social space and those who fear negative evaluation may have high wiki anxiety. It was found in both studies that wiki anxiety measured during interaction was correlated significantly with fear of negative evaluation levels. However the correlations in the *Editing Identity Experiment* were much more robust than those noted in the *Content Flexibility Experiment* that at points were relatively weak for the amount of analysis conducted. Fear of negative evaluations' links with the concept of social anxiety have been noted in research (Collins et al. 2005). It may then be that anxiety towards wikis (and potentially anxiety towards the use of other Web 2.0 systems) is related to users' level of social anxiety. This may shed light on reasons for the difference in relationship with this variable between the two experiments. The scenario in the *Editing Identity Experiment* was more focused on identity and social judgement where conditions are varying in terms of salience of real world user identity. This type of scenario was not salient in the *Content Flexibility Experiment* and thus may not have led to as much of a consistent relationship between these variables. What is for certain though is that future research should explore the causal influence of social anxiety and fear of negative evaluation on wiki anxiety towards and during editing.

Chapter 5 (The *Content Flexibility Experiment*) focused on the effect of content flexibility, the concept at the core of wiki sites. Throughout the other experiments the existence of other users on the site was only implied yet due to the social nature of the system other users and their behaviour on the wiki were seen as an important element of the investigation of the wiki user experience. It aimed to identify whether content flexibility and other user behaviour towards participants edits would affect the anxiety experienced during further editing and the usability of

the editing experience after being exposed to different flexibility conditions. It was found that flexibility and other users' behaviour towards their edits did not significantly affect editors' wiki anxiety and usability after experiencing this behaviour. This may be the case for users with some experience with the wiki but other user behaviour may affect novice users differently as they will have never experienced such behaviour towards their contributions. It is suggested that further research replicate the experiment using novice users to explore this hypothesis.

The findings of a lack of effect on subsequent edits may also be due to the nature of the wiki. It was made clear in the experiment that other students were contributing to the wiki and that the wiki was used in their psychology course. This may have made users assume a level of ability from the other users who were editing their content. These users all have the shared group identity of *student* highlighting a shared social identity (Tajfel & Turner, 1986) and a level of knowledge as contributors (Nielsen 2007). Therefore the experience of other students editing their content and writing content for other students in the edits subsequently may affect the user emotionally less than if they were to edit an open wiki such as *Wikipedia* where contributor social identity, knowledge state and motivations are more opaque.

Users' anxiety during their initial edit in the experiment was seen to be significantly higher than that after experiencing any of the flexibility conditions. Similarly usability rating after this initial edit was significantly lower than ratings subsequent to this. This is explained in terms of the length of time between users' last wiki edit and taking part in the experiment where many of the participants had not edited a wiki for between 1 and 6 months before the experiment. Users regaining familiarity with the wiki may therefore explain these effects. Higher anxiety in the

first edit may also be due to lack of familiarity with the experimental procedure and the tasks.

Interestingly, wiki anxiety measured before interaction in this study did not significantly differ from that measured during participants' initial editing experience. This infers that the measure of wiki anxiety before interaction may be a valid baseline measure of anxiety during editing in situations where, due to time constraints for instance, an initial practice edit is not appropriate. It has to be stressed that this conclusion is cautiously made as further replication of the lack of significant difference between the two measures would have to be achieved in a variety of experimental scenarios.

Looking at the wider implications of the work, UX researchers have previously argued that usability questionnaire measures tend to focus on usability evaluation rather than emotionality of interaction (Folstad & Rolfsen 2006). For instance users may be influenced subjectively by aspects of the system that are not related to core task completion. In other words users may react subjectively to the aesthetics of a website or interface rather than just the structure and clarity of an interface. Usability metrics may therefore be too narrow to encapsulate the wider user experience and characteristics that affect this. Indeed recent research has identified this very problem in terms of researching Facebook interactions (Hart et al., 2008). This also seems the case in this research. Although there was a significant difference in wiki usability in the research where the experiment focused specifically on the interaction with the wiki markup interface (*The Training Spaces Experiment- Chapter 3*), there was no significant effect of either editing identity (*The Editing Identity Experiment- Chapter 4*) or flexibility and other user editing behaviour (*The*

Content Flexibility Experiment- Chapter 5) on usability rating. Users in these later chapters may have felt that the experience they were having editing (i.e. interacting with the editing interface) was no different in each experience and thus rated it as such. However editing identity did significantly affect wiki anxiety when editing. It suggests a dichotomy between the concept of usability, which measures the experience with the interface, and emotional reaction (such as anxiety) to the experience as a whole, which as shown can be affected by wiki characteristics. Although the concepts are related then it seems they behave differently in terms of their reaction to experimental manipulation of the wider experience.

Another major implication of the wider work lies in highlighting the role that experiment-based research can have in the exploration of UX issues. It is a concern that user experiences' subjective nature may be exploited (as seen in previous wiki user experience research) so that robust, replicable and controlled experiment research will be overlooked. The success of this research in using controlled experiment demonstrates that these methods, as evidenced in decades of psychology research on emotion, can be used effectively when measuring such subjective phenomena. This research acts as a platform for the use of usability engineering methodology and experiment-based HCI research principles in the investigation of UX. Indeed this research highlights the possibility for the development of an academic discipline in *UX engineering* where using such research methods system designers can design for optimal emotional reaction during interaction through iterative system development and testing.

6.2 Limitations and Further Research

Although the research gives much needed causal insight into the wiki user experience, there are limitations that need to be noted. One of the significant limitations of this research is the relative homogeneity of the samples used throughout the research in terms of gender and age distributions. These are however reflective of the population being studied in terms of psychology undergraduate students. It was decided that, due to the author's knowledge of the course and subject area from previous undergraduate experience the use of psychology students would facilitate the creation of a more realistic context and the seeding of the wiki with course related content for wiki use. Especially for the research in Chapters 4 and 5, the use of a wiki in previous years of the psychology course also meant a sample of users with previous experience with wikis in an HE context could be recruited. The facilitation of seeding the content with accurate and relevant information to the user group no doubt adds to the ecological validity of the research presented but due to the gender characteristics of the psychology course more females were represented in the sample. Although this reflected the characteristics of the sample studied replication of the research using more even gender distributions may make the findings more generalisable.

A further limitation of this research lies in the controlled experimental nature of the methods used. This is especially evident in both the *Editing Identity* (Chapter 4) and *Content Flexibility* (Chapter 5) experiments. In the research on editing identity the use of false identities is likely to have influenced the dependent variables. This is likely to have led to an underestimation of the likely real world differences between the three identity conditions used as the matriculation and named identities,

compared to the user's real identity, are still relatively anonymous. The desire for controlled and consistent conditions in terms of directly informing users to add and delete content when editing in the *Editing Identity Experiment* also does not truly reflect the realism of the processes involved in these task processes, a difficulty in experiment-based research in HCI (Dix 2010). In the *Content Flexibility Experiment*, experiment-based constraints in terms of the time between the user edit and the administering of the flexibility condition again were likely to affect the outcomes of the experiment.

However the controlled nature of the research is also one of the main strengths of this research. Experiment based research is vitally important in giving insight into problems whilst controlling for other potential confounds and aspects can be included in the design to improve ecological validity as was the case in this research. For instance users were given tasks that were relevant to the representative user group and were asked to edit in a relevant scenario. Additionally efforts were made to control for effects of condition order, task order and other confounds which may have influenced the measures in the research in each experiment (more details about the specific efforts of confound reduction in each study can be found in the individual chapters). The insight gathered from these pieces of experimental research allow for more certain causal conclusions about the effects of specific variables on the wiki user experience than can be gathered using more qualitative methods, which arguably have higher ecological validity. Importantly experiment-based research offers the benefit of a replicable methodology so that findings using the same methods across different scenarios can be compared and contrasted.

The research has shown that experiment-based research can give robust and replicable knowledge about the wiki user experience and the influence of wiki site characteristics on this, which is needed in understanding this complex domain. This is not to say that experiment-based findings should be the only knowledge interpreted in the domain. Experiment findings should be combined with that gained from qualitative methods such as interviews and user comments to triangulate and interpret the findings from experiments. However an area without experiment-based and quantified observations of phenomena is certainly weaker than that which incorporates this methodology into the study of the variables within the domain.

A further limitation of this work is the ability of the measures to identify the fluidity of anxiety during interaction. User experience is a fluid concept as the users' mental state changes during interaction (Roto 2006). The measures used for wiki anxiety during interaction were administered soon after completion of the editing task yet methods exist for a more objective measurement of emotion during interaction. Physiological measures such as galvanic skin response (GSR), blood volume pulse (BVP), respiration and muscle tension in certain areas of the face and shoulders common in affective computing research (Picard 2000; Picard et al. 2001; Scheirer et al. 2002) could be used in measuring emotions during interaction. Such methods have been used previously to monitor emotion in HCI scenarios such as in response to interaction with different web pages (Ward & Marsden 2003) and word processor interaction (Branco et al. 2005) as well as in response to designed interactions for high emotional arousal (Scheirer et al. 2002; Ward 2004). The tools for such analysis are however expensive and complex to use with the addition of sensors influencing the naturalness of the setting, although advances have been made

in the development of unobtrusive sensors. Furthermore the measures can be affected easily by environment (Ward & Marsden 2003) and lack the ability to ensure the focus of the measure is on a specific stressor as can be done in a questionnaire. The difficulties in identifying specific emotions from such measures have also been noted (Ward 2004). With developments of these methods the use of physiological measures in user experience research may become more common and could be an area for further study in analysing emotional arousal in wiki interaction.

The measures used in this research, although developed using thematic groupings have also not as yet been factor analysed to identify whether the questionnaire items group on these proposed factors. From the item analyses performed it seems that the items are not uniform in the effect the independent variables have upon them. Factor analysis was not performed due to the number of participants recruited for each experiment being lower than that needed for the analysis to give stable and replicable factors, suggested to be from 100 participants (Kline 2000) up to around 300 participants (Field 2005). The measures developed for the research did hold high internal reliability as unitary scales, which suggest their use as such is valid. It could be ensured then that the scales were consistent in measuring a specific construct however internal consistency does not necessarily imply that the underlying structure of the scales is uni-dimensional (Field 2005). Future testing of the measure with the aim of factor extraction must be a priority for future research.

As emphasised throughout this thesis the type of wiki is important to the interpretation of any findings related to wiki user experience. Wikis which are less open to editing from all users and which the user group is reflected in the real world

(such as those in Higher Education or work scenarios) are likely to lead to different user experiences to those which are freely editable and where there is not real world reflection of the user editing group. This has been noted in recent research observing the use of public and semi-public wikis in Higher Education (Guth, 2007). Users were seen to prefer semi-public wikis as in the open wiki they felt frustrated, insecure and intimidated but their edits were of higher quality in the public wiki space. The conclusions from the research presented are limited to less open wikis due to the context of use in this thesis but further research should compare the types of wikis described in terms of the user experience variables measured in this thesis.

As wiki uptake grows into business areas research should focus on exploring the wiki user experience in these areas and the challenges wiki use in these arenas bring. Recent research has mentioned that wikis are now commonplace on business intranets and that there may be a high desire in industry to be recognised for contributions and expressing individual points of view (Chi 2008). However, research in this thesis suggests that anonymity reduces anxiety during contribution and, as mentioned by previous research on *lurker* behaviour in discussion forums (Preece et al. 2004), may encourage users to contribute. In addition, business-based users have noted that they feel the contribution of content is more altruistic and that the existence of corporate power hierarchy is a concern for content contribution in this context (Holtzblatt et al. 2010). Increasing collaboration and information exchange across and within departments in business spheres has huge economic benefit and wikis are able to facilitate this information dissemination. The challenge of getting users to contribute their knowledge in a competitive environment where knowledge and expertise is likely to influence job prospects is a key research

question needing exploration. Work has been done looking at their use in private organisations (Majchrzak et al. 2006; Munson 2008; Hasan & Pfaff 2006; Holtzblatt et al. 2010) but again this is based on interview and qualitative data collection. User emotions and usability are likely to be affected by the different user needs and environment in a business context and future experimental studies need to engage with wiki user experience in this environment.

An interesting area for further research also lies in the spaces' social dynamic. As mentioned a unitary social identity was highlighted throughout these experiments. Yet the introduction of other groups (such as other psychology students from different universities, other students in subjects related to the wiki topics or even lecturers) into the space may influence editing behaviour and emotional reaction to contribution. For instance users may be more anxious about editing due to the variation in status of the audiences to which they are contributing (i.e. contributing to a page where lecturers are known to view and contribute to the information) similar to the hierarchy concerns mentioned in business based wiki use above. Moreover, users who are contributing to a joint project wiki space may get frustrated with the other groups editing wiki content included. Indeed, power relationships between users who have access to wiki content have been seen to affect contribution towards wikis and ultimately wiki success (Holtzblatt et al. 2010; Giordano 2007) Wikis are by design social spaces so it is in no doubt that traditional social psychological processes are likely to be in action in these systems. The amalgamation of wiki user experience and social psychological phenomena could therefore provide a fruitful area for further study.

The interviews in this research also highlight some interesting areas for further study. For instance many users suggested that, with the use of the wiki in an educational scenario, a moderator would be preferable to monitor the content being included. This tends away from the open editing ethos at the core of wikis yet users seem to desire such monitoring on the content they and others include. Similar suggestions of constraints and supervisory roles for lecturers have been noted previously (Jaksch et al. 2008). This may have interesting consequences on the wiki editing user experience as editors find they cannot edit as freely as in more open wiki scenarios. It may however influence the view of the quality of information included on the wiki and increase trust of this information. Again the trust and the concern over the flexibility of content leading to a poor and unstable information source was something regularly mentioned in the user interviews. The research in this thesis focused on the wiki editing experience but it is clear from the comments in the interviews throughout the thesis that wiki attributes such as flexibility could affect the wiki viewing experience. Aspects such as moderation, page stabilisation and page notices about the quality or completeness of the information on each page (common on *Wikipedia*) could be investigated as methods to reduce such concerns and the anxiety towards content quality. The viewing wiki experience may therefore be an interesting area for consideration in any further experimental investigation of the wiki user experience.

Opportunities for further research are also likely to lie in the behavioural implications of experiencing the wiki site characteristics explored. Interview comments in this research suggest that the different identity and flexibility conditions may affect editing behaviour in terms of the quality, effort and volume of

contribution. As mentioned previously users differ in the quality of edits they include due to the openness of the space (Guth 2007). With respects to flexibility experiences, users may also likely retaliate, return their edits to the page or become more open to the deletion and flexible nature of wiki content. Research on these behavioural consequences would be of value in identifying how the system affects editing behaviour. It would also benefit those striving to use wikis to develop a high quality, dynamic and collaboratively created knowledge resource where users are fully engaged in contributing to the best of their ability.

The way in which wikis are being edited and the interface features added to wiki systems are also constantly in development. Rich text editors are growing in popularity to improve the editing experience for users when completing simple formatting tasks. These allow users with little technical knowledge to format wiki content and add content without the need to use wiki markup language. Interface attributes which highlight users' contributions and editing activities are also being researched as researchers seek ways to improve accountability and motivation to edit wikis (Arazy et al. 2010; Viegas et al. 2004). These developments need to be tested for their influence on the wiki editing user experience in future. Rich text editing is likely to improve usability and reduce anxiety when editing compared to the use of wiki markup language yet in more complex editing tasks its simplicity and lack of functionality may frustrate users. The increase in salience of the identity of users who have contributed to the page may also lead to more marked differences in anxiety when editing using different identity conditions and may lead more users to edit anonymously because of concerns over judgement by others. The aim to increase contribution may be curbed because of the focus on identifying contributors.

Developments on the interface and the system experience therefore need to consider the impact on the emotionality and usability assessment of the user. Future studies should aim to observe the impact of these on the wiki editing experience.

The thesis expounded in this work is supported in that the work provides evidence that anxiety due to wiki editing and usability of editing experience is significantly influenced by wiki site characteristics. Initially the work aimed to explore the effect of common in-built training spaces such as sandboxes and tutorials on the wiki editing experience and demonstrate experimentally that positive first experiences affected anxiety towards further interaction. Through engineering the experience to include different inbuilt training spaces for novice users in their first editing experience the work demonstrated that site characteristics affect how usable wikis are evaluated and affected wiki anxiety during editing rather than influencing anxiety towards further editing. The wiki site characteristic of identity salience was also seen to affect wiki anxiety during editing but did not affect the usability rating of the editing experience. The wiki characteristic of flexibility and potential resultant other user behaviour, core to such a social system, was seen to not have an effect on subsequent anxiety and usability scores when editing. The work provides a contribution to the knowledge of the area of wiki user experience in observing user anxiety and usability towards wiki editing using experiment-based methods rather than inferring user reactions from qualitative research. It provides an example of the ability to successfully implement experiment-based wiki user studies and highlights that user experience variables can be observed successfully using experimental methods. The work also contributes valid and reliable measures of wiki anxiety and wiki usability that can be used in further research on the wiki editing user experience.

The research presented also gives guidance on the characteristics which could be used to reduce anxiety during editing (such as tutorial based training spaces and anonymous editing) and identifies that specificity is needed when experimentally observing anxiety towards technology which is not supplied by the use of computer anxiety in research.

REFERENCES

- Arazy, O. et al., 2010. Recognizing contributions on wikis: Authorship, Categories, Algorithms, and Visualizations. *Journal of the American Society for Information Science and Technology*, 61, pp.1166-1179.
- Ardichvilli, A., Page, V. & Wentling, T., 2003. Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7, pp.67-77.
- Augar, N., Raitman, R. & Zhou, W., 2004. Teaching and learning online with wikis. In *Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference*. 21st ASCILITE Conference. Perth, Australia: Jossey-Bass Publishers, pp. 95-104.
- Barbeite, F.G. & Weiss, E.M., 2004. Computer self-efficacy and anxiety scales for an Internet sample: testing measurement equivalence of existing measures and development of new scales. *Computers in Human Behavior*, 20, pp.1-15.
- Beckers, J., 2010. Personal Communication.
- Beckers, J., Rikers, R. & Schmidt, H., 2006. The influence of computer anxiety on experienced computer users while performing complex computer tasks. *Computers in Human Behavior*, 22, pp.456-466.
- Beckers, J. & Schmidt, H., 2003. Computer experience and computer anxiety. *Computers in Human Behavior*, 19, pp.785-797.
- Beckers, J. & Schmidt, H., 2001. The structure of computer anxiety: a six factor model. *Computers in Human Behavior*, 17, pp.35-49.
- Beckers, J., Wicherts, J. & Smith, H., 2007. Computer Anxiety: "Trait" or "State". *Computers in Human Behavior*, 23, pp.2851-2862.
- Benetti, C. & Kambouropoulos, N., 2006. Affect-regulated indirect effects of trait anxiety and trait resilience on self-esteem. *Personality and Individual Differences*, 41, pp.341-352.
- Bevan, N., 2009. What is the difference between the purpose of usability and user experience evaluation methods? In *UXEM'09 Workshop*. INTERACT 2009. Uppsala, Sweden.
- Bevan, N. & Macleod, M., 1994. Usability measurement in context. *Behaviour and Information Technology*, 13, pp.132-145.

- Blandford, A., Cox, A. & Cairns, P., 2008. Controlled Experiments. In *Research Methods for Human-Computer Interaction*. Cambridge, UK: Cambridge University Press, pp. 1-16.
- Borcea-Pfitzmann, K., Franz, E. & Pfitzmann, A., 2005. Usable presentation of secure pseudonyms. In *Proceedings of the 2005 Workshop on Digital Identity Management*. DIM'05. Fairfax, Virginia, USA: ACM, pp. 70-76.
- Branco, P. et al., 2005. Faces of emotion in human-computer interaction. In *CHI '05 extended abstracts on Human factors in computing systems*. CHI '05. Portland, Oregon: ACM, pp. 1236-1239.
- Brosnan, M.J., 1998. *Technophobia; The psychological impact of information technology*, London, UK: Routledge.
- Bruns, A. & Humphreys, S., 2007. Building collaborative capacities in learners. In *Proceedings of the 2007 International Symposium on Wikis*. WikiSym '07. Montreal, Quebec, Canada: ACM, pp. 1-10.
- Bryant, S., Forte, A. & Bruckman, A., 2005. Becoming Wikipedian: Transformation of participation in a collaborative online encyclopedia. In *Proceedings of the 2005 International ACM SIGGROUP conference on Supporting Group Work*. GROUP '05. Sanibel Island, Florida, USA: ACM, pp. 1-10.
- Carleton, R. et al., 2006. Brief Fear of Negative Evaluation Scale-Revised. *Depression and Anxiety*, 23, pp.297-303.
- Carr, T. et al., 2007. Weathering wikis: Net-based learning meets political science in a South African university. *Computers and Composition*, 24, pp.266-284.
- Carroll, J. et al., 1985. Exploring a word processor. *Human-Computer Interaction*, 1, pp.283-307.
- Chambers, J., Power, K. & Durham, R., 2004. The relationship between trait vulnerability and depressive diagnoses at long-term follow-up of Generalized Anxiety Disorder. *Journal of Anxiety Disorders*, 18, pp.587-607.
- Chi, E., 2008. The social web: Research and Opportunities. *IEEE Computer*, 41, pp.88-91.
- Chin, J., Diehl, V. & Norman, K., 1988. Development of an instrument for measuring user satisfaction of the human-computer interface. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. CHI '88. Washington, D.C.: ACM, pp. 213-218.
- Chou, C., 2003. Incidences and correlates of Internet anxiety among high school teachers in Taiwan. *Computers in Human Behavior*, 19, pp.731-749.

- Christopherson, K., 2007. The positive and negative implications of anonymity in Internet social interactions: "On the Internet, Nobody Knows You're a Dog". *Computers in Human Behavior*, 23, pp.3038-3056.
- Chua, S.L., Chen, D.T. & Wong, A.F., 1999. Computer anxiety and its correlates: a meta-analysis. *Computers in Human Behavior*, 15, pp.609-623.
- Cleland, A. & Pickering, M., 2003. The use of lexical and syntactic information in language production: Evidence from the priming of noun-phrase structure. *Journal of Memory and Language*, 49, pp.214-230.
- Cole, M., 2009. Using wiki technology to support student engagement: Lessons from the trenches. *Computers & Education*, 52, pp.141-146.
- Collins, K. et al., 2005. The validity of the brief version of the Fear of Negative Evaluation Scale. *Journal of Anxiety Disorders*, 19, pp.345-359.
- Cowan, B.R., Vigentini, L. & Jack, M.A., 2009. Exploring the effects of experience on wiki anxiety and wiki usability: An online study. In *Proceedings of the 23rd BCS Conference on Human Computer Interaction*. BCS HCI '09. Cambridge, UK, pp. 175-183.
- Cowan, B.R., Vigentini, L. & Jack, M.A., 2008. Exploring the relationship between anxiety and usability evaluation- An online study of Internet and wiki anxiety. In *Proceedings of IADIS International Conference; Interfaces and Human Computer Interaction 2008*. IADIS Multi Conference on Computer Science and Information Systems. Amsterdam, The Netherlands: IADIS, pp. 69-76.
- Cress, U. & Kimmerle, J., 2006. Information exchange with shared databases as a social dilemma; The effects of metaknowledge, bonus systems, and costs. *Communication Research*, 33, pp.370-390.
- Creswell, J., 2003. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* 2nd ed., Thousand Oaks, California, USA: Sage Publications.
- Curran, K., Doherty, K. & Power, R., 2004. WikiWikiWeb as a tool for collaboration. *Information Technology Journal*, 3, pp.206-210.
- Da Lio, E., Fraboni, L. & Leo, T., 2005. TWiki-based facilitation in a newly formed academic community of practice. In *Proceedings of the 2005 International Symposium on Wikis*. WikiSym '05. San Diego, USA: ACM, pp. 85-111.
- Davidson, N., McInnes, F. & Jack, M.A., 2004. Usability of dialogue design strategies for automated surname capture. *Speech Communication*, 43, pp.55-70.

- Davis, S. & Wiedenbeck, S., 1998. The effect of interaction style and training method on end user learning of software packages. *Interacting with Computers*, 11, pp.147-172.
- Davis, S. & Bostrom, R., 1993. Training end users: An experimental investigation of the roles of the computer interface and training methods. *MIS Quarterly*, 17, pp.61-85.
- Desilets, A., Paquet, S. & Vinson, N.G., 2005. Are Wikis Usable? In *Proceedings of the 2005 International Symposium on Wikis*. WikiSym '05. San Diego, USA: ACM, pp. 3-15.
- Di Iorio, A. & Zacchiroli, S., 2006. Constrained Wiki: an Oxymoron? In *Proceedings of the 2006 International Symposium on Wikis*. WikiSym '06. Odense, Denmark: ACM, pp. 89-98.
- Dix, A., 2010. Human-computer interaction: A stable discipline, a nascent science, and the growth of the long tail. *Interacting with Computers*, 22, pp.13-27.
- Donath, J., 1998. Identity and deception in the virtual community. In *Communities in cyberspace*. Routledge, pp. 27-53.
- Dubrovsky, V., Kiesler, S. & Sethna, B., 1991. The equalization phenomenon: Status effects in computer-mediated and face to face decision making groups. *Human-Computer Interaction*, 6, pp.119-146.
- Duke, D. et al., 2006. The psychometric properties of the Brief Fear of Negative Evaluation Scale. *Journal of Anxiety Disorders*, 20, pp.807-817.
- Durndell, A. & Hagg, Z., 2002. Computer self efficacy, computer anxiety, attitudes towards the Internet and reported experience with the Internet, by gender, in an Eastern European sample. *Computers in Human Behavior*, 18, pp.521-535.
- Dutton, R.T. et al., 1993. Identifying usability attributes of automated telephone services. In *Proceedings of the 3rd European Conference on Speech Communication and Technology*. EUROSPEECH '93. Berlin: ISCA, pp. 1335-1338.
- Ebner, M., Kickmeier-Rust, M. & Holzinger, A., 2008. Utilizing Wiki-Systems in higher education classes: a chance for universal access? *Universal Access and the Information Society*, 7, pp.199-207.
- Ebner, M., Zechner, J. & Holzinger, A., 2006. Why is Wikipedia so successful? Experiences in establishing the principles in Higher Education. In *Proceedings of the 6th International Conference on Knowledge Management*. I-KNOW '06. Graz, Austria, pp. 527-535.

- Endler, N.S., 2001. State and trait anxiety revisited. *Journal of Anxiety Disorders*, 15, pp.231-245.
- Eysenk, M. & Van Berkum, J., 1992. Trait anxiety, defensiveness, and the structure of worry. *Personality and Individual Differences*, 13, pp.1285-1290.
- Farina, F. et al., 1991. Predictors of anxiety towards computers. *Computers in Human Behavior*, 7, pp.263-267.
- Faulkner, X., 2000. *Usability Engineering*, Hampshire, UK: Palgrave.
- Field, A., 2005. *Discovering statistics using SPSS* 2nd ed., London, UK: Sage Publications.
- Folstad, A. & Rolfsen, R., 2006. Measuring the effect of User Experience design changes in e-Commerce web sites: A case on customer guidance. In *User eXperience: Towards a unified view*. 2nd COST294-MAUSE International Open Workshop at NordiCHI '06. Oslo, Norway, pp. 10-15.
- Forte, A. & Bruckman, A., 2007. Constructing text: Wiki as a toolkit for (Collaborative?) Learning. In *Proceedings of the 2007 International Symposium on Wikis*. WikiSym '07. Montreal, Quebec, Canada: ACM, pp. 31-41.
- Garland, K.J. & Noyes, J.M., 2008. Computer attitude scales: How relevant today? *Computers in Human Behavior*, 24, pp.563-575.
- Giles, J., 2005. Internet encyclopaedias go head to head. *Nature*, 438, pp.900-901.
- Giordano, R., 2007. An investigation of the use of a wiki to support knowledge exchange in public health. In *Proceedings of the 2007 International ACM SIGGROUP Conference on Supporting Group Work*. GROUP 2007. Sanibel Island, Florida, USA: ACM, pp. 269-272.
- Glaser, A., 2004. Towards emancipatory use of a medium: The Wiki. *International Journal of Information Ethics*, 2, pp.1-9.
- Goodwin-Jones, R., 2003. Emerging Technologies- Blogs and Wikis: Environments for On-line Collaboration. *Language, Learning and Technology*, 7, pp.12-16.
- Guth, S., 2007. Wikis in Education: Is Public Better? In *Proceedings of the 2007 International Symposium on Wikis*. WikiSym '07. Montreal, Quebec, Canada: ACM, pp. 61-68.
- Guzdial, M. et al., 2002. When collaboration doesn't work. In *Proceedings of the International Conference of the Learning Sciences*. Seattle, Washington, USA: Lawrence Erlbaum Associates, pp. 125-130.

- Hart, J. et al., 2008. Exploring the Facebook Experience: A new approach to usability. In *Proceedings of the 2008 Nordic Conference on Human-Computer Interaction*. NordiCHI '08. Lund, Sweden: ACM, pp. 471-474.
- Hasan, H. & Pfaff, C., 2006. The Wiki: An environment to revolutionise employees interaction with corporate knowledge. In *Proceedings of the 18th Australia conference on Computer-Human Interaction: Design: Activities, Artefacts and Environments*. OZCHI '06. Sydney, Australia: ACM, pp. 377-380.
- Hassenzahl, M., Diefenbach, S. & Goritz, A., 2010. Needs, affect, and interactive products- Facets of user experience. *Interacting with Computers*, 22, pp.353-362.
- Hassenzahl, M. & Tractinsky, N., 2006. User experience- a research agenda. *Behaviour & Information Technology*, 25, pp.91-97.
- Heinssen, R.K., Glass, C.R. & Knight, L.A., 1987. Assessing Computer Anxiety: Development and validation of the Computer Anxiety Rating Scale. *Computers in Human Behavior*, 3, pp.49-59.
- Holtzblatt, L., Damianos, L. & Weiss, D., 2010. Factors impeding wiki use in the enterprise: A case study. In *Proceedings of the 28th International conference extended abstracts on Human factors in computing systems*. CHI '10. Atlanta, GA, USA: ACM, pp. 4661-4676.
- Hornbaek, K., 2006. Current practice in measuring usability: Challenges to usability studies and research. *International Journal of Human-Computer Studies*, 64, pp.79-102.
- Howard, G. & Smith, R., 1986. Computer anxiety in management: Myth or reality? *Communications of the ACM*, 29, pp.611-615.
- Jaksch, B., Kepp, S. & Womser-Hacker, C., 2008. Integration of a wiki for collaborative knowledge development in an E-Learning context for University teaching. In *HCI and Usability for Education and Work*. Lectures in Computer Science. Heidelberg: Springer, pp. 77-96.
- Joiner, R. et al., 2007. The relationship between Internet identification, Internet anxiety and Internet use. *Computers in Human Behavior*, 23, pp.1408-1420.
- Joinson, A., 2001. Self disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology*, 31, pp.177-192.
- Joinson, A., 1999. Social desirability, anonymity, and Internet-based questionnaires. *Behavior Research Methods, Instruments, & Computers*, 31, pp.433-438.

- Kickmeier-Rust, M., Ebner, M. & Holzinger, A., 2006. Wikis: Do they need usability engineering? In *Interdisciplinary Aspects of Digital Media & Education: Conference Proceeding of the 2nd Symposium WG HCI&UE*. 2nd Symposium WG HCI&UE. Vienna, Austria, pp. 137-144.
- Kiesler, S., Siegel, J. & McGuire, W., 1984. Social psychological aspects of computer-mediated communication. *American Psychologist*, 39, pp.1123-1134.
- Kirakowski, J. & Corbett, M., 1993. SUMI: the software usability measurement inventory. *British Journal of Educational Technology*, 24, pp.210-212.
- Kline, P., 2000. *A Psychometrics Primer*, London, UK: Free Association Books.
- Kohrman, R., 2003. Computer Anxiety in the 21st Century: When You Are Not In Kansas Any More. In *Proceedings of the ACRL 11th National Conference*. ACRL 11th National Conference. Charlotte, North Carolina.
- Landauer, T., 1990. Relations between cognitive psychology and computer system design. In *Human-Computer Interaction*. New Jersey, USA: Prentice Hall, pp. 141-160.
- Larzelere, R. & Mulaik, S., 1977. Single-sample tests for many correlations. *Psychological Bulletin*, 84, pp.557-569.
- Law, E. et al., 2009. Understanding, scoping and defining User eXperience: A survey approach. In *Proceedings of the 27th International conference on Human factors in computing systems*. CHI '09. Boston, MA, USA: ACM, pp. 719-720.
- Law, E. & van Schaik, P., 2010. Modelling user experience- an agenda for research and practice. *Interacting with Computers*, 22, pp.313-322.
- Law, E. et al., 2007. Towards a UX Manifesto. In *Proceedings of the 21st British HCI Group Annual Conference on HCI 2008: People and Computers XXI: HCI...but not as we know it*. HCI 2008. Lancaster, UK: ACM, pp. 205-206.
- Leso, T. & Peck, K.L., 1992. Computer Anxiety and Different Types of Computer Courses. *Journal of Educational Computing Research*, 8, pp.469-478.
- Leuf, B. & Cunningham, W., 2001. *The Wiki Way: Collaboration and Sharing on the Internet*, Addison-Wesley Professional.
- Levelt, W., Roelofs, A. & Meyer, A., 1999. A theory of lexical access in speech production. *Behavioral and Brain Sciences*, 22, pp.1-75.
- Lindgaard, G., 2009. Early traces of usability as a science and as a profession. *Interacting with Computers*, 21, pp.350-352.

- Long, J. & Dowell, J., 1989. Conceptions of the discipline of HCI: Craft, Applied Science, and Engineering. In *People and Computers V; Proceedings of the Fifth Conference of the BCS HCI SIG*. Nottingham, UK: Cambridge University Press, pp. 1-23.
- Love, S. et al., 1994. Identifying salient usability attributes for automated telephone services. In *Proceedings of the 3rd International Conference on Spoken Language Processing*. ICSLP 94. Yokohama, Japan: ISCA, pp. 1307-1310.
- Lund, A. & Smordal, O., 2006. Is there a space for the teacher in a WIKI? In *Proceedings of the 2006 International Symposium on Wikis*. WikiSym '06. Odense, Denmark: ACM, pp. 37-46.
- Mader, S., 2008. *Wikipatterns; a practical guide to improving productivity and collaboration in your organization*, Indianapolis: Wiley Publishing Inc.
- Mahar, D., Henderson, R. & Deane, F., 1997. The effects of computer anxiety, state anxiety, and computer experience on users' performance of computer based tasks. *Personality and Individual Differences*, 22, pp.683-692.
- Majchrzak, A., Wagner, C. & Yates, D., 2006. Corporate wiki users: Results of a survey. In *Proceedings of the 2006 International Symposium on Wikis*. WikiSym '06. Odense, Denmark: ACM, pp. 99-104.
- Marteau, T.M. & Bekker, H., 1992. The development of a six-item short form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *British Journal of Clinical Psychology*, 31, pp.301-306.
- McIlroy, D. et al., 2001. The relation of gender and background experience to self-reported computing anxieties and cognitions. *Computers in Human Behavior*, 17, pp.21-33.
- McIlroy, D., Sadler, C. & Boojawon, N., 2007. Computer phobia and computer self efficacy: their association with undergraduates' use of university computer facilities. *Computers in Human Behavior*, 23, pp.1285-1299.
- McKenna, K., 2008. Influences on the nature and functioning of Online Groups. In *Psychological Aspects of Cyberspace; Theory, Research Application*. Cambridge: Cambridge University Press, pp. 228-242.
- McKenna, K. & Bargh, J., 2000. Plan 9 from cyberspace: The implications of the Internet for Personality and Social Psychology. *Personality and Social Psychology Review*, 4, pp.57-75.
- Millen, D. & Patterson, J., 2003. Identity disclosure and the creation of social capital. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. CHI 2003. Ft. Lauderdale, Florida, USA: ACM, pp. 720-721.

- Munson, S., 2008. Motivating and enabling organizational memory with a workgroup wiki. In *Proceedings of the 2008 International Symposium on Wikis. WikiSym '08*. Porto, Portugal: ACM.
- Nickell, G.S. & Pinto, J.N., 1986. The Computer Attitude Scale. *Computers in Human Behavior*, 2, pp.301-306.
- Nielsen, J., 1992. The usability engineering life cycle. *IEEE Computer*, 25, pp.12-22.
- Nielsen, J., 1993. *Usability Engineering*, London, UK: Academic Press.
- Nielsen, J., 2007. Web 2.0 can be dangerous... *Jakob Nielsen's Alertbox*. Available at: <http://www.useit.com/alertbox/web-2.html> [Accessed April 8, 2009].
- O'Neill, M.E., 2005. Automated use of a Wiki for collaborative lecture notes. *SIGCSE Bulletin*, 37, pp.267-271.
- Olson, G. & Olson, J., 2003. Human-Computer Interaction: Psychological Aspects of the Human Use of Computing. *Annual Review of Psychology*, 54, pp.491-516.
- Parker, K.R. & Chao, J.T., 2007. Wiki as a teaching tool. *Interdisciplinary Journal of Knowledge and Learning Objects*, 3, pp.57-72.
- Peevers, G., Douglas, G. & Jack, M.A., 2008. A usability comparison of three alternative message formats for an SMS banking service. *International Journal of Human-Computer Studies*, 66, pp.113-123.
- Picard, R.W., 2000. *Affective Computing*, London, UK: MIT Press.
- Picard, R.W., Vyzas, E. & Healey, J., 2001. Towards machine emotional intelligence: Analysis of affective physiological states. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 23, pp.1175-1191.
- Popovich, P.M. et al., 2008. Comparing attitudes towards computer usage by undergraduates from 1986 to 2005. *Computers in Human Behavior*, 24, pp.986-992.
- Preece, J., 2001. Sociability and usability in online communities: determining and measuring success. *Behaviour & Information Technology*, 20, pp.347-356.
- Preece, J., Nonnecke, B. & Andrews, D., 2004. The top 5 reasons for lurking: Improving community experiences for everyone. *Computers in Human Behavior*, 20, pp.201-223.
- Preece, J., Sharp, H. & Rogers, Y., 2007. *Interaction Design: Beyond Human-Computer Interaction* 2nd ed., Chichester, UK: John Wiley & Sons.

- Presno, C., 1998. Taking the byte out of Internet Anxiety: Instructional techniques that reduce Computer/Internet Anxiety in the classroom. *Journal of Educational Computing Research*, 18, pp.147-161.
- Raitman, R. et al., 2005. Security in the Online E-learning Environment. In *Proceedings of The Fifth IEEE International Conference on Advanced Learning Technologies*. ICALT '05. Kaohsiung, Taiwan: IEEE Computer Society Press, pp. 702-706.
- Ravid, G., Kalman, Y. & Rafaeli, S., 2008. Wikibooks in higher education: Empowerment through online distributed collaboration. *Computers in Human Behavior*, 24, pp.1913-1928.
- Rice, L. & Markey, P., 2009. The role of extraversion and neuroticism in influencing anxiety following computer-mediated communication. *Personality and Individual Differences*, 46, pp.35-39.
- Roca, J.C., Chiu, C. & Martinez, F.J., 2006. Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. *International Journal of Human-Computer Studies*, 64, pp.683-696.
- Rosen, L.D., Sears, D.C. & Weil, M.M., 1987. Computerphobia. *Behavior Research Methods, Instruments, & Computers*, 19, pp.167-179.
- Rosen, L.D. & Weil, M.M., 1994. What we have learned from a decade of research (1983-1993) on "The Psychological Impact of Technology". *Computers and Society*, pp.3-9.
- Roto, V., 2006. User Experience Building Blocks. In *User eXperience: Towards a unified view*. 2nd COST294-MAUSE International Open Workshop at NordiCHI '06. Oslo, Norway, pp. 124-128.
- Saade, R.G. & Kira, D., 2007. Mediating the impact of technology usage on perceived ease of use by anxiety. *Computers & Education*, 49, pp.1189-1204.
- Scheirer, J. et al., 2002. Frustrating the user on purpose: a step toward building an affective computer. *Interacting with Computers*, 14, pp.93-118.
- Shackel, B., 1990. Human Factors and Usability. In J. Preece & L. Keller, eds. *Human-Computer Interaction*. Cambridge: Prentice Hall, pp. 26-41.
- Shackel, B., 2009a. Human-Computer Interaction- Whence and whither? *Interacting with Computers*, 21, pp.353-366.
- Shackel, B., 2009b. Usability-Context, Framework, Definition, Design and Evaluation. *Interacting with Computers*, 21, pp.339-346.

- Simon, S.J. et al., 1996. The relationship of information system training methods and cognitive ability to end-user satisfaction, comprehension, and skill transfer: A longitudinal field study. *Information Systems Research*, 7, pp.466-490.
- Simon, S.J. & Werner, J.M., 1996. Computer training through behavior modeling, self-paced, and instructional approaches: A field experiment. *Journal of Applied Psychology*, 81, pp.648-659.
- Smith, B. & Caputi, P., 2001. Cognitive interference in computer anxiety. *Behaviour & Information Technology*, 20, pp.265-273.
- Spielberger, C.D. et al., 1983. *Manual for the State-Trait Anxiety Inventory (Form Y)*, Palo Alto, CA: Consulting Psychologists Press.
- Tajfel, H. & Turner, J.C., 1986. The social identity of intergroup relations. In *Psychology of intergroup relations*. Chicago: Nelson-Hall.
- Tanis, M. & Postmes, T., 2007. Two faces of anonymity: Paradoxical effects of cues to identity in CMC. *Computers in Human Behavior*, 23, pp.955-970.
- Taylor, J. & Deane, F., 2002. Development of a short form of the Test Anxiety Inventory (TAI). *Journal of General Psychology*, 129, pp.127-136.
- Thatcher, J.B. et al., 2007. Internet anxiety: An empirical study of the effects of personality, beliefs, and social support. *Information & Management*, 44, pp.353-363.
- Thorpe, S.J. & Brosnan, M.J., 2007. Does computer anxiety reach levels that conform to DSM IV criteria for specific phobias? *Computers in Human Behavior*, 23, pp.1258-1272.
- Todman, J. & Day, K., 2006. Computer anxiety: the role of psychological gender. *Computers in Human Behavior*, 22, pp.856-869.
- Todman, J. & Drysdale, E., 2004. Effects of qualitative differences in initial and subsequent computer experience on computer anxiety. *Computers in Human Behavior*, 20, pp.581-590.
- Todman, J. & Monaghan, E., 1994. Qualitative differences in computer experience, computer anxiety, and students' use of computers: A path model. *Computers in Human Behavior*, 10, pp.529-539.
- Torkzadeh, G. & Dwyer, D., 1994. A path analytic study of determinants of Information System usage. *Omega*, 22, pp.339-348.
- Venkatesh, V., 2000. Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the Technology Acceptance Model. *Information Systems Research*, 11, pp.342-365.

- Viegas, F., Wattenberg, M. & Dave, K., 2004. Studying cooperation and conflict between authors with history flow visualizations. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. CHI '04. Vienna, Austria: ACM, pp. 575-582.
- Wang, C. & Turner, D., 2004. Extending the wiki paradigm for use in the classroom. In *Proceedings of the International Conference on Information Technology: Coding and Computing*. ITCC 2004. Las Vegas, USA: IEEE, pp. 255-259.
- Ward, R.D., 2004. An analysis of facial movement tracking in ordinary human-computer interaction. *Interacting with Computers*, 16, pp.879-896.
- Ward, R.D. & Marsden, P.H., 2003. Physiological responses to different WEB page designs. *International Journal of Human-Computer Studies*, 59, pp.199-212.
- Weeks, J. et al., 2005. Empirical validation and psychometric evaluation of the Brief Fear of Negative Evaluation Scale in patients with Social Anxiety Disorder. *Psychological Assessment*, 17, pp.179-190.
- Weil, M.M. & Rosen, L.D., 1995. The psychological impact of technology from a global perspective: A study of technological sophistication and technophobia in University students from twenty-three countries. *Computers in Human Behavior*, 11, pp.95-133.
- Weil, M.M., Rosen, L.D. & Wugalter, S.E., 1990. The Etiology of Computerphobia. *Computers in Human Behavior*, 6, pp.361-379.
- Weir, C.S. et al., 2009. User perceptions of security, convenience and usability for ebanking authentication tokens. *Computers & Security*, 28, pp.47-62.
- Wheeler, S., Yeomans, P. & Wheeler, D., 2008. The good, the bad and the wiki: Evaluating student-generated content for collaborative learning. *British Journal of Educational Technology*, 39, pp.987-995.
- White, K., Gurzick, D. & Lutters, W., 2009. Wiki Anxiety: Impediments to implementing wikis for IT support groups. In *Proceedings of the Symposium on Computer Human Interaction for the Management of Information Technology*. CHIMIT '09. Baltimore, Maryland, USA: ACM, pp. 64-67.
- Wilson, B., 1999. Redressing the anxiety imbalance: computerphobia and educators. *Behaviour and Information Technology*, 18, pp.445-453.
- Wood, E. et al., 2002. Developing a computer workshop to facilitate computer skills and minimize anxiety for early childhood educators. *Journal of Educational Psychology*, 94, pp.164-170.

THESIS APPENDIX

Appendix 1.1- Scenarios in Chapter 3 research

Experiment Scenario

You are using UNIWIKI in your Psychology degree. Your Differential Psychology lecturer has asked all students to collaborate to create a **Personality Background** page on UNIWIKI as part of a course assignment.

The page aims to give general background on Personality. This **Personality Background** page will be live on the wiki and will be used by students in your class as the basic class reference for the **Differential Psychology** lecture series in semester 2.

Students have been adding and editing the information over the past week and you have decided to start contributing.

Other students will also be adding and editing information on the page as part of the same class exercise over the coming days.

As part of the assignment, the wiki must be edited using the **wiki markup editor**

Sandbox Scenario

As an introduction to editing content on the UNIWIKI site, your lecturer has asked you to practice using **wiki markup language** by editing content on the UNIWIKI Sandbox before editing the Personality Background page. The sandbox is an area where you can practice editing content without affecting the live content which other users can see on the wiki. She has given you specific tasks to complete in the sandbox.

Tutorial Scenario

As an introduction to editing content on the UNIWIKI site, your lecturer has asked you to complete the UNIWIKI tutorial supplied on the UNIWIKI site.

Tutorial & Sandbox Scenario

As an additional introduction to editing content on the UNIWIKI site, your lecturer has asked you to practice using the **wiki markup language** you have learned by editing content on the UNIWIKI Sandbox before editing the Personality Background page. The sandbox is an area where you can practice editing content without affecting the live content which other users can see on the wiki. She has given you specific tasks to complete in the sandbox.

Editing Instructions

To start editing the wiki:

Page Operations > Edit.

Click **Save** when you finish each edit

Appendix 1.2- Short Wiki Description for Chapter 3 research

What is a wiki?

A wiki is a type of web page designed so that its content can be edited by anyone who accesses it, using a simplified markup language. In wiki terms, **Editing** refers to the change or adding of formatting and content to wiki pages. Users can change the pages content by adding, amending and deleting content available on these pages. Any user can also change the way this information is visually presented and how it is formatted. These changes then become part of the 'live' pages (pages which can then be viewed normally by anyone, just like a web page). Because the live pages can be edited by any user at any time, all users have a say about the content on the system. The content and its visual presentation can change constantly.

To change the display of content and add formatting to the edits users need to use a markup language called **wiki markup language**. Wiki markup language is a set of syntax commands, like a simple programming language, which changes the way the content is displayed.



Wikis in action: WIKIPEDIA

One of the most well known examples of a wiki is **wikipedia**. In wikipedia everyone can look up information about a topic of interest. Users can also edit any of the live information available on wikipedia. Anyone can add or amend the information on any topic they are interested in. Anyone can also change the way the information is presented by using wiki markup language syntax. Through this the "community" (all users of the wiki) collaborates on a topic to get the most accurate, full and well presented encyclopedia entry for that topic. Other users will add and change information and layout so that a well designed encyclopedia entry can be reached. This is how a wiki works.

Appendix 1.3- Sandbox page, Tutorial content and Live Wiki Page content for Chapter 3 research

Sandbox Content

Anna's Pear and Almond Tart

Anna Smith was having some frieaaands round for dinner to celebrate getting her Psychology degree. Anna was cooking her favourite Pear and Almondff tart but wanted to make one that everyone would like. She decided to use the wiki to collaborate on the recipe so that she could make a tart everyone would like. She drew up a shopping list of the items she needed for the tart;

milk, puff pastry, eggs, almonds, pears and custard.

To make her list she used a wiki and passed the address to her friends so that they could change the recipe to what they liked. They all suggested an additional item to add.

TABLE OF ADDITIONAL INGREDIENTS

Anna added these to her list and ordered all of her shopping online from Sainsbury's.

the tart was so nice Anna decided to file it away for safe keeping as her and her friends 'special recipe'.

Ready to go 'live'?

Why not try editing a 'live' document? Head to the [Personality Background Page](#) and start editing some content.

Tutorial Content

Welcome to the UNIWIKI Tutorial!

This tutorial will explain what a wiki is and why it is useful to you as a UNIWIKI user.

It will also supply you with some simple edit commands to get you started using the wiki.

To move on in the tutorial click on the **Next** Link at the end of each page.

WHAT IS IT?

A wiki is a website which can be directly edited by anyone with access to it. Users can change (edit) the pages content by adding, amending and deleting content available on these pages. Any user can also change (edit) the way this information is visually presented and how it is formatted. These changes (edits) then become part of the pages which can then be viewed normally by anyone, just like a web page.

Because the pages can be edited by any user at any time, all users have a say about

the content on the system and the content and its visual presentation changes constantly.

To change the display of content and add formatting to the edits users need to use a markup language called **wiki markup language**. **Wiki markup language** is a set of syntax commands which change the way the content is displayed.

One of the most well known examples of a wiki is **wikipedia**.

WHY IS IT USEFUL TO MY COURSE?

Because you can collaborate with other users, wikis can be useful in a multitude of group settings. The aim of UNIWIKI is to allow all of the Psychology year to collaborate and create content together which you all can use. We wish users to share resources, comments and knowledge.

It is also a great tool for writing group coursework for group assessment. You and your group members can work on the same document together with it being stored in one location.

It also allows you to get access to the differing expertise of the teaching staff in the department through one single system.

HOW CAN I EDIT A WIKI?

On the wiki all pages have the *Page Operations* Menu in the left hand navigation menu. To start editing the wiki click on *Page Operations* and *Edit*. This then takes you to the **wiki markup editor** where you can add and edit the information on that specific wiki page.

When you have finished your edit click the **Save** button either at the top or the bottom left hand side of the editor. Your edits are then added to the 'live' wiki page for other users to see.

Text can be added without formatting simply through typing the text you want to appear directly into the editor. It can be formatted and other elements added to the page by using wiki markup language.

WHAT IS WIKI MARKUP LANGUAGE?

Formatting content on UNIWIKI is different from writing on a standard word processor. Instead of icons and menus being used to format the content, **Wiki markup language** is used as the main way to edit the look and feel of the wiki. It is a basic command based language that allows users to edit the style and layout of the page being edited.

To change the formatting of content you just add wiki markup commands to the text in the **wiki markup editor**.

The next part of this tutorial will show you some basic wiki markup commands to get you started.

WIKI MARKUP COMMANDS

Here are some basic wiki markup commands to get you started.

TEXT FORMATTING

To make content appear in bold place a * directly before (i.e. no space) and directly after the word or phrase you want in bold.

Example: `*Word*` = **Word**

To make your text appear in italics place a `_` directly before (i.e. no space) and directly after the word or phrase you want to appear in italics.

Example: `_Word_` = *Word*

To underline content place a `+` directly before (i.e. no space) and direct after the word or phrase you want to underline

Example: `+Word+` = Word

HEADINGS

To improve the layout and break up the text in the article, headings can be used. Different sizes of headings are available. To create a heading include one of the following pieces of code (e.g. `h1.`) beside the text you want to appear as a heading leaving a space between the code and the heading text.

Examples: `h1.` Large Heading =

Large Heading

`h3.` Medium Heading =

Medium Heading

`h5.` Small Heading =

Small Heading

LISTING

With wiki markup you can also create lists of items, which improve the look of the page and makes it much easier to read. You can create either Numbered or Bulleted lists.

To create a numbered list use a `#` symbol at the start of each of the items you wish to appear in that list. Make sure you leave a space between the `#` and each item.

Example:

`# Apple`

`# Orange` =

1. Apple
2. Orange

To create a bulleted list use a `*` symbol at the start of each of the items you wish to appear in that list. Make sure you leave a space between the `*` and each item.

Example:

`* Bulleted List`

`* Bulleted List` =

- Bulleted List
- Bulleted List

CREATING TABLES

Tables can make the information on your page easy to read and understand. It can also add an organisation to any data that appears in your document which is hard

with just plain text. To add tables to your pages first you need to type the headings which are needed for each column of the table. Two vertical lines (||) must be placed directly before and after **each** item of text you want as a column heading. To add data to your table simply type the data you want in the same order that you want it to appear under the headings. One vertical line (|) must be placed directly before and after each item you want to appear as data in the table.

Example:

```
||Fruits||Nuts||Vegetables||
|Apple|Pistachio|Carrot|    =
Fruits  Nuts  Vegetables
Apple Pistachio Carrot
```

You should now be familiar with the concepts of a wiki and a few simple wiki markup commands.

Ready to go 'live'?

Why not try editing a 'live' document? Head to the [Personality Background Page](#), select the relevant ID and start editing some content.

Live Wiki Page Content

WELCOME TO THE PERSONALITY BACKGROUND PAGE

This background review focuses on personality. It is meant as a brief refresher on the aspects of personality and how it is measured.

What is personality?

There are two major strands of personality research; nomothetic & idiographic

Nomothetic is the study of personality by examining common features in humans whereas Idiographic study focuses on individuality and the unique aspects of the individual.

Trait theories are a major example of nomothetic study. They categorise individuals into a common set of traits applicable to a population such as Extraversion or Neuroticism. Trait theories believe that individuals have habitual responses in conjunction with a specific personality trait and that people can be categorised into a trait type due to their behaviour, cognition or attitude.

Idiographic approaches involve more psychoanalytic (Freudian in approach), humanistic and behavioural attitudes to human personality with the most famous being Freud's theory of the self.

The approaches differ in their adoption of scientific methodology and whether the personality traits have been seen to endure.

TRAIT THEORIES

There are two popular trait theories

EYSENK'S 3 DIMENSIONAL MODEL:

Traits included are

Neuroticism

Extraversion

Psychoticism

COSTA & McCRAE'S 5 FACTOR MODEL

Traits included are

Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness

Useful References

Matthews, G., Deary, I.J., & Whiteman, M. (2003). *Personality Traits*. Cambridge University Press. Cambridge

Check availability from the University library

[Back to Lecture Space](#)

Appendix 1.4- Sandbox and Live Tasks for Chapter 3 research

Sandbox Simple Tasks

SBS1

Add the text “Shopping List” before the list of items near the top of the page.

SBS2

Correct the two spelling mistakes in the first paragraph.

SBS3

Make the text “Anna’s Pear and Almond Tart” into a large heading.

Sandbox Complex Tasks

SBC1

Make the name “Anna Smith” appear in bold.

SBC2


Make a numbered list out of the items listed for the shopping list near the top of the page.

SBC3

Add the following table after the title “Table of additional ingredients”:

Guest	Ingredient	Amount
Antoinne	Honey	30g
Melissa	Walnuts	50g
Richard	Vanilla Essence	10ml
Becca	Brandy	20ml

Appendix 1.5- Help Tips Box from Chapter 3 research

 **Help Tips**

Notation Help: ([full guide](#))

Text formatting:
bold » **bold**
italic » *italic*
-strike- » ~~strike~~
+under+ » under

Headings:
h1. Large heading!
h3. Medium heading
h5. Small heading...

Lists:
* Bulleted point
Numbered point

Linking:
[title#anchor] » Link a page
[dev:title#anchor] » In space with 'dev'
[http://host.com] » Remote link
[phrase@shortcut] » Shortcut
Note: [alias|any_of_above_links] » Custom link title

Tables:
	head1		head2	
colA1	colA2			
colB1	colB2			

Details and full examples are in the [full notation guide](#) »

Appendix 1.6- Live Content Tasks for Chapter 3 research

Live Content Simple Tasks

ES1

Add the following sentence of text underneath the title
“What is Personality?” at the top of the page:

Personality is characteristic patterns of
thought, emotion and behaviour.

ES2

Correct the two spelling mistakes in the paragraph of
text commencing with “Trait theories.....”

ES3

Make the title “What is personality?” at the top of the
page into a large heading.

Live Content Complex Tasks

EC1

Make the word “Nomothetic” near the top of the page appear in bold.

EC2

Make a numbered list out of the personality traits in Costa and MacRae’s five factor model.

EC3

Add the following table to the end of the “What is Personality?” Section:

Theory	Scientific Method	Enduring Difference
Trait	Yes	Yes
Psychoanalytic	No	Yes
Humanistic	No	No
Behavioural	Yes	No

Appendix 1.7- Item Development for Wiki Anxiety Inventory-Editing

Table A. 1- Original items used to develop items for Wiki Anxiety Inventory-Editing iterations

ID	ITEM SOURCE	ITEM	THEME
1	If given the opportunity, I would like to learn more about and use computers more (Heinssen et al., 1987)	Having to learn more about editing wikis would upset me	Learning
2		Learning wiki markup language is stressful for me	Learning
3	Learning computer terminology (tick box which describes how anxious you are) (Rosen et al.,1987)	The thought of learning wiki markup makes me nervous	Learning
4	Learning to operate computers is like learning any new skill, the more you practice the better you become (Heinssen et al., 1987)	Learning to edit wikis is like learning any new skill, the more you practice, the better you become	Learning
5	I am sure that with time and practice I will be as comfortable working with computers as I am in working with a typewriter (Heinssen et al., 1987)	I am sure that with time and practice I will be comfortable editing the wiki	Learning
6	Computers make me uncomfortable because I do not understand them (Nickell & Pinto, 1986)	Wikis make me uncomfortable because I do not understand them	Interaction
7	I hesitate to use a computer for fear of making mistakes that I cannot correct (Heinssen et al., 1987)	I hesitate to edit the wiki for fear of making mistakes	Interaction
8	I look forward to using a computer (Heinssen et al., 1987)	I look forward to editing a wiki	Interaction
9		I would try to edit the wiki as little as possible because it would make me uncomfortable	Interaction
10		I feel at ease editing wiki pages using wiki markup language	Interaction
11		Wiki markup language confuses me	Interaction
12		I feel tense when editing the wiki	Interaction
13	I get a sinking feeling when I think of trying to use a computer (Barbeite & Weiss, 2004; Venkatesh, 2000)	I get a sinking feeling when I try and edit the wiki	Interaction
14		I'd like to use the wiki in my University courses	Interaction
15		I hope that soon every course will be using wikis	Interaction
16		I am nervous about using wiki	Interaction

		markup to edit the wiki	
17	Computer intimidates me because they seems so complex (Garland & Noyes, 2008)	The complexity of wiki markup language intimidates me	Interaction
18	Computers are difficult to understand and are frustrating to work with (Garland & Noyes, 2008)	I find editing the wiki frustrating	Interaction
19		When editing the wiki I have an uneasy, upset feeling	Confidence
20		If I encounter a problem whilst editing the wiki, I am confident I can solve it easily	Confidence
21		I feel confident about my ability to add information to a wiki	Confidence
22		I am confident that I can make the wiki do what I want	Confidence
23	I hesitate to use a computer for fear of making mistakes that I cannot correct (Heinssen et al., 1987)	I worry that I cannot correct any mistakes I may make when editing the wiki	Confidence
24		I am relaxed when editing the wiki because I'm in control	Confidence
25	I feel intimidated by computers (Garland & Noyes, 2008)	I feel intimidated by the wiki	Confidence
26	It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key (Heinssen et al., 1987)	It scares me to think that I could destroy a large amount of information on the wiki by hitting the wrong key	Confidence
27		The fact that other users can see my comments and changes excites me	Fear of judgement
28		I am comfortable with other users being able to see my changes to the wiki	Fear of judgement
29		Thoughts of my edits being judged by my classmates worry me	Fear of judgement
30		I trust others to put useful information of the wiki	Flexibility Concerns
31		I'm worried that the content I create can be changed by any user	Flexibility Concerns
32		Being able to change the content available on the wiki excites me	Flexibility Concerns
33		It makes me tense thinking that the information on the wiki is constantly changing	Flexibility Concerns
34		The fact that information can be easily changed makes me nervous	Flexibility Concerns
35		I am uncomfortable that any kind of information can be added to the wiki	Flexibility Concerns

Table A. 2- Items removed from initial list

ID	ITEM SOURCE	ITEM	REASON FOR EXCLUSION
36		I find it frustrating when wiki pages take a long time to load	Item not relevant in wiki editing scenario. Usability issue rather than emotion towards wiki editing.
37		I heavily rely on the accuracy of the information available on the wiki	Item not relevant in wiki editing scenario. Item is conceptually ambiguous in the way anxious users would be expected to answer.
38		Allowing other users to see my comments excites me	Concept already covered in item 27. Item suggests that the openness of wiki is optional.
39	I am afraid that if I begin to use computers I will become dependent upon them and lose some of my reasoning skills (Heinssen et al., 1987)	I am afraid that if I begin to use wikis more I will become more dependent upon them	Attitude statement rather than item measuring anxiety.
40		Thoughts of being judged by my classmates when I edit the wiki make me feel tense	Potential confusion in reference- could refer to classmates judging the users editing ability or judging their edits. Concept more accurately described in item 29.
41		Searching for information on the wiki is a nuisance	Item not relevant in wiki editing scenario. Viewing usability issue rather than emotion towards wiki editing.
42		The idea that I will not be able to access content that I created because somebody removed it upsets me	Concept already covered in items 31 and 32. Item length.
43	I hesitate to use a computer for fear of making a mistake I cannot correct (Heinssen et al., 1987)	I hesitate to use a wiki for fear of making mistakes that I cannot correct	Mixed concepts in item- Concern in terms of making mistakes and inability to recover from errors. Both already covered in items 7 and 23.
44		The fact that anyone can edit a page	Mixed concepts in

		with any information frightens me	item- The ability for any user to edit a page and the freedom of including any information on the wiki. Both already covered in items 31 and 35.
45	Anyone can learn to use a computer if they are patient and motivated (Heinssen et al., 1987)	Anyone can learn to edit a wiki if they are patient and motivated	Attitude statement rather than anxiety related.
46		Editing the wiki makes me feel uncomfortable	Similar to concepts in items 9, 10 and 12.
47		Editing the wiki frightens me	Similar to concepts in items 10 and 12.
48		I feel at ease when learning about editing the wiki	Concept is similar to item 3 when made into a past tense item. Item is badly worded.
49		I am nervous about learning wiki editing skills	Concept similar to item 3.
50	Working with a computer would make me nervous (Barbeite & Weiss, 2004)	Working with wikis makes me nervous	Vagueness in reference to activity with the wiki. Similar to item 16 when made to focus on wiki markup.
51	If given the opportunity, I would like to learn more about and use computers more (Heinssen et al., 1987)	Having to use wikis in my courses would make me unhappy	Concept covered in item 14.
52	I have avoided computers because they are unfamiliar and somewhat intimidating to me (Heinssen et al., 1987)	I have avoided wikis because they are unfamiliar and somewhat intimidating to me	Difficult to produce a relevant item for WAI-EF questionnaire. User group also makes unfamiliarity likely. Aspect of intimidation covered in item 25.
53		I am confident in my ability to edit the wiki	Similar concept to item 21.
54	Computers are difficult to understand and are frustrating to work with (Garland & Noyes, 2008)	I find wiki markup difficult to understand	Concept focuses on users' cognitive ability rather than anxiety.
55		The idea that I will not be able to access content that I created because somebody removed it upsets me	Similar concept to item 31.
56		I am satisfied that the information on a wiki is accurate	Item irrelevant to editing scenario.
57		I am unsure about using information posted on the wiki to inform my work	Item irrelevant to editing scenario.

58		I am worried about using a wiki because everything can change all the time	Similar to concept in item 31 and 34. Also vagueness in reference to activity with wiki.
59		It makes me restless that another user can remove or edit the content I add	Similar concept to item 31.
60		The fact that I may not be able to access content I have previously used because someone has deleted it makes me uncomfortable	Similar concept to item 31. Item length and wording.

Table A. 3- Final items for the Wiki Anxiety Inventory- Editing

ID	Related ² ID from Table 1	ITEM SOURCE	WAI-EP	WAI-EA	WAI-EF	POLARITY	THEME
1	NI		I will enjoy learning about editing the wiki	I enjoyed learning about editing the wiki	I would enjoy learning more about editing the wiki	(+)	Learning
2	NI		I will get distracted easily when learning about editing wikis	I got distracted easily when learning about editing the wiki	I would get distracted easily if I had to learn about editing wikis again	(-)	Learning
3	NI	I am confident I can learn computer skills (Heinssen et al., 1987)	I am confident that I will be able to learn wiki markup language	I felt confident learning wiki markup language	I am confident that I will be able to learn more wiki markup language	(+)	Learning
4	5	I am sure that with time and practice I will be as comfortable working with computers as I am in working with a typewriter (Heinssen et al., 1987)	With experience I think I will feel comfortable using wiki markup language	As I became more experienced I felt more comfortable using wiki markup language	With more experience I think I will feel even more comfortable using wiki markup language	(+)	Learning
5	NI	Learning computer terminology (Rosen et	I think learning wiki markup language will	Learning wiki markup language was stressful for	I think learning more wiki markup language will	(-)	Learning

² Although the items identified are the core sources of the present items, wording may differ due to wording changes over the design period to improve the clarity of the item. NI= new item developed since the original 35 items displayed in Table A.1. Such items were created from feedback from meetings and the small pilot study after initial items were created.

		al.,1987)	be stressful for me	me	be stressful for me		
6	NI	I feel apprehensive about using computers (Heinssen et al., 1987)	I am apprehensive about editing the wiki	I felt apprehensive when editing the wiki	I am apprehensive about editing the wiki again	(-)	Interaction
7	7	I hesitate to use a computer for fear of making mistakes that I cannot correct (Heinssen et al., 1987)	I am anxious about editing the wiki for fear of making mistakes	When editing the wiki I felt anxious about making a mistake	I am anxious about editing the wiki again for fear of making mistakes	(-)	Interaction
8	8	I look forward to using a computer (Heinssen et al., 1987)	I am excited about editing the wiki	I felt excited when editing the wiki	I am excited about editing the wiki again	(+)	Interaction
9	9		I feel uncomfortable about editing the wiki	I felt uncomfortable about editing the wiki	I feel uncomfortable about editing the wiki again	(-)	Interaction
10	10		I feel at ease about using wiki markup language	I felt at ease using wiki markup language	I feel at ease about using wiki markup language again	(+)	Interaction
11	11		Wiki markup language will confuse me	Wiki markup language confused me	Wiki markup language would confuse me	(-)	Interaction
12	12		I feel tense about editing the wiki	I felt tense whilst editing the wiki	I feel tense about editing the wiki again	(-)	Interaction
13	17	Computer intimidates me because they seems so complex (Garland & Noyes, 2008)	I feel intimidated about editing the wiki	I felt intimidated while editing the wiki	I feel intimidated about editing the wiki again	(-)	Interaction
14	NI	Thoughts of doing poorly interfere with my concentration on tests (Taylor & Deane, 2002)	I will find it hard to concentrate when editing the wiki	I found it hard to concentrate when editing the wiki	I would find it hard to concentrate if I edited the wiki again	(-)	Interaction
15	NI	I feel insecure in	I would feel secure in my	I felt secure in my ability to	I would feel secure in my	(+)	Confidence

		my ability to interpret a computer printout (Heinssen et al., 1987)	ability to edit the wiki	edit the wiki	ability to edit the wiki again		
16	20		I am certain that I can overcome any difficulties I may encounter when editing the wiki	I was certain I could overcome any difficulties I encountered in editing the wiki	I am certain I can overcome any difficulties I may encounter when editing the wiki	(+)	Confidence
17	21		I am confident that I would be able to use wiki markup language	I felt confident when using wiki markup language	I am confident I would be able to use wiki markup language again	(+)	Confidence
18	22		I am sure that I can make the wiki do what I want it to do	I felt sure that I could make the wiki do what I wanted it to do	I am sure that I could make the wiki do what I want it to do if I edited it again	(+)	Confidence
19	23	I hesitate to use a computer for fear of making mistakes that I cannot correct (Heinssen et al., 1987)	I am worried about making mistakes that I cannot correct when editing the wiki	I was worried about making a mistake that I could not correct when editing the wiki	I am worried about making mistakes that I cannot correct.	(-)	Confidence
20	26 (Divided Original Concept)	It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key (Heinssen et al., 1987)	I am afraid that I may do something wrong when editing the wiki	I was afraid that I might do something wrong when editing the wiki	I am afraid I may do something wrong if I edit the wiki again	(-)	Confidence
21	28		I am happy with other users being able to see my changes to the wiki	I was happy with other users being able to see my changes to content on the wiki	I am happy with other users being able to see any further changes I make to the wiki	(+)	Fear of Judgement
22	NI	I am afraid that people	I am afraid that people	I was afraid that people	I am afraid that people	(-)	Fear of Judgement

		will find faults with me (Weeks et al., 2005)	will find faults with any edits I may make	may find faults with any edits I made	will find faults with any edits I make if I edit the wiki again		
23	34		The fact that content can be changed makes me uneasy	The fact that content could be changed made me uneasy	The fact that content can be changed makes me uneasy	(-)	Flexibility Concerns
24	31		I am concerned that other users can change the edits I make	I was concerned that other users could change the edits I made	I am concerned that other users could change the edits I would make	(-)	Flexibility Concerns
25	26 (Divided Original Concept)	It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key (Heinssen et al., 1987)	It scares me to think that I could accidentally destroy someone else's content	It scared me to think that I could accidentally destroy somebody else's content	I scares me to think I could accidentally destroy someone else's content	(-)	Flexibility Concerns

Table A. 4- Items omitted from Final Wiki Anxiety Inventory- Editing

ID	Related ID from Table 1	ITEM SOURCE	WAI-EP	WAI-EA	WAI-EF	Reason for Exclusion
26	4	Learning to operate computers is like learning any new skill, the more you practice the better you become (Heinssen et al., 1987)	The more you practise editing the wiki, the better you become	I am sure that with more practice I would have been better at editing the wiki	The more you practise editing the wiki, the better you become	Attitude statement and speculative about the effect of further experience improving performance
27	13	I get a sinking feeling when I think of trying to use a computer (Barbeite & Weiss, 2004; Venkatesh, 2000)	The thought of editing the wiki gives me a sinking feeling	I got a sinking feeling when I edited the wiki	The thought of having to edit the wiki again gives me a sinking feeling	Sinking feeling is not descriptive in terms of emotions felt towards interaction.

28	15		I hope that soon every course will be using wikis	I hope that soon every course will be using wikis	I hope that soon every course will be using wikis	Attitude statement rather than focused on emotion.
29	24		I think I would feel in control when editing the wiki	I felt in control whilst editing the wiki	I would feel in control if I had to edit the wiki again	Concept included in the wiki usability measure (WUI)
30	27		The fact that other users can see my comments and changes excites me	The fact that other users could see my comments and changes excited me	The fact that other users can see my comments and changes excites me	Concept covered more clearly in item 21 in Table 3.
31	30		I trust others to put useful content on the wiki	I trusted others to put useful content on the wiki	I would trust others to put useful content on the wiki	Item not relevant to Experiment or concept of anxiety towards wiki editing.
32	33		It makes me tense to think that the information on the wiki is constantly changing	It made me tense thinking that the content on the wiki could constantly change	It makes me tense to think that the information on the wiki is constantly changing	Concept covered more clearly in item 23 in Table 3.
33	1	If given the opportunity, I would like to learn more about and use computers more (Heinssen et al., 1987)	I would like to learn about editing wikis	I liked learning about editing wikis	I would like to learn more about editing wikis	Similar concept covered in item 1 in Table 3.
34	NI		I think I will feel strained when learning how to edit the wiki	I felt strained when learning how to edit the wiki	I would feel strained if had to learn about editing the wiki again	Unclear whether 'strained' adequately refers to anxiety.
35	NI		I think I will get flustered when using wiki markup language	I got flustered when using wiki markup language	I would get flustered if I had to use wiki markup language again	Concept included in the wiki usability measure (WUI).
36	14		I'd be happy to edit a wiki in my University courses	I'd be happy to edit a wiki like this in my University courses	I'd be happy to edit a wiki in my University courses	Concept included in the wiki usability measure (WUI).
37	18	Computers are difficult to understand	I think I would find wiki markup	I found wiki markup language	I would feel frustrated if I had to use	Frustration not specifically anxiety related.

		and are frustrating to work with (Garland & Noyes, 2008)	language frustrating	frustrating	wiki markup language again	Concept included in the wiki usability measure (WUI)
38	NI		I would think of possible misfortunes if I had to edit the wiki	When editing the wiki I was thinking of possible misfortunes	I would think of possible misfortunes if I had to edit the wiki again	Term “possible misfortunes” is vague in reference and of questionable relevance to anxiety concept.
39	NI		I would feel indecisive if I had to edit a wiki	When I was editing the wiki I felt indecisive	I would feel indecisive if I had to edit a wiki again	Indecisiveness seen as having low relevance to anxiety concept being measured.
40	29		The thought of my edits being judged by my classmates would worry me	The thought of my edits being judged by my classmates worried me	The thought of my edits being judged by my classmates worries me	Similar concept covered in item 21 in Table 3.
41	35		I would be upset that any kind of content can be added to the wiki	I was upset that any content could be added to the wiki	I would be upset if using the wiki again because any content could be added to the wiki	Not relevant to measure of users’ anxiety towards editing
42	2	The challenge of learning about computers is exciting (Heinssen et al., 1987)	I find the idea of learning about editing wikis exciting	I found that learning about editing the wiki was exciting	I find the idea of learning more about editing wikis is exciting	Similar concept covered in item 1 in Table 3.
43	3		The thought of learning wiki markup language makes me nervous	I felt nervous when learning wiki markup language	The thought of learning more wiki markup language makes me nervous	Similar concept covered in item 3 in Table 3.
44	16		I am nervous about editing the wiki	I felt nervous editing the wiki	I would feel nervous editing the wiki again	Similar concept covered in item 6 in Table 3.
45	19		The thought of using wiki markup language makes me feel uneasy	When using wiki markup language I felt uneasy	The thought of using wiki markup language again makes me feel	Similar concept covered in item 10 in Table 3.

					uneasy	
46	NI		I would feel stressed knowing that other students could see what I have changed	I felt stressed knowing that other students could see what I have changed on the wiki	I would feel stressed editing the wiki again knowing that other students can see my changes	Similar concept covered in item 21 in Table 3.
47	NI	I am afraid that people will find faults with me (Weeks et al., 2005)	I am concerned that other users might be critical of my edits	I was concerned that other users would be critical of my edits	I am concerned that other users would be critical of my edits if I edited the wiki again	Similar concept covered in item 22 in Table 3.
48	NI	I am afraid that others will not approve of me (Week et al., 2005)	I am worried that other users may not approve of my edits	I was worried that other users would not approve of my edits	I am worried that other users would not approve of my edits if I edited the wiki again	Similar concept covered in item 22 in Table 3.
49	32		Being able to edit the content on the wiki does not bother me	Being able to edit the content on the wiki did not bother me	Being able to edit the content on the wiki would not bother me	Wording unclear and similar concept covered in item 23 in Table 3.

Appendix 1.8- Item Development for Wiki Usability Inventory

Table A. 5- Final Items for the Wiki Usability Inventory

ID	ITEM SOURCE	ITEM		THEME
1	The way the system information is presented is clear and understandable (SUMI)/My interaction with the system is clear and understandable (Venkatesh, 2000)	It was clear how to edit the wiki	(+)	Ease of use
2	I find the system to be easy to use (Venkatesh, 2000)/ The ATS was easy to use (MINERVA)	I found wiki markup easy to use	(+)	Ease of use
3	I thought the ATS was too complicated (MINERVA)	I thought editing the wiki was too complicated	(-)	Ease of use
4	The ATS was easy to use (MINERVA)	The wiki was difficult to edit	(-)	Ease of use
5	I got flustered when using the ATS (MINERVA)	I got flustered when using wiki markup language	(-)	Enjoyment
6	Using lotus was fun (Molnar & Kletke, 1996)	Editing the wiki was fun	(+)	Enjoyment
7	I enjoyed using the ATS (MINERVA)/ I enjoy my sessions with this software (SUMI)	I enjoyed editing the wiki	(+)	Enjoyment
8	I felt under stress while using the ATS (MINERVA)	I felt under stress when editing the wiki	(-)	Enjoyment
9	There have been times in using this software when I have felt quite tense (SUMI)	Editing the wiki made me feel nervous	(-)	Enjoyment
10	I had to concentrate hard to use the service (MINERVA)	I had to concentrate hard when editing the wiki	(-)	Enjoyment
11	I felt frustrated while using the ATS (MINERVA)/ Using this software is frustrating (SUMI)	I found editing the wiki frustrating	(-)	Enjoyment
12	When using this website I didn't always know what to do next (MINERVA)	When editing the wiki I always knew what to do next.	(+)	Control
13	I felt in control when using this website (MINERVA)	I felt in control when editing the wiki	(+)	Control
14	It is easy to make the software do exactly what you want (SUMI)/ I find it easy to get this web site to do what I want it to do (Palmer, 2002)	I found it easy to get the wiki to do what I wanted it to do	(+)	Control
15	Layout of the E-library screens is clear and consistent (Thong et al., 2002)	The layout of the wiki edit screen was clear	(+)	Quality of Interface
16	I feel that the ATS needs a lot of improvement (MINERVA)	The wiki editing interface needs a lot of improvement	(-)	Quality of Interface

17	I would recommend this software to my colleagues (SUMI)	I would recommend using a wiki to others	(+)	Intentions to use
18	I would not use this website again (MINERVA)	I would not edit a wiki like this again	(-)	Intentions to use
19	There is too much to read before you can use the software (SUMI)	There was too much to learn before I could edit the wiki	(-)	Learnability
20	I have to look for assistance most times when I use this software (SUMI)	I often needed to use the on screen help to edit the wiki	(-)	Learnability
21	Remembering commands was difficult/easy (QUIS)	Remembering wiki markup was easy	(+)	Learnability
22	Lotus was easy to learn (Molnar & Kletker,1996)	Wiki markup was easy to learn	(+)	Learnability

Table A. 6- Items omitted from the Wiki Usability Inventory

ID	ITEM SOURCE	ITEM	Reason for Exclusion
23		I had problems editing the wiki	Interface may not be the cause of editing problems.
24	The way the system information is presented is clear and understandable (SUMI)/ My interaction with the system is clear and understandable (Venkatesh, 2000)	The editing interface was easy to understand	Similar concept covered in item 3 in Table A.5
25	This software is awkward when I want to do something which is not standard (SUMI)	Editing the wiki is awkward when I want to do something which is not standard	The reference of what is standard is unknown to novice wiki users
26	Tasks can be performed in a straightforward manner using this software (SUMI)	Editing the wiki was straightforward	Similar concept covered in item 4 in Table A.5
27		I found it difficult to correct any mistakes	Item cannot be answered by users unless errors were made in interaction
28	It is easy for me to become skilful at using the e-learning service (Roca et al., 2006)	It would be easy for me to become skilful at editing the wiki	Opinion rather than a concept related to usability
29	Interacting with the system does not require a lot of my mental effort (Venkatesh, 2000)	Editing the wiki did not require a lot of mental effort	Similar concept covered in item 10 in Table A.5
30		While editing the wiki I felt comfortable	The reference to what makes the user comfortable is unclear
31		I was confident editing the wiki	Item covered in anxiety measure and is not relevant to measurement of usability
32	I liked using this website (MINERVA)	I liked editing the wiki	Similar concept covered in items 6 and 7 in Table A.5

33	Working with this software is satisfying. (SUMI)	Editing the wiki was satisfying	Users may feel satisfied of their achievement of editing the wiki, not because the interface is satisfying. Therefore vague in its reference to the interface.
34	This software is really very awkward. (SUMI)	Editing the wiki was awkward	Concept is not clear
35	There have been times in using this software when I have felt quite tense (SUMI)	Editing the wiki made me feel tense	Item covered in anxiety measure and is not relevant to the measurement of usability
36	The software hasn't always done what I was expecting (SUMI)	The wiki didn't always do what I expected	Similar concept covered in item 14. It also focuses on wiki being to blame for errors made with interface.
37	The software allows the user to be economic of keystrokes (SUMI)	The wiki allows users to be economical with keystrokes when editing the system	Concept is unclear and poor wording of item.
38	Error prevention messages are not adequate (SUMI)	The error messages presented were not adequate	Not all users may see an error message or make an error
39	I find that the help information given by this software is not very useful (SUMI)	The wiki editing Help Tips box was useful	Similar concept covered in item 20 in Table A.5
40	Experienced and inexperienced users needs are taken into consideration never/always (QUIS)	The wiki system doesn't take inexperienced users needs into consideration	Opinion rather than a concept related to usability
41	The E-library commands are well depicted by buttons and symbols (Thong et al., 2002)	The wiki function buttons were well depicted	Experiment focuses on markup based rather than graphical user interface
42	Correcting your mistakes was difficult/easy (QUIS)	I found it difficult to correct a mistake	Not all users may make an error using the interface
43		Instruction information on the wiki was easy to understand	Instruction was not given in all conditions
44	The system was reliable/unreliable (QUIS)	The wiki application was reliable	Reliability is a difficult concept to evaluate in experiment scenario. Concept is also vague.
45	The instructions and prompts are helpful (SUMI)	The instructions and prompts were unhelpful	Instruction information was not given in all conditions
46	I find that the help information given by this software is not very useful (SUMI)	The help information was useless	Similar concept covered in item 20 in Table A.5
47	I would not like to use this software every day (SUMI)	I would dislike using the wiki in my course at University	Conjecture and item not relevant to experiment experience
48	Assuming I had access to the system, I intend to use it (Venkatesh, 2000)	Assuming I had access to a wiki in my University courses I would intend to edit it	Conjecture and item not relevant to experiment experience

49	I will use the e-learning system on a regular basis in the future (Roca, 2006)	Assuming I had access to a wiki in my University courses I would avoid editing it on a regular basis	Conjecture and item not relevant to experiment experience
50		I look forward to using a wiki in my course at University	Conjecture and item not relevant to experiment experience
51	It takes too long to learn the software commands (SUMI)/ It took too much time to learn/use Lotus (Molnar & Kletker, 1996)	It took too long to learn wiki markup commands	Conditions may confound the evaluation of this
52	Learning how to use new functions is difficult (SUMI)	Learning new wiki markup commands was easy	Similar concept covered in item 22 in Table A. 5
53	I will never learn to use all that is offered in this software (SUMI)	I could easily learn to use all that is offered by the wiki	Users would need knowledge of all possible functionality to be able to answer this
54		I kept having to look at the wiki Help Tips box	Similar concept covered in item 20 in Table A.5
55	I sometimes wonder if I'm using the right command (SUMI)	I sometimes wondered whether I was using the right wiki markup commands when editing the wiki	Item refers to confidence in ability rather than usability of interface.
56	It is easy to forget how to do things with this software (SUMI)	It was easy to forget how to edit the wiki	Similar concept covered in item 21 in Table A.5
57	I thought the ATS was too complicated (MINERVA)	Learning to edit the wiki was uncomplicated	Poorly worded item
58	Exploring new features by trial and error was difficult/easy (QUIS)	Learning wiki markup by trial and error was facilitated by the wiki system	Item not applicable to all conditions in the experiment
59	It took too much time to use/learn Lotus (Molnar & Kletker, 1996)	It took little time to learn how to edit the wiki	Conditions may confound the evaluation of this
60		Aspects of the wiki system were helpful in the learning of wiki markup	Item is vague in its reference to aspects of the interface/interaction
61	Using the e-learning service can improve my learning performance (Roca et al., 2006)	Using the wiki would diminish my learning performance	Conjecture and item not relevant to experiment experience
62	Using web based learning system in the program would enhance my productivity (Sun et al.	Using the wiki in my course would improve my productivity	Conjecture and item not relevant to experiment experience
63	Using web based learning system in the program would enhance my productivity (Roca et al., 2006)	Using the wiki would reduce my learning effectiveness	Conjecture and item not relevant to experiment experience
64	The resources in the E-learning relate well to my study needs (Thong et al., 2002)	The wiki relates well to my study needs	Conjecture and item not relevant to experiment experience
65		The wiki was ineffective in	Conjecture and item not

		supporting my work	relevant to experiment experience
66		The wiki facilitates group work and collaboration	Conjecture and item not relevant to experiment experience

Appendix 1.9- Questionnaires used in Chapter 3 research

Demographic Questionnaire

1. Gender:

- Male
- Female

2. Age:yrsmonths

3. Are you a 1st year psychology student?

- Yes
- No (If No then finish session)

4. For how long have you been using computers?

- less than 6 months
- between 6 months and a year
- 1-3 years
- 3-5 years
- 5 years or more

5. How many hours a week on average do you use a computer?hrs

Comments:

6. For how long have you been using the Internet?

- less than 6 months
- between 6 months and a year
- 1-3 years
- 3-5 years
- 5 years or more

7. How many hours a week on average do you use the Internet?hrs

Comments:

8. Have you used a wiki before?

- Yes
- No
- Not sure

9. (If yes above) Have you edited a wiki before?
- Yes (If Yes then finish session)
 - No
 - Not sure

10. What wikis have you used previously?

.....

.....

.....

.....

11. (If yes to the questions above) For how long have you been using wikis?
- less than 6 months
 - between 6 months and a year
 - 1-3 years
 - 3-5 years
 - 5 years or more

12. How many hours a week on average do you use wikis?hrs

Comments:

STATE

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel **right now**, that is, **at this moment**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately	Very much
9911	I am tense	1	2	3	4
9901	I feel calm	1	2	3	4
9903	I feel content	1	2	3	4
9912	I feel upset	1	2	3	4
9913	I am worried	1	2	3	4
9902	I am relaxed	1	2	3	4

TRAIT

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you **generally** feel.

	Almost never	Sometimes	Often	Almost Always
24 I wish I could be as happy as others seem to be	1	2	3	4
27 I am "calm, cool, and collected"	1	2	3	4
22 I feel nervous and restless	1	2	3	4
31 I have disturbing thoughts	1	2	3	4
35 I feel inadequate	1	2	3	4
37 Some unimportant thought runs through my mind and bothers me	1	2	3	4
25 I feel like a failure	1	2	3	4
40 I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4
32 I lack self-confidence	1	2	3	4
33 I feel secure	1	2	3	4
21 I feel pleasant	1	2	3	4
38 I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
29 I worry too much over something that really doesn't matter	1	2	3	4
26 I feel restless	1	2	3	4
34 I make decisions easily	1	2	3	4
30 I am happy	1	2	3	4
28 I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
23 I feel satisfied with myself	1	2	3	4
39 I am a steady person	1	2	3	4
36 I am content	1	2	3	4

BSCAS

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
8809	Life will be easier and faster with computers.					
8819	When I work with a computer, my hands are sweaty.					
8811	I am reticent in the use of computers.					
8806	I have difficulty in understanding the technical aspects of computers.					
8827	Computers are wasted on me.					
8832	I am sure that I could learn computer applications.					
8804	Computers are bringing us into a bright new era.					
8823	I feel that I will be able to keep up with the advances happening in the computer field.					
8826	I seldom understand the explanation of a computer expert.					
8803	I understand how computers function.					
8824	My heart beats faster when I think about working with a computer.					
8820	Learning to operate computers is like learning any new skill: the more you practice, the better you become.					
8805	I find it difficult to understand how a computer program functions.					
8828	Computers create economic stability.					
8802	My friends ask me frequently for advice when they have problems with their computer.					
8822	I find it easy to make a computer do what I want.					
8829	I have avoided computers because they are unfamiliar and somewhat intimidating to me.					
8817	Working with a computer has made my life more enjoyable.					
8825	I stay away from everything that has to do with computers.					
8815	I feel suffocated when I am in front of the computer.					

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
8831	Computers are essential in education.					
8812	Soon our lives will be controlled by computers					
8818	Computers turn people into just another number.					
8801	Computers are nice to work with.					
8810	The challenge of learning about computers is exciting.					
8816	I tense up when I am behind the screen.					
8830	People are becoming slaves to computers.					
8821	Computers are difficult to understand and frustrating to work with.					
8813	Computers and everything related to them fascinate me.					
8807	I am confident that I can learn computer skills.					
8808	I find computers easy to work with.					
8814	Everyone can learn to use a computer, as long as one is patient and motivated.					

WAI-EP

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
40001	I am happy with other users being able to see my changes to the wiki					
20011	I am apprehensive about editing the wiki					
40012	I am afraid that people will find faults with any edits I may make					
30002	I am certain that I can overcome any difficulties I may encounter when editing the wiki					
20018	I will find it hard to concentrate when editing the wiki					
20001	I am excited about editing the wiki					
30001	I would feel secure in my ability to edit the wiki					
20013	I feel uncomfortable about editing the wiki					
30013	I am afraid that I may do something wrong when editing the wiki					
50011	The fact that content can be changed makes me uneasy					
30011	I am worried about making mistakes that I cannot correct when editing the wiki					
20015	I feel tense about editing the wiki					
20002	I feel at ease about using wiki markup language					
50013	It scares me to think that I could accidentally destroy someone else's content					
20012	I am anxious about editing the wiki for fear of making mistakes					
10001	I will enjoy learning about editing the wiki					
20014	Wiki markup language will confuse me					
30004	I am sure that I can make the wiki do what I want it to do					
30003	I am confident that I would be able to use wiki markup language					
10002	I am confident that I will be able to learn wiki markup language					
10012	I think learning wiki markup language will be stressful for me					
50012	I am concerned that other users can change the edits I make					
20017	I feel intimidated about editing the wiki					
10003	With experience I think I will feel comfortable using wiki markup language					
10011	I will get distracted easily when learning about editing wikis					

WAI-EA

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
20012	When editing the wiki I felt anxious about making a mistake					
40012	I was afraid that people may find faults with any edits I made					
20015	I felt tense whilst editing the wiki					
50011	The fact that content could be changed made me uneasy					
50013	It scared me to think that I could accidentally destroy somebody else's content					
40001	I was happy with other users being able to see my changes to content on the wiki					
20011	I felt apprehensive when editing the wiki					
30002	I was certain I could overcome any difficulties I encountered in editing the wiki					
50012	I was concerned that other users could change the edits I made					
10001	I enjoyed learning about editing the wiki					
10012	Learning wiki markup language was stressful for me					
20002	I felt at ease using wiki markup language					
20018	I found it hard to concentrate when editing the wiki					
30001	I felt secure in my ability to edit the wiki					
20013	I felt uncomfortable about editing the wiki					
10003	As I became more experienced I felt more comfortable using wiki markup language					
20001	I felt excited when editing the wiki					
30003	I felt confident when using wiki markup language					
10011	I got distracted easily when learning about editing the wiki					
20014	Wiki markup language confused me					
20017	I felt intimidated while editing the wiki					
30013	I was afraid that I might do something wrong when editing the wiki					
30011	I was worried about making a mistake that I could not correct when editing the wiki					
30004	I felt sure that I could make the wiki do what I wanted it to do					
10002	I felt confident learning wiki markup language					

WUI

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
120011	There was too much to learn before I could edit the wiki					
80014	I had to concentrate hard when editing the wiki					
120001	Remembering wiki markup was easy					
80015	I found editing the wiki frustrating					
70011	I thought editing the wiki was too complicated					
70001	It was clear how to edit the wiki					
90003	I found it easy to get the wiki to do what I wanted it to do					
110011	I would not edit a wiki like this again					
80013	Editing the wiki made me feel nervous					
90001	when editing the wiki I always knew what to do next.					
70012	The wiki was difficult to edit					
80011	I got flustered when using wiki markup language					
80001	Editing the wiki was fun					
70002	I found wiki markup easy to use					
80012	I felt under stress when editing the wiki					
110001	I would recommend using a wiki to others					
120012	I often needed to use the on screen help to edit the wiki					
80002	I enjoyed editing the wiki					
100011	The wiki editing interface needs a lot of improvement					
100001	The layout of the wiki edit screen was clear					
120002	Wiki markup was easy to learn					
90002	I felt in control when editing the wiki					

WAI-EF

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
10003					
20001					
30002					
50011					
10012					
30003					
50012					
20018					
20013					
10002					
30001					
20012					
30011					
20011					
30004					
40001					
40012					
50013					
10001					
20015					
30013					
20017					
10011					
20014					
20002					

Exit Questionnaire

Thank you very much for taking part in this experiment. I am now going to ask you a few questions about your experiences here today.

Today you experienced editing a wiki. (You also experienced a learning tool i.e. sandbox etc.)

General experience

1. Is there anything you liked about editing the wiki today?

2. Is there anything you disliked about editing the wiki today?

3. Do you feel anything can be improved to make your editing experience better in the future?

4. How did you feel about having to use wiki markup language to edit the wiki?

5. Did you find it difficult to correct any mistakes that you may have made whilst completing the tasks today?

6. How would you feel if you had to use a wiki as part of your course?

7. (Only for learning tool conditions)

You experienced a (tutorial/sandbox/tutorial +sandbox) (Show screenshot) before editing content which other users could see and use on the live wiki. Did you find this helpful?

8. How effective did you think it was in making you comfortable with wiki markup language?

Help Tips

9. Did you notice the wiki markup language help tips box at the right hand side of the editing screen (show editing interface screen shot)?

- Yes
- No

a. (if yes) Did you use it when you were completing any of the tasks?

- Yes
- No

When in the session did you use it?

Did you find it helpful? How could it be improved?

Other Experiment Ideas

Wikis are fully editable by other users. Other users can include any content which they feel is appropriate to the page whenever they feel. This flexibility means that content can change.

10. How do you feel about this?

11. Knowing this, how would you feel if you had to use a wiki in your course?

12. What do you think could be done on the wiki to make people feel more comfortable with this?

13. Would you be happy using content from a wiki to inform your written course work? Please give reasons

14. Is there anything you think could be done to make people feel confident about the accuracy of information on the system?

On most wikis, when editing content your username can be associated with the edit or you can edit the wiki anonymously. On the wiki you were using today you can also have your full name associated with the edit.

15. Which of these would you prefer if you were editing the wiki for your course?

- Anonymity
- Username only
- Full Name only
- None of the above

a. Why would you prefer that?

16. Do you feel that knowing something about the editor that has modified the wiki is important if this wiki was to be used as part of your university course? If so then why?

Appendix 1.10- Consent form used in Chapter 3 research

Consent form

I, _____ have consented to taking part in this experiment observing learning of web based tools. I understand that all the data gathered here will be stored anonymously and that I have the right to withdraw from the session at any time.

Signature: _____

Appendix 1.11- Experimenter Sheet used in Chapter 3 research

Task 1:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

Task 2:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

Task 3:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

--

Task 4:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

--

Task 5:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

--

Task 6:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Completed accurately?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd
Time take to complete:	Start time:hrsminsecs End time:hrsminsecs		

Comments and observations:

--

Appendix 1.12- Experimenter Scripts used in Chapter 3 research

Script for Direct Edit

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called UNIWIKI. This is a wiki (much like wikipedia) and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to perform some editing tasks on the wiki. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete some questionnaires.

(Given them STAI-S, then STAI-T after STAI-S completion)

Please follow the instructions at the top of the page and complete this questionnaire.

Now I would like you to think about your attitudes towards computers when completing this questionnaire. Please answer the questions by placing a tick in the box which best matches your opinion from strongly disagree to strongly agree. Do not spend too much time on any one statement but give the answers that best describe your opinion.

Thanks

Now, I would like you to take a few minutes to read the information I am about to give you about wikis. It lets you know what a wiki is and how they work and gives you an example of a wiki in action. Please now take a few minutes to read through the text.

We will be editing the wiki in a few minutes. Before that I would like you to complete this questionnaire about your feelings at this moment.

I would now like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

Thanks

Ok let's begin.

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using UNIWIKI in your Psychology degree. Your Differential Psychology lecturer has asked all students to collaborate to create a *Personality Background* page on UNIWIKI as part of a course assignment.

The page aims to give general background information on Personality. This *Personality Background* page will be used by students in your class as the basic reference for the *Differential Psychology* lecture series in semester 2.

Students have been adding and editing the information over the past week and you have decided to start contributing.

Other students will also be adding and editing information on the page as part of the same class exercise over the coming days.

As part of the assignment, the wiki must be edited using the wiki markup editor

Please Navigate to the Personality Background page (Background Space) and take a few minutes to read through the page. Your ID is

(Give the participants edit instruction sheet)

Now I would like you to commence editing the information on this page. To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before editing the wiki I must inform you that this is live content and I cannot help you during the tasks however do not worry if you make mistakes, we are testing the system and not you.

Please make the following edits to the Personality Background page

(Look in folder for task order-E tasks)

Tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment.

Thanks. Now I would like you to complete this questionnaire about your attitudes towards editing wikis after experiencing editing the wiki today.

(Post Experience Questionnaire)

Now I would like you to think about the experience you had with the wiki today whilst answering these questions about the wiki.

(Usability Questionnaire)

Please fill in this brief questionnaire about how you feel at this moment.

Now I would like you answer these questions about how you feel at this moment if you had to edit the wiki again.

(Future Interaction Questionnaire)

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and whether that affected how satisfied you were with the wiki interface you experienced. It also aims to see how that may change depending on what learning condition you are exposed to. Other users are being asked to take part in a tutorial and a sandbox practice area before editing content live on the wiki system. You have taken part in the condition without any learning tool. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow psychology 1 students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Sandbox

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called UNIWIKI. This is a wiki (much like wikipedia) and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to perform some editing tasks on the wiki. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete some questionnaires.

(Given them STAI-S, then STAI-T after STAI-S completion)

Please follow the instructions at the top of the page and complete this questionnaire.

Now I would like you to think about your attitudes towards computers when completing this questionnaire. Please answer the questions by placing a tick in the box which best matches your opinion from strongly disagree to strongly agree. Do not spend too much time on any one statement but give the answers that best describe your opinion.

Thanks

Now, I would like you to take a few minutes to read the information I am about to give you about wikis. It lets you know what a wiki is and how they work and gives you an example of a wiki in action. Please now take a few minutes to read through the text.

We will be editing the wiki in a few minutes. Before that I would like you to complete this questionnaire about your feelings at this moment.

I would now like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

Thanks

Ok let's begin.

(Give the participant the scenario sheet CORE)

Please take a few minutes to read the scenario sheet.

(Let them read scenario sheet)

Scenario:

You are using UNIWIKI in your Psychology degree. Your Differential Psychology lecturer has asked all students to collaborate to create a *Personality Background* page on UNIWIKI as part of a course assignment.

The page aims to give general background on Personality. This *Personality Background* page will be used by students in your class as a basic reference in the *Differential Psychology* lecture series in semester 2.

Students have been adding and editing the information over the past week and you have decided to start contributing.

Other students will also be adding and editing information on the page as part of the same class exercise over the coming days.

As part of the assignment, the wiki must be edited using the wiki markup editor

(Give the participant the scenario sheet SBX)

As an introduction to editing content on the UNIWIKI site, your lecturer has asked you to practice using wiki markup language using the UNIWIKI Sandbox provided on the UNIWIKI site. She has given you specific tasks to complete in the sandbox.

To start practicing in the sandbox please click on one of the links to the UNIWIKI Sandbox on the UNIWIKI homepage. Then please click on the Sandbox link. Your ID is.....

Please take a few minutes to read through the information on the page.

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before editing the wiki I must inform you that this is a practice space where you can take as many attempt to complete a task as you like. Once you feel you have completed the task please let me know and I will give you another task to complete. The edits you make on this page will not be seen by your classmates and you are not changing any live wiki content. I cannot help you during the tasks however do not worry if you make mistakes, this is a practice space away from live content and we are testing the system and not you.

Now I would like you to make edits to the information on the Sandbox page.

(Look in folder for task order- SB tasks)

Sandbox Tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their sandbox page should be taken to ensure that all tasks were completed successfully.

Thanks.

Now you are ready to complete your assignment of contributing to the Personality Background page set by your lecturer.

Please now click on the Personality Background Page link in the “Ready to go live” box.

Before editing the wiki I must inform you that this is live content and I cannot help you during the tasks however do not worry if you make mistakes, we are testing the system and not you.

Please make the following edits to the Personality Background page.

(Look in folder for task order- E tasks)

Page edit tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment.

Thanks. Now I would like you to complete this questionnaire about your attitudes towards editing wikis after experiencing editing the wiki today.

(Post Experience Questionnaire)

Now I would like you to think about the experience you had with the wiki today whilst answering these questions about the wiki.

(Usability Questionnaire)

Please fill in this brief questionnaire about how you feel at this moment.

Now I would like you answer these questions about how you feel at this moment if you had to edit the wiki again.

(Future Interaction Questionnaire)

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and whether that affected how satisfied you were with the wiki interface you experienced. It also aims to see how that may change depending on what learning condition you are exposed to. Other users are being asked to take part in a tutorial before editing content live on the wiki system or directly editing the content without any learning. You have taken part in the sandbox condition where users are able to practice before editing live content. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow psychology 1 students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Tutorial

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called UNIWIKI. This is a wiki (much like wikipedia) and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to perform some editing tasks on the wiki. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.

(Ask questions on Demographic Questionnaire)

Now I would like you to complete some questionnaires.

(Given them STAI-S, then STAI-T after STAI-S completion)

Please follow the instructions at the top of the page and complete this questionnaire.

Now I would like you to think about your attitudes towards computers when completing this questionnaire. Please answer the questions by placing a tick in the box which best matches your opinion from strongly disagree to strongly agree. Do not spend too much time on any one statement but give the answers that best describe your opinion.

Thanks

Now, I would like you to take a few minutes to read the information I am about to give you about wikis. It lets you know what a wiki is and how they work and gives you an example of a wiki in action. Please now take a few minutes to read through the text.

We will be editing the wiki in a few minutes. Before that I would like you to complete this questionnaire about your feelings at this moment.

I would now like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

Thanks

Ok let's begin.

(Give the participant the scenario sheet CORE)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using UNIWIKI in your Psychology degree. Your Personality lecturer has asked all students to collaborate to create a *Personality Background* page on UNIWIKI as part of a course assignment.

The page aims to give general background on Personality. This *Personality Background* page will be used by students in your class as the basic reading for the first lecture in the *Differential Psychology* lecture series in semester 2.

Students have been adding and editing the information over the past week and you have decided to start contributing.

Other students will also be adding and editing information on the page as part of the same class exercise over the coming days.

As part of the assignment, the wiki must be edited using the wiki markup editor.

(Give the participant the scenario sheet TUT)

As an introduction to editing content on the UNIWIKI site, your lecturer has asked you to complete the UNIWIKI tutorial supplied on the UNIWIKI site.

Please navigate to the UNIWIKI Tutorial.

Before starting the tutorial I must remind you that you must not edit any content whilst in the tutorial. You will have a chance to edit the wiki after the tutorial session is complete but you will not be able to return to the tutorial when editing the wiki. Please take some time to complete the tutorial.

Now you are ready to complete your assignment of contributing to the Personality Background page set by your lecturer.

To start please click on the Personality Background Page link on the final page of the tutorial. Your ID is.....

Before editing the wiki I must inform you that this is live content and I cannot help you during the tasks however do not worry if you make mistakes, we are testing the system and not you.

Please make the following edits to the Personality Background Page.

(Look in folder for E tasks)

Page edit Tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment.

Thanks. Now I would like you to complete this questionnaire about your attitudes towards editing wikis after experiencing editing the wiki today.

(Post Experience Questionnaire)

Now I would like you to think about the experience you had with the wiki today whilst answering these questions about the wiki.

(Usability Questionnaire)

Please fill in this brief questionnaire about how you feel at this moment.

Now I would like you answer these questions about how you feel at this moment if you had to edit the wiki again.

(Future Interaction Questionnaire)

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

The aim of the experiment today was to measure your emotional reactions towards editing a wiki and whether that affected how satisfied you were with the wiki interface you experienced. It also aims to see how that may change depending on what learning condition you are exposed to. Other users are being asked to take part in a sandbox practice area before editing content live on the wiki system or directly editing the content without any learning. You have taken part in the tutorial condition. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow psychology 1 students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Tutorial and Sandbox

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called UNIWIKI. This is a wiki (much like wikipedia) and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to perform some editing tasks on the wiki. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.

(Ask questions on Demographic Questionnaire)

Now I would like you to complete some questionnaires.

(Given them STAI-S, then STAI-T after STAI-S completion)

Please follow the instructions at the top of the page and complete this questionnaire.

Now I would like you to think about your attitudes towards computers when completing this questionnaire. Please answer the questions by placing a tick in the box which best matches your opinion from strongly disagree to strongly agree. Do not spend too much time on any one statement but give the answers that best describe your opinion.

Thanks

Now, I would like you to take a few minutes to read the information I am about to give you about wikis. It lets you know what a wiki is and how they work and gives you an example of a wiki in action. Please now take a few minutes to read through the text.

We will be editing the wiki in a few minutes. Before that I would like you to complete this questionnaire about your feelings at this moment.

I would now like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

Thanks

Ok let's begin.

(Give the participant the scenario sheet CORE)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using UNIWIKI in your Psychology degree. Your Personality lecturer has asked all students to collaborate to create a *Personality Background* page on UNIWIKI as part of a course assignment.

The page aims to give general background on Personality. This *Personality Background* page will be used by students in your class as the basic reading for the first lecture in the *Differential Psychology* lecture series in semester 2.

Students have been adding and editing the information over the past week and you have decided to start contributing.

Other students will also be adding and editing information on the page as part of the same class exercise over the coming days.

As part of the assignment, the wiki must be edited using the wiki markup editor
(Give the participant the scenario sheet TUT)

As an introduction to editing content on the UNIWIKI site, your lecturer has asked you to complete the UNIWIKI tutorial supplied on the UNIWIKI site.

Please navigate to the UNIWIKI Tutorial.

Before starting the tutorial I must remind you that you must not edit any content whilst in the tutorial. You will have a chance to edit the wiki after the tutorial session is complete but you will not be able to return to the tutorial when editing the wiki. Please take some time to complete the tutorial.

(Give the participant the scenario sheet TUT-SBX)

As an additional introduction to editing content on the UNIWIKI site, your lecturer has asked you to practice using the wiki markup language you have learned by editing content on the UNIWIKI Sandbox before editing the Personality Background page. The sandbox is an area where you can practice editing without affecting live content which other users can see on the wiki. She has given you specific tasks to complete in the sandbox.

To start practicing in the sandbox please click on the link at the end of the tutorial and the Sandbox link on the next page. Your ID is.....

Please take a few minutes to read through the information on the page.

Before editing the wiki I must inform you that this is a practice space where you can take as many attempt to complete a task as you like. Once you feel you have completed the task please let me know and I will give you another task to complete. The edits you make on this page will not be seen by your classmates and you are not changing any live wiki content. I cannot help you during the tasks however do not worry if you make mistakes, this is a practice space away from live content and we are testing the system and not you.

Now I would like you to make edits to the information on the Sandbox page.

(Look in folder for task order-SB tasks)

Sandbox Tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their sandbox page should be taken to ensure that all tasks were completed successfully.

Now you are ready to complete your assignment of contributing to the Personality Background page set by your lecturer.

To start please click on the Personality Background Page link in the “Ready to go live” box at the end of the page.

Before editing the wiki I must inform you that this is live content and I cannot help you during the tasks however do not worry if you make mistakes, we are testing the system and not you.

Please make the following edits to the Personality Background Page.

(Look in folder for task order-E tasks)

Page edit tasks:

Firstly I would like you to.....

Secondly.....

Thirdly....

Now.....

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment.

Thanks. Now I would like you to complete this questionnaire about your attitudes towards editing wikis after experiencing editing the wiki today.

(Post Experience Questionnaire)

Now I would like you to think about the experience you had with the wiki today whilst answering these questions about the wiki.

(Usability Questionnaire)

Please fill in this brief questionnaire about how you feel at this moment.

Now I would like you answer these questions about how you feel at this moment if you had to edit the wiki again.

(Future Interaction Questionnaire)

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and whether that affected how satisfied you were with the wiki interface you experienced. It also aims to see how that may change depending on what learning condition you are exposed to. Other users are being asked to take part in either a tutorial or a sandbox practice area before editing content live on the wiki system whereas some are directly editing live content without any learning. You have taken part in the condition with both the tutorial and the sandbox where users get to practice what they have learned in the tutorial away from the live content. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow psychology 1 students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Appendix 1.13- Interaction Graphs from Chapter 3 Item Analysis

Figure A. 1- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 3 mean score

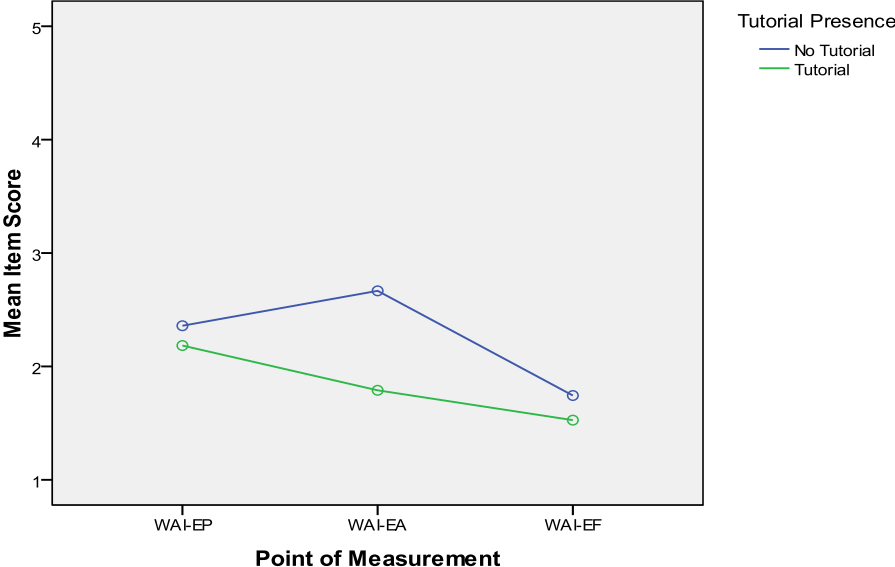


Figure A. 2- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 10 mean score

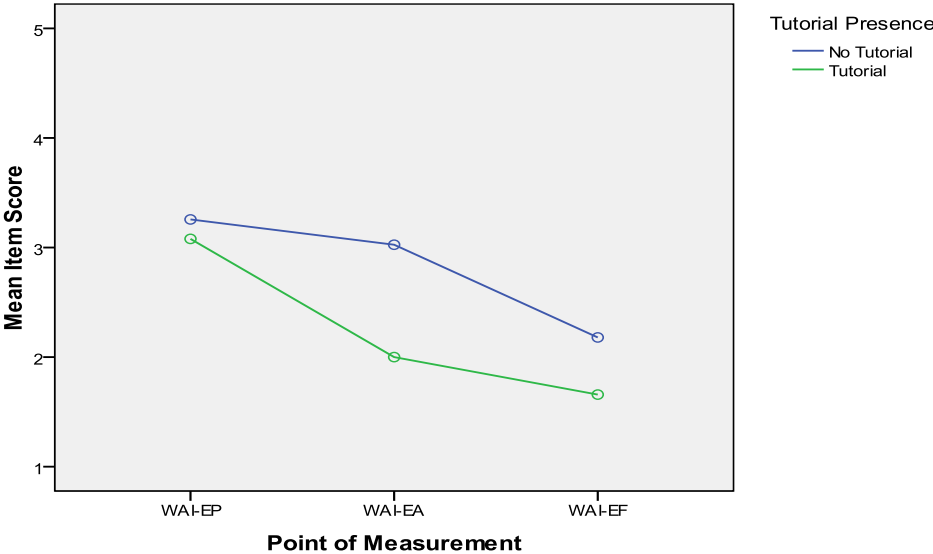


Figure A. 3- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 11 mean score

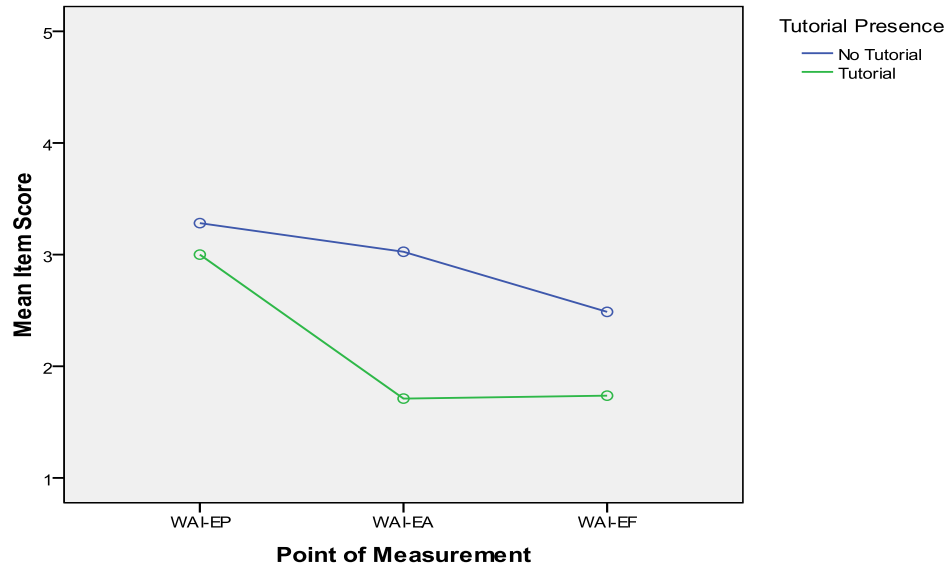


Figure A. 4- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 15 mean score

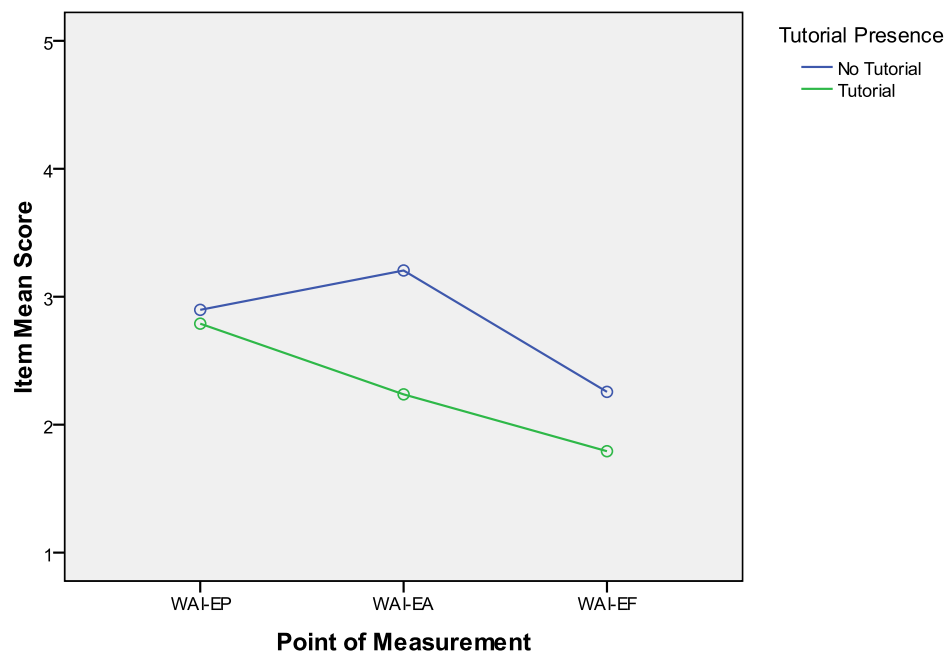


Figure A. 5- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 3 mean score

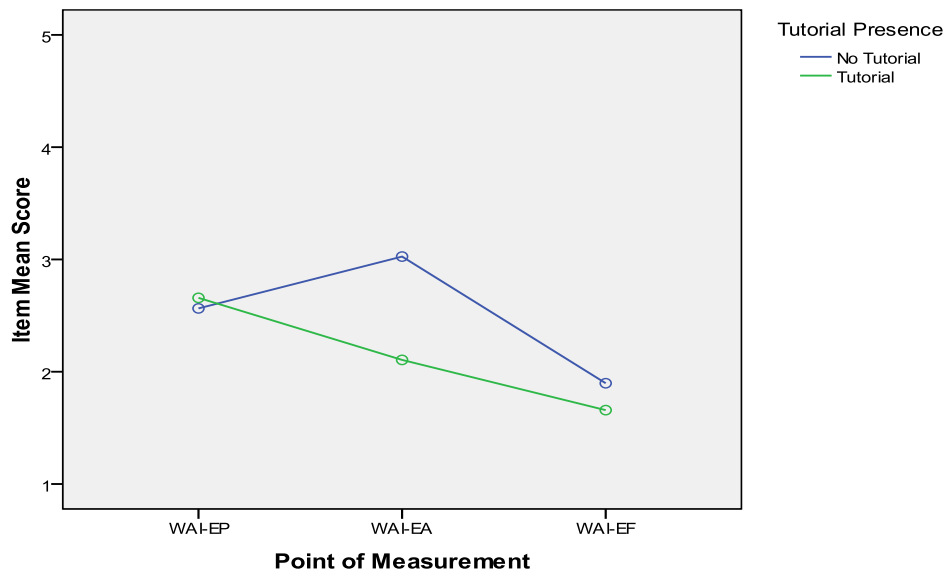
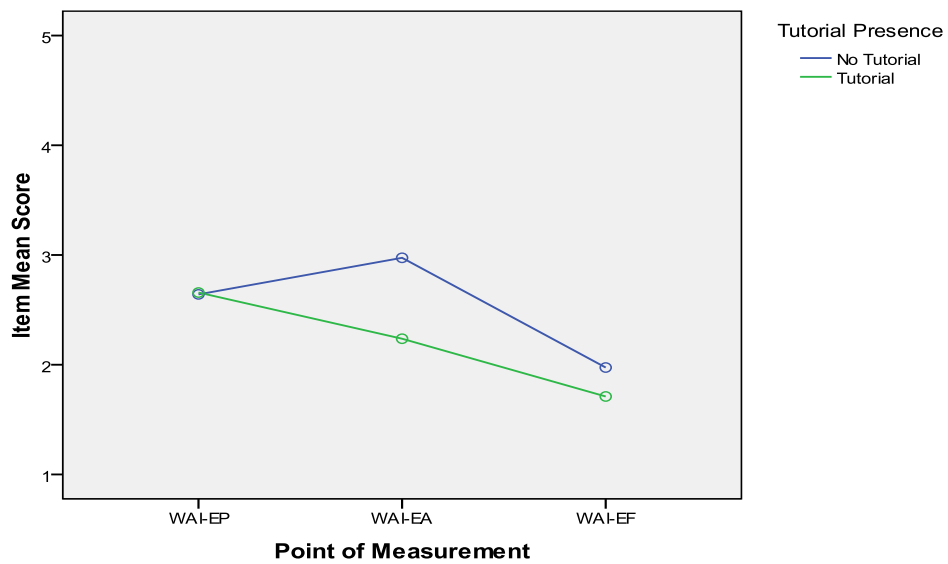


Figure A. 6- Graphical representation of the interaction between tutorial presence and point of measurement on WAI item 18 mean score



Appendix 2.1- Experiment Scenario for Chapter 4 Research

SC:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

Appendix 2.2.1- Content from PSYCHWIKI Page for Addition Condition

Dashboard > PsychWiki(1) > ... > ID Selection,EX2 > Levelt's model of language production_A
Search

PsychWiki(1)

Essential Links

- Home
- Research Synopses
- Theories & Debates
- Lecture Space
- Course Resources
- Assignments & Past Papers
- Student Project Space
- Usage Statistics
- Page Operations
- Browse Space
- Add Content

Levelt's model of language production_A

Added by [Benjamin Cowan](#), last edited by [Benjamin Cowan](#) on Aug 12, 2010
Labels: [ADD LABELS](#)

✓ This page was last modified by [Benjamin Cowan](#) on Aug 12, 2010 11:54

Levelt's (1999) model of language production involves 3 levels; the conceptual stratum, lemma stratum and Word form stratum.

- The **Conceptual stratum** holds representations of semantic (meaning) information about words. Each node in this level represents one concept.
- The **Lemma stratum** contains syntactic features of words represented in the conceptual stratum.
- The **Word-Form stratum** contains phonological information for the production of the word into speech.

The diagram illustrates Levelt's (1999) language production model across three strata. The **Conceptual Stratum** contains nodes for ANIMAL, SHEEP, GOAT, and SHIP. The **Lemma Stratum** contains nodes for sheep, goat, ship, NRC, and AN. The **Word-form Stratum** contains nodes for <sheep>, <goat>, and <ship>. Arrows indicate the flow of activation from the Conceptual Stratum to the Lemma Stratum, and then to the Word-form Stratum. There are also feedback arrows from the Word-form Stratum back to the Lemma Stratum.

- The activation feeds down the levels of the model. When someone wants to utter the word SHEEP for example, the relevant conceptual node gets activated. Activation of the conceptual nodes of semantically related words is also increased (such as the word ANIMAL or GOAT).
- The activation of the conceptual node SHEEP spreads activation to the relevant lemma node for that word. Other conceptual nodes activated also spread activation to their relevant nodes but the activation is spread in proportion to their activation at the conceptual stratum level (SHEEP thus receiving more activation than GOAT). A lemma node activates other nodes in the level linking to the words syntactic properties i.e. gender and noun.
- The activation is then spread to the Word Form stratum. Only one lemma is selected before the activation is passed to Word Form stratum. This suggests there would be no activation of words such as GOAT as their lemma activation is not passed to the Word Form level. Also importantly, the model predicts that no feedback can be passed from the Word Form level to the Lemma level.

Figure 1: Graphical representation of Levelt et al. (1999)'s language production model (Taken from Cleland & Pickering, 2003).

RECENT RESEARCH ON THE MODEL

Cleland, A., & Pickering, M.J. (2003). *The use of lexical and syntactic information in language production: Evidence from the priming of noun phrase structure*. Journal of Memory and Language, 49, p. 214-230.

The paper looks at Levelt's model in the production of complex sentence structures.

METHOD OF STUDY:

The study uses 3 similar tasks to observe syntactic priming in dialogue. Participants had to describe and match cards from boxes presented to them by the experimenters to other participants (actually a confederate). Each card described had a pairing of colour and shape. Users had to describe the card to their partner so that they could locate the correct card in their box. The confederate had a script telling them how to describe the cards. Both the confederate and the participant took turns being the describer or the matcher. The utterances of the participants were then noted to see if they were similar in syntactic structure to the confederates' utterances. The participants were separated by a wooden screen so that they could not see the others cards.

Syntactic Priming Experiment

Purpose- Aimed to observe the effects of using the same/different nouns on the priming effect of 2 different syntactic structures (prenominal and relative clause structures) in the participants utterances when they are the describer.

Findings-

Semantic Relation Experiment

Purpose- Aimed to investigate activation at the conceptual stratum and the lemma stratum. It uses similar methodology to Experiment 1 but varies the nouns in the confederate description to being the same, semantically related or unrelated to the card the participant will be describing as the describer in their next go. Again the same 2 grammatical structures were primed (prenominal and relative clause).

If Levelt's model is correct, we would expect the priming effect of same and related nouns to be higher than the priming effect in unrelated noun utterances.

Findings-

Phonological Relation Experiment

Purpose- This experiment is crucial for supporting the model's lack of feedback between the Lemma and Word Form strata in language production. Instead of varying the relatedness of the nouns, Cleland and Pickering varied the phonological relatedness of the nouns (i.e. sheep-same, ship-related, ball-unrelated).

If the model feeds back at the Word form strata to the lemma strata, we would expect when the confederate uses both the same and related phonological nouns, they will copy the syntactic structure of the confederate more. For instance if the confederate said "the sheep that is red", it would activate the lemma for sheep and the phonemes related to sheep. If the strata feeds back (as hypothesised in Dell's interactive account), the fact that these phonemes have been activated will also activate phonologically related (i.e. ship) lemma nodes. Priming of the structure when describing "the ship that is red" should thus be more likely in comparison to descriptive utterances where an unrelated noun is being described (i.e. "the door that is red").

Findings-

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364

Appendix 2.2.2- Content from PSYCHWIKI Page for Delete and Replace Condition

Dashboard > PsychWiki(1) > ... > ID-Selection.EX2 > Levelt's model of language production
Welcome Benjamin Cowan | History | Preferences | Log Out

PsychWiki(1)

Levelt's model of language production

Added by Benjamin Cowan, last edited by Benjamin Cowan on Aug 12, 2010 ([view change](#))

Labels: [ADD LABELS](#)

✓ This page was last modified by Benjamin Cowan on Aug 12, 2010 11:45

Levelt's (1999) model of language production involves 3 levels; the conceptual stratum, lemma stratum and Word form stratum.

- The **Conceptual stratum** holds representations of semantic (meaning) information about words. Each node in this level represents one concept.
- The **Lemma stratum** contains syntactic features of words represented in the conceptual stratum.
- The **Word-Form stratum** contains phonological information for the production of the word into speech.

Figure 1: Graphical representation of Levelt et al. (1999)'s language production model (Taken from Cleland & Pickering, 2003).

- The activation feeds down the levels of the model. When someone wants to utter the word SHEEP for example, the relevant conceptual node gets activated. Activation of the conceptual nodes of semantically related words is also increased (such as the word ANIMAL or GOAT).
- The activation of the conceptual node SHEEP spreads activation to the relevant lemma node for that word. Other conceptual nodes activated also spread activation to their relevant nodes but the activation is spread in proportion to their activation at the conceptual stratum level (SHEEP thus receiving more activation than GOAT). A lemma node activates other nodes in the level linking to the words syntactic properties i.e. gender and noun.
- The activation is then spread to the Word Form stratum. Only one lemma is selected before the activation is passed to Word Form stratum. This suggests there would be no activation of words such as GOAT as their lemma activation is not passed to the Word Form level. Also importantly, the model predicts that no feedback can be passed from the Word Form level to the Lemma level.

RECENT RESEARCH ON THE MODEL

Cleland, A., & Pickering, M.J. (2003). *The use of lexical and syntactic information in language production: Evidence from the priming of noun phrase structure*. *Journal of Memory and Language*, 49, p. 214-230.

The paper looks at Levelt's model in the production of complex sentence structures.

METHOD OF STUDY:

The study uses 3 similar tasks to observe syntactic priming in dialogue. Participants had to describe and match cards from boxes presented to them by the experimenters to other participants (actually a confederate). Each card described had a pairing of colour and shape. Users had to describe the card to their partner so that they could locate the correct card in their box. The confederate had a script telling them how to describe the cards. Both the confederate and the participant took turns being the *describer* or *the matcher*. The utterances of the participants were then noted to see if they were similar in syntactic structure to the confederates' utterances. The participants were separated by a wooden screen so that they could not see the others cards.

Syntactic Priming Experiment

Purpose- Aimed to observe the effects of using the same/different nouns on the priming effect of 2 different syntactic structures (prenominal and relative clause structures) in the participants utterances when they are the describer.

Findings- Speakers were not influenced by the grammatical structure used by their partner in dialogue. There was no effect of noun similarity on syntactic alignment in the experiment.

Semantic Relation Experiment

Purpose- Aimed to investigate activation at the conceptual stratum and the lemma stratum. It uses similar methodology to Experiment 1 but varies the nouns in the confederate description to being the same, semantically related or unrelated to the card the participant will be describing as the describer in their next go. Again the same 2 grammatical structures were primed (prenominal and relative clause).

If Levelt's model is correct, we would expect the priming effect of same and related nouns to be higher than the priming effect in unrelated noun utterances.

Findings- The semantic relationship between the nouns used by the conversational partner and the ones to be used by the speaker had no influence on the likelihood of the speaker using their conversational partners' previous grammatical construction.

Phonological Relation Experiment

Purpose- This experiment is crucial for supporting the model's lack of feedback between the Lemma and Word Form strata in language production. Instead of varying the relatedness of the nouns, Cleland and Pickering varied the phonological relatedness of the nouns (i.e. sheep-same, ship-related, ball-unrelated).

If the model feeds back at the Word form strata to the lemma strata, we would expect when the confederate uses both the same and related phonological nouns, they will copy the syntactic structure of the confederate more. For instance if the confederate said "the sheep that is red", it would activate the lemma for sheep and the phonemes related to sheep. If the strata feeds back (as hypothesised in Dell's interactive account), the fact that these phonemes have been activated will also activate phonologically related (i.e. ship) lemma nodes. Priming of the structure when describing "the ship that is red" should thus be more likely in comparison to descriptive utterances where an unrelated noun is being described (i.e. "the door that is red").

Findings- There was a difference in priming when the nouns were phonologically related to when they were unrelated suggesting that phonological relatedness of the nouns has an affect on the likelihood of the speaker using the same grammatical structure as their conversational partner.

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Appendix 2.3- Login Material used in Chapter 4 Research

Matriculation (s0686784) Login Details

EASE Username: stu148

EASE Password: intigu43n

Name (Sam Smith) Login Details

EASE Username: stu158

EASE Password: envigo56a

Appendix 2.4- Excerpts and Tasks used in Chapter 4 Research

Excerpt 1:

Please read this excerpt from Cleland & Pickering (2003) describing the findings from their syntactic priming experiment.

“The overall... priming effect is consistent with the finding of Branigan et al. (2000) that speakers tend to repeat the construction used by their interlocutors in dialogue. Moreover, it demonstrates that the tendency to repeat syntactic structure occurs at the level of the noun phrase. The fact that priming is greater when the noun was repeated than when it was not is also consistent with Branigan et al., and indicates that the additional effect due to repeating a head occurs for nouns as well as verbs.”

To summarise, in the syntactic priming experiment, Cleland & Pickering found that speakers tended to repeat the grammatical structure used by their partners when in dialogue. This occurred more when the noun being used in the speakers' utterance was the same as the one just used by their conversational partner.

Task 1 Addition:

These findings have not been added to the page.

Please add the findings mentioned in the excerpt beside the Findings heading in the Syntactic Priming Experiment box on the wiki page. Please do this in your own words.

Task 1 Delete and Replace:

Previous contributors to this page have inaccurately quoted the findings of this experiment.

Please delete the previous content beside the Findings heading in the Syntactic Priming Experiment box and add the correct findings mentioned in the excerpt. Please do this in your own words.

Excerpt 2:

Please read this excerpt from Cleland & Pickering (2003) describing the findings from their semantic relation experiment.

“The overall priming effectwas affected by the relationship between prime and target nouns. In particular, naive participants tended to repeat the construction just used by the confederate to a greater extent if prime and target nouns were semantically related than if they were unrelated.”

To summarise, in the semantic relation experiment, Cleland and Pickering found that the semantic relationship between the noun previously used by their conversational partner (prime) and the noun to be used by the speaker in their utterance (target) significantly affected the likelihood of the speaker using the same grammatical construction as their conversational partner. Speakers were more likely to use the same structure when the nouns were related compared to when they were unrelated.

Task 2 Addition:

These findings have not been added to the page.

Please add the findings from the excerpt beside the Findings heading in the Semantic Relation Experiment box on the wiki page. Please do this in your own words.

Task 2 Delete and Replace:

Previous contributors to this page have inaccurately quoted the findings of this experiment.

Please delete the previous content beside the Findings heading in the Semantic Relation Experiment box and add the correct findings mentioned in the excerpt. Please do this in your own words.

Excerpt 3:

Please read this excerpt from Cleland & Pickering (2003) describing the findings from their phonological relation experiment.

“There was stronger priming when prime and target nouns were the same versus when they were phonologically related. However, there was no hint of a difference in priming when prime and target nouns were phonologically related versus when they were unrelated. In other words, phonological relationship had no effect on the degree of syntactic priming.”

To summarise, in the phonological relation experiment, Cleland & Pickering found that phonological relatedness was not significantly different at priming grammatical structure in the speaker when compared to priming when the nouns were unrelated. Phonological relatedness of the nouns did not have an influence on the likelihood of the speaker using the same grammatical structure as used by the conversational partner.

Task 3 Addition:

These findings have not been added to the page.

Please add the findings from the excerpt beside the Findings heading in the Phonological Relation Experiment box on the wiki page. Please do this in your own words.

Task 3 Delete and Replace:

Previous contributors to this page have inaccurately quoted the findings of this experiment.

Please delete the previous content beside the Findings heading in the Phonological Relation Experiment box and add the correct findings mentioned in the excerpt. Please do this in your own words.

Appendix 2.5- Questionnaires used in Chapter 4 Research

Demographic Questionnaire

1. Gender:
 - Male
 - Female
2. Age:yrsmonths
3. What year of your Psychology Undergraduate degree are you in at the moment?
 - Y2
 - Y3
 - Y4
4. Are you an honours year psychology student?
 - Yes
 - No
5. Have you in the past or are you currently enrolled in any of the Psycholinguistic Honours courses offered by the Psychology Department?
 - Yes
 - No
6. If so, which are you enrolled in or have you completed?
 - Taught Courses*
 - Psychology of Thinking and Language (Y3-Term2)
 - Psycholinguistics of Language Production (Y4-Term1)
 - Sentence Processing and Psycholinguistics (Y4-Term2)
 - Project Choices*
 - Psycholinguistics Research Project (Y3)
 - Dissertation in Psycholinguistics (Y4)
7. When, if at all, was the last time you edited a wiki?
 - Today
 - 1-7 days ago
 - 1-4 weeks ago
 - 1-6 months ago
 - 6 months-12 months
 - Over a year ago
 - Never

8. What wiki was it? What was it used for?

9. What other wikis have you edited previously (if any)?

.....
.....
.....
.....

10. How many hours a week on average do you spend editing wikis?hrs
Comments:

11. How many hours a week on average do you spend viewing information on
wikis?hrs
Comments:

STATE

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel **right now**, that is, **at this moment**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	Not at all	Somewhat	Moderately	Very much
9901 I feel calm	1	2	3	4
9912 I feel upset	1	2	3	4
9902 I am relaxed	1	2	3	4
9911 I am tense	1	2	3	4
9903 I feel content	1	2	3	4
9913 I am worried	1	2	3	4

TRAIT

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you **generally** feel.

	Almost never	Sometimes	Often	Almost Always
241 I wish I could be as happy as others seem to be	1	2	3	4
381 I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
230 I feel satisfied with myself	1	2	3	4
371 Some unimportant thought runs through my mind and bothers me	1	2	3	4
360 I am content	1	2	3	4
351 I feel inadequate	1	2	3	4
221 I feel nervous and restless	1	2	3	4
251 I feel like a failure	1	2	3	4
330 I feel secure	1	2	3	4
281 I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
291 I worry too much over something that really doesn't matter	1	2	3	4
210 I feel pleasant	1	2	3	4
300 I am happy	1	2	3	4
401 I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4
340 I make decisions easily	1	2	3	4
390 I am a steady person	1	2	3	4
311 I have disturbing thoughts	1	2	3	4
321 I lack self-confidence	1	2	3	4
270 I am "calm, cool, and collected"	1	2	3	4
260 I feel rested	1	2	3	4

FNEB

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
712	I worry about what kind of impression I am making on someone					
707	I worry about what people will think of me even when I know it doesn't make any difference					
705	I often worry that I will say or do the wrong things					
704	I am afraid that people will find fault with me					
711	Other people's opinions of me bother me					
702	I am afraid that others will not approve of me					
703	When I am talking with someone, I worry about what they may be thinking about me					
709	It bothers me when I know people are forming an unfavourable impression of me					
708	Sometimes I think I am too concerned with what other people think of me					
701	I am usually worried about what kind of impression I make					
710	If I know someone is judging me, it has a big effect on me.					
706	I am frequently afraid of other people noticing my shortcomings					

WAI-E-PRE

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
50013	It scares me to think that I could accidentally destroy someone else's content					
20012	I am anxious about editing the wiki for fear of making mistakes					
20003	I feel comfortable about editing the wiki					
40015	Thoughts of being judged by other users make me feel tense					
20018	I will find it hard to concentrate when editing the wiki					
50014	I am nervous about changing existing content on the wiki					
20001	I am excited about editing the wiki					
40002	I am confident that the information I contribute will be correct					
20011	I am apprehensive about editing the wiki					
40012	I am afraid that people will find faults with any edits I make					
30011	I am worried about making mistakes that I cannot correct when editing the wiki					
20005	I feel relaxed about editing the wiki					
40013	I am nervous about what other users will think of my edits					
20002	I feel at ease about editing the wiki					
30003	I am confident that I would be able to contribute to the wiki					
20017	I feel intimidated about editing the wiki					
30001	I will feel secure when editing the wiki					
40014	I am concerned that people will know it was me that was contributing to the wiki					
50011	The fact that content can be changed makes me uneasy					
30013	I am afraid that I may do something wrong when editing the wiki					
30005	I am happy to contribute content to the wiki					
30002	I am certain that I can overcome any difficulties I may encounter when editing the wiki					

WAI-E

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
40013	I was nervous of what other users might think of my edits					
20005	I felt relaxed whilst editing the wiki					
40012	I was afraid that people would find faults with any edits I made					
30005	I was happy to contribute content to the wiki					
30013	I was afraid that I might do something wrong when editing the wiki					
50013	It scared me to think that I could accidentally destroy somebody else's content					
40002	I was confident that the information I was contributing was correct					
50011	The fact that content could be changed made me uneasy					
20017	I felt intimidated while editing the wiki					
40014	I was concerned that people would know it was me that was contributing to the wiki					
30002	I was certain I could overcome any difficulties I encountered in editing the wiki					
30003	I felt confident when contributing to the wiki					
30011	I was worried about making a mistake that I could not correct when editing the wiki					
20001	I felt excited when editing the wiki					
40015	Thoughts of being judged by other users made me feel tense					
30001	I felt secure when editing the wiki					
20018	I found it hard to concentrate when editing the wiki					
20003	I felt comfortable about editing the wiki					
20011	I felt apprehensive when editing the wiki					
50014	I was nervous about changing existing content on the wiki					
20012	When editing the wiki I felt anxious about making a mistake					
20002	I felt at ease editing the wiki					

WUI

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
20016	I found editing the wiki frustrating					
20011	I got flustered when editing the wiki					
10001	It was clear how to edit the wiki					
40004	The layout of the wiki edit screen was clear					
40015	I felt that editing the wiki took too long					
40014	The wiki editing interface needs improvement					
10006	I found the wiki easy to use					
20012	I felt under stress when editing the wiki					
20005	I found editing the wiki satisfying					
10011	I thought editing the wiki was complicated					
20002	Editing the wiki was fun					
10013	The wiki was difficult to edit					
40005	I thought the interaction with the wiki was efficient					
50001	I would recommend editing a wiki to others					
20013	Editing the wiki made me feel nervous					
30003	I found it easy to get the wiki to do what I wanted it to do					
20017	I thought editing the wiki was confusing					
20015	I had to concentrate hard when editing the wiki					
30002	I felt in control when editing the wiki					
30001	When editing the wiki I always knew what to do next					
50013	I would not edit a wiki like this again					
20004	I enjoyed editing the wiki					

Exit Questionnaire

Thank you very much for taking part in this experiment. I am now going to ask you a few questions about your experiences here today.

Today you experienced three different approaches to editing the wiki.

General experience

1. Is there anything you liked about the different approaches?

2. Is there anything you disliked about the different approaches?

Condition Specific Questions

You experienced editing live wiki content (*order as appropriate- anonymously, using a matriculation number and using a full name*). You were also (*adding OR changing*) content on the wiki.

3. How did you feel when you were editing the wiki [*anonymously, using a matriculation number or full name* (Show screenshot)]?

4. How did you feel when editing the wiki [*anonymously, using a matriculation number or full name* (Show screenshot)]?

5. How did you feel when editing the wiki [*anonymously, using a matriculation number or full name* (Show screenshot)]?

6. Which one of the conditions experienced today would you prefer to use if you had to edit a wiki in your course?
- Anonymous
 - Matriculation Number
 - Full Name

Reasons?

7. Did you feel that different identity conditions had an effect on the quality of your editing experience? If so why?

8. I'd like you to rate your 3 experiences editing the wiki today; where a rating of 0 is the worst rating you can give and 30 is the best.

Please place the tip of the marker at the point on the scale where you think each of your experiences lie.

Positions:

A: ____cm

B: ____cm

C: ____cm

Comments:

9. I'd like you to rate your 3 experiences editing the wiki today thinking about how you felt when editing in these conditions; where a rating of 0 is very negative and 30 is very positive.

Please place the tip of the marker at the point on the scale where you think each of your experiences lie.

Positions:

A: ____cm

B: ____cm

C: ____cm

Comments:

10. Today you were (*changing information included by other users OR adding information to content included by other users*). How did you feel about that?

Other Experiment Ideas

Wikis are fully editable by all users. All users can include any content which they feel is appropriate to the page whenever they feel. This flexibility means that content can change.

11. What do you think about this?

12. Knowing this, how would you feel if you had to use a wiki in your course?

13. What do you think could be done on the wiki to make people feel less concerned with this flexibility?

14. Would you be happy using content from this wiki to inform your written course work or revision? Please give reasons

15. Again, the wikis flexibility allows users to amend any content. How would you feel if other users amended or deleted the content you had included on the wiki?

16. Would this affect how you felt about editing the wiki in the future? If so why?

Appendix 2.6- Consent form used in Chapter 4 Research

Consent form

I, _____ have consented to taking part in this experiment investigating the use of web based tools. I understand that all the data gathered here will be stored anonymously and that I have the right to withdraw from the session at any time.

Signature: _____

Appendix 2.7- Experimenter Sheet for Chapter 4 Research

Edit 1:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Own Words?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd

Comments and observations:

--

Edit 2:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Own Words?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd

Comments and observations:

--

Edit 3:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Own Words?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd

Comments and observations:

--

Appendix 2.8- Experiment Scripts used in Chapter 4 Research

Script for Experiment Order ABC

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

We will be asking you to edit content on a live wiki page on PSYCHWIKI. You are contributing for the first time, although others are already using and contributing to the site. Don't worry, you will be given all the information you need to complete the editing tasks today.

Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Anonymous

You will firstly be editing this page anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

I would like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Matriculation number

Thanks.

Now you are ready to edit the page again.

This time you will be editing as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Full Name

Thanks

Now you are ready to edit the page again.

This time you will be editing the wiki as Sam Smith. For data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

When prompted please enter the EASE username and password details (Give login FN).

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order ACB

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

We will be asking you to edit content on a live wiki page on PSYCHWIKI. You are contributing for the first time, although others are already using and contributing to the site. Don't worry, you will be given all the information you need to complete the editing tasks today.

Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Anonymous

You will firstly be editing this page anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

Now I would now like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Full Name

Thanks

Now you are ready to edit the page again.

This time you will be editing the wiki as Sam Smith. For data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

When prompted please enter the EASE username and password details (Give login FN).

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Matriculation number

Thanks.

Now you are ready to edit the page again.

This time you will be editing as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order BAC

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

We will be asking you to edit content on a live wiki page on PSYCHWIKI. You are contributing for the first time, although others are already using and contributing to the site. Don't worry, you will be given all the information you need to complete the editing tasks today.

Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Matriculation number

You will firstly be editing the wiki as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

Now I would now like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Anonymous

Thanks.

Now you are ready to edit the page again.

This time you will be editing the wiki anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Full Name

Thanks

Now you are ready to edit the page again.

You will be firstly editing the wiki as Sam Smith. Again for data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login FN). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order BCA

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.

(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

We will be asking you to edit content on a live wiki page on PSYCHWIKI. You are contributing for the first time, although others are already using and contributing to the site. Don't worry, you will be given all the information you need to complete the editing tasks today.

Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Matriculation number

You will firstly be editing the wiki as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

Now I would now like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Full Name

Thanks.

Now you are ready to edit the page again.

This time you will be editing the wiki as Sam Smith. For data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login FN). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Anonymous

Thanks

Now you are ready to edit the page again.

This time you will be editing the wiki anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order CAB

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

We will be asking you to edit content on a live wiki page on PSYCHWIKI. You are contributing for the first time, although others are already using and contributing to

the site. Don't worry, you will be given all the information you need to complete the editing tasks today.

Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Full Name

You will firstly be editing the wiki as Sam Smith. For data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login FN). Please enter the EASE username and password details.

Now I would now like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Anonymous

Thanks.

Now you are ready to edit the page again.

This time you will be editing the wiki anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Matriculation number

Thanks

Now you are ready to edit the page again.

This time you will be editing the wiki as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last

editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order CBA

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and Brief Fear of Negative Evaluation)

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(Give participants WAI-P)

Thanks

(Give the participant Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about the central theories in each area of Psychology taught in the Undergraduate course. The wiki pages take the form of firstly describing the main theory and then explaining a relevant and important recent paper which has influenced thoughts on the theory. You are contributing for the first time, although others are already using and contributing to the site.

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Before editing the wiki page, you will be given an excerpt from the paper used on the wiki page being edited. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page. I would like you to use the information from the excerpt to complete the task.

Ok, let's begin

Condition- Full Name

You will be firstly editing the wiki as Sam Smith. For data protection reasons we would like you to act as if this is your name. Your full name will appear at the top of the page informing other users that you were the last editor of the page. Your full name will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login FN). Please enter the EASE username and password details.

Now I would now like you to read the following excerpt from a recent paper by Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing the wiki with your full name attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

Condition- Matriculation number

Thanks.

Now you are ready to edit the page again.

This time you will be editing the wiki as s0686784. For data protection reasons we cannot use your real matriculation number but we would like you to pretend that this is your real matriculation number. When you edit the wiki, your matriculation number will appear at the top of the page informing other users that you were the last editor of the page. Your matriculation number will also be recorded in the pages edit history along with the details of the edit made. This can also be accessed by other users.

Before editing the wiki you need to use the login details shown (Give login U). Please enter the EASE username and password details.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki with your matriculation number attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

LOG IN TO THE WIKI USING ANONYMOUS LOG IN

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

Condition- Anonymous

Thanks

Now you are ready to edit the page again.

This time you will be editing the wiki anonymously. When you edit the wiki no information about your identity will appear on the top of the page informing users of the last editor and your identity will not be linked to the edit you make in the page editing history. The edit you make will be labelled as Anonymous.

I would now like you to read another excerpt from Cleland and Pickering (2003). Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing the wiki anonymously so no identity information will be attached to your edit and that you are editing live content that other users can access and see. Also please complete the task using your own words. (If Deleting task- tell them to delete the previous contribution)

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this experiment. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aims to see how your emotions towards editing the wiki changed when editing in the three conditions (anonymously, with a matriculation number or a full name). If you would like to know more about this research and be informed of any publications which come out of this research then please fill in this contact form.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Appendix 2.9- Interaction Graphs from Chapter 4 Item Analysis

Figure A. 7- Graphical representation of the interaction between condition order and identity conditions on WAI item 5 mean score

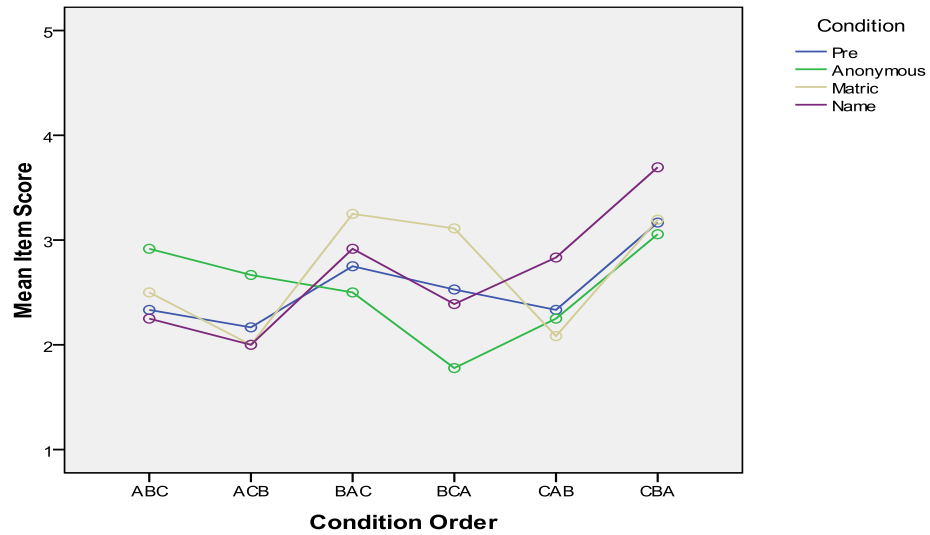


Figure A. 8- Graphical representation of the interaction between condition order and identity conditions on WAI item 4 mean scores

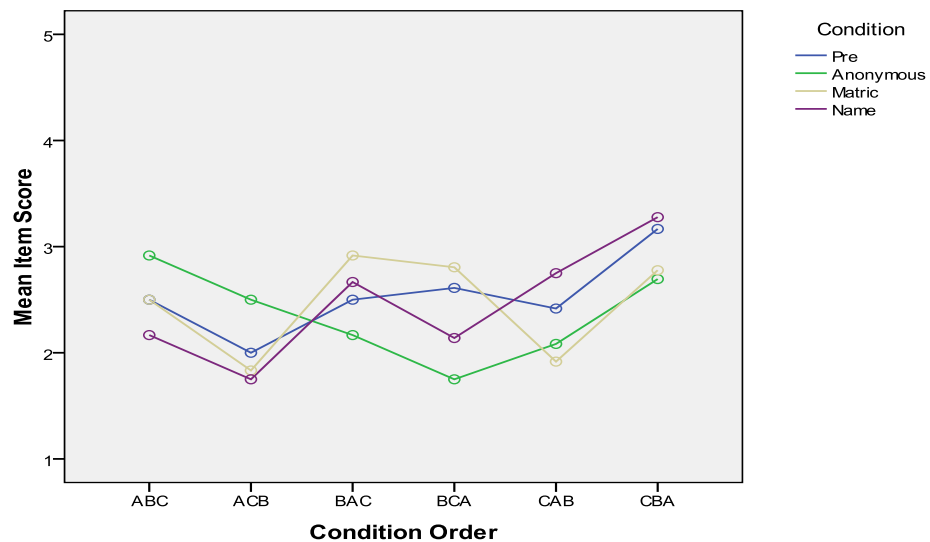


Figure A. 9- Graphical representation of the interaction between condition order and identity conditions on WAI item 6 mean score

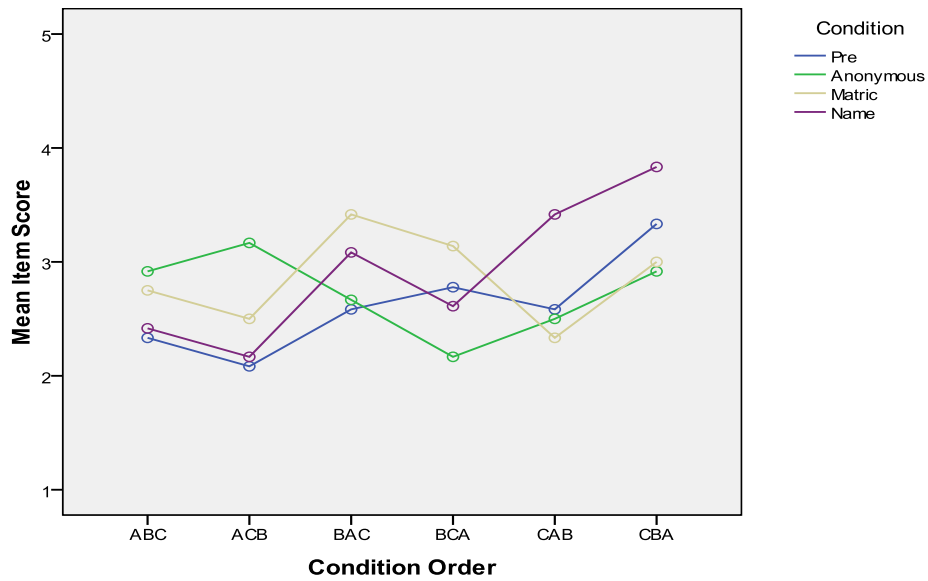


Figure A. 10- Graphical representation of the interaction between condition order and identity conditions on WAI item 1 mean score

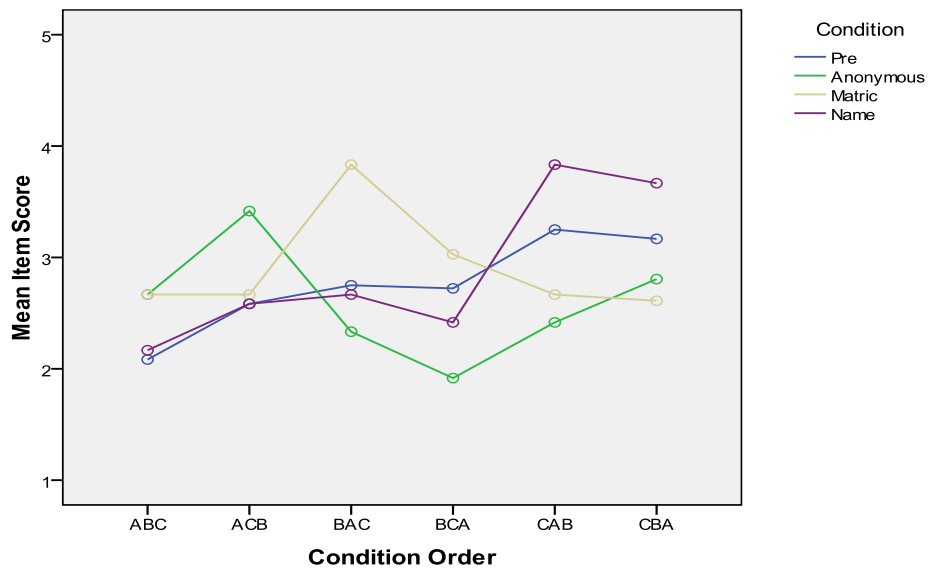


Figure A. 11- Graphical representation of the interaction between condition order and identity conditions on WAI item 2 mean score

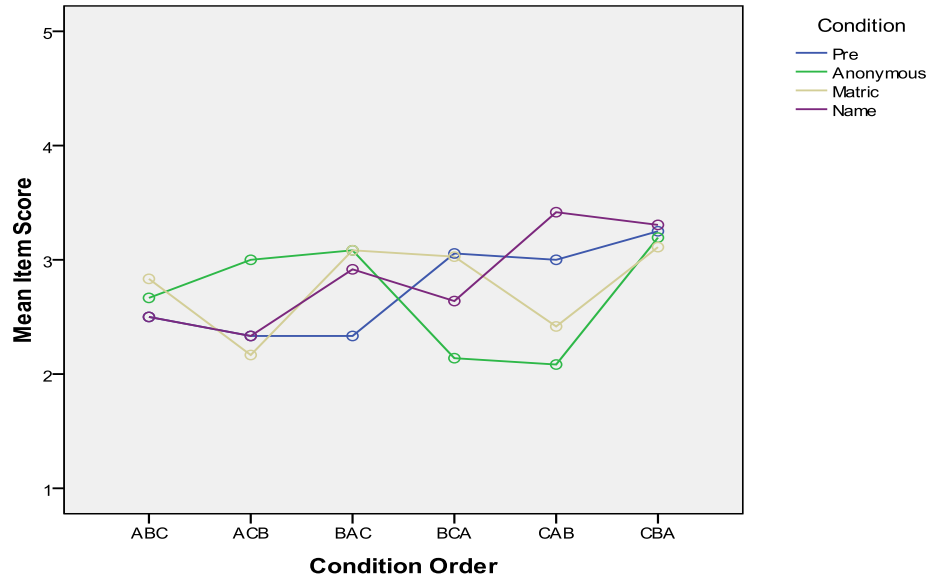


Figure A. 12- Graphical representation of the interaction between condition order and identity conditions on WAI item 7 mean score

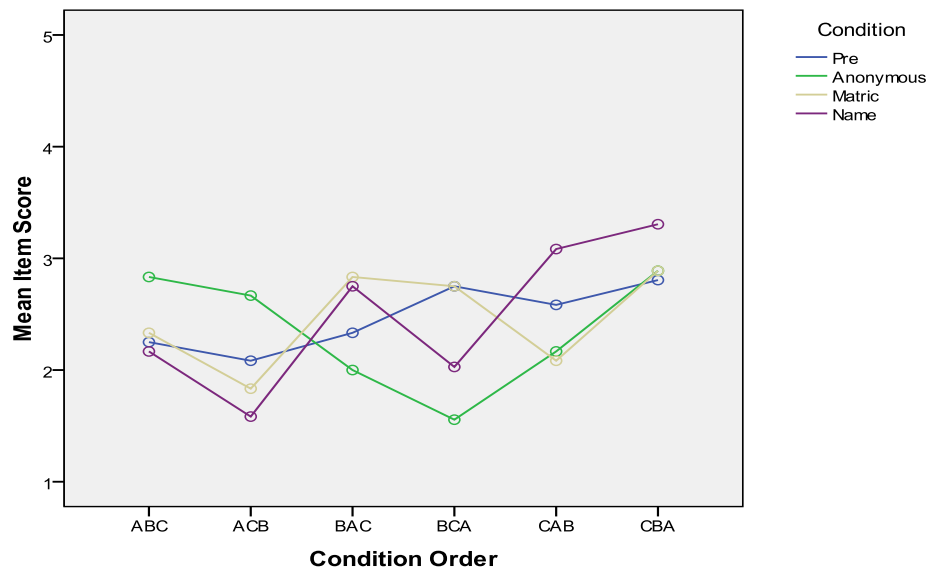


Figure A. 13- Graphical representation of the interaction between condition order and identity conditions on WAI item 9 mean score

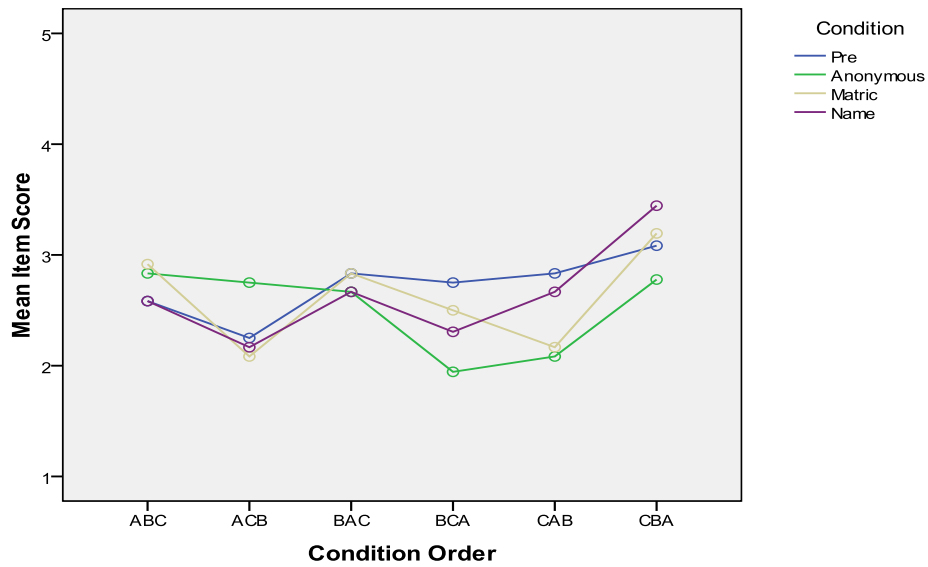


Figure A. 14- Graphical representation of the interaction between condition order and identity conditions on WAI item 14 mean score

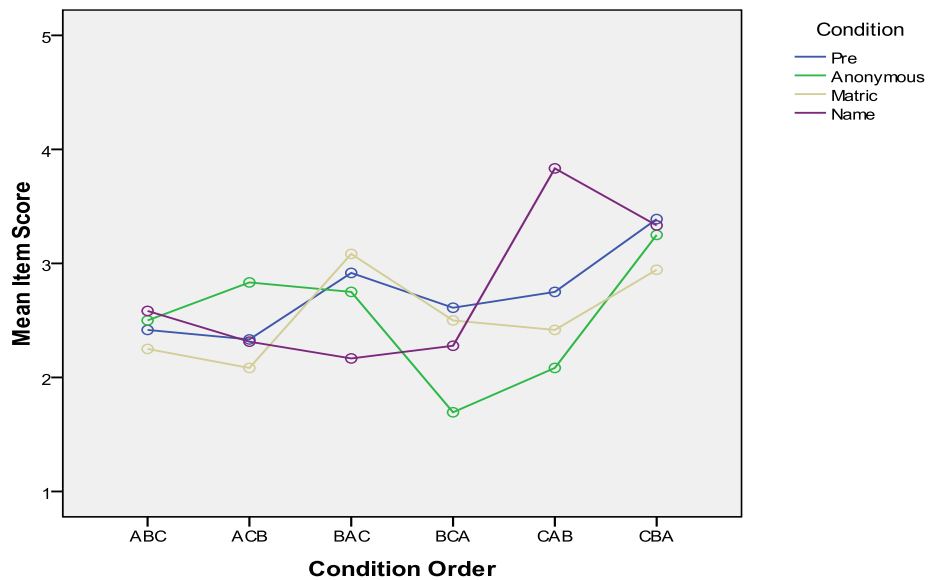


Figure A. 15- Graphical representation of the interaction between condition order and identity conditions on WAI item 8 mean score

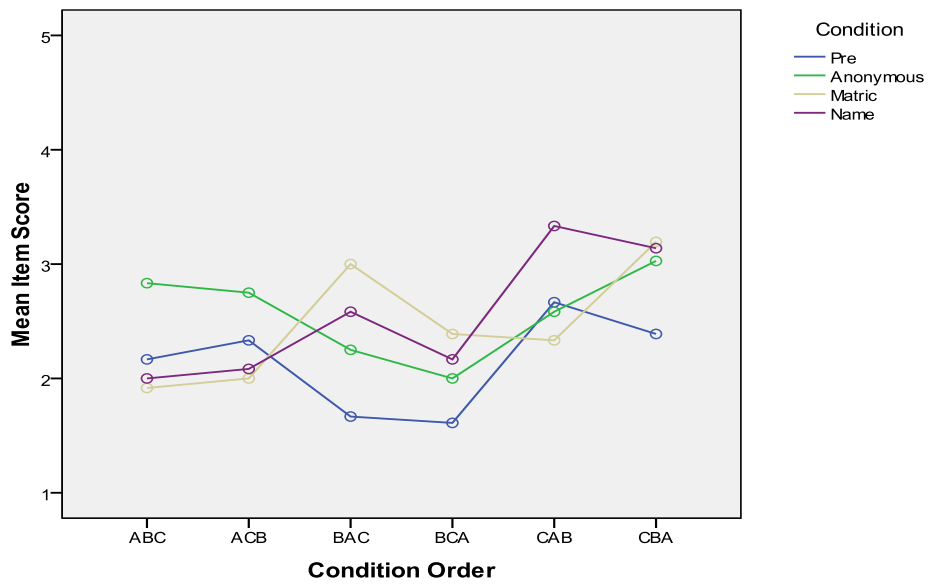


Figure A. 16- Graphical representation of the interaction between condition order and identity conditions on WAI item 11 mean score

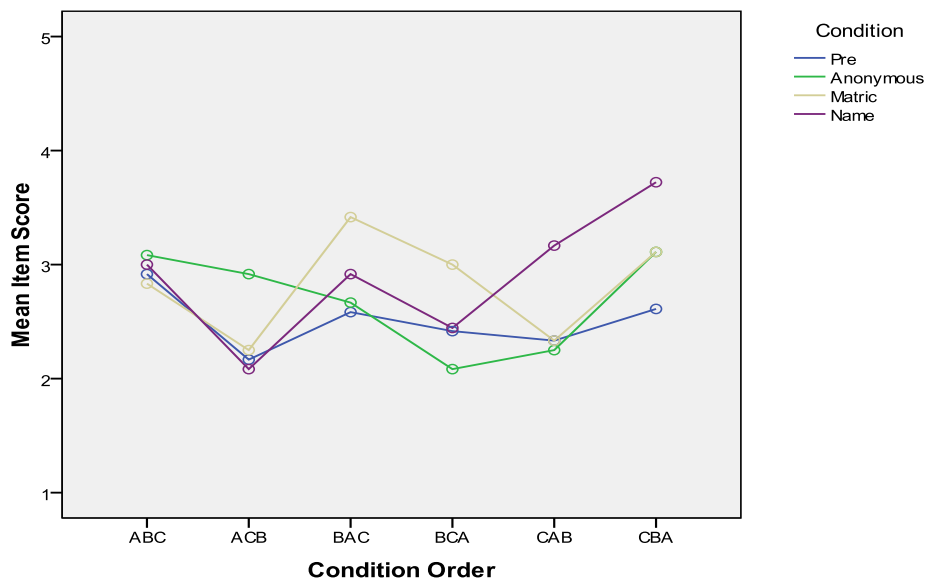


Figure A. 17- Graphical representation of the interaction between condition order and identity conditions on WAI item 17 mean score

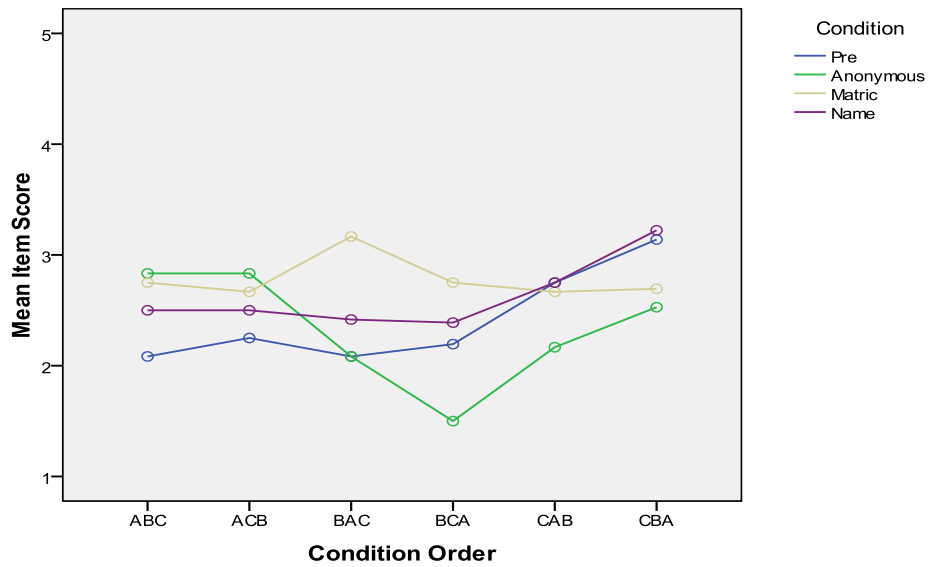


Figure A. 18- Graphical representation of the interaction between condition order and identity conditions on WAI item 21 mean score

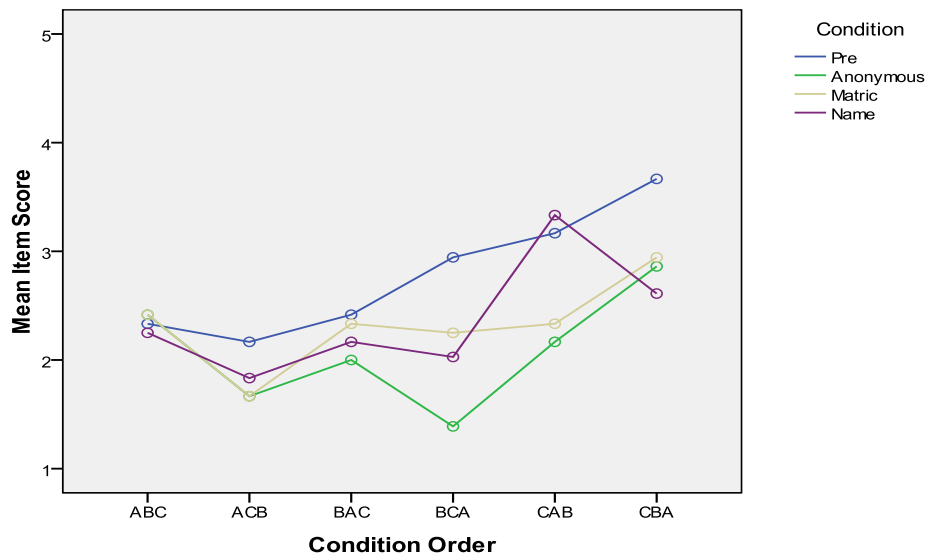


Figure A. 19- Graphical representation of the interaction between condition order and identity conditions on WUI item 6 mean score

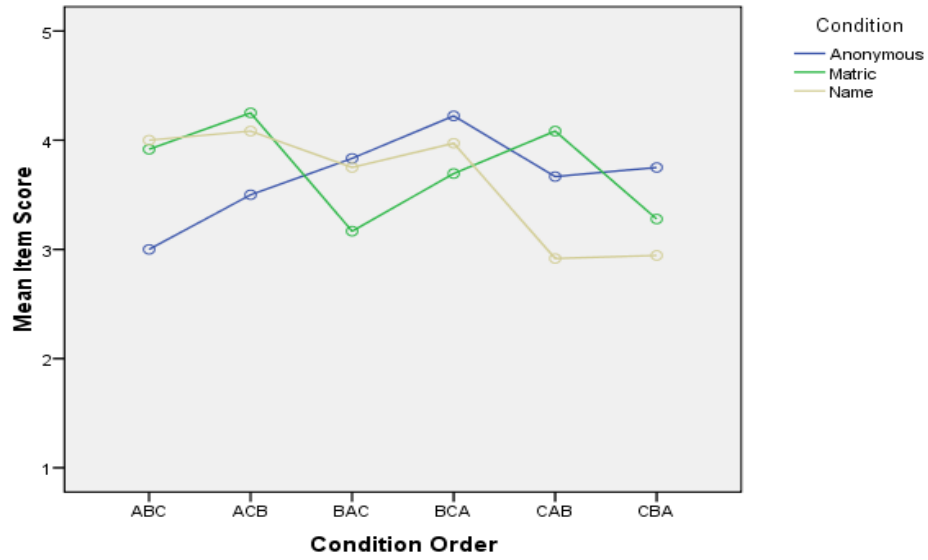


Figure A. 20- Graphical representation of the interaction between condition order and identity conditions on WUI item 10 mean score

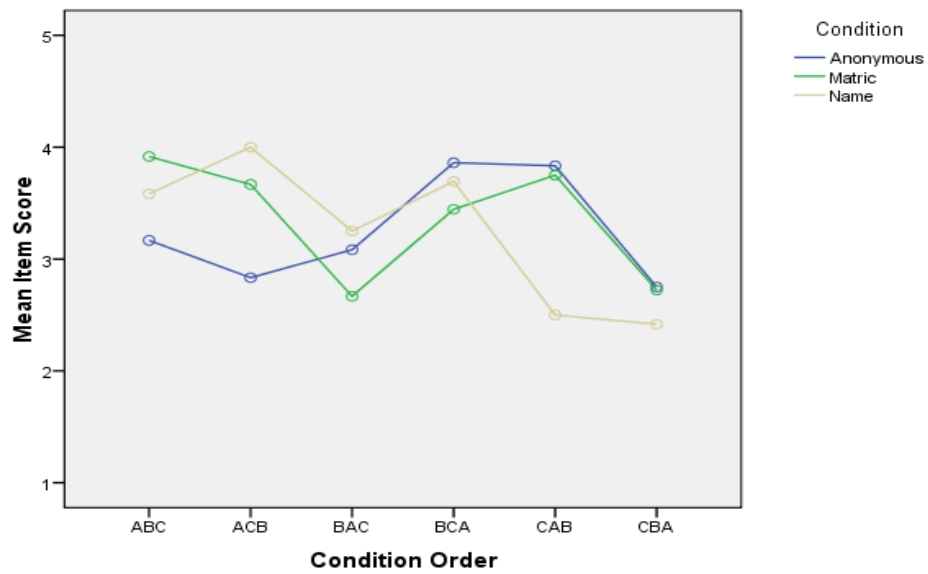


Figure A. 21- Graphical representation of the interaction between condition order and identity conditions on WUI item 11 mean score

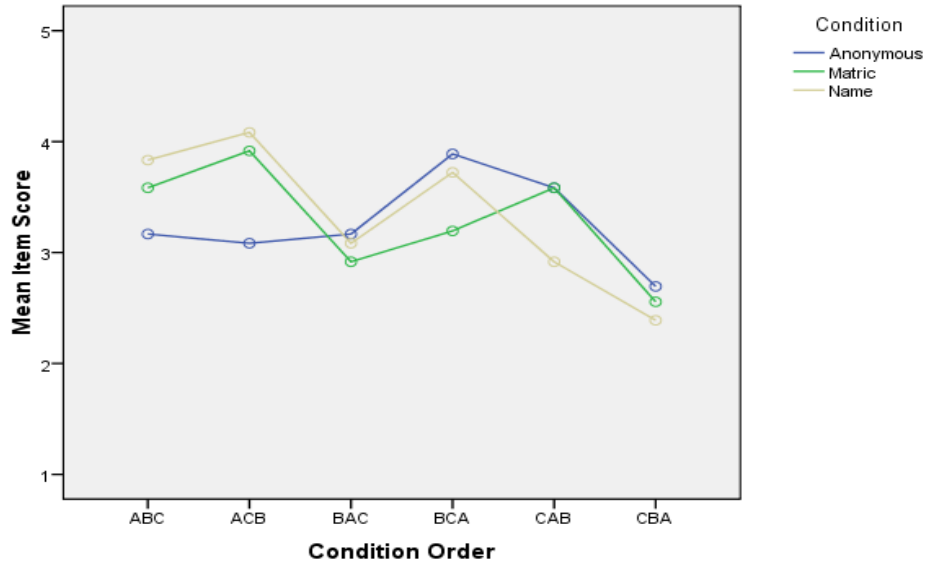


Figure A. 22- Graphical representation of the interaction between condition order and identity conditions on WUI item 15 mean score

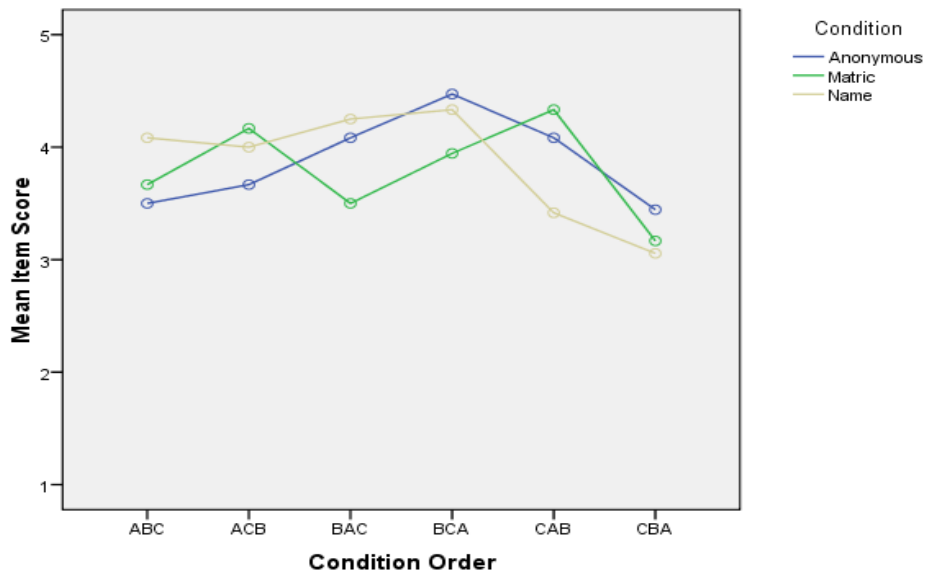


Figure A. 23- Graphical representation of the interaction between condition order and identity conditions on WUI item 1 mean score

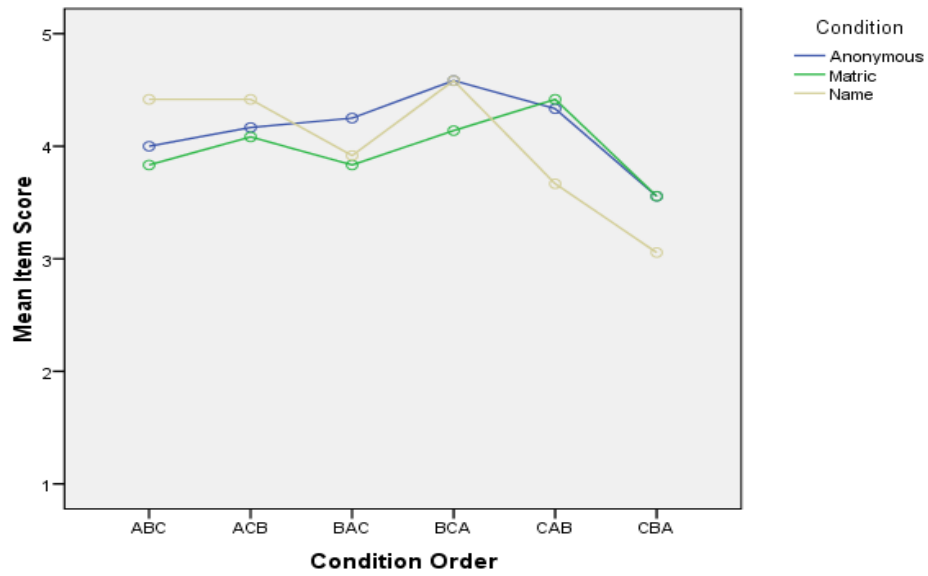


Figure A. 24- Graphical representation of the interaction between condition order and identity conditions on WUI item 2 mean score

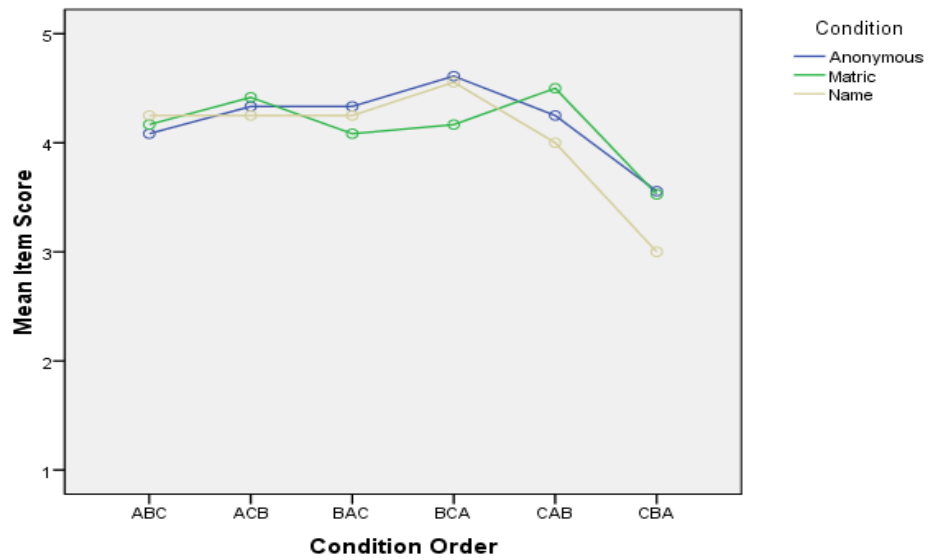


Figure A. 25- Graphical representation of the interaction between condition order and identity conditions on WUI item 14 mean score

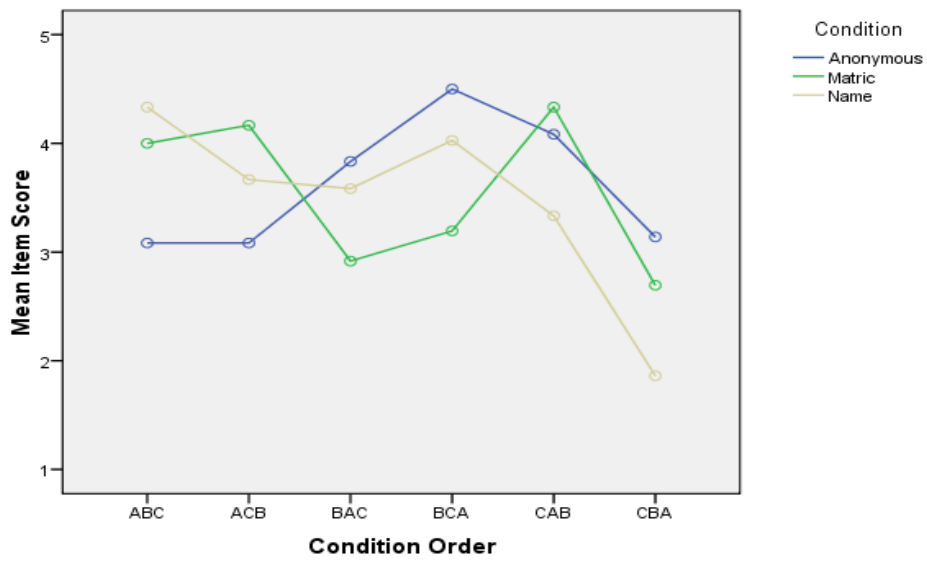


Figure A. 26- Graphical representation of the interaction between condition order and identity conditions on WUI item 3 mean score

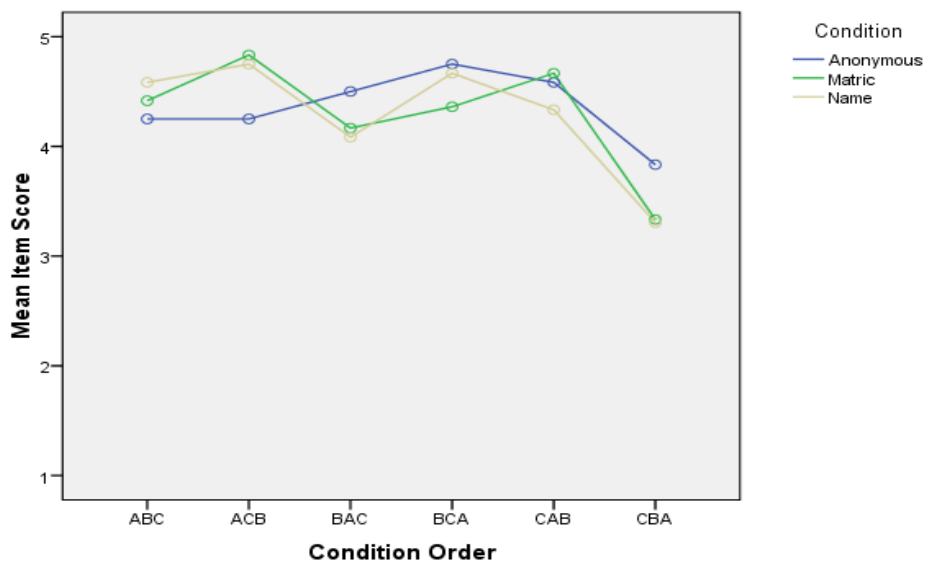


Figure A. 27- Graphical representation of the interaction between condition order and identity conditions on WUI item 4 mean score

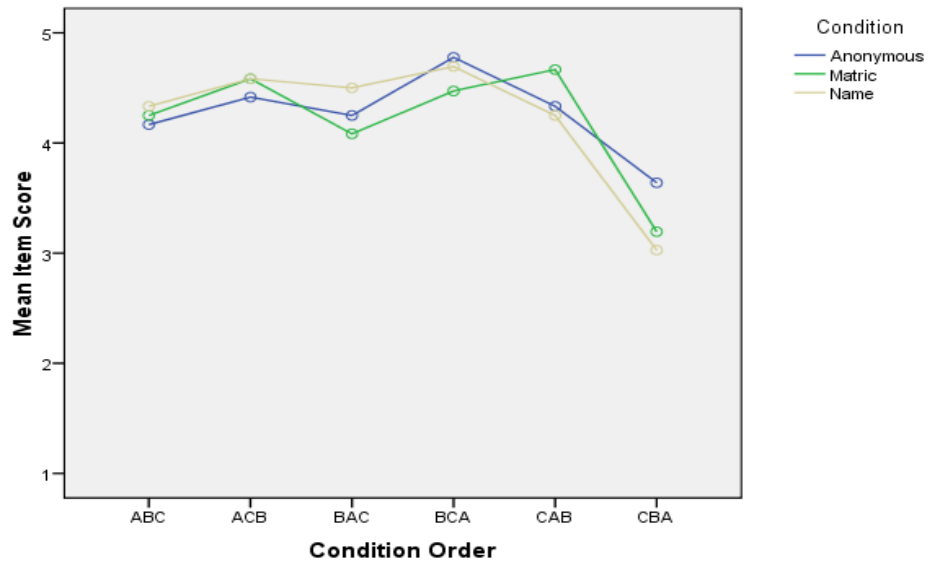


Figure A. 28- Graphical representation of the interaction between condition order and identity conditions on WUI item 17 mean score

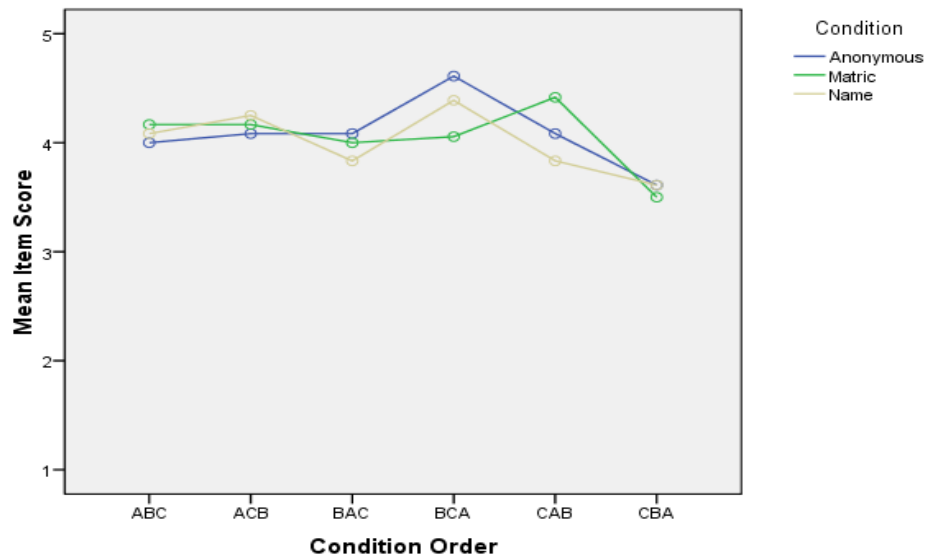
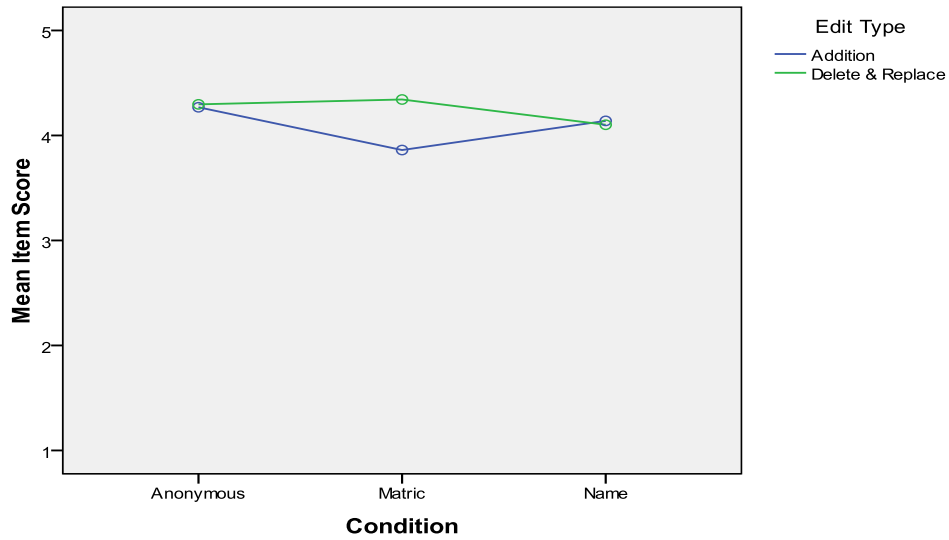


Figure A. 29- Graphical representation of the interaction between identity condition and edit type on WUI item 16 mean score



Appendix 3.1- Experiment Scenario for Chapter 5 Research

Experiment Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

Appendix 3.2- Content from PSYCHWIKI Page for Chapter 5 Research

The screenshot shows a web browser window displaying a page from PsychWiki. The browser's address bar shows the URL: [Dashboard > PsychWiki\(1\) > ... > ID Selection,EX3 > Genetics and Personality_1311](#). The page title is "Genetics and Personality".

Essential Links:

- Home
- Research Synopses
- Theories & Debates
- Lecture Space
- Course Resources
- Assignments & Past Papers
- Student Project Space
- Usage Statistics
- Page Operations
- Browse Space
- Add Content

Page Content:

PsychWiki(1)
Genetics and Personality
Added by [Benjamin Cowan](#), last edited by [Benjamin Cowan](#) on Feb 22, 2010
Labels: [ADD LABELS](#)

Introduction
Personality is thought to be influenced by environmental (aspects such as common environment or non shared environment) and genetic contributors (hereditary determinants of personality).

Methods in Personality Heritability Research
The study of Monozygotic (MZ-100% genetically similar) and Dizygotic (DZ-50% genetically similar) twins can help us disentangle the reasons for variation in personality. These studies are termed genetically informative studies. Twin studies hold the assumption that personality difference is affected by two contributors; genetic and environmental effects.

Twin studies rely on the comparison of personality within DZ and MZ twin pairs. If personality is genetically pre-determined, then we would assume that MZ twins would be more similar in their personality traits than DZ twins. Correlations between personality scores for MZ should be higher than for DZ as they share the same genes. Of course both twin sets are likely to experience the same family environment as their other twin (shared environment) but may also have different experiences (non shared environment) which could have an effect on personality.

Different types of twin studies such as separated twin studies and twin family studies allow for the genetic effect of personality to be studied. Both allow researchers to observe the effect of shared and non shared environment.

Studies of Personality Heritability
The genetic contribution to personality was seen to be high from recent research looking at German adult twins (Borkenau et al., 2001). Using peer reports of personality rather than self report, the authors found that genetics contributed between 33 to 44 percent of trait variance. Non shared environment was seen to make the highest contribution whereas shared environment made little contribution to personality.

Bouchard (1994) found in his summary of the Minnesota Study of Twins Reared Apart that broad heritability was a significant contributor to personality traits. It was found that broad heritability stood at around 50% for Neuroticism and 30% for Agreeableness. There were also some large non additive genetic effects (i.e. effects due to genetic dominance or epistasis) found for the traits of Extraversion and Agreeableness.

A recent review of prominent self report twin study research by Bouchard & Loehlin (2001) highlighted that the broad heritability of the 5 factors of personality was reasonably consistent between studies and that around 50% of the variance in these personality traits is caused by genetic contributions. It also highlighted that shared environment has very little effect on the variance of personality.

Molecular Genetics and Personality
The study of molecular genetics and personality is based on the assumption that variants within DNA locations are the basis for individual differences in DNA sequences. These variants (polymorphisms) within these loci may lead to phenotypic (trait) variations between individuals.

In personality research it is likely that personality is affected by many genetic differences with each having a small effect, the main conclusion of research using Quantitative Trait Loci approaches to personality (Plomin et al., 2001). Such studies have had some success at identifying genes that affect personality. Research has linked novelty seeking and extraversion to the D4 dopamine receptor gene (Cloninger, Adolfsson & Svrakic, 1996; Benjamin et al.1996) and that this gene can explain 10% of the variance in novelty seeking levels.

A recent meta-analysis by Munafo et al. (2003) of 46 molecular genetic studies on personality found a strong link between avoidance type traits like anxiety and neuroticism and 5-HTT LPR polymorphisms. Dopamine receptors were also found to relate to approach type traits like novelty seeking.

Personality Change and Genetics
The change in personality over the lifespan has been a highly researched area of personality and individual difference research. Such studies test whether individuals vary in terms of personality traits at different periods of time across the lifespan.

Research suggests that personality is relatively constant in older life around the age of 30 (Costa & McCrae, 1994). Many longitudinal studies have however identified that before such an age personality is not as constant (Watson & Walker, 1996; Block 1993). A meta-analysis looking at the stability of personality over the lifespan (Roberts & DelVecchio, 2000) showed that the stability of personality traits increased from childhood to college age and to 30 years old, reaching high stability around the age of 50.

The influence of genetics on such personality changes has been demonstrated to be insignificant. Longitudinal twin data has highlighted that the change in personality in adulthood is not mediated by genetics (Plomin & Nesselroade, 1990).

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Appendix 3.3- Excerpts, Tasks and Confederate Edits used in Chapter 5 Research

Excerpt 1:

Please read the following excerpt from Matthews, Deary & Whiteman (2003) on genetics and personality traits:

“The hypotheses offered by twin and family studies may be combined to provide another behaviour genetic study design. Consider two MZ twins who have children. The child of an MZ twin will be as closely related to the parent as to the co-twin (his or her uncle or aunt). In the absence of shared environment effects, therefore, the personality correlations between a twin and his or her nephew or niece should be the same as that between the twin and his own children”

In summary, twin family studies allow personality researchers to develop their knowledge of the effects of genetics on personality. These studies observe the correlations that MZ twins have with their families. For instance if a set of MZ twins have children, those children will be as closely related to their uncle or aunt as to their parent (due to their parents 100% genetic similarity). Therefore the MZ twins should correlate similarly with their nieces or nephews as they do with their own children if shared environment does not play a role in personality as shared environment effects are absent.

Task 1:

This information is not present on the wiki page. Please include this information **at the end** of the “Methods in Personality Heritability Research” section. Please use your own words.

Confederate Edit for Excerpt 1:

Although twin studies are informative in terms of genetic effects of personality the assumption that MZ genetic contribution to personality in MZ is twice that of DZ twins is flawed. One of the reasons for this is epistasis effects. Multiple genes operating in combination may be needed to produce a personality trait (Lykken et al. 1992). MZ twins will have 100% similar gene configurations in this case yet DZ twins may not have the same gene combinations. This means that the assumption that MZ are twice as similar as DZ twins is wrong. They are in fact more than twice as similar. This is taken into account in most twin studies by adding a genetic dominance parameter.

Excerpt 2:

Please read the following excerpt from Matthews, Deary & Whiteman (2003) on genetics and personality traits:

“A massive study of the genetic and environmental contributions to neuroticism differences examined twins and their extended families in the USA and Australia. Over 45,000 subjects provided data (Lake et al., 2000). The proposed best model included genetic influences, non shared environment, and a small influence of assortative mating. There was no evidence of substantial influences from shared environment.... The above studies add a lot of weight to the claim that genetic factors contribute substantially to the causation of individual differences in personality traits.”

In summary, a large study into the genetic and environmental contributions to extraversion and neuroticism by Lake et al. (2000) highlighted that genetic influences and non shared environment explained differences in personality. Shared environment was not seen to contribute substantially to these differences. Genetics therefore play a more important role in personality than shared environmental aspects.

Task 2:

This information is not present on the wiki page. Please include this information **at the end** of the “Studies of Personality Heritability” section. Please use your own words.

Confederate Edit for Excerpt 2:

Although studies have highlighted that around 50% of the variance in personality was caused by genetic factors rather than shared environment (Bouchard & Loehlin, 1990), Endler (1989) states that heredity and environment are in fact interactive. He states that "Trying to obtain variance proportions of heredity and environment in personality is like asking how much the area of a rectangle is due to length and how much due to width". Also shared environment is difficult to measure so it is difficult to say with certainty that its effects are insignificant (Hoffmann, 1991).

Excerpt 3:

Please read the following excerpt from Matthews, Deary & Whiteman (2003) on genetics and personality traits:

“A second apparent success for molecular genetic techniques linked neuroticism to the neurotransmitter serotonin (also called 5-hydroxytryptamine or 5HT).....A single gene on chromosome 17 codes for the 5HT transporter (5-HTT), which regulates re-uptake of 5-HT at the synapses where it is released. Two alleles of this transporter gene (5-HTT) have been found, one long and one short.....The short allele was associated with higher neuroticism levels in a study of 505 subjects, whether measured by the NEO-PI or Cattell’s 16PF (Goldman, 1996; Lesch et al. 1996).....The gene accounted for 3 to 4 per cent of total neuroticism variance.

In summary, the personality trait of Neuroticism has been linked with the serotonin transporter gene 5-HTT (5-hydroxytryptamine). Short alleles in the gene are related to higher neuroticism levels. The gene has been shown to account for 3-4% of the variance in Neuroticism scores.

Task 3:

This information is not present on the wiki page. Please include this information **at the end** of the “Molecular Genetics and Personality” section. Please use your own words.

Confederate Edit for Excerpt 3:

Although short alleles in the 5HTT gene have shown to be associated with Neuroticism recent research has found it hard to replicate such findings (Deary et al. 1999). Using a large random sample of the general population in Edinburgh, they found no significant association between self reported neuroticism and the alleles on the 5HTT gene. The relationship between 5HTT and Neuroticism is therefore far from conclusive.

Excerpt 4:

Please read the following excerpt from Matthews, Deary & Whiteman (2003) on genetics and personality traits:

“Genetic studies tend to be equated in people’s minds with static aspects of the person, but genetic approaches can be used to examine personality change and development....By gathering longitudinal data on MZ and DZ twins the correlation between the genetic contribution at time 1 and time 2 may be estimated.....McGue, Bacon and Lykken (1993) found that stability of personality was associated with genetic effects and change with environmental factors”

In summary, longitudinal twin research on the role of genetics in personality change seems to suggest that genetics are more associated with stability of personality over time rather than contributing to any change in personality (McGue, Bacon & Lykken, 1993). Change is more associated with environmental effects.

Task 4:

This information is not present on the wiki page. Please include this information **at the end** of the “Personality Change and Genetics” section. Please use your own words.

Confederate Edit for Excerpt 4:

Although genetics have been shown to contribute to the stability of personality previous research has also suggested that genetic factors play a role in personality change from adolescence to adulthood. A sample of MZ and DZ twins tested once in adolescence and another time in adulthood showed that changes in personality traits between adolescence and adulthood may be caused by a genetic influence (Dworkin et al., 1976). It may be that the influence of genetics on personality change may depend on the point of development, with genetic influences seen also in personality change in childhood (Plomin & Nesselroade, 1990).

Appendix 3.4- Questionnaires used in Chapter 5 Research

Demographic Questionnaire

1. Gender:
 - Male
 - Female

2. Age:yrsmonths

3. What year of your Psychology Undergraduate degree are you in at the moment?
 - Y2
 - Y3
 - Y4

4. Are you an honours year psychology student?
 - Yes
 - No

5. Have you in the past or are you currently enrolled in any of the Differential Psychology courses offered by the Psychology Department?
 - Yes
 - No

6. If so, which are you enrolled in or have you completed?
 - Taught Courses*
 - Differential Psychology (Y3-Term1)
 - Basic Tendencies of Personality (Y4-Term1)
 - Causes and Consequences of Personality (Y4- Term1)
 - Project Choices*
 - Differential Psychology Research Project (Y3)
 - Dissertation in Personality and Genetics (Y4)

7. When, if at all, was the last time you edited a wiki?
 - Today
 - 1-7 days ago
 - 1-4 weeks ago
 - 1-6 months ago
 - 6 months-12 months
 - Over a year ago
 - Never

8. What wiki was it? What was it used for?

9. What other wikis have you edited previously (if any)?

.....
.....
.....
.....

10. How many hours a week on average do you spend editing wikis?hrs
Comments:

11. How many hours a week on average do you spend viewing information on
wikis?hrs
Comments:

STATE

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel **right now**, that is, **at this moment**. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

		Not at all	Somewhat	Moderately	Very much
9903	I feel content	1	2	3	4
9912	I feel upset	1	2	3	4
9913	I am worried	1	2	3	4
9902	I am relaxed	1	2	3	4
9911	I am tense	1	2	3	4
9901	I feel calm	1	2	3	4

TRAIT

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you **generally** feel.

	Almost never	Sometimes	Often	Almost Always
321 I lack self-confidence	1	2	3	4
281 I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
390 I am a steady person	1	2	3	4
351 I feel inadequate	1	2	3	4
270 I am "calm, cool, and collected"	1	2	3	4
291 I worry too much over something that really doesn't matter	1	2	3	4
210 I feel pleasant	1	2	3	4
241 I wish I could be as happy as others seem to be	1	2	3	4
300 I am happy	1	2	3	4
340 I make decisions easily	1	2	3	4
251 I feel like a failure	1	2	3	4
381 I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
221 I feel nervous and restless	1	2	3	4
360 I am content	1	2	3	4
311 I have disturbing thoughts	1	2	3	4
371 Some unimportant thought runs through my mind and bothers me	1	2	3	4
401 I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4
330 I feel secure	1	2	3	4
230 I feel satisfied with myself	1	2	3	4
260 I feel rested	1	2	3	4

FNEB

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
702	I am afraid that others will not approve of me					
709	It bothers me when I know people are forming an unfavourable impression of me					
705	I often worry that I will say or do the wrong things					
706	I am frequently afraid of other people noticing my shortcomings					
708	Sometimes I think I am too concerned with what other people think of me					
712	I worry about what kind of impression I am making on someone					
711	Other people's opinions of me bother me					
703	When I am talking with someone, I worry about what they may be thinking about me					
710	If I know someone is judging me, it has a big effect on me					
707	I worry about what people will think of me even when I know it doesn't make any difference					
704	I am afraid that people will find fault with me					
701	I am usually worried about what kind of impression I make					

WAI-E-PRE

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
40012	I am afraid that people will find faults with any edits I make					
40013	I am nervous about what other users will think of my edits					
30005	I am happy to contribute content to the wiki					
20005	I feel relaxed about editing the wiki					
20012	I am anxious about editing the wiki for fear of making mistakes					
40002	I am confident that the information I contribute will be correct					
50013	It scares me to think that I could accidentally destroy someone else's content					
30013	I am afraid that I may do something wrong when editing the wiki					
30003	I am confident that I would be able to contribute to the wiki					
50012	I am concerned that other users can change the edits I make					
20002	I feel at ease about editing the wiki					
50014	I am nervous about changing existing content on the wiki					
20018	I will find it hard to concentrate when editing the wiki					
20011	I am apprehensive about editing the wiki					
30011	I am worried about making mistakes that I cannot correct when editing the wiki					
20003	I feel comfortable about editing the wiki					
30002	I am certain that I can overcome any difficulties I may encounter when editing the wiki					
40015	Thoughts of being judged by other users make me feel tense					
50011	The fact that content can be changed makes me uneasy					
20017	I feel intimidated about editing the wiki					
20001	I am excited about editing the wiki					
40014	I am concerned that people will know it was me that was contributing to the wiki					
30001	I will feel secure when editing the wiki					

WAI-E

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
20001	I felt excited when editing the wiki					
50012	I was concerned that other users could change the edits I made					
40002	I was confident that the information I was contributing was correct					
40014	I was concerned that people would know it was me that was contributing to the wiki					
30005	I was happy to contribute content to the wiki					
30002	I was certain I could overcome any difficulties I encountered in editing the wiki					
50013	It scared me to think that I could accidentally destroy somebody else's content					
40012	I was afraid that people would find faults with any edits I made					
20005	I felt relaxed whilst editing the wiki					
30011	I was worried about making a mistake that I could not correct when editing the wiki					
20017	I felt intimidated while editing the wiki					
20002	I felt at ease editing the wiki					
50014	I was nervous about changing existing content on the wiki					
50011	The fact that content could be changed made me uneasy					
30013	I was afraid that I might do something wrong when editing the wiki					
20003	I felt comfortable about editing the wiki					
20012	When editing the wiki I felt anxious about making a mistake					
30003	I felt confident when contributing to the wiki					
20011	I felt apprehensive when editing the wiki					
40015	Thoughts of being judged by other users made me feel tense					
30001	I felt secure when editing the wiki					
40013	I was nervous of what other users might think of my edits					
20018	I found it hard to concentrate when editing the wiki					

WUI

Please place a tick (✓) in the box showing your level of agreement with each of the statements below.

		Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
30001	When editing the wiki I always knew what to do next					
20013	Editing the wiki made me feel nervous					
10001	It was clear how to edit the wiki					
20005	I found editing the wiki satisfying					
20017	I thought editing the wiki was confusing					
40004	The layout of the wiki edit screen was clear					
10013	The wiki was difficult to edit					
40014	The wiki editing interface needs improvement					
20016	I found editing the wiki frustrating					
40005	I thought the interaction with the wiki was efficient					
30002	I felt in control when editing the wiki					
50013	I would not edit a wiki like this again					
10011	I thought editing the wiki was complicated					
20002	Editing the wiki was fun					
50001	I would recommend editing a wiki to others					
40015	I felt that editing the wiki took too long					
20011	I got flustered when editing the wiki					
10006	I found the wiki easy to use					
30003	I found it easy to get the wiki to do what I wanted it to do					
20015	I had to concentrate hard when editing the wiki					
20004	I enjoyed editing the wiki					
20012	I felt under stress when editing the wiki					

Exit Questionnaire

Thank you very much for taking part in this experiment. I am now going to ask you a few questions about your experiences here today.

Today you experienced three different content change conditions when editing the wiki today.

General experience

1. Is there anything you liked about editing the wiki today?

2. Is there anything you disliked about editing the wiki?

Condition Specific Questions

You experienced other users (Order as appropriate- (A) *leaving your edit unchanged*, (B) *adding information to your previous edit*, (C) *deleting your edit and including other information*.)

3. You firstly experienced your edits being (*unchanged/ added to/ deleted*). How did you feel when you edited the wiki after experiencing this?

4. You then experienced your edits being (*unchanged/ added to/ deleted*). How did you feel when you edited the wiki after experiencing this?

5. You then experienced your edits being (*unchanged/ added to/ deleted*). How did you feel when you edited the wiki after experiencing this?

6. You edited the wiki 4 times today. After editing the wiki the first time (Edit 1) you experienced your edit being (*unchanged/ added to/ deleted*). You then edited the wiki a second time (Edit 2). After editing the wiki this time you experienced your edit being (*unchanged/ added to/ deleted*). You then edited the wiki a third time (Edit 3) and this edit was (*unchanged/ added to/ deleted*). You then made your fourth and final edit (Edit 4).

I'd like you to rate your 4 experiences editing the wiki where a rating of 0 is the worst rating you can give and 30 is the best thinking about the overall quality of your editing experience when editing at each point.

Please place the tip of the marker at the point on the scale where you think each of your experiences lie.

Positions:

Edit 1: _____cm Edit 2: _____cm Edit 3: _____cm Edit 4: _____cm

Comments:

7. I'd like you to rate your 4 experiences editing the wiki thinking about how you felt when editing the wiki at each time where a rating of 0 is very negative rating you can give and 30 is very positive.

Please place the tip of the marker at the point on the scale where you think each of your experiences lie.

Positions:

Edit 1: _____cm Edit 2: _____cm Edit 3: _____cm Edit 4: _____cm

Comments:

8. Did you feel that the different conditions had an effect on the quality of your subsequent editing experiences? If so why?

9. How did you feel about the fact that content could be changed in general?

10. Do you feel that experiencing other users changing your content would influence your intentions towards editing the wiki again?

Wikis are fully editable by all users. This flexibility means that content can change.

11. After experiencing this flexibility today, how would you feel if you had to use a wiki in your honours course?

12. What do you think could be done on the wiki to make people feel less concerned with this flexibility?

13. Would you be happy using content from this wiki to inform your written course work or revision? Please give reasons

Experiment Design Questions:

14. How did you feel about using your own words to complete the tasks?

15. Did you feel that any of the tasks varied in difficulty? If so which ones?

16. How did you feel about the accuracy of information you were contributing when editing the wiki in each case?

17. Did you feel that there was a difference in the amount of attention you paid to the content you added after experiencing any of the conditions?

Appendix 3.5- Consent form used in Chapter 5 Research

Consent form

I, _____ have consented to taking part in this experiment investigating the use of web based tools. I understand that all the data gathered here will be stored anonymously and that I have the right to withdraw from the session at any time.

Signature: _____

Appendix 3.6- Confederate Record Sheet for Chapter 5 Research

Confederate Task 1:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------	------------------------------	-----------------------------

Comments and observations:

Confederate Task 2:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------	------------------------------	-----------------------------

Comments and observations:

Appendix 3.7- Experimenter Sheet for Chapter 5 Research

Edit 1:

Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Own Words?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd

Comments and observations:

--

Edit 2:

Manipulation Correct?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Manipulation Noticed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Task Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Own Words?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd

Comments and observations:

--

Edit 3:

Manipulation Correct?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Manipulation Noticed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Task Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Own Words? Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd	

Comments and observations:

--

Edit 4:

Manipulation Correct?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Manipulation Noticed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Task Completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Own Words? Attempts?	<input type="checkbox"/> 1st	<input type="checkbox"/> 2nd	<input type="checkbox"/> 3rd	

Comments and observations:

--

Appendix 3.8- Experiment Scripts in Chapter 5 Research

Script for Experiment Order ABC

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and BFNES)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

You will be editing one of the wiki pages today. Before editing the page today, you will be given an excerpt from a course reading which you will need to use when editing the wiki page. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page.

Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

Please take a few minutes to read the information on the page you are about to edit today.

At this point can I ask you to give me your observations about the sections?

Now I would now like you to read the following excerpt from Matthews, Deary & Whiteman (2003) on Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

*Unchanged- (If noticed-*As you have seen) the content you added when you edited the wiki last has been added to the page

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Adding Experiment – (If noticed-As you have seen) since you edited the wiki last another user has added content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Deleting Experiment- (If noticed-As you have seen) since you edited the wiki last another user has removed the content you added and has added their own content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aimed to observe your reaction to the dynamic nature of a wiki when creating content for your course. Today you edited the wiki in 3 conditions. In one condition your edit was left unchanged, in another condition your edit was deleted before editing the wiki again and in another condition your edit was kept and information added to it by the confederate. This was to highlight and observe your reaction to the dynamic nature of a wiki when creating content for your course. The research used a confederate to simulate this dynamism and the wiki was designed solely for the purpose of this experiment. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

Again the wiki is not active at present and is not being used as part of the teaching tools in Psychology.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology

students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment 3-ACB

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and BFNES)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered

throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

You will be editing one of the wiki pages today. Before editing the page today, you will be given an excerpt from a course reading which you will need to use when editing the wiki page. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page.

Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

Please take a few minutes to read the information on the page you are about to edit today.

At this point can I ask you to give me your observations about the sections?

Now I would now like you to read the following excerpt from Matthews, Deary & Whiteman (2003) on Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

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Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Unchanged- (If noticed-As you have seen) the content you added when you edited the wiki last has been added to the page

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

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Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Deleting Experiment- (If noticed-As you have seen) since you edited the wiki last another user has removed the content you added and has added their own content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

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Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

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Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aimed to observe your reaction to the dynamic nature of a wiki when creating content for your course. Today you edited the wiki in 3 conditions. In one condition your edit was left unchanged, in another condition your edit was deleted before editing the wiki again and in another condition your edit was kept and information added to it by the confederate. This was to highlight and observe your reaction to the dynamic nature of a wiki when creating content for your course. The research used a confederate to simulate this dynamism and the wiki was designed solely for the purpose of this experiment. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

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END OF EXPERIMENTAL SESSION

Script for Experiment Order BAC

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1 hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and BFNES)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

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editing the wiki page. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page.

Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

Please take a few minutes to read the information on the page you are about to edit today.

At this point can I ask you to give me your observations about the sections?

Now I would now like you to read the following excerpt from Matthews, Deary & Whiteman (2003) on Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

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Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

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(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

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Thanks

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(Give participant Excerpt)

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Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

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Thanks

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At this point can I ask you to give me your observations about the section?

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(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aimed to observe your reaction to the dynamic nature of a wiki when creating content for your course. Today you edited the wiki in 3 conditions. In one condition your edit was left unchanged, in another condition your edit was deleted before editing the wiki again and in another condition your edit was kept and information added to it by the confederate. This was to highlight and observe your reaction to the dynamic nature of a wiki when creating content for your course. The research used a confederate to simulate this dynamism and the wiki was designed solely for the purpose of this experiment. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

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END OF EXPERIMENTAL SESSION

Script for Experiment Order BCA

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour

where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and BFNES)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

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Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

Please take a few minutes to read the information on the page you are about to edit today.

At this point can I ask you to give me your observations about the sections?

Now I would now like you to read the following excerpt from Matthews, Deary & Whiteman (2003) on Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.

(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Adding Experiment – (If noticed-As you have seen) since you edited the wiki last another user has added content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Deleting Experiment- (If noticed-As you have seen) since you edited the wiki last another user has removed the content you added and has added their own content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.

(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

!!!!!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Unchanged- (If noticed-As you have seen) the content you added when you edited the wiki last has been added to the page

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

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END OF EXPERIMENTAL SESSION

Script for Experiment Order CAB

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.

(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

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(Give participants WAI-P)

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(Give the participant SSC Scenario Sheet)

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Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

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Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

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(Give participant Excerpt)

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(Give participant Task)

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Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

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Thanks

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Now you are ready to edit the wiki page. Please now take a moment to read this task. (Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed and you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Adding Experiment – (If noticed-As you have seen) since you edited the wiki last another user has added content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards editing a wiki and how satisfied you were with the wiki interface you experienced. It also aimed to observe your reaction to the dynamic nature of a wiki when creating content for your course. Today you edited the wiki in 3 conditions. In one condition your edit was left unchanged, in another condition your edit was deleted before editing the wiki again and in another condition your edit was kept and information added to it by the confederate. This was to highlight and observe your reaction to the dynamic nature of a wiki when creating content for your course. The research used a confederate to simulate this dynamism and the wiki was designed solely for the purpose of this experiment. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

Again the wiki is not active at present and is not being used as part of the teaching tools in Psychology.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Script for Experiment Order CBA

Thank you for taking part in this study. Today you will be doing some tasks on a new web based tool being tested at the University called PSYCHWIKI. This is a wiki and is aimed at Psychology students. The experiment will last approximately 1hour where you will be asked to edit some content on PSYCHWIKI. Don't worry, we are not testing you, we are testing the system. I would like to remind you that all comments and data gained here today will remain confidential and you may stop the session if you feel uncomfortable at any time. If you do not want to continue with the session let me know at any point during the experiment.

(Get them to sign a consent form before starting)

Firstly I would like to ask you a few questions about yourself.
(Ask questions on Demographic Questionnaire)

Now I would like you to complete these questionnaires before editing the wiki today. Please follow the instructions at the top of the page and complete these questionnaires.

(Given them STAI-S, STAI-T and BFNES)

We will be editing the wiki soon. Just now though I would like you to complete this questionnaire about your feelings on editing the wiki soon. To do this I would like you to tick the box that best matches your opinion about the statements. Please be as honest as possible in your answers and do not take too much time on each item.

(Give participants WAI-P)

Thanks

(Give the participant SSC Scenario Sheet)

Please take a few minutes to read the scenario sheet.

Scenario:

You are using PSYCHWIKI in your Psychology degree. The wiki aims to collaboratively build knowledge about topics covered in the Psychology Undergraduate course lectures. Each wiki page focuses on a topic covered throughout the Undergraduate course. You are contributing to the wiki for the first time, although others are already using and contributing to the site.

You will be editing one of the wiki pages today. Before editing the page today, you will be given an excerpt from a course reading which you will need to use when editing the wiki page. Please take some time to read the excerpt given to you. After reading the excerpt you will be given a task involving contributing to the live information on the wiki page.

Don't worry, you will be given all the information you need to complete the editing tasks today.

Ok, let's begin

Today you will be editing the wiki as s0621423.

Please take a few minutes to read the information on the page you are about to edit today.

At this point can I ask you to give me your observations about the sections?

Now I would now like you to read the following excerpt from Matthews, Deary & Whiteman (2003) on Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Please now take a moment to read this task.
(Give participant Task)

To start editing click on the Page Operations option in the left hand menu and select Edit. When you have finished editing click the Save button at either the top or the bottom right of the editing screen.

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-1).

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-1).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire. (WikiUsab-1)

!!!!!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Thanks.

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Deleting Experiment- (If noticed-As you have seen) since you edited the wiki last another user has removed the content you added and has added their own content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-2)

Thanks. Now I would like you to complete this questionnaire about how you felt when you edited the wiki (WikiAnx-2).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-2)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Adding Experiment – (If noticed-As you have seen) since you edited the wiki last another user has added content.

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-3)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-3).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-3)

!!!!!!!!!!!!!!!!!!!!!!!!REFRESH PAGE!!!!!!!!!!!!!!!!!!!!!!!!

Thanks

Now imagine that some time has passed are you are now ready to edit the wiki again. Please take some time to read the section you edited previously.

At this point can I ask you to give me your observations about the section?

Unchanged- (If noticed-As you have seen) the content you added when you edited the wiki last has been added to the page

I would now like you to read another excerpt from Matthews, Deary & Whiteman (2003) about Genetics and Personality. Please take as long as you need to read the excerpt.

(Give participant Excerpt)

Now you are ready to edit the wiki page. Please now take a moment to read this task.
(Give participant Task)

Before you start editing I would like to remind you that you are editing live content that other users can access and see. Also please use your own words when editing the wiki. (After edit) Please check to see if your edit has been saved to the page.

Thanks. Please now fill in this brief questionnaire thinking about how you feel at this moment (State-4)

Thanks. Now I would like you to complete this questionnaire about you felt when you edited the wiki (WikiAnx-4).

Now I would like you to think about the experience you had when editing the wiki there whilst completing this questionnaire (WikiUsab-4)

A pdf copy of their final page should be taken to ensure that all tasks were completed successfully.

Thank you again for taking part in this research. I am now going to ask you a few short questions about your experiences today.

Debrief:

Thanks you again for taking part in this research. Your help is much appreciated. The aim of the experiment today was to measure your emotional reactions towards

editing a wiki and how satisfied you were with the wiki interface you experienced. It also aimed to observe your reaction to the dynamic nature of a wiki when creating content for your course. Today you edited the wiki in 3 conditions. In one condition your edit was left unchanged, in another condition your edit was deleted before editing the wiki again and in another condition your edit was kept and information added to it by the confederate. This was to highlight and observe your reaction to the dynamic nature of a wiki when creating content for your course. The research used a confederate to simulate this dynamism and the wiki was designed solely for the purpose of this experiment. If you would like to know more about this research and be informed of the results then please fill in this contact form and I would be happy to let you know our findings.

Again the wiki is not active at present and is not being used as part of the teaching tools in Psychology.

So as not to influence other students who may be completing the experiment at a later date, I would like to ask you to try and refrain from revealing the motivations of the experiment to your fellow students. Also if you know of any fellow Psychology students who you feel would like to take part, please get them to email me as soon as they can on b.cowan@ed.ac.uk.

END OF EXPERIMENTAL SESSION

Appendix 3.9- Interaction Graphs in Chapter 5 Item Analysis

Figure A. 30- Graphical representation of the interaction between condition order and identity conditions on WAI item 2 mean score

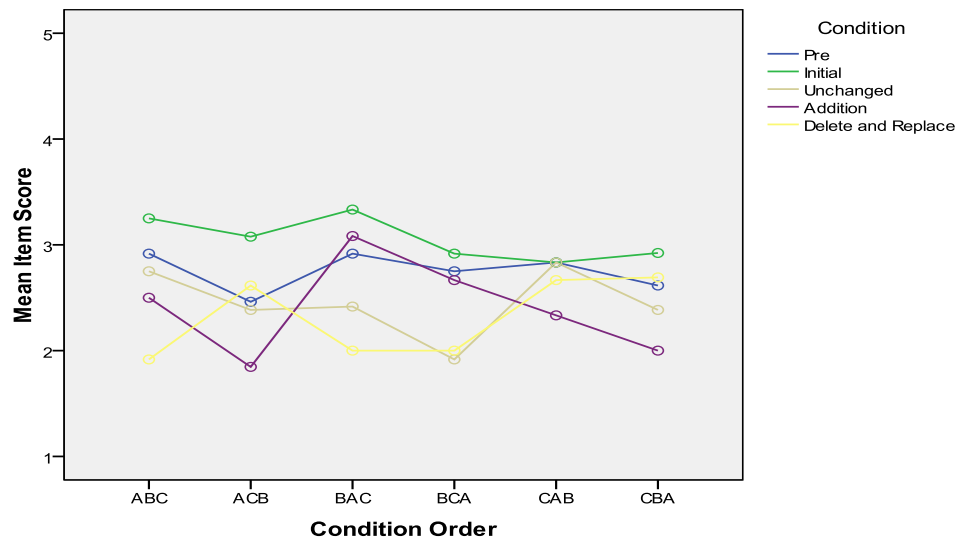


Figure A. 31- Graphical representation of the interaction between condition order and identity conditions on WUI item 10 mean score

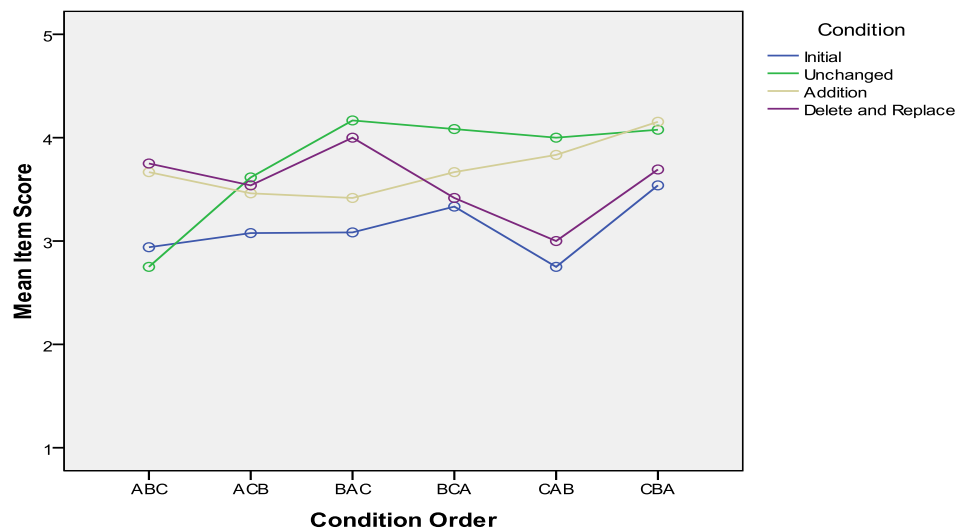


Figure A. 32- Graphical representation of the interaction between condition order and identity conditions on WUI item 14 mean score

