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PHD

The Effects of Day-to-Day Interaction via Social Network Sites on Interpersonal Relationships

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*The effects of day-to-day interaction via social network sites on interpersonal
relationships*

David Joseph Houghton

A thesis submitted for the degree of Doctor of Philosophy

University of Bath

School of Management

October 2012

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LIST OF ACRONYMS

CAT: Communication Accommodation Theory

CMC: Computer-Mediated Communication

CPM: Communication Privacy Management

DAT: Discrepancy Arousal Theory

ERG: Existence, Relatedness, Growth (a theory of human needs)

EVT: Expectancy Violation Theory

FtF: Face-to-Face

IAT: Interpersonal Adaptation Theory

ICT: Information Communication Technology

IM: Instant Messenger (e.g. Skype chat, Windows Live Messenger)

IRC: Internet Relay Chat (e.g. an open online chat room)

JSDQ: Jourard Self-Disclosure Questionnaire

SDSS: Self-Disclosure Situation Survey

SET: Social Exchange Theory

SM: Social Media

SMS: Short Message Service |(aka: Text Message). Text communication via digital mobile network devices.

SNS: Social Network Site (e.g. Facebook)

SPSS: Statistical Package for the Social Sciences (aka: IBM SPSS Statistics)

SPT: Social Penetration Theory

URT: Uncertainty Reduction Theory

Abstract

The current research identifies the impact of sharing day-to-day information in social network sites (SNS) on the relationships we hold within and outside of them. Stemming from the literature on self-disclosure, uncertainty reduction, personal relationships, privacy and computer-mediated communication (CMC), a concurrent triangulation research strategy is adopted to identify the patterns of relationship development and interaction in SNS. Using a mixed methods approach, five studies were conducted to determine how young adults interact via SNS. Empirical findings suggest SNS users are driven by the need to reduce uncertainty and gather information about their interaction partners. An interaction between several factors was found to impact on relationships between communication partners: the frequency of information sharing; the content of the shared information; the type of relationship held between the sender and recipient; the stage of relationship development; the medium of communication, and; an expected social contract. A conceptual model of interpersonal interaction within SNS environments is proposed, identifying the links between sharing, certainty and relationship quality, and manifested communication behaviour throughout relationship development. Implications for the fields of communication science, CMC, and social and behavioural psychology are discussed.

Related publications from the author

Several ideas and pre-conceptual works of this thesis have been published in peer-reviewed sources. They include (a) identifying what privacy is in lay terms and identifying links between offline and online interactions on our perceptions of others; (b) the concept of overcrowding other online users through over sharing; and (c) the use of linguistic markers to identify sensitive posts in Twitter.

(a) Houghton, D. J., & Joinson, A. N. (2010). Privacy, Social Network Sites, and Social Relations. *Journal of Technology in Human Services*, 28(1), 74-94.

(b) Joinson, A. N., Houghton, D. J., Vasalou, A., & Marder, B. L. (2011). Digital Crowding: Privacy, Self-Disclosure and Technology. In S. Trepte & L. Reinecke (Eds.), *Privacy Online. Perspectives on Privacy and Self-Disclosure in the Social Web* (pp. 31-44). Heidelberg and New York: Springer.

(c) Houghton, D. J., & Joinson, A. N. (2012). *Linguistic markers of secrets and sensitive self-disclosure in Twitter*. Paper presented at the 45th Hawaii International Conference on Systems Sciences, Maui, HI.

1. Introduction

The present research identifies the effects of day-to-day information sharing in social network sites (SNS) on relationships. Using multiple samples of Facebook user across five studies, the current work identifies the effects of the content and channel of communication on the quality of relationships with different recipient types and at discrete relationship stages. A mixed methods, triangulation research strategy is used to ascertain the links between information sharing and perceived liking of disclosers and recipients. Simultaneously, the motivations and appropriateness of sharing with expected audiences in Facebook are addressed from the perspectives of the fields of communication, behavioural and social psychology and human computer interaction; to which each of the current research outcomes claim a contribution. Figure 1.1 shows the research focus of the current work with regard to the key contributing fields: the communication and psychology literature, including disclosure, uncertainty reduction theory (URT) and privacy; the body of literature on the use of Information Communication Technologies (ICTs); and recent work on the costs and benefits of using SNS.

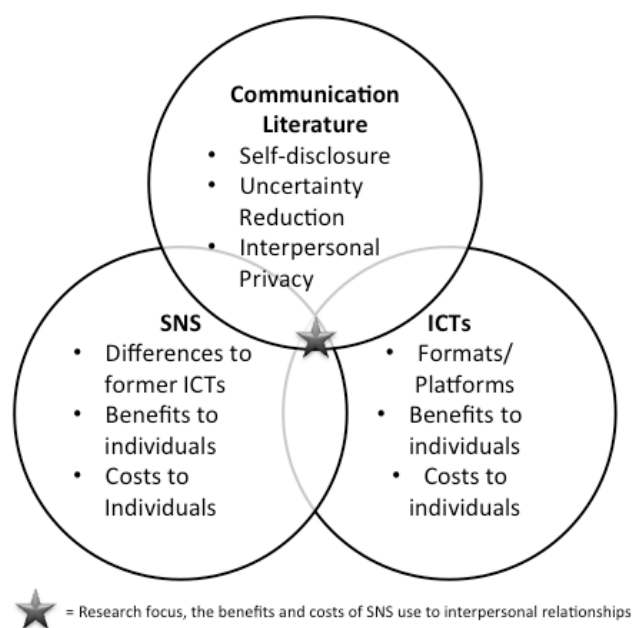


Figure 1.1: Research focus and contributions to wider bodies of knowledge

Other areas of literature that may impact upon or be contributed to by the current work are acknowledged below. However, the following are not included due to scope and time limitations of the present research, and may be considered for future research or discussion. Such research fields comprise communication literature on Discrepancy Arousal Theory (DAT)(e.g. Cappella & Greene, 1982), Communication Accommodation Theory (CAT)(e.g. Giles, Taylor, & Bourhism, 1973), and Interpersonal Adaptation Theory (e.g. Burgoon, Stern, & Dillman, 1995), each of which are discussed with comparison to uncertainty reduction theory in section 2.3.1. Other areas of research that could impact upon the current work are trust and its influence on decisions to disclose (e.g. Johnson-George & Swap, 1982; Larzelere & Huston, 1980; Rempel, Holmes, & Zanna, 1985) – within social and behavioural psychology; and, privacy from the perspective of website security and civil liberties (e.g. Bonneau & Preibusch, 2009; Lyon, 2001; Miyazaki & Fernandez, 2000) – within both sociological and security frameworks. Work in the field of sociology may impact on why individuals interact online and how interactions may impact liking and vice versa, but is not included due to the psychological and communications focus adopted. In addition, the current research does not make a contribution to social cognition and the human brain from an evolutionary and neurological psychology perspective (e.g. Adolphs, 1999; Dunbar, 1995), yet the mechanisms of neural networks may impact on disclosure decisions and the liking of others. Broadly, a marketing and media literature base is not included within the current thesis - whereas information systems research within a business and management framework is considered - in particular external influences such as businesses, media and marketing on user behaviour through adverts and general marketing placed within and outside of the environments in which people share online (e.g. Chu, 2011; Kaplan & Haenlein, 2010).

Within the social and behavioural psychology literature, Social Identity Theory may impact on the decision to share in order to identify with others or have one's own identity verified by a group (e.g. Hogg & Abrams, 1988; Tajfel & Turner, 1979) and is acknowledged here but does not form part of the current research. Social Learning Theory, within the developmental and social psychology literature may also indicate why individuals adopt similar sharing behaviour to others (e.g. Bandura, Ross, & Ross, 1963), but the aims of the present research are to identify the type of sharing between individuals already occurring and the types of information disclosed based on the quality of the relationship, rather than a vicarious learning process of disclosure. Although the importance in individual differences amongst dyads and SNS users is recognised, differences in personality or personal background (e.g. Christofides, Muise, & Desmarais, 2009; Fischer & Juni, 1982; Ross et al., 2009), on the motivations or decisions to disclose or the content disclosed are not included herein. A final consideration is the body of literature on self-discrepancy theory, self-regulation theory and self-presentation theory alongside social anxiety, which may impact on a user's decision to share information online based on the expectations of their different relationships, their status as an individual, or potential consequences to their ought, actual, expected and perceived self (e.g. Carver & Scheier, 1981; Goffman, 1973; Higgins, 1987; Marder, Joinson, & Shankar, 2012). Undoubtedly each of the above theories, topics and research bases are important but to include all of the above would be impractical. However, consideration to each of the above may be given in future work.

1.1. Background

ICTs provide users with the opportunity to connect to others geographically close and distant via different formats including text, pictures, audio, video, animations, shared URLs and gaming, and can include traditional communication channels such as the telephone network. As early as 1984 the effects of networked computer-mediated communication (CMC) raised questions about the changing nature of interpersonal connectivity: -

“Today, no one can predict in any detail the nature of the transformations that computers will bring, but one aspect of life that will certainly be affected is communication... Computers could make communication easier, just as the canning of perishables and the development of can openers made food preparation easier, or they could have much more complex implications” (Kiesler, Siegel, & McGuire, 1984, pp. 1123-1124).

Since Kiesler et al. (1984) made this statement computer hardware and software platforms for interpersonal communication have continued to evolve. Throughout the 1980s and early 1990s email, newsgroups, UseNets and forums increased in popularity. By the late 1990s AOL and MSN developed web portals that incorporated Instant Messenger (IM), Internet Relay Chat (IRC), email and Internet search functions. Currently, Voice over IP (VOIP) services such as Skype allow users to conduct audio and video calls online while simultaneously sharing files, screens and ‘whiteboards’, and using IM. The move to web 2.0 marks a change in communication patterns from one-to-one conversations and the one-to-many broadcast nature of personal and business webpages, to user-generated content. However, throughout these technological advances it cannot be assumed that the underlying psychological processes, motivations

or outcomes of communication have remained consistent. Therefore, the present work addresses the issue of information sharing and its impact on relationship qualities in the new era of web2.0, specifically SNS platforms, to determine the complexity of the implications of their use between individuals.

SNS have been defined as: -

“Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system” (Boyd & Ellison, 2008, p. 211).

SNS platforms allow simultaneous one-to-one, one-to-many, and many-to-many communication via text, photographs, IM, direct messages (akin to email) and videos (Boyd & Ellison, 2008). Communication can occur synchronously and asynchronously. Millions of users interact via these platforms each day. Facebook is the most popular SNS with over 955 million active users worldwide¹, and 2.5 billion pieces of information and more than 500 terabytes processed each day². Users click ‘Like’ 2.7 billion times and share 300 million photographs per day². As SNS are increasingly popular with millions of users connecting within and beyond the platform, it is important to understand the effects of SNS use to identify the potential benefits and costs to the relationships between users.

The benefits of sharing personal information and conversing with others are widely established in common practice and the extant interpersonal communication

¹ <http://newsroom.fb.com/content/default.aspx?NewsAreaId=22> accessed September, 2012.

² <http://techcrunch.com/2012/08/22/how-big-is-facebooks-data-2-5-billion-pieces-of-content-and-500-terabytes-ingested-every-day/> accessed August, 2012.

literature. As Ellison and colleagues note, “the primary function of these sites is to consume and distribute personal content about the self” (Ellison, Vitak, Steinfield, Gray, & Lampe, 2011, p. 19). To establish a relationship individuals must gain access to, gather and evaluate information about others (Altman & Taylor, 1973; Berger & Bradac, 1982). The frequency of information exchange between individuals in the early stages of a relationship is higher than in periods of relational consistency (Altman & Taylor, 1973; Berger & Bradac, 1982). To become intimate, individuals increase the depth of their information disclosure between one another, to allow access to previously withheld information (Altman & Taylor, 1973; Berger & Bradac, 1982; Taylor & Altman, 1966; Worthy, Gary, & Kahn, 1969). An increase in the amount (frequency) and level (depth) of self-disclosure has been linked to an increase in liking between individuals (Altman, 1975; Collins & Miller, 1994; Cozby, 1972), and enough information about another is required to reduce uncertainty and allow a relationship to build (Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975). However, it is further suggested that over-disclosure can also have negative effects on a relationship, for example disclosing intimate information to a new acquaintance can result in the recipient withdrawing from the conversation and deeming the discloser as deviant (Altman & Taylor, 1973; Berger & Bradac, 1982).

As demonstrated above, the large amount of data processed each day and the aim of SNSs to distribute personal data can provide network connections with the information traditionally required to develop and maintain a relationship. However, as CMC environments continue to develop, it is critical to identify the effects of sharing such large quantities of data to avoid relying on the assumption – often clear in the developments of SNS - that communication on this scale benefits interpersonal relationships due to ease of access.

To identify the processes and relational outcomes of communication via SNS, previous research on interpersonal communication and the use of pre-SNS ICTs must be addressed. While the benefits and drawbacks of information sharing are understood in the interpersonal communication literature, research to date has focused on offline ‘traditional’ communication (e.g. Altman, 1975; Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Chelune, 1979b; Cozby, 1973; Petronio, 2002), or early ICTs including email, phone technology, network communities and IM (e.g. Boneva, Kraut, & Frohlich, 2001; Hampton & Wellman, 2003; Ramirez & Zhang, 2007; Rheingold, 1993; Shklovski, Kraut, & Cummings, 2008; Tanis & Postmes, 2007; Tidwell & Walther, 2002). More recently there has been a growing body of literature on the use of social media (e.g. Acquisti & Gross, 2006, 2009; Binder, Howes, & Sutcliffe, 2009; Marwick & Boyd, 2011; Park, Kee, & Valenzuela, 2009; Wondracek, Holz, Kirda, & Kruegel, 2010), which typically concentrates on the impact of sharing information for personal privacy, being unaware of audiences and their expectations, and the de-anonymising of users. It is unclear what the effects are of day-to-day information sharing on relationships with known audience members.

The effects investigated in the current work are those resulting from *deliberately* and *knowingly* sharing similar information across *boundaries* and *contexts* with new and established relationships. *Similar* information refers to sharing information of the same format but with different content, i.e. sharing photographs with different depictions. Sharing across *boundaries* and *contexts* refers to disclosing information for different purposes with different relationship types typically held in SNS. The contributions of this thesis come from identifying the outcomes of using SNS to communicate through a single theoretical lens comprised of the perspectives of self-disclosure, uncertainty reduction and the need to connect with others. Figure 1.2 illustrates how the current

work combines traditional communication literature and research on SNS interaction to improve the current body of knowledge.

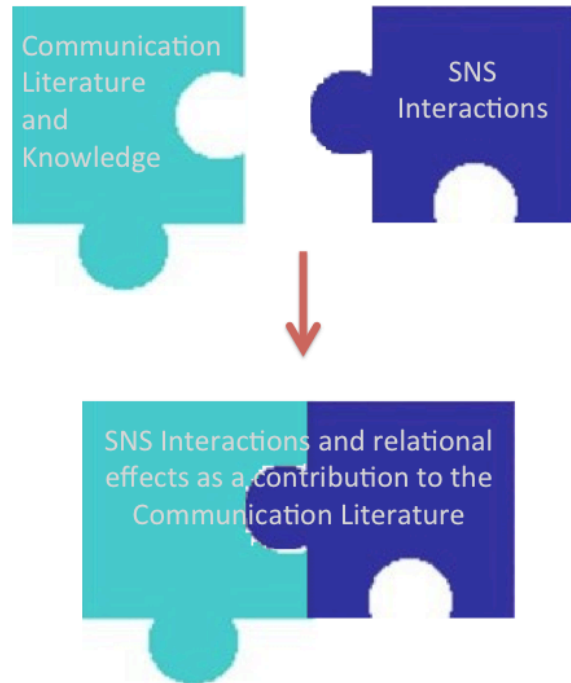


Figure 1.2: Combination of new SNS research with pervious communication literature.

In order to fulfil this objective, a review of the traditional communications literature on self-disclosure, uncertainty reduction, the need to connect with others, relationship development, pre-SNS ICTs and current SNS knowledge is conducted in Chapter 2. The following research questions and hypotheses, derived from the following literature review, are addressed by the empirical work in chapters 4, 5 and 6.

1. SNS use and relationships:
 - a. How does information sharing in SNS environments strengthen or weaken our relationships?
 - b. How do the features of SNS affect the qualities of our relationships?

- c. How does the sharing of information in SNS affect our relationships with different types of recipient?
2. Relationship progression and uncertainty:
 - a. Is there a relationship between stage of relationship and sharing information in SNS?
 - b. Is there a relationship between certainty and SNS use with others?
3. Balancing disclosure and privacy for successful outcomes:
 - a. How are privacy and self-disclosure balanced in SNS to manage relationships?

H1: Different relationship types will have different levels of relationship qualities to each other.

H2: Different targets have different uses of Facebook.

H3: There will be an association between the information shared (both type and frequency) and relationship quality.

H4: There will be an interaction between the relationship type, the type and frequency of information shared, and the relationship qualities held with that relationship type.

H5: Participants will communicate with Old friends more frequently than New friends across all mediums.

H6: Certainty will correlate positively with liking for all participants (sample validation).

H7: Sharing (information seeking and interaction) will lead to greater certainty.

H8: Sharing (information seeking and interaction) will lead to greater liking.

H9: The relationship between Sharing (information seeking and interaction) and liking will be mediated by certainty.

The research questions are addressed using empirical research with a mixed methods research strategy. Using the findings of studies 1-5, triangulation is conducted to fulfil the research objectives and resolve the research questions. Within this strategy not all studies provide evidence for all research questions. Figure 1.3 illustrates the research questions each study is targeted to answer³. The use of a concurrent triangulation research strategy ensures that an advantage is gained where several studies target the same research question.

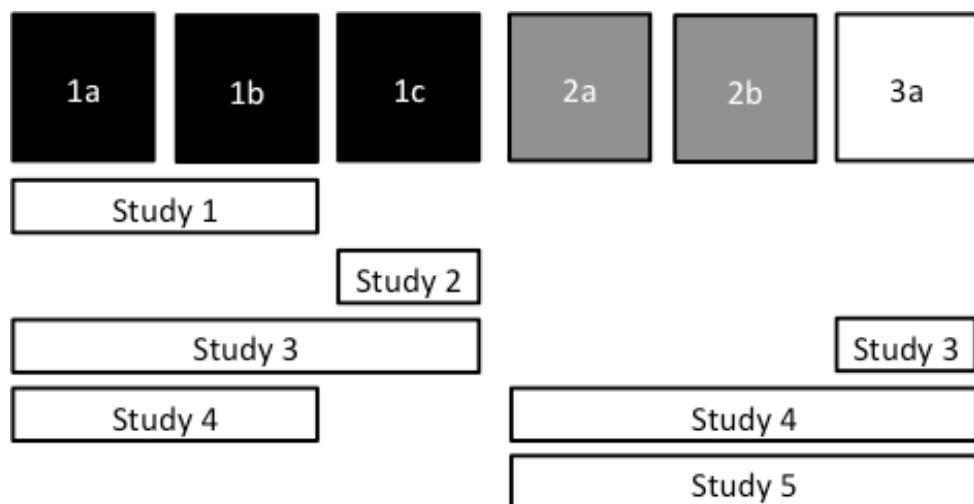


Figure 1.3: Study plan to inform answers for research questions

³ Studies 1 & 2 inform the design of Study 3, and partially answer their respective research questions.

2. Literature Review

The key search terms and synonyms used in the literature review relate to relationships, self-disclosure, information sharing, uncertainty reduction, privacy, friendship, liking, CMC and SNS. A brief introduction is given at the beginning of each section of the literature review to signpost the topics covered.

The self-disclosure section identifies literature originating in the 1950s on how individuals disclose to others and to whom they choose to disclose. In addition, research throughout the 1970s and 1980s begins to identify the processes and reasons for self-disclosure. Self-disclosure has been linked to Uncertainty Reduction Theory (URT), which states that to reduce uncertainty about others information about them must be obtained. Competing theories of URT are outlined briefly before more detail on URT is investigated. Privacy is identified as marking the opposing end of a continuum of self-disclosure. Although privacy theories are not in direct opposition to self-disclosure they emphasise the use of different levels of disclosure to obtain or forego privacy, revealing or concealing information.

Within the present work trust is not researched explicitly. Trust has been identified as a component of disclosure and relationship development (e.g. Joinson, Paine, Reips, & Buchanan, 2006; Larzelere & Huston, 1980; Rempel, et al., 1985; Wheelless, 1978). In the main, trust-disclosure research focuses on the belief that a shared disclosure will not be further disseminated (Petronio, 2002). In the present thesis, rather than using the term 'trust', which nowadays tends to focus on the lack of control, predictability and the beliefs of the trustor (e.g. Joinson, Reips, Buchanan, & Paine, 2010), a focus is placed on the specific disclosure-trust nexus of boundaries and boundary permeability (e.g. Altman, 1975; Derlega & Chaikin, 1977).

When communicating via SNS users must disclose information for others to view, allowing them to engage with one another. A key element of forming relationships is that people ‘like’ one another – or establish a bond - and therefore a review of the liking and friendship literature is included. Previous work on the use of CMC and relationships is outlined to establish the processes and results of disclosure in other platforms. The layout of this literature review can be seen in Figure 2.1. Topics are progressed from left to right before outlining the current research focus.

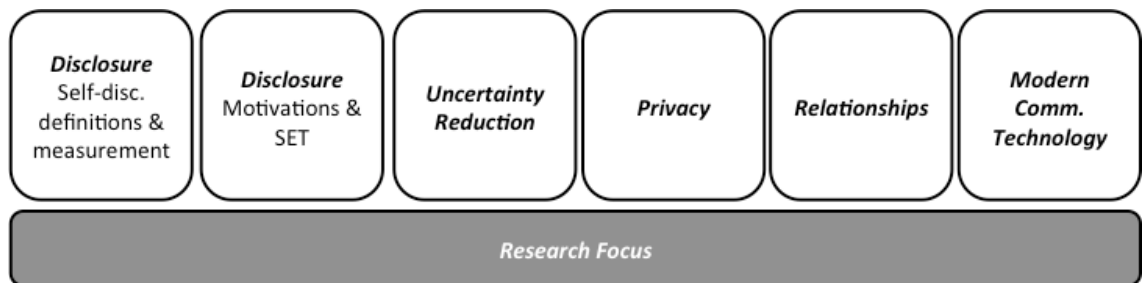


Figure 2.1: The Literature Review

2.1 Disclosure

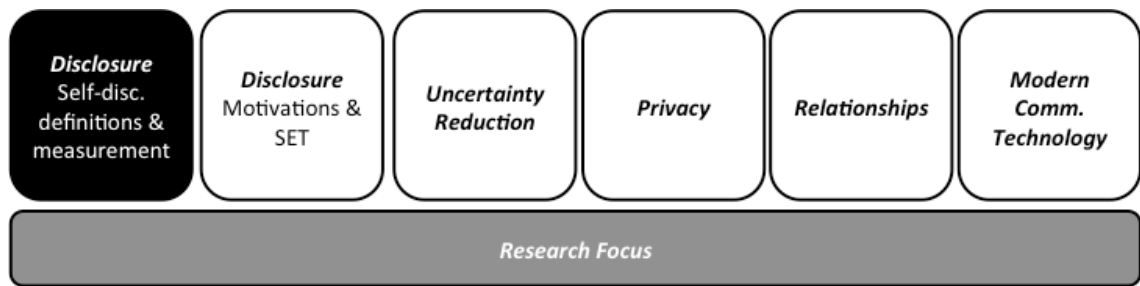


Figure 2.2: Self-Disclosure Review

2.1.1. Self-Disclosure definitions, measurement and influences

Self-disclosure is necessary in SNS environments for users to be able to share information about themselves and provide the content that others browse and interact with (Boyd & Ellison, 2008; Burke, Marlow, & Lento, 2009). Information that users can share via SNS includes updates about themselves and their thoughts via short text-based messages, photographs of interest, videos and URLs, amongst others (Boyd & Ellison, 2008). Although users can upload information about others via text, video or photographs it is the phenomenon of intentional information sharing by information subjects and the effects on the relationships held with others that are under investigation in this thesis (i.e. users are not under duress, sharing information by mistake, or leaking more sensitive information to the ‘wrong’ audience). Therefore, to understand disclosure in SNS it is important to identify early work on the process of self-disclosure, what motivates an individual to disclose information about themselves and how others perceive it.

Self-disclosure is a critical part of relationship development. Early research by Sidney Jourard focused on self-disclosure as a method to achieve and understand good mental health (Chelune, 1979a; Rosenfeld, Civikly, & Herron, 1979). Jourard (1971) argued that only by disclosing information about the self to others, do individuals

successfully begin to understand themselves and self-actualise. This understanding links strongly with the humanistic approach of psychology.

The first era of self-disclosure research was concerned with a trait approach to self-disclosure (Chelune, 1979a). In particular the research focused on the properties of self-disclosure as if they were stable personality constructs (Chelune, 1979a). The variation in self-disclosure observed was typically studied in terms of the target individual to which a person had disclosed (Chelune, 1979a). For example, the Jourard Self-Disclosure Questionnaire (JSDQ) asks participants if they have disclosed information about a variety of topics with different intimacy levels to one of several target individuals, such as a mother, father, partner and friend (Jourard & Lasakow, 1958).

Many of the early demographic and personality correlation results have either been contradicted, received little empirical support, or been only partially replicated (Chelune, 1979b; Dindia & Allen, 1992). The second era of self-disclosure research shifted focus from personality traits and target individuals to the *processes* involved in self-disclosure, e.g. motivations and reciprocity (Archer, 1979; Chelune, 1979a). This paradigm typically follows social exchange theories (e.g. Altman & Taylor, 1973; Homans, 1958). As Chelune (1979b) suggests, studies of this era used self-disclosure as an independent variable against ratings of intimacy, or self-descriptive statements given by those communicating with confederates (e.g. Derlega, Harris, & Chaikin, 1973; Worthy, et al., 1969).

In the late 1970s Chelune (1979a) called for a third era of self-disclosure research. He stated that self-disclosure research appeared to be moving toward interactions between the person and situation, shifting from the focus on personality traits and processes. Around the same period of the 1970s, Altman's (1975) work on

privacy and the environment and Derlega & Chaikin's (1977) boundaries of disclosure work began to address the issues of interaction and self-disclosure from the perspective of disclosure decisions. The interaction between the self and the environment provides a good framework for the present research. The environment in this thesis may be defined as the SNS and the communication inherent within it.

There are a variety of paradigms within self-disclosure research alongside differences in definition and measurement; therefore the remainder of this section is as follows. First, the measurement and definitions of self-disclosure are outlined alongside the potential issues of each. Second, there is a discussion of the variables that affect self-disclosure. Third, motivations for self-disclosure and the rule of reciprocity are outlined. Fourth, social exchange theory (SET) of self-disclosure is discussed.

2.1.2 Self-Disclosure Definition

Since the early research of Jourard there have been several definitions developed to cover more specific aspects of self-disclosure. However, these narrow definitions risk defining only part of self-disclosure, and the results of various studies become difficult to compare (Chelune, 1979a). Questions that should be considered before conducting self-disclosure research relate to its definition and precisely what is being measured, alongside its use as an IV, a DV, or an interaction process. Archer (1979) states that conflicts in the research on self-disclosure can arise as researchers use different definitions. Archer notes that some identify self-disclosure as the interpersonal interaction, and others view it as the content that is disclosed.

Jourard's early work gives a broad definition of self-disclosure as, "the process of making the self known to other persons" (Jourard & Lasakow, 1958, p. 91). This suffers the same shortfall as his later definition, that simply perceiving or knowing

about somebody does not mean that they have disclosed directly and does not define what type of information constitutes self-disclosure. For example, a person with brown hair can be seen by others in public to have brown hair. If they announce that they have brown hair it may not be considered a disclosure as it can already be seen. Such a proclamation in public, even though benign, may see the discloser labelled a social deviant due to the unsuitability of the environment for such disclosure (Altman, 1975).

Later refining his definition, Jourard (1971, p. 19) proclaims, “self-disclosure is the act of making yourself manifest, showing yourself so others can perceive you.” This is quite a broad definition and centres on others being able to *perceive* you. This definition answers the question regarding self-disclosure existing regardless of personal expression of information, as observed in the previous example. However, others may perceive an individual regardless of the information being disclosed by the data subject or another. Thus raising the issue of the inclusion of the word ‘self’ in self-disclosure and identifying concerns over control of information disclosure (more detail on information management can be found in the Privacy section of this literature review).

Derlega & Grzelak (1979) call for a more rigorous definition of self-disclosure. However, a more rigorous definition may suffer because it is too narrow. Derlega & Grzelak (1979) define self-disclosure as any verbal message that begins with ‘I’ or contains anything about the self, which could be considered to have added little precision. This definition only allocates a disclosure as self-disclosed if done so verbally. Whereas physical presence, e.g. revealing one’s hair colour in public, body language or a written excerpt may also constitute a self-disclosure.

Other definitions also suffer from being too narrow. For example, restricting a disclosure to information that is verbally disclosed, new, of a particular intimacy to be worth receiving, or that it must involve a recipient (e.g. Chelune, 1979b; Cozby, 1972,

1973; Derlega & Grzelak, 1979; Dindia & Allen, 1992; Jourard, 1959; Worthy, et al., 1969). If information about the self is announced aloud but is not heard by anybody, it becomes difficult to determine if it is a self-disclosure. Cozby defines self-disclosure as “any information about himself which Person A communicates verbally to Person B” (Cozby, 1973, p. 73). However, if it is written, or in the modern era made available over the Internet via photographs or status updates, this definition would not consider the expression to be a self-disclosure. Cozby’s definition of ‘verbal’ could be conceived to include any written or personal communication, however it is not defined as such. Chelune (1979a) notes that in Cozby’s definition the information must be about person A, i.e. be personal information. Chelune addresses the issue of others disclosing information about person A and it being labelled self-disclosure. However, it does not mean that if personal information about person A is disclosed by a third party that it is not subject to the same consequences to the relationships the data subject holds with others (e.g. Houghton & Joinson, 2010).

Worthy, Gary & Kahn (1969) use a similar but further refined definition to that of Cozby (Chelune, 1979a). They define disclosure as “that which occurs when A *knowingly* communicates to B information about A which is *not generally known* and is not otherwise available to B” [italics added] (Worthy, et al., 1969, p. 59). Worthy et al.’s definition emphasises that information must be *knowingly* communicated, and that it is *not generally known*. Using the earlier example of a person in public with brown hair, an announcement of that information would not be considered a self-disclosure, as it is already generally known. Additionally, the individual can expect that this information *is* knowingly communicated in public environments unless their head is covered.

Allen (1974) adds to the debate over the definition of self-disclosure by stating that the disclosure must be ‘uncoerced’ (Chelune, 1979a). However, if under duress a disclosure about the self is made, presuming it were correct, it would still be *self*-disclosure. Such disclosure may not have been shared willingly and any information obtained through coercion will suffer poor validity, as well as ethical viability. Nonetheless, it may still constitute self-disclosure. For example, if person A asked person B for their telephone number and person B did not wish to share it with person A but the social norm was to do so, then it may be reluctantly shared and would constitute a self-disclosure.

The example of exchanging telephone numbers highlights a further issue with the definition of self-disclosure. In the majority of the definitions outlined above, self-disclosure is termed as information about the self. A phone number is not ‘about the self’, but a property of one’s life and personal information. Such revelations may normatively be considered self-disclosure. In the literature concerning the disclosure of personal information via SNS, such biographical, geographical and demographical information disclosure is considered self-disclosure although not strictly termed as such (e.g. Acquisti & Gross, 2009; Christofides, et al., 2009).

Self-disclosure can also vary on its dimensionality. One approach is to treat self-disclosure as if it were unidimensional, such as the process of revealing information while not considering other aspects such as time and scenario (Chelune, 1979a; Derlega & Grzelak, 1979; Wheelless, 1978). An alternative approach is to treat self-disclosure as if it were multidimensional, consisting of both person and environment variables (Chelune, 1979a), (e.g. Altman, 1975; Petronio, 2002). There may also be moderating or mediating variables between self-disclosure and outcome variables such as

reciprocity or liking, e.g. age and gender, and place, mood and receiver characteristics respectively (Altman, 1975; Altman & Taylor, 1973; Chelune, 1979b; Petronio, 2002).

It has further been argued that disclosure varies along two dimensions: breadth and depth (Collins & Miller, 1994; Joinson, 2001; Moon, 2000; Spiekermann, Grossklags, & Berendt, 2001; Tidwell & Walther, 2002). Breadth relates to the quantity of information disclosed (both frequency and category), and depth to the quality. Depth can range from surface information, for example demographic data, to deeper aspects, such as sexual fantasies and desires (Joinson & Paine, 2007). Altman & Taylor (1973) suggest that when thinking about the information people disclose about themselves we should think of the person as comprising many different ‘layers’, akin to an onion. The core or central layers contain fewer aspects of the self (less breadth), but these aspects are much deeper and more central to our self-concept. Breadth of self-disclosure can vary along two planes: frequency and category (Altman & Taylor, 1973). Category refers to the different types of information one may reveal about a particular characteristic, and frequency refers to the number of occurrences of disclosure.

Self-disclosure in this thesis will be defined as:

“Information intentionally communicated about person A to any person(s) via any form of communication and interaction by person A”.

Information that is about person A but not disclosed by person A in any form of communication will be considered a privacy violation due to another individual or group sharing person A’s information without their doing so (e.g. Houghton & Joinson, 2010). A discussion of self-disclosure measurement now follows to identify suitable methods for use in this thesis.

2.1.3. *Self-Disclosure Measurement*

Due to the variety of definitions and operationalisation used in the field, self-disclosure has been measured in a number of ways. Methods of measuring levels of self-disclosure include self-report surveys, behavioural observation, and objective metrics (Chelune, 1979b; Joinson, 2001).

2.1.3.1. Self Report Measures. One of the few validated measurement questionnaires, the JSDQ, consists of six sub-scales including attitudes and opinions, tastes and interests, work, money, personality and body, each containing ten items (Jourard & Lasakow, 1958). The self-report survey asks participants to indicate which items they have discussed with four different target individuals – mother, father, best opposite-sex friend, and best same-sex friend. Items include, “How I wish I looked: my ideals for overall appearance”, “How I feel my work is appreciated by others”, and “The aspects of my personality that I dislike, worry about, that I regard as a handicap to me” (Jourard & Lasakow, 1958). Taylor & Altman (1966) used the JSDQ, which refers to frequency and category of disclosure, and the Thurstone procedure, which is an early form of paired comparison (Taylor & Altman, 1966), to determine intimacy scales, or *depth* of self-disclosure.

Completing the survey, however, is fairly time consuming. A reliance on self-reports of self-disclosure may result in impression management or social desirability. Participants may not reveal to- or may act to impress- the researchers with what or why they have disclosed to a particular target if it is particularly private or sensitive to them. Furthermore, the use of only four target individuals in self-report surveys of disclosure (e.g. Chelune, 1976b; Jourard & Lasakow, 1958) restricts the options available to participants: self-disclosure may exist between other significant individuals. Therefore,

self-report surveys for self-disclosure may offer face validity, but suffer the limitations of reduced construct or predictive validity. Nevertheless, it is recognised that with the number of questions involved in the full JSDQ it may not be practical to collect information on more than four target recipients.

When measuring self-disclosure it is important to observe the perspective and goals of the researcher (Archer, 1979). The JSDQ measures self-disclosure from the participant's perspective by asking what they *had* disclosed previously to different target individuals, i.e. their history of self-disclosure within a confined time period (Chelune, 1979a). As Jourard takes a humanistic perspective to self-disclosure as a process to achieve good mental health and self-actualisation (Archer, 1979), the JSDQ forms a strong basis to measure self-disclosure for reflection purposes. Self-reflection requires a measure to be history related, i.e. information that *has* been disclosed to person B. History measures are used by framing questions of behaviour around a certain time period, e.g. "in the last two weeks..." (Archer, 1979; Chelune, 1979a). This framing can cause restrictions of validity. Participants might be willing to disclose highly personal and intimate information to a target but have not done so in the specified period. For the participant to recall all disclosure or relevant disclosure may be difficult, especially if participants cannot remember or recall the disclosures between themselves and a target individual in that timeframe (Archer, 1979; Chelune, 1979a).

Chelune (1979a) suggests that a good measure of self-disclosure is self-disclosure willingness, i.e. to determine the relationship of self-disclosure with a target individual, researchers can ask the question, "*would* you disclose information X to target B?" Therefore representing the process involved in deciding to disclose to target B, whereas a history measure might be confounded with having disclosed to target B because they were perhaps the only person around at the time, or because they knew

something about the information to be disclosed (Archer, 1979). The location or state of mind of person A when deciding to disclose may be influential in the decision to disclose to a target (Archer, 1979), as well as other factors. The Self-Disclosure Situations Survey (SDSS) looks at self-disclosure from the perspective of the situation in which the individual is found, and the effects of the situation on disclosure (Chelune, 1979b). The SDSS adds a further dimension to measuring self-disclosure by choosing targets that are both individuals and groups, and measures disclosure with targets as friends or strangers (Dindia, Fitzpatrick, & Kenny, 1997).

A history measure that may not consider disclosures occurring due to the situation or knowledge of the recipient would not be valid in measuring amount or level of disclosure. However, the concern with a future ‘likelihood to disclose’ measure is that participants cannot be certain if they would disclose in the future. Whereas if they *have* disclosed, assuming they can recall the incident, participants can be certain that with a particular target, in a specified time frame, disclosure *has* occurred.

An alternative self-report measure of self-disclosure was developed by Wheelless (1978) to assess how individuals disclose to other people in general and to measure their personal baseline level of self-disclosure. Wheelless’s survey has received endorsement through its later use to measure general disclosiveness and self-disclosure in, for example, Internet dating (Gibbs, Ellison, & Heino, 2006). Information is gathered from respondents by asking them questions relating to their disclosure behaviour and does not adopt a historical approach. Questions are based on general behaviours and are in the present tense. For example, “I usually disclose positive things about myself” (Wheelless, 1978, p. 148).

Concerns are also raised with the method of measuring self-disclosure with a particular target. Questions relating to a specific target, i.e. father, may not capture the

gradation within this generalised relationship. One participant's interpersonal relationship expectations with a father may differ to others. As with other types of cross-sectional research the acceptance that a large population sample should form a normal distribution may be applicable. While it is acceptable to use these methods, consideration can be made to incorporate differences in relationships. Furman & Buhrmester (1985) in their measurement of relationship qualities with the Network Relationship Inventory (NRI) ask respondents about their relationship with a specific target type, for example a relative. Conversely, they take into account differences in relationships by asking the participant to think of their closest relative. The target could be a mother, father, sibling or grandparent, but it is the nature of the relationship that they wish to capture.

2.1.3.2. Observations and Experimental Manipulations. Other methods have been used to assess the amount and level of intimacy and reciprocity of self-disclosure. In a study of the intimacy level of self-disclosure and its elicited reciprocity, Worthy, Gary & Kahn (1969) gave participants 10 sets of 7 questions of varying intimacy levels for them to ask 3 interaction partners. Self-disclosure intimacy and its subsequent level of intimacy in (forced) reciprocation was determined by the level of intimacy the recipient chose to respond with. Therefore, self-disclosure and reciprocity were measured using observations and subjectively designed questions with varying levels of intimacy and the decision to reciprocate at the same, lower or higher intimacy level was observed (Worthy, et al., 1969).

The same ten sets of seven questions used by Worthy, Gary & Kahn (1969) were also used in Cozby's (1972) self-disclosure studies (Chelune, 1979b). Participants were exposed to low, medium or high disclosing subjects using a selection of low,

medium or high intimacy ratings on question cards. They then chose 10 of the 70 items available to discuss with their interaction partner from any of the full range of question cards (i.e. they were presented with high, medium or low disclosers, but could respond with any of high, medium or low responses). Participants then rated their partner on an eight-item impression formation scale and two liking items (Cozby, 1972). Cozby (1972) found strong support for a curvilinear relationship between self-disclosure and liking; too little or too much self-disclosure was related to lower scores of liking. Participants also matched their discloser's intimacy level; high disclosure was reciprocated to high disclosers, low intimacy to low intimacy disclosers and medium intimacy to medium disclosers.

Another method of measuring self-disclosure is to tape-record the conversations between interaction partners in experimental conditions. Dindia, Fitzpatrick and Kenny (1997) recorded conversations between married couples and strangers before coding them for interactions analysis. The coders were rating the recorded conversations for low intimacy feelings and high intimacy feelings. This method benefits from a reduction in self-report bias by participants and allows coders to review audio material after the experiment. However, it relies on the subjectivity of raters' definitions and interpretations of high and low intimacy feelings.

2.1.4. Factors that influence self-disclosure

A variety of variables are suggested to affect self-disclosure. These include age, attraction, recipient and discloser gender, status, verbal and nonverbal behaviour, and the avoidance of self-disclosure (Altman & Taylor, 1973; Archer, 1979; Brooks, 1974; Chelune, 1976a; Cozby, 1973; Gilbert, 1976; Rosenfeld, et al., 1979). Additionally, self-disclosure has been studied from four typical approaches (Rosenfeld, et al., 1979):

from the perspective of mental health and personal reflection, looking at the role of reciprocity, identifying methodological concerns, and the relationship between gender and self-disclosure (Rosenfeld, et al., 1979). This research does not aim to investigate mental health stability and personal adjustment, and therefore such an approach will not be reviewed further. Methodological concerns were reviewed in section 2.1.3. The effects of individuals as senders or receivers of information will be addressed in the remainder of this section. Reciprocity and motivations of self-disclosure are reviewed in section 2.2, introducing social exchange theory and in 2.3 uncertainty reduction theory.

2.1.4.1. Gender Variables. Gender differences have been both reported and found unsubstantiated in research on self-disclosure. For example Collins & Miller's (1994) meta-review of self-disclosure studies found an array of gender effects, but concluded that overall there was little support due to the different operationalisation and measurements between the studies investigated. However, they suggested that disclosure was more favourably received when the discloser was female and that females tended to disclose more frequently and more intimately to female recipients (Collins & Miller, 1994). When sex differences are found the general relationship is that females disclose more than males (Collins & Miller, 1994; Rosenfeld, et al., 1979). Reactions to male and female disclosure have been shown to affect a recipient's perception of a discloser's emotional health and likeability (Chelune, 1976a). Males were perceived as less likable when they disclosed more, and females were perceived as more likable when they disclosed more (Chelune, 1979b). Derlega & Chaikin (1976) found that males were seen as better adjusted if they did not disclose compared to females that did not disclose. They also found that males who monopolised conversation were seen less favourably than females who monopolised conversation.

Different patterns of self-disclosure between males and females have been demonstrated depending on the target and topic of disclosure (Jourard & Lasakow, 1958).

However, gender differences in self-disclosure differ between studies. Brooks (1974) found that females disclose more to males and males disclose more to females, suggesting a cross-sex effect of disclosure conflicting with Collin's (1994) suggestion that females disclose more to females and females disclose more, generally. Brooks (1974) found that males disclose more to high-status individuals and females disclose more to low-status individuals, suggesting a further confounding or mediating variable.

A review by Kleinke (1979) suggests that from the perspective of individual differences in the evaluator of self-disclosure (the recipient), there are no gender effects on the perception of self-disclosure. Dindia & Allen (1992) also conducted a review on sex-differences in self-disclosure, concluding that sex-differences on self-disclosure are inconsistent but the inconsistencies may be explained by moderating variables.

Therefore, support is added to the general finding that sex-differences do not directly relate to self-disclosure. A laboratory study of self-disclosure, relationships and the rule of reciprocity found no effects of gender on self-disclosure, except for some descriptive (low intimacy) self-disclosure (Dindia, et al., 1997).

The variability in results of gender influence on self-disclosure and early work on personality influence on disclosure led Rosenfeld, Civikly & Herron (1979) to conclude that differences in self-disclosure may be due to psychological gender rather than anatomical gender. Using Bem's (1974) sex role inventory Rosenfeld et al. (1979) identify the types of people in their participant pool and use this as a metric for gender and disclosure measurement in determining their psychological gender type. In their participant pool they report eight distinct types of psychological sex.

The eight types of psychological gender identified by Rosenfeld and colleagues (1979) were Masculine Males, Feminine Males, Androgynous Males (high male and female traits), Undifferentiated Males (low female and male traits), Feminine Females, Masculine Females, Androgynous Females, and Undifferentiated Females. Participants were asked to disclose to one of four targets: a friend alone, a group of friends, a stranger alone, or groups of strangers. The results did not demonstrate any general trend for any of the eight gender types and highlighted a complex relationship between psychological sex and self-disclosure levels. More generally however, some conclusions were drawn. Self-disclosure to a friend rather than a stranger has a complex relationship with psychological sex type, topic and situation circumstances. Male and female participants do not differ in their disclosure to a friend one-on-one or a group of friends. However, when disclosing to strangers, males disclose more to a group of strangers *and* to strangers one-on-one, and vary more with situational circumstances when disclosing to a stranger, than do females. For scores of the SDSS and JSDQ it was found that when recipients were not differentiated as being individuals or groups, they were scored differently if they were classified as strangers or friends, i.e. there was no main effect of number of recipients, but there was a main effect of recipient type (Rosenfeld, et al., 1979).

The general conclusion of Rosenfeld and colleagues was that if the target of a self-disclosure was a stranger then the topic and situation variables were irrelevant. Males preferred to disclose to strangers than to friends. Females preferred targets tended to be friends or strangers but disclosure interacted with topic and situation variables.

Overall, the research findings for gender effects on self-disclosure are confounding and confusing. From the literature above, the thorough meta-reviews of Collins & Miller (1994), Cozby (1973) and Dindia (1992), and from the general finding

that sex differences vary greatly depending on self-disclosure operationalisation, the present research will control for gender but no significant differences in disclosure behaviour in SNS are expected.

2.1.4.2. Recipient Variables. When disclosure occurs between interaction partners, the nature of the recipient may alter how self-disclosure is perceived, and the amount and level of disclosure received. The aphorism, “beauty is in the eye of the beholder” can be applied to self-disclosure. The perception of information received may be subject to the recipient’s interpretations of the discloser, message content and channel, situation and circumstance (Kleinke, 1979). Additionally, the value a recipient places on their being chosen as a target for information disclosure may affect how the disclosure and discloser are valued (Brock, 1968).

Kleinke (1979) discusses self-disclosure with regard to recipient effects on the way in which disclosures are received. Although research has previously observed differences in the type of target person that individuals disclose to, e.g. mother, father or a friend (Jourard, 1959; Jourard & Lasakow, 1958), Kleinke focuses on the effects of personal evaluations and self-disclosure predispositions of the recipient. The level of self-disclosure that the evaluators adhere to themselves will affect the reception of a disclosure from another. Kleinke further suggests that as well as social norms the expected disclosure levels that an evaluator is predisposed to in certain scenarios will affect the way information is received from another in the same scenario. For example, if person B is typically a high-intimacy-discloser of personal information at formal events, then person A disclosing high levels of intimacy to person B at such an event will meet their expectations. Such a level of disclosure can be in line with, or contrary to, social norms for a formal event or the social environment.

Attribution theory has been argued to be an appropriate lens through which to investigate the evaluations by recipients of self-disclosure (Kleinke, 1979). Kleinke proposes that the greatest effect of an attributional variable on receipt of a disclosure is that of timing and personalism of the message. For example, a late disclosure in the development of a conversation may increase personalism of the message as the recipient evaluates it as less likely to be disclosed to everybody and that they personally have been chosen due to the increased intimacy of their relationship. A late disclosure is likely to be evaluated by a recipient as reflecting their own likability and social perspective.

The recipient of a disclosure is more likely to reciprocate if the information is personalised to them (Jones & Gordon, 1972), i.e. the message is attributed to the recipient who is more likely to perceive it as personalised to them because they are seen favourably by the discloser. Jones & Gordon highlight that the personalised message content does not need to be aimed directly at the recipient. The recipient must perceive it as attributed to them, as opposed to the content being a general message or disclosure, for the message to have the effects of personalisation.

The number of recipients of a disclosure is argued to affect the value of the message received (Brock, 1968). Similar to a late stage exchange in a developing relationship that leads to the message being seen as more personalised, the fewer recipients of the information, the higher the perceived value of the disclosure (Brock, 1968; Kleinke, 1979). A similar cognitive and social process can be observed in bystander intervention with the diffusion of responsibility across the number of people who witness a crime. For example, if only one person witnesses a crime any intervention is more likely than if 100 people witness it because one person carries the entire responsibility for acting, rather than 1% of it (Darley & Latane, 1968). Therefore

this weighting of self-disclosure value according to recipients may be linked to similar social psychological processes that occur in bystander intervention, such as the perceived personal benefit of being the sole recipient of information, or moving to a more personalised channel of communication.

2.1.5. Summary and implications of self-disclosure definitions, measurement and influences.

Self-disclosure can vary in its definition, which in turn sets the boundaries of any research conducted. The current research will utilise a definition of disclosure as *intentional* from one person to another in SNS environments. There are different dimensions of self-disclosure that can be measured: breadth – including number of categories of information and frequency – and depth – constructs of a more or less personal nature. Key factors of measurement have been identified. Broadly speaking self-disclosure can be measured as a process, IV, DV or overall interaction. It is important to recognise the differences in measurement for later analyses. A method of data triangulation is appropriate to determine how disclosure occurs in SNS platforms. Factors that may influence the amount and depth of disclosure include variables of both the sender and recipient of information, such as gender, predisposition to level of disclosure, previous disclosure patterns and timeliness of a disclosure with regard to the attributions placed on the information received. However, it is so far unclear as to *why* people disclose to others, i.e. the reasons and motivations behind a sender's choice to share information with others. The discussion will continue to investigate possible motivations of self-disclosure and identify social exchange theory as a primary consideration for this thesis, before moving the discussion to uncertainty reduction theory.

2.2. Disclosure motivations and Social Exchange Theory

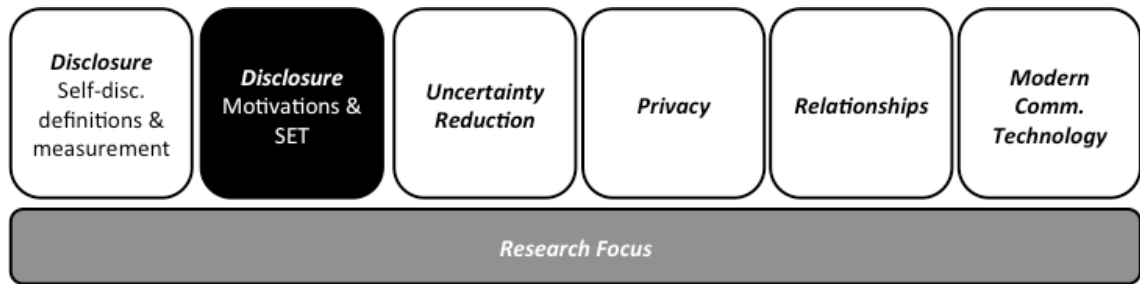


Figure 2.3: Disclosure. Motivations and Social Exchange Theory

2.2.1. Motivations of Self-Disclosure

A decision to disclose can be based on the environment or situation in which the individual finds themselves as well as personal characteristics (Altman, 1975; Altman & Taylor, 1973; Taylor, De Soto, & Lieb, 1979). For example, a desire to share something personal about a romantic partner with a friend may motivate a disclosure. However, if the dyad were on a public stage the environment and situation would alter the decision and the costs of disclosing (others hearing) would far outweigh the benefits. A further effect of the environment on the motivation to disclose is the number of people in receipt of the disclosed information (Solano & Dunnam, 1985; Taylor, et al., 1979). Smaller group sizes are related to greater willingness to disclose (Solano & Dunnam, 1985) and increased intimacy (Taylor, et al., 1979).

Another consideration of personal interaction with the environment and the effects on self-disclosure is the physical space between interaction partners (Altman & Taylor, 1973). A closer proximity with the other person may lead to an accelerated rate of self-disclosure intimacy (Altman & Taylor, 1973). Support is found in Jourard & Friedman's (1970) study of experimenter and subject distance on self-disclosure duration. In their second reported study, subjects increased their disclosure as distance to the experimenter decreased. Distance in Jourard & Friedman's (1970) second study

ranged from experimenter silence to making physical contact with the subject and disclosing to them. In addition they found that less distance between the experimenter and subject was related to increases in positive experience of the subjects (Jourard & Friedman, 1970). However, these effects could be due to the increased disclosure by the experimenter rather than distance (Johnson & Dabbs, 1976).

Self-disclosure may not occur when there is either a chronically low need to disclose, a withholding of disclosure, a fear of disclosure, or the inability to disclose (a deficiency in *ability* to disclose) (Polansky, 1965, cited in Taylor, 1979). However Polansky, like Jourard, views self-disclosure as a method to achieve good mental health (Taylor, 1979). While this may be useful for fulfilled self-actualisation, there are some instances where it is appropriate to keep information to oneself, such as the desire to maintain privacy (Altman, 1975; Westin, 1967), or for success in intimate relationships (Afifi, Caughlin, & Afifi, 2007). Petronio (1991) suggests, “there are good reasons to balance openness with secrecy in a relationship,” and Afifi and colleagues argue that, “withholding information is sometimes benign or even useful” (Afifi, et al., 2007, p. 78). Such usefulness can be observed in interaction with strangers who share information of a high intimacy in a first meeting. An unwilling recipient can regain control by limiting the intimacy of their reciprocation, thus forcing the stranger into an interaction of low intimacy (Cozby, 1972; Derlega & Grzelak, 1979).

It has been suggested that interpersonal behaviours are based on a reward and cost analysis (e.g. Homans, 1958; Thibaut & Kelley, 1959). Thibaut & Kelley suggest both external and internal motivations for self-disclosure. The characteristics of the relationship (external) are compared with the internal ideals of a relationship. This process relies on a comparison of the current relationship with norms of relationships, and a comparison alternative is sought if the current relationship is below norm

expectations, i.e. if the current relationship is not rewarding another will be sought. Social norms of self-disclosure can also be detrimental to the individual. The typical early finding of self-disclosure research that males disclose less than females is a social stereotype. A male may therefore forego any beneficial mental and physical health benefits afforded by self-disclosure (Derlega & Grzelak, 1979).

The appropriateness of the subject (disclosure content) of information may motivate self-disclosure. The appropriateness of a disclosure can be determined from two perspectives, that of the disclosure and recipient, and that of the culture in which the disclosure is to be made (Derlega & Grzelak, 1979). Differences in recipients have been reported to affect disclosure levels (Jourard & Lasakow, 1958). Support for cultural and environmental influence on self-disclosure can be found in privacy and exchange literature. Privacy (and thus its opposition: disclosure) have been identified as universal but culturally bound, driven by societal norms and the context in which the disclosure is to occur (Altman, 1975; Derlega & Grzelak, 1979; Westin, 1967, 2003).

There are several aspects of the context of self-disclosure (Derlega & Grzelak, 1979). *Reward value*, which identifies outcome values for both the sender and the receiver; *informativeness*, which refers to depth and level of the disclosure; *accessibility*, the ease of obtaining the information; *truthfulness*, whether the information is truthful; *voluntariness*, which determines if the information was offered voluntarily, if it was offered as the result of an interaction, or if the information was taken under duress; *social norms*, identifying whether the disclosure deviates from social norms; and the *effectiveness*, outlining whether the disclosure achieves the discloser's goal of communication.

Self-disclosure appropriateness is based on two concepts: function and normativity (Derlega & Grzelak, 1979). *Function* defines whether the discloser has

some function or goal to achieve in disclosing information. If the disclosure is perceived to be too obvious for the desired function then it may be perceived as inappropriate. Whether the disclosure is *normative* is based on norms of culture, social scenario, language or social group. Disclosure that deviates from these norms may be perceived as inappropriate (Altman & Taylor, 1973; Berger & Bradac, 1982; Derlega & Grzelak, 1979). However, it could be that stepping outside the norm of a disclosure is entirely appropriate, but would depend on the norm of the situation (Derlega & Grzelak, 1979). For example, being blunt with a stranger to achieve an altruistic outcome, such as telling them their relationship is fruitless, may serve a better purpose yet be considered inappropriate. Or a doctor who is overly blunt in warning a patient that they must lose weight for health reasons may be acting inappropriately but serves a greater long term goal. Therefore disclosure that deviates from norms may fulfil another function, and there is an indication that function and normativity often relate.

The functions of a disclosure can affect the sender and receiver's view of the appropriateness of a disclosure (Derlega & Grzelak, 1979). For example, if a receiver believes a disclosure was aimed at eliciting sympathy from them they may see it as manipulative. However, if the receiver believes the disclosure is altruistic it may be evaluated more favourably. Derlega & Grzelak (1979) suggest five functions of self-disclosure. Based on these functions, self-disclosure may have several purposes depending on the discloser's goals. *Expression*, whereby a disclosure is made to express oneself with no motives other than self-expression. For example, telling somebody that you like a certain film with no intention to use this to gain reward. *Self-Clarification* is a disclosure of one's beliefs and opinions to clarify one's own position or knowledge. The disclosure may be to oneself as well as to other people. *Social Validation* is a disclosure is made to incite feedback from the recipient to validate one's self-concept, a form of

reinforcement. *Relationship Development* is a disclosure to enable the recipient to find out more about the sender of information. Reciprocity is often induced from self-disclosure and so the development, or maintenance, of a relationship then involves the information exchange between the sender and recipient alternately. *Social Control* is the use of disclosure in order to control a social situation or another person/group. This could be used to potentially exploit another person or situation.

The majority of the functions proposed by Derlega & Grzelak (1979) require reciprocity from a recipient to fulfil their purpose. Furthermore, the appropriateness of a disclosure must be pointed out to the discloser, which also requires reciprocity. In getting to know someone and develop a relationship a conversation must be bi-directional, again requiring reciprocity. Rewards and costs of self-disclosure and interpersonal communication must also involve a bi-directional process, and we can only tell if a person is rewarding if they reciprocate. An exception to this rule may be the uni-directional influence of the environment on the rate of self-disclosure (Altman, 1975). However, as Altman notes communication and disclosure are an *interaction with* the environment, and so on some level reciprocity must occur.

2.2.2. *Reciprocity*

Reciprocity is the most reliable of the contextual variables measured and understood in self-disclosure (Chelune, 1979a). Jourard (1959) used the term 'dyadic effect' to explain the development of mutual closeness and intimacy between two interaction partners, and identified significant effects of disclosure input and output as a key contributor. SET and URT (discussed later) identify reciprocal self-disclosure as key to the development of intimacy, liking and trust in relationships (Altman & Taylor, 1973; Berger, 1979, 1993; Berger & Bradac, 1982). Liking is suggested to be related to

reciprocity, perhaps motivated by reciprocity and information disclosure (Collins & Miller, 1994; Jourard, 1959; Kleinke, 1979). A lack of self-disclosure identifies individuals as threatening and untrustworthy (Altman & Taylor, 1973; Berger & Bradac, 1982; Jones & Archer, 1976).

The rule of thumb of reciprocity - that disclosure begets disclosure (Jourard, 1959) - can be broken. For example, when a personalistic disclosure goes beyond the desired intimacy level of the recipient they are less likely to reciprocate (Altman & Taylor, 1973; Berger & Bradac, 1982; Chelune, 1979b). Such over-disclosure may threaten the freedom of the recipient forcing them into an intimate disclosure, meaning they may not respond or may respond with a different intimacy level (Altman & Taylor, 1973; Archer, 1979; Berger & Bradac, 1982; Chelune, 1979b; Derlega, et al., 1973). As a result, the intimacy gap between sender and receiver may grow (Archer, 1979).

Failure to reciprocate, or reciprocity at a lower/desired level, may act as a form of boundary management (Chelune, 1979b; Derlega & Chaikin, 1976; Petronio, 2002). When there is an intimacy overload, i.e. somebody is too close proximally, we alter our reciprocal behaviour to signal the desired lower intimacy level and to try and force the other person into the 'acquaintance' box or to a particular intimacy level, e.g. by averting our gaze (Argyle & Dean, 1965; Jourard & Friedman, 1970; Worthy, et al., 1969). This research further indicates an interaction of communication and the physical environment. Proximity and eye contact may serve as components of intimacy (Argyle & Dean, 1965). Therefore, the findings may be extrapolated to other intimacy-behaviours. For example, if an opposite sex friend reveals they have strong intimate feelings towards you, it may be necessary to shift the intimacy level of disclosure to a lower level to signal your intention to remain as friends. However, more recent research has found that both spouses and strangers match high intimacy level in reciprocal self-

disclosure for both same and opposite sex dyads, and same-sex strangers also matched low intimacy disclosures in their reciprocity (Dindia & Allen, 1992). Cozby (1972) found that reciprocity was less powerful at encouraging responses when disclosure between interaction partners reached a high intimacy level. This relationship suggests that reciprocity does not simply incite self-disclosure uniformly but can vary with other factors of interaction, such as intimacy, liking or anticipated future interaction.

Derlega, Harris and Chaikin (1973) conducted an experiment with three disclosure conditions: high conventional self-disclosure, high deviant self-disclosure and low self-disclosure. The authors found that when the disclosure was deviant, as long as it was a high level of disclosure the reciprocated level of disclosure was also high, i.e. recipients matched high disclosure level regardless of conformity to social norms. However, participants reported that they did not like the deviant high discloser as much as they did the conventional high discloser *or* the low discloser. Therefore, even when the disclosure is deviant, if it is a high level then it is likely to beget a high reciprocation disclosure level, but the discloser may not be liked. A concern with this study is whether the phrases the confederates used as conventional or deviant were considered conventional or deviant by the recipient. The relative influence of social exchange or modelling on self-disclosure reciprocity depends on the context or situation (Kleinke, 1979). For example, a well-known friend whose disclosures are extreme according to social norms, yet are customary in general conversation with them may not be considered to be deviant. Whereas, somebody that does not know the norms of conversation with this friend but applies societal norms may find the communication as deviant (Kleinke, 1979). It should therefore be noted that the deviance is away from social norms and does not take into account the individual differences possible in this relationship.

To conclude, reciprocity urges self-disclosure and vice versa. Encouraging reciprocity may aid the development of personal relationships with others as it allows them to discover more about each other. Reciprocity is also the social norm in many social environments, e.g. at formal dinners or when somebody starts talking to you on a train. Revealing information at a high intimacy level encourages interaction partners to disclose at similar levels, but does not necessarily mean the discloser is liked. Reciprocity can also be used as a method to control the intimacy level of a conversation by reciprocating at one's desired level of intimacy, signalling appropriate conversation. Reciprocity finds most support from SET (Chelune, 1979a). The concept of exchanging information between individuals to achieve a relational reward is fundamental to the process of information sharing in SNS. Users must contribute information to ensure the site is entertaining. An entertaining site is continuously used because material is shared in return (Beenen et al., 2004; Burke, et al., 2009). Therefore, the focus of this review moves towards social exchange as an underlying concept of reciprocity and liking, and self-disclosure more generally.

2.2.3. Social Exchange, Intimacy and Rewards

SET suggests that self-disclosure is a sequence of exchanges from one person to another and in reciprocation (Homans, 1958; Taylor, 1979; Worthy, et al., 1969). Behind the sequence of social exchanges is an underlying goal to communicate and develop relationships by gradually increasing the intimacy of self-disclosure in line with social and situational norms (Altman & Taylor, 1973).

The proponents of Social Penetration Theory (SPT), Altman & Taylor (1973), suggest a layered model of the self, akin to an onion (Figure 2.4). For example, they suggest our sexuality, ideal and true views of our self-concept are core parts of

ourselves. Towards the peripheral layers of the onion there are more characteristics and aspects of our self, but these are less sensitive, or shallower, constructs. For example, information about the clothes somebody wears to work or their physical features are peripheral features of the self. Peripheral categories of information exist in great quantity and are driven by the fewer core aspects of the self.

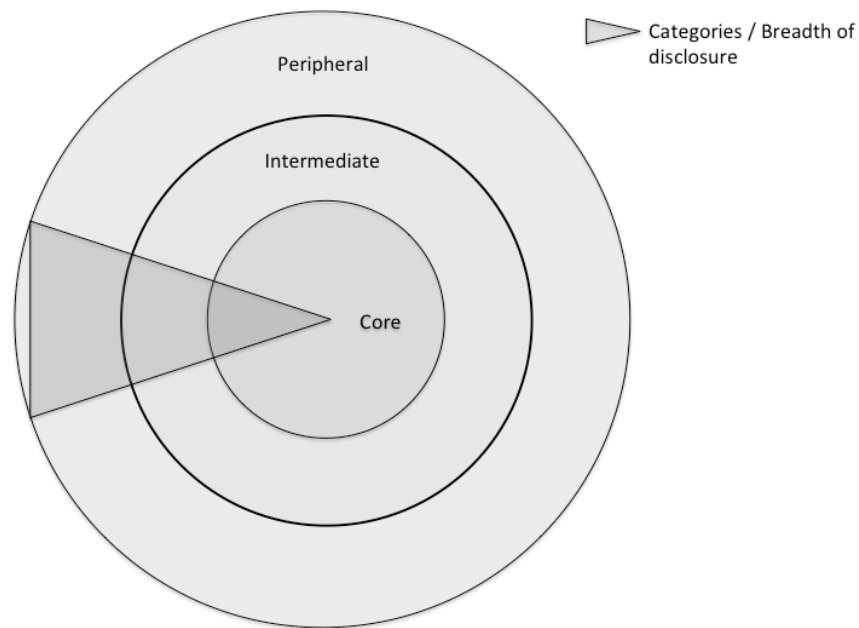


Figure 2.4: Adapted from Altman & Taylor's (1973) Social Penetration Model

SPT identifies the progression of a relationship through reciprocal self-disclosure. As is typical at a formal party, new acquaintances meet and discuss shallower, peripheral level intimacy topics, such as the weather and the traffic on the way to the venue; then as a relationship progresses interaction partners begin to ask increasingly intimate questions and disclose increasingly intimate information to encourage reciprocation (Altman & Taylor, 1973; Berger & Bradac, 1982). The relationship progresses to uncover more core constructs of each others personality (Altman & Taylor, 1973).

Key drivers of relationship development include social, environmental and communication norms (Altman & Taylor, 1973). If an interaction partner does not progressively increase the level of intimacy in their disclosures, recipients may find them untrustworthy or become suspicious (Altman & Taylor, 1973; Berger & Bradac, 1982; Jones & Archer, 1976). Similarly, should an interaction partner disclose information of too high an intimacy level too soon in the relationship, recipients may label them a social deviant, suspicious of their behavioural intentions (Altman & Taylor, 1973; Berger & Bradac, 1982). However, Archer (1979) suggests that once a relationship is established there is a lower rate of intimacy increment overall than at the initial stages of a relationship, i.e. it plateaus. Altman & Taylor acknowledge that once a relationship is developed, levels of reciprocal self-disclosure are different compared to developmental stages. Thus, it can be concluded that the phenomenon of intimacy increasing through communication exchange is evident in developing relationships but a plateau is reached in later relationship maintenance. This effect suggests that the relationship between disclosure and liking is curvilinear (Altman & Taylor, 1973; Berger & Bradac, 1982; Cozby, 1972; Tidwell & Walther, 2002), although this was not found conclusively in a more recent meta-review of disclosure and liking research (Collins & Miller, 1994).

Within the broader umbrella of SET, motivations for continued reciprocal self-disclosure are found in the rewards of communicating with a particular interaction partner (e.g. Taylor, 1979; Taylor, et al., 1979). These two authors suggest that continued reciprocation occurs between interaction partners when there is a mutually experienced favourable outcome from communicating. A reward versus cost model is developed to determine if an experience is mutually rewarding. For a relationship to

develop and be favourable to both interaction partners there must be equal exchanges, i.e. similar valued inputs and outputs between the pair (Taylor, 1979).

In the development and maintenance of a relationship two properties have been proposed, *information* and *reward* (Derlega & Grzelak, 1979). A reward may exist from an induced emotion or general physiological response to disclosed information.

Alternatively or simultaneously, the information itself may be rewarding based on its content alone (i.e. not on the induced physiological or psychological response).

Therefore, it is important to understand the evaluation of information and its reward.

Developing the basic reward/cost basis of self-disclosure and social penetration, commodity and equity theory are useful in identifying how disclosures are received and, where necessary, controlled. Commodity theory suggests that an item high in value is typically a scarce resource, which links with attribution theory in understanding the reward or cost of disclosure (Brock, 1968; Kleinke, 1979). If a recipient ascertains that they are part of an exclusive or small audience then a higher value is likely to be placed on the information shared (Brock, 1968; Kleinke, 1979). Additionally, the evaluation of the discloser may contribute to the evaluations of a disclosure (e.g. Derlega & Grzelak, 1979). As Derlega and Grzelak note, if a typically shy and reserved discloser shares information to an exclusive individual or very small audience, then the normal nature of the discloser is taken into account. If they are deciding to disclose when typically they do not, the recipient may attribute this as a rare (scarce) event and so place higher value on the disclosure or discloser.

The valuation of an information exchange is argued to contain three factors (Derlega & Grzelak, 1979): (1) *the interdependence structure*, that is the pattern of interests in communication for each of the involved parties; (2) *uncertainty reduction*, if the information received helps to reduce uncertainty about a discloser it may be deemed

valuable; and, (3) *the individual's system of values*, which are the influences on an individual's perceptions of what is possible to leverage from the communication.

The structure of the social interdependence between people can effect the evaluation of disclosure by interaction partners (Derlega & Grzelak, 1979). When an individual discloses to another it implicates them in an interdependence structure, regardless of whether they reciprocate or not. The original discloser is still interdependent on the recipient's response, and the recipient, if unwilling to reciprocate, depends on the initial discloser to remove contact. One person's disclosure no longer affects just their own outcome, but the recipient's. For example, two passengers on a plane are sitting next to each other, one wishes to converse throughout the flight while the other wishes to remain silent (e.g. Derlega & Grzelak, 1979; Kelley & Thibaut, 1978). If the individual that wishes to converse, discloses to the recipient they have began a relationship of interdependence. The initial discloser requires the recipient to reciprocate to achieve maximum value, but this is of no value to the recipient (Kelley & Thibaut, 1978). The recipient requires the discloser to withdraw from conversation to achieve maximum value. However, like the trust game, or prisoner's dilemma, the best overall outcome may be for the interdependence structure to require some restraint from the discloser and some conversation from the recipient (Kelley & Thibaut, 1978). Ideally, they would come to an arrangement whereby they talk for half of the flight, and be silent for the second half; thus, for the greatest *overall* outcome the interaction partners must cooperate and compromise (Derlega & Grzelak, 1979; Kelley & Thibaut, 1978), see Figure 2.5.

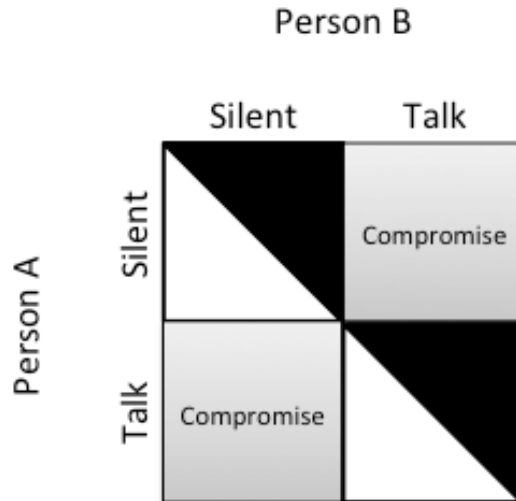


Figure 2.5: Interdependence Structures, adapted from Kelley & Thibaut (1978)

Overall, theories of social exchange require more than one individual, the process of reciprocity and the gradual increase in intimacy between two or more individuals. The exchange of information is not specified to a particular type of information, but intimacy can increase across a range of conversational topics and information sharing instances, as demonstrated by the range of self-constructs in the social penetration model (Altman & Taylor, 1973). SNS rely on social exchanges (Burke, et al., 2009), individuals and groups sharing information of different types for other connected users to browse and consume. Without social exchange, SNS would not retain their user base. Therefore, it seems appropriate to predict that sharing via social media, as in the offline social exchange theories presented here, will result in gradual intimacy increases over time and the development of relationships between users. However, this effect has not been studied to the author's knowledge of the extant academic literature. Therefore, in determining whether self-disclosure via SNS affects liking, an investigation of what, how much, and to whom information is shared is necessary. Consideration of new and older (longer held) connections (friends) may be

necessary to determine if sharing between users occurs more at the early stages of relationships.

2.2.4 Self-Disclosure Summary and Implications for this thesis

Although much of the work referenced above stems from the 1950s-1990s, these were the key periods for self-disclosure research. Conducting a keyword search for self-disclosure identifies work in this era above others. For example, of the first 20 Google scholar results, 14 are directly relevant and 11 of these are published in the 1950s-1990s. The mean citation count of these 11 articles is 463. More recent research on self-disclosure, from the late 1990s onwards, is linked to disclosure in online environments and will be outlined in the *Modern Communication Technology* section (2.6). The current research will use the offline communication work outlined above as a framework for understanding interpersonal interaction in SNS.

The overall body of research on self-disclosure provides a lack of clarity over its antecedents, processes, variables and outcomes. As early as 1979, Archer (1979) argues that there is no single solution to approach research on self-disclosure. Critical components of self-disclosure research revolve around the definition used, the measurement of self-disclosure, which interaction partner is assessed and the implications of disclosure on relationships. A variety of functions and norms act to motivate self-disclosure and individuals can manipulate their use of self-disclosure to appear to require one function, but in reality fulfil another. The recipients of disclosure can apply their own predispositions, evaluations and uncertainty to the disclosure to vary how it is perceived. Therefore, it can be concluded from this section that the use of self-disclosure for relationship development and information gathering about others is complex.

The research outlined in this section originates in offline interaction. Amongst this research there are fundamental differences and expected outcomes of self-disclosure. It is concluded that disclosure and its effects differ depending on relationship types (targets and purpose), the developmental stage of a relationship, the content of exchanged messages and the timing of message delivery. Work on self-disclosure in *online* environments is therefore expected to differ based on these or closely related variables and are included in the investigation within this thesis on self-disclosure. This approach to researching disclosure and relationship development in SNS environments will begin to answer: what should be expected of self-disclosure in online environments for relationship development? A pragmatic approach is taken to approach self-disclosure from a variety of methodological and theoretical angles, such as self-disclosure frequency, depth and type (verbal, direct, indirect), and using multiple methods of data collection to triangulate results to inform theory on the effects of day-to-day disclosure in SNS.

Whilst a pragmatic approach is taken to the variables used and operationalised in this research, SET and SPT will form the basis for understanding self-disclosure. SET can be argued to be overly simplistic, relying on a basic cost-reward structure to interpersonal disclosure, whereas humans may utilise many processes when choosing what and to whom to disclose. For example, some of the factors that may influence a disclosure outside of exchange are power (i.e. the status of an individual), rights, needs and favours, whereby individuals may disclose information to gain help in a time of need with the helper not expecting a reward (for a thorough critique of exchange theory see Heath, 1976). However, many of these same variables also influence the potential costs and benefits of disclosure – for example, by increasing vulnerability or the possibility of intimacy.

As Berg & Derlega (1987) note, self-disclosure work is often conducted without the aim or focus on developing or enhancing theory, but pinned to some situation or research paradigm. The basic cost-reward structure of SET and the further enhancement of SPT provide a strong theoretical background whilst offering a simple framework from which the initial phases of self-disclosure effects and determinants in a new CMC environment are understood. Therefore, the basic exchange process aids the initial development and interpretation of relationship development in SNS, but it is intended that the inclusion of other perspectives will move the theorising beyond simple costs and rewards, e.g. through the inclusion of multiple disciplines, URT and human needs.

The general findings of offline research, such as a disclosure to liking link, the effects of different levels of disclosure (breadth and depth), and sender and recipient variables can be tested in online environments. Such an approach can include a general exploration of the effects of gender on self-disclosure and relationship development, the method of disclosure, the depth and breadth of information disclosed, and the stage of the relationship amongst communicators to identify how they disclose in online environments. To understand how these variables may lead to relationship differences further academic literature is now reviewed to identify the potential links between disclosure and liking, including uncertainty reduction, privacy and relationship development more generally.

2.3. Uncertainty Reduction Theory

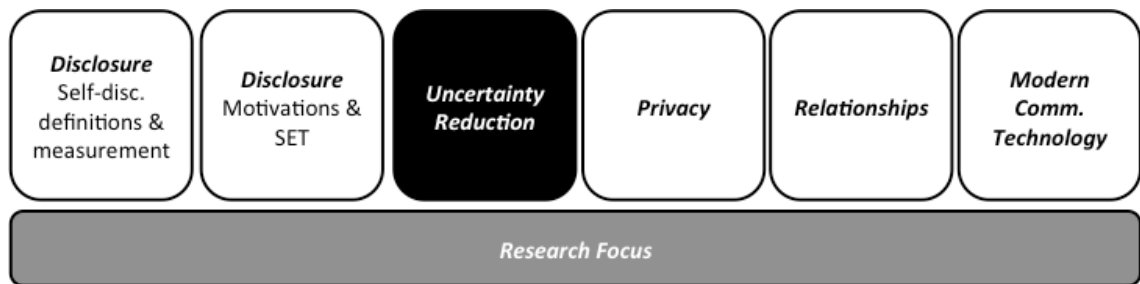


Figure 2.6: Uncertainty Reduction Theory Review

2.3.1. Background

In the self-disclosure review above, uncertainty reduction was introduced as a function of self-disclosure, as was relationship development. URT is one of several theories that identify reasons for individuals to communicate, releasing information between one another. URT follows logically from social exchange theories, provides insight into relationship development patterns, and suggests uncertainty reduction as a key motivator for self-disclosure.

A number of alternative theories have looked at relationships through a communication lens. These include, but are not limited to, Discrepancy Arousal Theory (DAT)(e.g. Cappella & Greene, 1982), Communication Accommodation Theory (CAT)(e.g. Giles, et al., 1973), Expectancy Violation Theory (e.g. Burgoon & Hale, 1988; Burgoon, Newton, Walther, & Baesler, 1989) and Interpersonal Adaptation Theory (e.g. Burgoon, et al., 1995). DAT states that a discrepancy between interaction partners creates arousal that in turn motivates the interaction partners to reduce this discrepancy. However, URT encompasses this phenomenon under the title of cognitive dissonance and the motivation to reduce dissonance and uncertainty about another, as such DAT is not directly used in this work. CAT identifies accommodation practices of users whereby they mirror speech style, vocal patterns and gestures. It assumes that

individuals move from using such signals to determine information about others, preferring to mirror one another, eliminating any effect of individuality on perceived liking or similarity.

Expectancy Violation Theory (EVT) can be considered a development from URT. EVT states that when an expected behaviour of another is violated it produces arousal and a subsequent positive or negative evaluation of them (Bevan, 2003; Burgoon, Berger, & Waldron, 2000; Burgoon & Hale, 1988; Burgoon, et al., 1989; Kernahan, Bartholow, & Bettencourt, 2000). EVT can be considered an addition to URT as EVT relies on knowledge bases of others and their expected behaviours for given scenarios. URT aims to develop such bases to form a relationship, suggesting uncertainty about their behaviours and attitudes to given scenarios is a motivator for information seeking and disclosing behaviour (Berger, 1993; Berger & Bradac, 1982; Berger & Calabrese, 1975; Bevan, 2003; Burgoon & Hale, 1988; Burgoon, et al., 1989). Further, EVT is based upon *violations* of norms, whereas this thesis aims to determine the results of communicating *within* SNS and social norms, i.e. the information regularly shared that is typically perceived to be mundane and of little consequence.

Interpersonal Adaptation Theory, proposed by Burgoon (1995) includes each of the above alternative theories, alongside others to form a general theory of communication adaptation. However, the present research identifies the results of disclosure method and type on relationship development as opposed to the ways in which interaction partners adapt within their communication. As such, URT is the most applicable development of self-disclosure theory, encompassing social exchange, cognitive dissonance and the motivation to discover information about others and share personal information activities more akin to the use of SNS. Identifying early theories of URT allows the present research to forego the assumptions of subsequent theories

and apply the basic underlying principles to a new research environment. Furthermore, URT has been successfully used in research on interaction in CMC environments (e.g. Tidwell & Walther, 2002), discussed later. It is necessary to investigate URT in SNS as web 2.0 marks a distinct change in the understood model of Internet communication practices and its underlying constructs.

2.3.2. URT motivations, reciprocity and relational effects

The motivational functions of self-disclosure and the reciprocity “Dyadic Affect” (e.g. Jourard & Lasakow, 1958) propose uncertainty reduction as a general motivation and function of self-disclosure. The five functions of self-disclosure, expression, self-clarification, social validation, relationship development, and social control (Derlega & Grzelak, 1979) are each connected to uncertainty reduction. It can be argued that self-disclosure for each of these functions allows the self or others to develop rules and axioms about one’s own or others’ attitudes and behaviour. URT primarily identifies self-disclosure as a means to develop an information base about others to make predictions about their attitudes and behaviour in certain scenarios and to drive relationship development (Berger, 1979; Berger & Bradac, 1982; Berger & Calabrese, 1975).

The self-disclosure and liking relationship can be generally reduced to three types of relationship (Collins & Miller, 1994): (1) Person A is liked by Person B because Person A has disclosed information to them, (2) Person A likes Person B initially and so discloses to them, or (3) Person A likes Person B *because* Person A has disclosed to Person B.

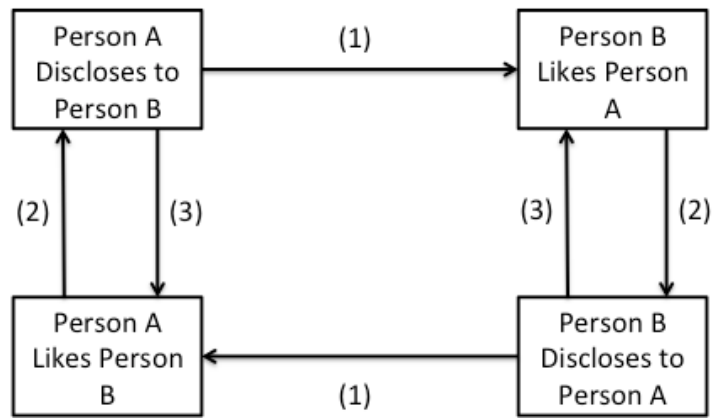


Figure 2.7: The 3 Liking-Disclosure relationships, adapted from (Collins & Miller, 1994)

However, receiving information about somebody cannot directly determine if they are liked or not. For example, person A says, “I like ice cream”. Person B reciprocates, “so do I!” We cannot say from these statements alone that person B or A likes the other, yet reciprocal disclosure has occurred. An array of contextual, situational, and personal variables alter the process, such as social norms, conversational ability, relevance to location (e.g. at the seaside) and general predisposition to disclosure of both person A and B.

URT and SET, however, allow the relationship between disclosure and liking to be interpreted more realistically. Several disclosures between interaction partners build to form an impression of one another (Altman & Taylor, 1973; Berger & Bradac, 1982). If this impression is liked, or it is possible to predict how they will behave in the scenario - reducing the cognitive dissonance of uncertainty - then liking may increase (Berger, 1993; Berger & Bradac, 1982; Berger & Calabrese, 1975). Therefore, it is argued that uncertainty reduction may act as a potential mediator between self-disclosure and liking.

URT has been extensively researched in offline social environments and a set of rules and axioms have been developed. URT was introduced to understand the development of relationships in initial interaction periods between strangers (Berger &

Calabrese, 1975). Since its early development, URT has been extended to include uncertainty reduction at the onset, duration and collapse of relationships with both friends and strangers, (see Berger & Bradac, 1982; Berger & Calabrese, 2005). Additionally, relational uncertainty has been implicated as affecting turmoil in dating couples (Knobloch, 2007). URT has recently been introduced to online environments, identifying uncertainty reduction patterns between individuals communicating via text-based instant messenger or email programs, (e.g. Tanis & Postmes, 2007; Tidwell & Walther, 2002), and has been used as a possible influence on interpersonal effects in CMC (Walther, 1992). These studies support the use of URT in this thesis but their effects are not yet confirmed within SNS, which are the context of this research.

There are two types of uncertainty according to URT: *cognitive* and *behavioural* (Berger & Bradac, 1982). Cognitive uncertainty relates to certainty about a person's attitudes, beliefs, and cognitive predispositions (whether innate or experienced). Behavioural uncertainty is that relating to a behavioural outcome when communicating with another or due to a belief set. The human condition is to understand and interpret our environments, the people within them, and their behaviours, to reduce both cognitive and behavioural uncertainty (Berger & Bradac, 1982). Uncertainty occurs when we are unsure of another's attitudes, beliefs, and behavioural outcomes (Berger, 1979, 1993; Berger & Bradac, 1982; Berger & Calabrese, 1975, 2005).

Increasing reciprocal interaction with a communication partner, both verbally and non-verbally, serves to increase our knowledge of the beliefs of others (Berger & Bradac, 1982; Berger & Calabrese, 1975). A greater understanding of their beliefs allows predictions to be made about their likely behaviour in a given situation and uncertainty is reduced (Berger, 1993; Berger & Bradac, 1982; Berger & Calabrese, 1975). There are often mediating and contributing factors in attitude to behaviour links,

which can include the interaction process with others, the situation and the communication environment (Altman, 1975; Fishbein & Ajzen, 1975).

The interaction between communication partners and the motivation to reduce uncertainty about one's self and others resonates with SET. We need to disclose to others to trigger reciprocation so that an impression of them can be formed (Berger & Bradac, 1982). This increasing certainty throughout the relationship relies on a social exchange process of increasing disclosure to new levels of frequency and depth (Altman & Taylor, 1973; Berger & Bradac, 1982). This can involve verbal and non-verbal communication and can include the interaction with others, the environment and demands to restrict disclosure (such as those made of the need for privacy) (e.g. Altman, 1975; Altman & Taylor, 1973; Berger & Bradac, 1982; Westin, 1967).

The information gathered about others to construct a framework of their attitudes, beliefs and behaviours can be extrapolated to other situations and environments (Berger, 1979, 1993; Berger & Calabrese, 1975, 2005). When reducing uncertainty through reciprocal information disclosure cognitive dissonance is gradually removed, resulting in comfort and increased intimacy (Berger & Bradac, 1982; Berger & Calabrese, 1975). As Altman & Taylor (1973) suggest, increased reciprocal interaction allows communication partners to move gradually towards core, more intimate, constructs of the self.

Like the social penetration model, URT also specifies that those who reveal too often or too intimate (depth) information are less favourably received. If an individual shares too much information compared to social norms and expectancies then they could be labelled a social deviant (Altman & Taylor, 1973) and those conversing with them would become suspicious of their intentions (Berger & Bradac, 1982). Berger & Bradac suggest this phenomenon can be extrapolated to a variety of social situations.

For example, taking off one's clothes outside of the home is a social *faux pas* (and also illegal). However, if the environment were to be a doctor's surgery then this act would be in line with expected social norms (depending on the ailment).

It is not just the environment that can dictate the social norms of behaviour and self-disclosure decisions. The nature of the relationship between interaction partners is also a contributing factor (Berger & Bradac, 1982). In the previous doctor's surgery example, the doctor-patient relationship alongside the environment of the doctor's surgery dictates that we can take off our clothes, and it is acceptable. Revealing oneself to the receptionist or other waiting patients in the doctor's surgery would move the behaviour back towards a behavioural transgression of social norms (Berger & Bradac, 1982).

The environment, social norms and personal characteristics of interaction partners can each influence feelings of uncertainty about others. A more comprehensive list of axioms of URT demonstrating the reduction and increment of uncertainty can be found in Table 2.1.

Table 2.1: Axioms of Uncertainty Reduction Theory adapted from (Berger & Calabrese, 1975)

Axiom	Description	
1	At onset phase, as the amount of verbal communication increases, the level of uncertainty decreases.	Decreases in uncertainty will result in increases of communication
2	As nonverbal affiliative expressiveness increases, uncertainty decreases.	Decreases in uncertainty will result in increases in nonverbal affiliative expressiveness
3	High levels of uncertainty cause an increase in information seeking	As uncertainty reduces, information seeking reduces
4	High uncertainty results in decreases of communication intimacy (content)	Low levels of uncertainty result in increased communication intimacy (content)
5	Increased uncertainty results in increased communication reciprocity	Decreased uncertainty results in decreased communication reciprocity
6	Similarity between interactants reduces uncertainty	Differences between interactants increases uncertainty
7	Increases in uncertainty increase disliking	Decreases in uncertainty increase liking

The axioms in Table 2.1 suggest that uncertainty is reduced through increased communication, increases in nonverbal expression, increased communication reciprocity, and similarity between interaction partners (Berger & Calabrese, 1975). It can also be proposed that high uncertainty is a motivation for increased communication intimacy and increased information seeking (Berger & Bradac, 1982; Berger & Calabrese, 1975). In addition there is also an implicit proposed link between certainty and liking, with increased uncertainty resulting in disliking of an interaction partner.

As uncertainty is not just affected by self-disclosure but can be reduced (and increased) through nonverbal communication and information seeking patterns, as well as perceived similarity between communication partners, URT is a good platform for understanding sharing and liking in online as well as offline environments. SNS require user input and encourage active sharing and information seeking by their users (Burke, et al., 2009), and feature both ‘verbal’ and non-verbal communication channels (Boyd

& Ellison, 2008), such as text-based communication and photograph sharing, respectively.

Douglas (1990) reviewed uncertainty and liking in initial interactions and suggested that liking does not always increase with certainty, but can be unstable across time. After lengthy conversations VanLear & Trujillo (1986) found participants' liking and uncertainty to be positively related, and suggest that affective judgements occur after uncertainty has been reduced, which may also be negative in valence. That is to say, once uncertainty has been reduced (and liking may be increased at this stage), interaction partners then make a judgement as to whether they like the other person or not. Such judgements introduce affect as a possible confounding variable in the certainty-liking relationship and suggests other confounding variables may exist. Literature on self-disclosure and privacy (discussed later) may be useful to identify these variables, such as situation, circumstance, social norms and expected behaviours. However, in his overall conclusion and study results Douglas found uncertainty to reduce with increased levels of disclosure and *decreased* question asking, and uncertainty was inversely related to social attraction.

Unlike *self*-disclosure, information does not have to be received directly from the target individual. Information seeking can help to reduce uncertainty and can be achieved in three distinct ways (Berger & Bradac, 1982; Berger & Calabrese, 2005): actively, passively, or interactively. *Actively* requires a situation or environment to be altered and the interaction partner's reactions to be observed (e.g. moving furniture and observing their reaction). An alternative active strategy can be to ask another person about the interaction partner. To gather information *passively* requires observation of the interaction partner without interfering or seeking information from other people. To collect information *interactively* involves asking the interaction partner directly,

gathering information and continuing to reciprocate to incite further questions and responses.

Parks & Floyd (1996) suggest that URT, as well as other SETs, do not explicitly state that communication must remain frequent, and so a flaw in the use of URT and SETs in general is that they presume a friendship remains in stasis if people do not communicate. However, Roberts and Dunbar (2010) note that kinship appears to be more robust than friendship in periods of reduced communication. While this implicates kin as stronger and more robust personal connections, it does not rule out the possibility of relationship degradation⁴ amongst kin (Roberts & Dunbar, 2010).

The discussion of URT and its relationship to disclosure, information seeking, relationship development and liking are central to understanding the underlying constructs that may affect disclosure and liking in offline environments. However, the literature on the measurement of certainty is more robust than self-disclosure due to the limited measures of uncertainty available, i.e. the measurement is consistent across studies. A thorough search by the researcher for quantifiable uncertainty measures produces references to two main scales. Clatterbuck (1979), a PhD student of Charles Berger (an author of URT), developed a set of 7 questionnaire items to form a general and specific (CLUES7/CL7) uncertainty measure, used or adapted by others (e.g. Antheunis, Valkenburg, & Peter, 2010; Kellermann & Reynolds, 1990; Tidwell & Walther, 2002). A second measure has been developed by Douglas (1990) to include uncertainty about the self as well as an interaction partner, which consists of measures of liking (social attraction) information-seeking, and global and specific uncertainty.

⁴ Although the term degradation, or similar, implies an active behaviour in the breakdown of a relationship, throughout this thesis it is used to represent a passive decrease in affiliation between individuals, such as a friends becoming more distant due to a lack of communication.

2.3.3. URT summary and implications for this thesis

There are two key points from the literature on URT. First, information helps to increase knowledge of others and in turn reduce one's anxiety and uncertainty about their likely attitudes and behaviour. For uncertainty reduction to occur, information must be disclosed by the data subject or be available to the recipient. In general, it is considered that the more information available about an individual leads to greater liking through the reduction of uncertainty. Second, disclosure by- and interaction with others impacts the perceived liking by recipients of the discloser. Ultimately, the information received about others is subject to norms of communication and social situations as well as the relationship held with the discloser.

The importance of disclosure by and interaction with others is critical to the present research. When investigating the relationship between sharing and liking in SNS environments, URT is likely to be implicated as either a contributor to liking, or through the *process* of establishing a relationship. Furthermore, discussion of SNS use typically relates to norms of disclosure and expected sharing levels with different relationship targets (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Marwick & Boyd, 2011). The current research will use mundane, day-to-day information disclosure in SNS environments, *within* the boundaries of social norms to identify how such disclosure may impact upon relationships, and to identify what information sharing is useful to develop and maintain particular relationships.

2.4. Privacy

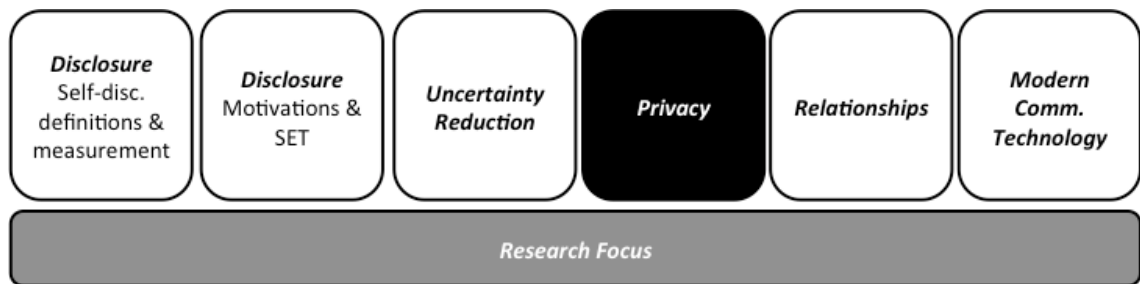


Figure 2.8: Privacy Review

2.4.1. Background

Self-disclosure, and disclosure more generally, can be viewed as one end of an opposing dialectic challenge to that of the desire and need to conceal information and maintain privacy (Petronio, 2002). To investigate the effects of disclosure in SNS environments on relationships with others, it is important not only to identify the motivations to disclose, but the reasons and methods that individuals use to conceal information. To develop relationships information revelation is required as it helps to build knowledge and reduce uncertainty of others. However there are instances in relationships where information is not willingly shared. It has been argued that withholding information may be more beneficial to relationship success than disclosure (e.g. Afifi, et al., 2007; Knobloch, 2007). Furthermore, some individuals are naturally more private than others (Marshall, 1974; Westin, 1967) and their comparative lower levels of disclosure could be either detrimental or beneficial to the relationships they hold in SNS.

Although privacy may seem a simple concept, it covers a multitude of constructs and phenomena, and is considered an “umbrella” term (DeCew, 1997). The research reported here will identify privacy as a mechanism to control information and manage interpersonal boundaries of information disclosure (e.g. Altman, 1975; Derlega &

Chaikin, 1977; Petronio, 1991, 2002, 2007). Privacy has been more widely researched and even claimed as a basic right (DeCew, 1997; Warren & Brandeis, 1890; Westin, 1967), from the perspective of intellectual property and legal jurisprudence (e.g. DeCew, 1997; Solove, 2006; Strahilivetz, 2004; Warren & Brandeis, 1890), as a freedom from and conflict of surveillance (e.g. Altman, 1975; Dinev, Hart, & Mullen, 2008; Gilbert, 2007; Joinson & Whitty, 2008; Lyon, 2001; Westin, 1967), a socio-politically defined concept of isolation and space for self-reflection (e.g. Westin, 1967; Westin, 2003), physical access to the self and isolation needs (e.g. Altman, 1975; Westin, 1967), overcrowding (e.g. Altman, 1975; Joinson, Houghton, Vasalou, & Marder, 2011), and concerns have been raised about the sharing of descriptive information over the Internet with relation to ID and financial fraud, stalking, a tyranny of openness and unwanted virtual attention (e.g. Acquisti & Gross, 2006, 2009; Christofides, et al., 2009; DeCew, 1997; Dinev, et al., 2008; Gross & Acquisti, 2005; Miyazaki & Fernandez, 2000; Solove, 2007), amongst others.

2.4.2. Privacy and Boundary Control

To understand the issues of privacy information management and the need to disclose information to build and maintain relationships it is important to identify the mechanisms of boundary regulation and information control. These two mechanisms ensure that data collected on the impacts of information sharing in SNS are derived from a strong theory base, contributing to the area of research on the effects of disclosure. For example, should users of SNS communicate effectively with different social groups the mechanisms of disclosure choice can be identified and synthesised with research in offline environments.

Altman's (1975) interactional privacy theory suggests that we interact with our environment to achieve a desired level of privacy. He argues that privacy is non-monotonic as different levels of privacy are desired on different occasions, or when experiencing a different mood. The dynamic nature of privacy is directly related to the differences in information sharing practices in the different relationships investigated in the current work. Individuals may have a personal or socially defined goal that requires them to share information with particular others or at certain relationship stages. Altman's theory is a behavioural, interpersonal and process based perspective of privacy focusing on social relationships and interaction with the environment. Privacy goals are understood to vary on a continuum of closeness to the self vs. closeness to the environment (Altman, 1975, p. 45). Closeness to the self suggests that an individual wishes the information to remain concealed, whereas closeness to the environment suggests the information can be shared more freely.

Altman's work suggests three functions of privacy: to control and manage interpersonal interaction; to plan, fulfil roles, and define strategies when dealing with others; and, to define self-identity (Altman, 1975). The first and second of these proposals are important to the current research. The development of interpersonal relationships is said to relate to disclosing appropriate amounts, with appropriate others in appropriate scenarios (Altman & Taylor, 1973; Berger & Bradac, 1982), therefore deciding what information to *conceal* is critical.

The concept of personal space and territorial behaviour are suggested to be mechanisms to achieve privacy, and crowding the result of a privacy failure (either over-crowded or under-crowded, i.e. isolated). Within online environments, personal space may represent a user's account or online portal, such as a Facebook or email account, with information flowing to and from the personal space. Users can then act to

control their personal space depending on their privacy or communication preferences at any particular moment, choosing to withdraw from the account or immerse to connect with others. In line with choosing to isolate oneself or immerse oneself into a social group, online interaction via user accounts may increase as a mechanism to allow others into one's personal space or to get closer to another's personal space, maintaining a closeness with others that may be geographically distant. Alternatively, restricting communication with other users may be indicative that the individual requires seclusion, e.g. for personal reflection (e.g. Westin, 1967), and to remove more frequent posts from entering the user's account, or inbox more generally. Indications of increased communication due a change in geographic dispersion to less proximal locations is found in the work of Shklovski et al. (2008), discussed later.

In line with this discussion of personal space, privacy is suggested to be a process of regulation that allows an individual to be open and accessible to varying degrees (Altman, 1975). It is from this definition that later work develops the theory of interpersonal boundary regulation and Communication Privacy Management (CPM - e.g. Derlega & Chaikin, 1977; Petronio, 1991, 2002, 2007). By understanding how information flows between individuals, self-disclosure mechanisms can be informed and the effects of restrictive access to personal information on relationships can be identified.

Altman (1975) likens interpersonal and self boundaries to a selectively permeable cell membrane. The permeability of the membrane can be adjusted to control the flow of information to and from the self, thus helping to obtain the desired level of privacy. Information is released from the 'self' boundary if the individual believes there is a closed boundary around the others (see Figure 2.9). Derlega & Chaikin (1977) ascertain that the extent of control we have over this boundary contributes to the level of

privacy we have. They further suggest that the state of these boundaries can determine the relationship we have with others in terms of what they may know about oneself, and thus determine the power balance. When choosing to disclose information in SNS we may look to social norms or our underlying goals and motives of disclosure to inform the permeability of our 'self' boundary. In SNS, when all our relationships are subject to the same boundary permeability and thus power relationships, it becomes difficult to manage the relationship and the consequences of their equivocal knowledge of us. As a result, information may take on a lowest common denominator of sensitivity (Joinson, et al., 2011; Marwick & Boyd, 2011)

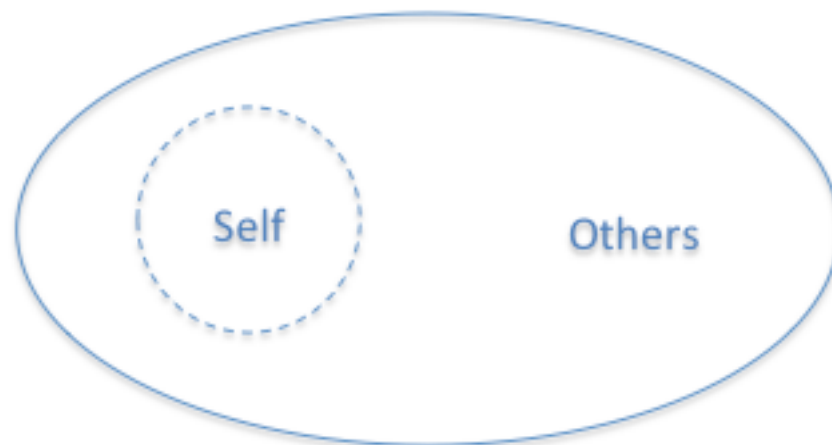


Figure 2.9: Example of boundary permeability when disclosing to others, adapted from Altman (1975), Petronio (2002) and Derlega & Chaikin (1977).

The flow of private information can occur within a selection of three boundaries: personal (self), dyadic or collective (group) (Petronio, 2002). The personal boundary surrounds the individual and represents the control of information disclosure to others and the reception of information from others. A dyadic boundary encloses two individuals. According to Petronio's theory, those within the boundary share private information that is not accessible to those outside. The boundary can also act to stop

information flow to the dyad should they decide to close themselves off. The collective boundary, like the dyadic boundary, encloses multiple individuals between whom private information is shared. In SNS environments it is not always possible to control the information received from others. The effects of receiving this information may be detrimental, even if the sender perceives the information to be benign. By identifying any possible effects, appropriate online defence mechanisms can be established to better interpersonal relationships.

The concept of boundary regulation is taken further in the theory of CPM (Petronio, 2002). Petronio states that information about the self when known only by oneself is private and solely owned, thus the permeability of the self-boundary is low. When this information is shared, leaked or taken from the individual, i.e. flows through the 'self boundary', it is suggested that for this piece of information the boundary now encompasses the other individual(s) that have this knowledge, akin to an elastic band stretched around multiple individuals (see Figure 2.10, transition from part A to B). When this process is not recognised (i.e. when the individual does not recognise the information is now co-owned) boundary turbulence is said to exist. This may be detrimental to the relationships the individual holds with others, thus in some instances of highly personal information, self-disclosure may be detrimental.

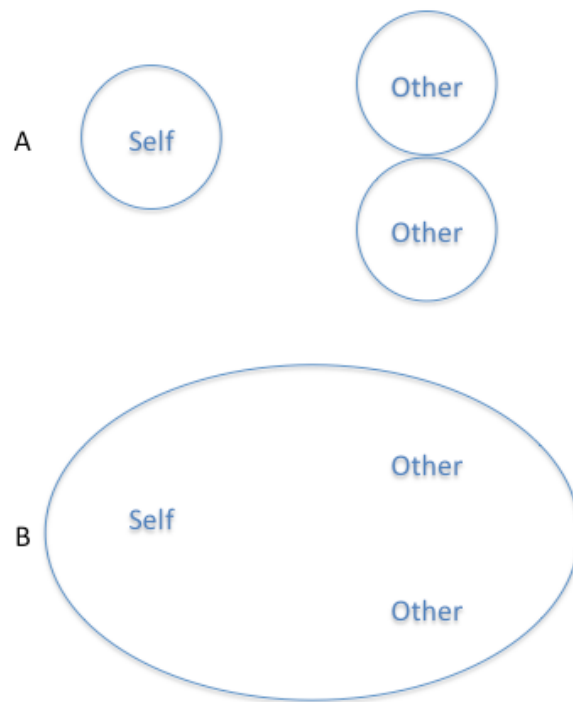


Figure 2.10: Example of boundary 'elasticity' of information co-ownership

The present research investigates the information shared within the group boundaries, but between a collection of dyads. When we disclose seemingly standard information in SNS, the exact effects on the group boundary *and* the dyadic relationships within the boundary are unknown. The theory of boundary regulation and CPM suggest 'boundary turbulence' may occur, but neither theory identifies what type of information causes different outcomes other than information labelled 'private'. The information may not be considered private by the sender or may be encapsulated within the bounds of social norms, but may still cause a negative relational outcome. Furthermore, information that may cause a negative outcome in one situation may be beneficial with other relationship types or at different relationship stages. In particular, it is not known which features of SNS or what type of day-to-day information sharing is most beneficial at different stages or relationship development or with different relationship types.

CPM develops the concept of disclosure varying from closeness to the self to closeness to the environment and introduces a series of dialectic conundrums (Petronio, 2002). These dialectics are not binary but stand at two ends of a continuum, i.e. individuals choose to position themselves on a continuum somewhere between disclosure-non-disclosure, concealment-revelation, public-private, openness-closedness and autonomy-connectedness. However, it can be argued that in SNS due to the demand to share information to maintain site stickiness, to contribute to the social pool of user-generated content and the human need to connect with others (e.g. Beenen, et al., 2004; Burke, et al., 2009; Chen, 2011; Joinson, 2008), that many of these dialectic decisions have become binary. For example, share to all or not share at all. Once information is shared via SNS it is at one extreme of the dialectic continuum. Only through selective disclosure over content can finer detail be controlled, and when users are aware that they have multiple relationship types in their audience (e.g. Binder, et al., 2009; DiMicco & Millen, 2007), they reduce the extremities of the content they disclose. The consequences of imposed extremes of sharing in SNS are also of interest to the present research. Privacy boundary theories assume that information withheld is typically sensitive or inappropriate to the environment, or disclosed because it is less central to the self. However, with individuals in SNS environments adopting a reserved content disclosure pattern, there is a need to understand the effects on relationships. Thus the disclosure and concealment of even mundane information to different groups may be beneficial or detrimental to social relationships, and the nuances within such day-to-day sharing need to be investigated.

Overall, the need to identify privacy and interpersonal boundary regulation practices will contribute to the current research by identifying what information is typically shared amongst users in day-to-day interaction that could result in positive and

negative relational outcomes. Understanding the needs of individuals to conceal information and the process by which they manage this will help understand their decisions to reveal information to some SNS users but not others, and why social norms and SNS requirements of sharing may not be the most appropriate approach to develop *all* relationship types. Particularly, the information flows between different groups of individuals may be necessarily different to prevent some types of day-to-day, mundane information in SNS detrimentally affecting relationships that require deeper, more personal disclosures.

2.5. Relationships

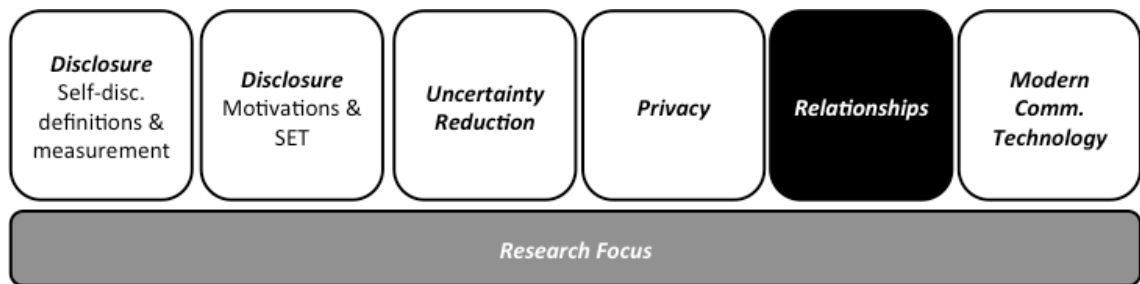


Figure 2.11: Relationships Review

2.5.1. Background

In order to identify the impact of disclosure in SNS it is necessary to establish the underlying constructs of liking and friendship. This section will first outline the necessary underlying human needs that enable us to be social and that motivate us to connect with others. This discussion will start by looking at Maslow's hierarchy of needs and an alternative needs theory: Existence, Relatedness, and Growth (ERG) theory. By identifying human needs, processes and structures the importance of social connections, affiliations and friendships can be determined. Emphasis for research on current technological communications practices is found in the assertion that belongingness needs persist under most conditions to allow users to form social attachment (Baumeister & Leary, 1995). In an empirical review Baumeister & Leary found support for the belongingness hypothesis noting that: -

“belongingness appears to have multiple and strong effects on emotional patterns and on cognitive processes. Lack of attachment is linked to a variety of ill effects on health, adjustment, and well-being” (Baumeister & Leary, 1995, p. 497).

Despite such strong motivations for humans to satisfy the need to belong, little research is conducted on the relationship between SNS use and the underlying motivations for communication amongst daily interaction.

2.5.2. Theories of Human Needs

The Oxford English Dictionary defines needs as “circumstances in which something is necessary; necessity”⁵. Maslow’s (1954) hierarchy of needs suggests that individuals have varying desires for five fundamental needs: physiological; safety; love/belonging; esteem; and self-actualisation. As indicated by the categories in the hierarchy, Maslow suggests that needs are progressed in order - starting with basic physiological needs: eating, drinking, sex, breathing, homeostasis, sleep and excretion (see Figure 2.12).

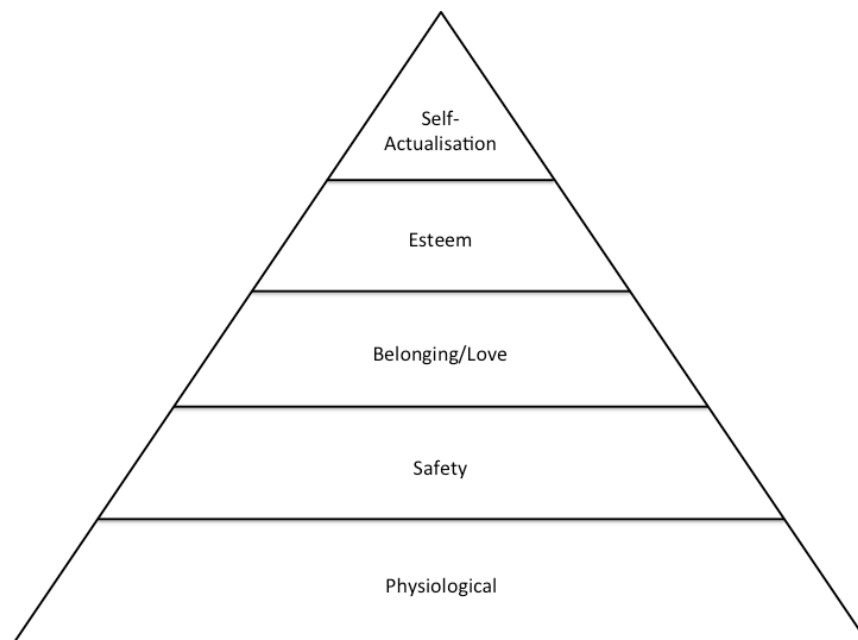


Figure 2.12: Maslow's (1954) Hierarchy of Needs

⁵ Oxford English Dictionary online <http://oxforddictionaries.com/definition/english/need?q=need>

These needs are key to our existence and only once these needs are satisfied can the next level of the hierarchy be addressed (Alderfer, 1969). Maslow (1954) suggests that as the desire for physiological need satisfaction decreases, the desire for safety increases. Safety includes security of the body, employment, resources, family members, health and property. Once safety is achieved the next need increases in desire. It can be argued that for the average person in Western society these first two needs are typically satisfied, pushing individuals to fulfil the following hierarchical stages. According to Maslow, love/belonging relates to the social need to feel part of a group, connected with others, both needing others and feeling needed by them. At this stage sexual intimacy is desired, but is distinguished from the mere physiological need of sex at the first level of the hierarchy. The esteem need becomes active once love/belonging is increasingly satisfied, and includes self-esteem, confidence, achievement, respect of others and respect from others. The final need at the top of Maslow's hierarchy is self-actualisation, which can only be achieved if each of the preceding needs is fulfilled. Self-actualisation allows an individual to reflect, realise morality, assess the desire for creativity, solve problems and accept the facts about one's existence and place in the world.

It should be noted that Maslow himself realises there are exceptions to the hierarchy (Maslow, 1954). Needs do not need to be 100% satisfied before the next tier is desired. Maslow outlines seven exceptions to the hierarchy: self-esteem for some individuals can be more important than love needs; creativity is more of a drive to some than basic needs and can be desired even in spite of basic needs; chronic lack of aspiration may be observed in some individuals; and those characterised as psychopathic appear to have no desire for love needs. Maslow suggests that those starved of love in early life never integrate the desire for love into their schema; a

reversal of the hierarchy can occur when a need has been satisfied for a long time it may become under evaluated; He further observes that actual behaviour may not reflect the need desired by the individual as conscious motivations may override unconscious desires; last, Maslow indicates that strong ideals can allow an individual to forego particular needs for the sake of an ideal or value.

Maslow's (1954) theory relies on unconscious drivers of need satisfaction, and as he notes it is possible for conscious motivations to override these basic needs. This may be observed in social exchange and privacy theories whereby the need to connect may be overridden by the desire to withhold information for another purpose. For example, an employee in a position of confidentiality may wish to connect to others by sharing personal information about their findings but overrides this subconscious need with known conscious motivators and potential legal consequences.

Maslow's theory suffers when underachievement occurs. While Maslow (1954) acknowledges that needs may remain unfulfilled in some individuals for ideals or if they have a psychopathic personality, this may not be the entire range of exceptional circumstances. Alderfer (1969) tests Maslow's theory in a more social setting, the organisation. Here, social is understood in terms of the research being less clinical and individually motivated. He finds only one study that empirically tests Maslow's theory, noting difficulty developing operational definitions for Maslow's hierarchy and the results in an organisational setting provided no support for Maslow's theory (Hall & Nougaim, 1968, cited in Alderfer, 1969).

In the same paper, Alderfer suggests that the five needs proposed by Maslow can be reduced to three needs: Existence, Relatedness, and Growth. He names his theory *ERG Theory*. While his studies test the basic hypotheses of both Maslow's and ERG theory, he notes that his findings do not support all the axioms of either. However,

it is important to outline Alderfer's theory as it contains several advancements on Maslow's theory that account for more socially constructed behaviour than is found in clinical observations.

One reason cited by Alderfer for the collapse of Maslow's five needs into three is that it is difficult to distinguish between different needs. For example, love, esteem and self-actualisation may overlap, as can belongingness and safety, or safety and physiological needs (such as physical safety). Maslow suggests that esteem can include the regard a person receives from others, which often forms a component of love in many definitions (Alderfer, 1969), (e.g. Rubin, 1970).

Existence needs "include all the various forms of material and physiological desires" (Alderfer, 1969, p. 145). An example Alderfer gives is that hunger and thirst are basic existence needs, and pay and working conditions represent other existence needs. Relatedness needs consist of an individual's social connection needs, the desire for belongingness, love and friendship. Growth needs relate most closely to Maslow's self-actualisation, that an individual has a growth need when they desire to better themselves from their current standing, to achieve their full potential. Although Maslow does not include a growth need categorically, he suggests that growth needs increase as they are satisfied (Alderfer, 1969). As an individual begins to grow and realise their potential the need to grow further exists. Alderfer's ERG theory states that when growth needs are satisfied, a person has utilised their full capacities and achieves a greater sense of fulfilment.

Maslow's (1954) theory suggests that individuals progress to a new level of the need hierarchy once a lower level need is increasingly satisfied. ERG theory proposes a fundamental change in this assumption. While the needs may be seen as hierarchical, there is no strict order to ERG needs (Alderfer, 1969). For example, once an existence

need is fulfilled, or nears fulfilment, relatedness desires may intensify. However, failure to achieve relatedness does not mean the individual's relatedness desires remain intense and increase. Alderfer states that existence needs may be further desired to counteract any lack of relatedness fulfilment. Similarly, the failure to satisfy a relatedness need may increase a desire for growth to compensate. The growth need could be to fulfil relatedness desires. Therefore, a need can be progressed to, but can also be reverted to upon failure to fulfil a higher order need (Alderfer, 1969).

It is important to understand how an individual comes to desire relatedness/belonging needs to understand where they are in their progression to growth and self-actualisation. Whether needs are fixed stages that cannot be reverted to once passed or form part of a more cyclical hierarchy, the work in this thesis does not aim to address the use of SNS in addressing *all* human needs. The focus of the current work is the desire to connect with others - ERG's relatedness and Maslow's belongingness - and the way that this desire can motivate the use of SNS to share information and develop and maintain relationships with others. Figure 2.13 identifies the relevant hierarchical level of each need theory, Maslow's hierarchy of needs and Alderfer's ERG theory.

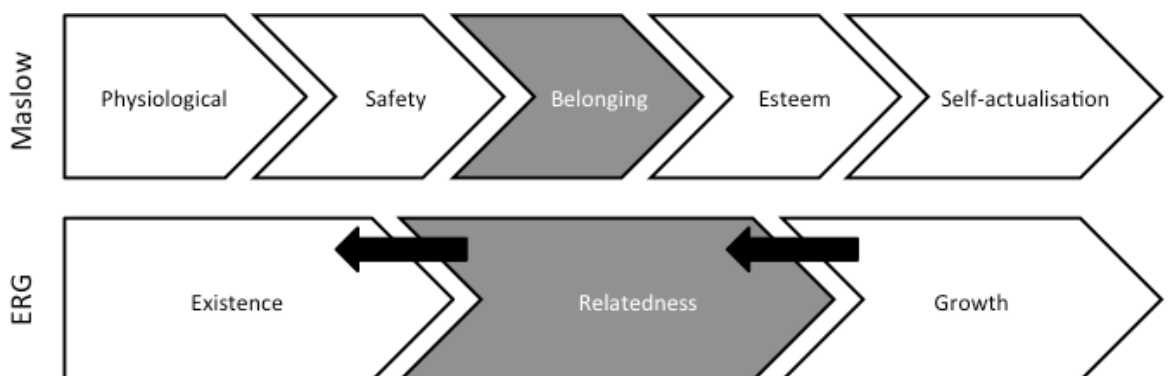


Figure 2.13: Focus of Needs Theories for this Thesis. Adapted from Maslow (1954) and Alderfer (1969).

It can be argued that relatedness needs drive our desire for social connection (Alderfer, 1969). The body of knowledge for communication and interaction between humans, such as general self-disclosure to others, SET, URT, privacy and the relatedness needs of individuals can be extended to include modern technology platforms. SNS have only existed with a critical mass in the last five to eight years (date calculation adjusted from Boyd & Ellison, 2008) and so identifying the processes of communication affected by them is important to advance these bodies of knowledge. Friendship and liking are now discussed as just one example of the need to belong, or relatedness needs.

2.5.3. Friendship and Liking

Research on what constitutes friendship and motivations for achieving it vary in operationalisation and definition across the literature. Friendship has been used interchangeably with affiliation, interpersonal communication, closeness, attraction, social attraction, intimacy, tie strength and frequency of communication (e.g. Altman, 1975; Altman & Taylor, 1973; Antheunis, et al., 2010; Gilbert & Karahalios, 2009; Gilbert, 1976; Granovetter, 1973, 1983; Rubin, 1970, 1973). As such the literature gives a mixed outcome of what determines whether two people are friends or not. This review outlines some of the factors considered in the academic literature as affecting friendship.

Physical and functional distance are suggested to influence the interaction and attraction between individuals (Byrne, 1961). This is supported by the self-disclosure and SET literature that suggests physical proximity can affect the rate of intimacy increase of self-disclosure between individuals (Altman & Taylor, 1973; Jourard & Friedman, 1970). However, research on the living proximities of students has suggested

that those in more distant relationships report being more in love than couples living in the same town (Stafford & Reske, 1990). This is further supported by research that suggests individuals maintain similar levels of closeness with friends after they have moved to a more distant location (Shklovski, et al., 2008).

Research on friendship and interpersonal attraction has largely focused on the similarity of attitudes, personality traits and values (e.g. Byrne & Griffitt, 1973; Kandel, 1978; Rubin, 1973; Secord & Backman, 1964). Greater similarity across a range of issues has been exhibited between friends (Bonney, 1946; Newcomb, 1956; Precker, 1952). It is suggested that people like those with similar attitudes and will perceive themselves as being more similar to those that they like (Byrne, 1971 cited in Byrne & Griffitt, 1973), similar to the notion of disclosure and liking (effect 1 and 2, Figure 2.7). Further, strangers that held similar attitudes have been shown to develop friendships over a course of 16 weeks (Newcomb, 1956). However, individuals may be friends for reasons other than personal similarity.

Attraction has been identified as a function of reciprocal exchange rewards of interaction (Newcomb, 1956). Newcomb's research identifies similarity of attitudes to be personally rewarding. If person A finds that person B holds similar attitudes to them, person A is likely to view this as a confirmation of their world view, understanding and interpretation. Newcomb therefore suggests attraction based on similar attitudes is not simply because person B is similar but because it reassures person A about their standing in society and their life views. The principal of attraction as a social exchange reward resonates with Altman & Taylor's (1973) social penetration model and URT, which propose that individuals self-disclose in order to incite reciprocity and gain information about an interaction partner. This knowledge acquisition and self-disclosure, if not too extreme, leads to increased intimacy levels of conversation and the

development of liking between interaction partners (Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Taylor, 1979).

Other academic work has demonstrated that in naturally occurring examples of dyadic interaction - as opposed to laboratory experiments and forced pairings with strangers – similarity of attitudes is not the most important aspect of friendship (Kandel, 1978). In naturally occurring dyads, Kandel found that similarity of attitudes, psychological factors and the quality of relationships with parents were less important variables to teenagers. More important variables were socio-demographic characteristics and behaviours such as drug use. In the same paper, high similarity between friendship pairs was found for variables including school year, gender, race, age, use of illicit drugs and academic interests. Factors low in similarity between friends were psychological states, attitude and relationship quality with parents. Kandel's sample demonstrates good ecological validity with 73% of the dyads having known each other for more than three years and only 11% knowing each other for one year or less. However, the sample may suffer from bias (particularly the importance of similarity of illicit drug use on friendship), as they were originally dyads participating in a survey on the use of illicit drugs.

Other work on variables of friendship has found that intelligence, academic grades, attitudes towards war and peace and public opinion are not important factors when forming friendships (Vreeland, 1935). Vreeland identified neuroticism and social intelligence as important factors in friendship formation, although the shyness included in Vreeland's definition of neuroticism could represent those who hold few but close relationships, biasing the results. This early exploratory work used simple correlations to determine the similarity of variables between members of a dyad. However, Vreeland did not calculate a statistical significance test (e.g. Pearson's test) using correlational

strength (linear gradient) alone. Further, the operationalisation of ‘friendship’ involved classmates who were either close or very close, suggesting pairs may not have been naturally occurring, choosing the proximally closest partner in the class rather than somebody who is naturally close.

While much research has considered the similarity of attitudes and values between friends, a limited body of research has identified differences and similarities in *needs* between friends. Secord & Backman (1964) identify that within a dyad attraction has two conditions: perceived similarity and interpersonal congruence. They suggest that if both members of a dyad have a need for affiliation this would motivate them to like one another. However, they point out that the *same* needs in each person do not necessarily have to be of the same desire or intensity, but needs can match between individuals if they complement one another (what Secord & Backman call congruency). For example, interaction partners both high in dominance are not likely to easily become friends. However, if one member was dominant and the other high in guidance needs, the two are likely to support each other’s needs and develop liking (Secord & Backman, 1964). This is congruent to the popular adage that “opposites attract”.

Needs as defined by Secord & Backman are better considered relationship qualities than needs as defined by Maslow or ERG theory. While these motivators for friendship are considered needs by Secord & Backman they do not refer to the same underlying traits of Maslow’s theory and ERG. The constructs such as dominance, aggression, and affiliation are more akin to relationship qualities, self-constructs as defined by Altman & Taylor (1973), or personality constructs more generally. Constructs that are valued positively by an individual are more likely to be attached to a friend and the self, whereas constructs with a negative valence are associated with others who are *valued* negatively (Secord & Backman, 1964). A similar effect is found

in positive outcomes of disclosure that are more likely to be attributed to those that are valued positively than those valued negatively and vice versa (Kleinke, 1979).

Similarities between individuals for attitudes and needs are two reasons that people may become friends. However, what friendship is, i.e. its components, is also important to this work. Rubin's (1973, 1974) work presents a detailed overview of academic research on friendship, its components and why people become friends. Rubin identifies two core components of friendship and liking: *affection* and *respect*. Affection is "liking that is based on the way another person relates to you personally, and it is experienced as an emotional warmth and closeness" (Rubin, 1973, p. 27). Respect is "liking that is based on another person's admirable characteristics or actions in spheres other than personal relations" (Rubin, 1973, p. 27). Both affection and respect appeal to the need to belong, and esteem, as they form the basis of connection to another individual in friendship terms.

Another concept of liking and friendship often considered is affiliation (Rubin, 1973). However, affiliation is not an interchangeable term for liking or friendship but is defined as, "the tendency for individuals to increase their proximity to others of the same species" (Rubin, 1973, p. 47). However, affiliation is associated with liking. Rubin suggests that for one to choose to be in close proximity with another can be an indication of intimacy and to choose, un-coerced, to be in close proximity requires one to like the other person or want to like them (attraction). However, affiliation refers to the "tendency to associate with other individuals in general, rather than to the formation of attachments to particular others, as in the case of liking or loving" (Rubin, 1973, p. 48). This contradicts the idea of affiliation requiring intimacy or liking to allow another to become close. Therefore, affiliation may be indicative of a basic need rather than a choice. Support for affiliation as a physiological need can be found in frightened

humans and animals (Rubin, 1973). Animals bunch together in flocks or groups when travelling to reduce the likelihood of an individual being taken by prey. Humans desire affiliation and the avoidance of isolation for long periods. In the same work, Rubin suggests these effects to be amplified when fear is induced, for example being shipwrecked at sea is terrifying, but when experienced in isolation the effects of fear are multiplied.

However, Altman (1975) suggests that individuals must balance the need to socialise with the need to be alone. At times, it is suggested isolation or seclusion from others is necessary to self-reflect and self-actualise (Altman, 1975; Westin, 1967). As Rubin (1973) notes, affiliation is evident when people are fearful, uncertain and when they wish to lose themselves in a group for anonymous security, but it can be costly, too. His work supports the suggestion by Altman and Westin that affiliation can become a burden and one may wish to “reject the company of others in favour of retreat or communion with ourselves” (Rubin, 1973, p. 62).

When socialising with others, individuals enter into an exchange. An individual appraises their own social value in the context in which they find themselves (Rubin, 1973). They can be rewarding for others or rewarded by others via a series of exchanges with their interaction partners (Rubin, 1973). SPT and URT reflect this phenomenon, that information is exchanged with liked others, and information is exchanged because others like us and disclose to us (Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Collins & Miller, 1994; Rubin, 1973). Exchange theory, according to Rubin, removes the romanticism from liking and loving and the belief that we give to- and reward- others merely because we get joy from doing so. Instead, he suggests that we reward and give to others because we are selfish and know that reciprocity is likely.

In summary, we develop friendships to fulfil the need to belong, and we tend to befriend others who have similar or congruent needs and attitudes to ourselves. Furthermore, friendship involves affection and respect between one another, and is reinforced by social approval and reciprocal reward exchanges. Due to the broad nature of what constitutes friendship and the satisfaction of our relatedness desires, the ability to measure friendship between two people proposes considerable challenge.

2.5.4. Measurement of Liking

Rubin (1973) suggests that prior to the development of his Liking and Loving scales, liking was measured in laboratory studies using a simple two item scale (consisting of 7 scales for each item that the participant must answer between 1 – extremely negative – to 7 – extremely positive). Since the development of Rubin's scales, they have been used and discussed extensively (e.g. Hendrick & Hendrick, 1986; Rubin, Hill, Peplau, & Dunkel-Schetter, 1980; Seligman, Fazio, & Zanna, 1980). However, the simplicity of Rubin's Loving scale has been suggested to mask the true complexity of Love (for a review see Hendrick & Hendrick, 1986). Rubin's Liking and Loving scales may also suffer bias as they were developed using ratings of student couples towards their respective partner, meaning the liking scale may be valid only for measuring liking between romantic partners (see Rubin, 1970, 1973; Rubin, et al., 1980). Despite its criticisms, a search for academic literature on the measurement of interpersonal liking demonstrates Rubin's (1970) scales are widely used, being cited over 800 times.

In developing his scales Rubin aimed to capture affiliative and dependent needs of another, the respondent's predisposition to help, and the pair's exclusiveness and absorption (Rubin, 1970). Rubin's original Liking items are responded to using a 9-

point scale from “Not at all true; disagree completely” scored as 1, to “Definitely true; agree completely” scored as 9. Example items include, “I think _____ is unusually well adjusted”, “I have great confidence in _____’s good judgment”, and “_____ is the sort of person whom I myself would like to be”.

More recent work on relationships and liking suggests several components to liking. Bukowski, Hoza & Boivin (1994) developed a friendship quality scale with five factors loading on the friendship quality of adolescents: companionship, conflict, help/aid, security and closeness. In another study of relationship qualities, Furman & Buhrmester (1985) developed the Network of Relationships Inventory (NRI) using a sample of children, and later adolescents (e.g. Furman & Buhrmester, 1992). The NRI measures relationship qualities, such as support, conflict, companionship, admiration, affection, intimacy and relative power, with a target individual, supporting the dimensions found by Bukowski and colleagues. Another strand of academic work has identified the closeness in network connections to represent intimacy with others, suggesting that individuals known through others - friends of friends - may provide useful information but are less regularly communicated with and are associated with less intimacy (Gilbert & Karahalios, 2009; Granovetter, 1973, 1983).

2.5.5. Summary of friendship, liking and relationship development

To conclude, the similarity in attitudes, relationship qualities, affection and respect may motivate information gathering and motivate the need to belong, similar to the motivations of uncertainty reduction and self-disclosure. Underlying needs of human belongingness act to encourage relationship development in a social capacity but are tiered, i.e. are only activated once other needs are fulfilled or remain unfulfilled. Affiliation suggests that in times of fear and uncertainty people will want to associate

with one another, however URT and self-disclosure theories suggest that deeper association occurs only through uncertainty reduction and reciprocal information sharing.

There are broadly two ways to understand friendship or liking: (1) a broad based collection of statements that indicate directly how well an individual likes another; and (2) identifying the components within liking, or friendship, and separating liking into these components for measurement and understanding. Rubin's loving and liking scales fall into category (1) for their simplicity and have been accepted widely in the academic literature. However, in his development and general discussion of the scales, Rubin does consider the scales to include components of liking, however they are not explicitly distinct in their measurement. More recent scales, such as the Network of Relationships Inventory, fall into category (2). Relationships are separated into components of relationship quality, which are driven by needs in communication networks, and in turn reflect how much an individual likes another, and provides various intimate and utility functions to one another.

As with self-disclosure, URT and privacy it is difficult to determine when, how and why at any particular moment humans are motivated to share or withhold information and precisely how they develop relationships. It should be observed that this research does not aim to develop new scales of liking, relationship association or uncertainty but to assess how they interact with one another in new, under-researched and fixed communications environments, namely SNS. Therefore, a discussion on the literature of disclosure, sharing, withholding and friendship development is needed in newer, CMC environments including pre-SNS communication platforms.

2.6. Modern Communication Technology

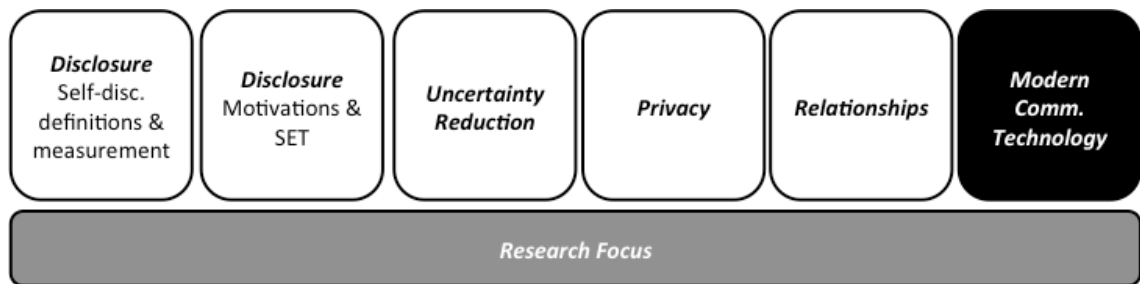


Figure 2.14: Modern Communication Technology Review

Before continuing the literature review to the application of self-disclosure, uncertainty reduction and relationships to ICT environments, the issues facing the present research are summarised as follows: -

- Humans are motivated to connect to others due to a basic desire to belong to a social group.
- To develop interpersonal relationships, thus fulfil the need to connect, reciprocal self-disclosure is required.
- There is a conflict between the need to share information and the dynamic and non-monotonic nature of privacy to control information, with both natural predispositions and social norms governing appropriate information release.
- Without available information about others, reciprocal communication cannot occur and a relationship may not develop, or an established relationship may degrade.

2.6.1. Background

To assess the impact of disclosure in SNS on our relationships it is important to identify what a SNS is, how they operate and to conduct a brief overview of the literature currently available on the use of SNS and effects on interpersonal

communication. However, the Internet did not begin with Facebook. Research conducted in the pre-SNS era, or pre-web2.0 era, can highlight critical differences and similarities between offline communication and general online communication that may be applicable to this research. Thus, a literature search was conducted to outline the established interpersonal and network communication findings prior to the availability of SNS. Included within this review is literature on other CMC environments which may have been conducted since the popular rise of SNS, e.g. work on virtual teams using a specifically developed communication platform.

A literature search was conducted using the broad terms and synonyms of self-disclosure, relationships and privacy, alongside the terms CMC or SNS. Literature was then filtered based on the research foci, and further articles located from the reference sections of these articles. This provided a list of 122 articles, books and book chapters. The full list of keywords used in the literature found are shown in Table 2.2 for keywords used more than five times across all sources. If keywords were not given or were unavailable keywords were generated from their title or abstract.

Table 2.2: Keywords of the CMC literature found

Keyword	No. Documents
SNS	44
Privacy	40
Self-Disclosure	27
Internet	23
Communication/Interaction	15
CMC	15
Online/Virtual Communities	14
Relationships/Friendship	14
Information Sharing	13
Groups	9
e-commerce	8
Trust	8
HCI	7
Networks	7
Social Spheres/Boundaries	5
e-mail	5
Identity	5
Social/New Media	5
Uses & Gratifications	5

Using the literature identified the definition of SNS will be given first. Then a discussion of the pre-SNS literature will commence, outlining the assumptions, uses and outcomes of CMC platforms. Then the research on the use of SNS as a form of CMC will be reviewed with particular reference to interpersonal communication and disclosure practices, and the uses and effects of Facebook. To identify what is already known about interpersonal communication, information management and connecting with different social circles in one environment, the literature on Privacy in CMC and SNS is then outlined with a focus on audience management.

2.6.2. Definition of SNS

There is increasing attention paid to SNS amongst academic and industry researchers, with millions of users creating accounts and logging in daily (Boyd &

Ellison, 2008). Due to this surge in interest Boyd & Ellison recognised the need to define what constitutes a SNS:-

“We define social network sites as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site” (Boyd & Ellison, 2008, p. 211).

The first major SNS launched its services in 1997, and several services developed throughout the late 1990s and early millennia (Boyd & Ellison, 2008). Many community sites re-launched as SNS. Of the developed SNS noticeable launches include Friendster in 2002, MySpace in 2003 and Facebook in 2004 (Boyd & Ellison, 2008). Facebook launched in 2004 for Harvard users only, later extending their user base to other US colleges and eventually to academia throughout the US and Europe. High School networks were included in 2005 and in late 2006 Facebook became available to everybody with an Internet connection (Boyd & Ellison, 2008). It is only since MySpace and Facebook (from late 2006) that SNS have experienced an almost ubiquitous status. The earlier years of SNS involved targeted communities rather than widespread use, e.g. BlackPlanet, AsianAvenue MySpace – which focused on musical interests – and Facebook – which focused on US colleges (Boyd & Ellison, 2008).

Boyd & Ellison (2008) provide a list of features that SNS contain. These include the ability to create a profile – typically containing name, age, description (an ‘about me’ section), and a profile picture – to view and add contacts to a list, the ability to browse this list and the friend connections of others, to change the look and feel of a

profile or add ‘applications’, and the ability to leave messages on the profiles of others or send them direct private messages. Boyd & Ellison found that when adding ‘friends’ most SNS require two-way confirmation that a relationship actually exists (or is desired). Furthermore they note that some SNS also allow the uploading of photographs and videos, although this is not a universal feature. These photographs and videos, as well as wall posts and status updates, can be ‘tagged’ which links a user to that object. Facebook includes an Instant Messenger (IM) feature, and are currently in beta stages of integrated a Voice over IP (VoIP) plugin with Skype⁶. Skype have also added a Facebook plugin to their VoIP software to allow users to communicate directly with their established Facebook connections⁷. Other areas of development include augmented reality, with the ability to wear glasses that link to Facebook’s database and show profile information based on facial recognition algorithms (Acquisti, Gross, & Stutzman, 2011).

Facebook and Twitter are two of the most popular SNS. Facebook currently has over 955 million active users worldwide¹. The average Facebook user has 130 friends and over 700 billion minutes per month are spent on Facebook⁸. The average user is connected to over 80 community pages, creates 90 pieces of content per month, totalling over 30 billion pieces of content, and more than 250 million people per day engage with Facebook from external sites and apps. In June 2012 over 543 million active users accessed Facebook from a mobile device¹. Facebook’s large user base provides the ideal

⁶ <https://www.facebook.com/VideoCallPluginInstaller>

<http://techcrunch.com/2011/07/06/facebook-launches-skype-powered-video-calling/>

⁷ <http://community.skype.com/t5/General-Discussion/New-facebook-plugin-on-skype-about-the-features/td-p/7878>

⁸ Facebook Statistics <http://www.facebook.com/press/info.php?statistics> accessed August 2011 – No longer available.

environment to investigate passively and actively the effects of sharing in SNS on interpersonal relationships. Crucially, with so many users posting such large numbers of items to SNS, research is required to determine precisely how and why Facebook may be beneficial or detrimental to interpersonal relationships.

2.6.3. Internet communication and pre-SNS interpersonal interaction

“The precise role of mediated communication in relationship maintenance has been difficult to isolate” (Shklovski, et al., 2008, p. 1). The general benefits for social interaction of ICTs include the ability to keep in touch and maintain relationships with others via telephone, email, fora or UseNets (Boneva, et al., 2001; McKenna & Bargh, 1998; Shklovski, et al., 2008), search for new relationships and those with common interests and identities (Bargh & McKenna, 2004; Madden & Smith, 2010; McKenna & Bargh, 1998, 1999), engage with online communities and virtual communities (Culnan, 2008; Golder, Wilkinson, & Huberman, 2007; Kavanaugh, Carroll, Rosson, Zin, & Reese, 2005; Ridings, Gefen, & Arinze, 2002; Wellman et al., 1996), and to communicate and work in geographically dispersed teams (Anawati & Craig, 2006; Hertel, Geister, & Konradt, 2005; Huysman et al., 2003; Jarvenpaa, Knoll, & Leidner, 1998; Shachaf, 2008).

Early research on Internet use and CMC has given different results (Shklovski, et al., 2008). Internet users were identified as being less socially involved, more lonely, and lower in psychological well-being than those that did not use the Internet, based on the conclusion that those who did not use the Internet would spend their time interacting with friends offline and the Internet was a distraction from this (e.g. Kraut et al., 1998). However, more recent academic work focused on the use of networked technology to develop and maintain existing social relationships, and to create new friendships

(e.g. Boneva, et al., 2001; Kraut et al., 2002; McKenna & Bargh, 1999; Nie, 2001; Shklovski, et al., 2008). CMC was also observed to help network connections and support many different types of relationships (e.g. McKenna & Bargh, 1998; Norris, 2004; Wellman, Haase, Witte, & Hampton, 2001). These can include people from different social groups (Handy, 1995), those looking to develop a common interest with another user (McKenna & Green, 2002; Wellman, et al., 2001), or individuals with marginalised identities searching for similar others (McKenna & Bargh, 1998; Mehra, Merkel, & Peterson Bishop, 2004). A key motivator for Internet use was considered to be the anonymity it afforded users allowing them to communicate and perform searches without being attached to the information they shared or sought (Buchanan, Joinson, Paine, & Reips, 2007; Joinson, 2001; Kraut, et al., 2002; McKenna & Bargh, 1998).

When communicating online compared to dyads that communicate offline, individuals report greater liking and acceptance by others (McKenna & Bargh, 1999). Increasingly geographically distant social networks were found amongst individuals who spent more time online, however, those who spent less time online had a larger localised social network (Kraut, et al., 1998). Email and Internet Relay Chat (IRC) have been shown to satisfy interpersonal needs (e.g. Parks & Floyd, 1996). These findings illustrate the use of CMC to establish further reaching networks and satisfy the need to connect with others, that online interaction is not necessarily a function of loneliness or interpersonal isolation. Hampton & Wellman (2003) found that electronic communities had positive effects on interaction amongst community members and encouraged involvement in communication. SNS by the nature of their design encourage users to connect with both strong and weak ties (Burke, et al., 2009; Gilbert & Karahalios, 2009) and so may be beneficial for interpersonal connection needs.

With regard to the outcomes of using ICTs on interpersonal relationships several studies have shown that depending on the technology used and the relationship held CMC is both beneficial and detrimental. Parks & Floyd note that,

“In short, both popular and scholarly accounts present sharply contrasting, often dramatized, views of the possibilities for on-line relationships” (Parks & Floyd, 1996, p. 4).

Friendships have been shown to be more susceptible to disruptions of physical distance and prolonged intervals between communication than family members or kinship (Roberts & Dunbar, 2010; Shklovski, et al., 2008). In a study of residential movers, the use of email to keep in touch with distant friends was shown to help maintain closeness between dyads (Shklovski, et al., 2008). Shklovski and colleagues found that a decrease in the frequency of email communication (self-disclosure breadth) was associated with a decrease in closeness between friends, however an increase in the use of email did not increase closeness. This demonstrates the effect of self-disclosure on liking but is restricted in its direction. Whereas, in the same paper, an earlier form of networked communication – the telephone – showed that an increase in its use resulted in an increase in closeness as well as a decrease in the frequency of its use resulting in a decrease of closeness. This suggests that some forms of technology help to grow and develop relationships – the telephone – and some forms of technology are useful to maintain relationships – email *and* the telephone. However, email communication has also been identified as less suited to the management of personal relationships (Cummings, Butler, & Kraut, 2002; Walther, 1996), suggesting other factors may intervene in the relationship between email use and friendship. For example, it could be considered that the voice communication involved in telephone calls is close to face-to-

face (FtF) meetings, whereas the text only environment of email makes it difficult to communicate in the same way. The relationship between disclosure in networked technology and liking differs depending on the technology, increasing the need for research on interpersonal communication in new platforms.

Of interest to the present research is the difference in communication between established and new friends over time. Variables associated with psychological closeness and enacted supports are influential in relationship maintenance (Shklovski, et al., 2008). Friends that were in contact more frequently before one of them moved away showed more resistance to the house move in terms of their interpersonal closeness. The same authors found that over a longer period both FtF and phone use was found to decrease with distant friends to a lower level, but email use remained similar to pre-move levels (although was less frequently used initially). Although there was an impact on closeness, the authors conclude that changes in location between friends do not affect the intimacy levels between them, and so an alteration in the frequency of FtF interaction was concluded to be independent of intimacy. Shklovski and colleagues' study highlights the possible effect of relationship status and communication patterns prior to moving from offline communication to a technological medium.

As with self-disclosure gender differences in technology use have also been investigated. It was thought that males are taught to be more instrumental in their communication and females more expressive, and these distinct communication patterns relate to different technological affordances (Boneva, et al., 2001). Boneva et al. (2001) hypothesised that email would suit male communication styles over female patterns, however email may encourage more expression as it has unlimited space and can be constructed over a longer period than synchronous communication methods such as the telephone (Joinson, 2003). Boneva and co-authors found that women spent more time

communicating with friends and family and using email in general compared to males. However, the general use of the Internet for music, entertainment and searching for information was not different between genders, suggesting that gender effects are not related to the Internet in general but to the way that individuals communicate with one another using ICTs.

In a meta-review of Internet communication research, use of the Internet was found to be beneficial to the individual as well as the relationships they hold with others (McKenna & Bargh, 1999). When becoming involved in a group via Internet communication, positive effects on self-acceptance and self-esteem were observed. Those with stigmatised and marginalised identities found support in Internet discussion groups with similar others to be able to 'come out' to family and non-Internet friends (McKenna & Bargh, 1998, 1999). In the same two papers, McKenna and colleagues identified that marginalised others felt more socially connected and less estranged because of their group involvement with similar others. These results suggest that the ability to find similar others and communicate online can encourage deep, intimate and secret aspects of the self to be disclosed and allow users to evolve their self and relationships positively.

The discussion above highlights that liking can occur alongside— and because of— CMC. Email has been shown useful to maintain relationships with geographically distant friends, the use of the telephone can help to develop relationships as well as maintain levels of intimacy with others, and UseNets and online communities are capable of encouraging the development of self-esteem, group and personal identities and relationships with similar others. It was also demonstrated that relying solely on one form of CMC, such as email, could be detrimental to relationships if used for the wrong purpose. For example, using email to build a relationship may be insufficient and so

prevent intimacy from developing. Furthermore, findings apparent in the identified technologies may transfer to modern forms of ICT. For example, telephone communication may transfer to the use of audio and video conferencing, whereas email and online communities may transfer to the use of similar SNS features. The discussion will now continue with research on the direct effects of using CMC on certainty and liking, and how these relate to self-disclosure in text-based CMC environments including IM, IRC and email.

2.6.4. Pre-SNS era interpersonal communication, liking and certainty

Before discussing the research on SNS it is necessary to identify pre-SNS era research that incorporates liking, uncertainty reduction and self-disclosure in CMC. URT is a useful addition to self-disclosure as it suggests that individuals are motivated to share and seek information to reduce cognitive dissonance. Broadly, there are three information-seeking strategies in uncertainty reduction: *active*, *passive*, and *interactive*. Each of these can be transferred to online environments and the interpersonal relationships held within them, however, different technology platforms will lend themselves towards different information seeking strategies. For example, email and IM involve direct communication and could be utilised for *interactive* information seeking. However, if email and IM are used in group mailing lists or group chat sessions, then *passive* information seeking could be performed.

Different CMC channels may be used to different ends. Users of text-based CMC may reveal more information than they would FtF to overcome the lack of visual cues available to them (Tanis & Postmes, 2007). Cues to identity in text-based CMC encourage interactions to be evaluated more positively (Tanis & Postmes, 2007), suggesting that more information about identity leads to greater positive interpretations

of communication. Tanis & Postmes also found that in the absence of cues to identity rich communication in the form of increased question asking and reciprocal self-disclosure led to reduced uncertainty. The axioms of URT suggest that common topics of interest result in lower uncertainty (Berger & Bradac, 1982; Berger & Calabrese, 1975), which in combination with the use of CMC to find similar others (e.g. McKenna & Bargh, 1998) suggests that CMC could be more beneficial to reduce uncertainty for some than FtF communication.

Users of text-based CMC also show a greater proportion of direct and intimate questions than those interacting FtF (Tidwell & Walther, 2002). CMC participants became more confident throughout the exchanges and were perceived by their interaction partners as more effective communicators than FtF participants. Therefore, not only do the axioms of URT apply to text-based CMC, but in turn, CMC may amplify the effects of direct communication when language is used to recover cues to identity (e.g. Tidwell & Walther, 2002; Walther, 1996).

However, Tidwell & Walther's (2002) study may oppose the initial arguments of URT and SPT, that too much disclosure at early relationship stages leads to disliking. CMC participants used more direct and intimate questioning than FtF participants, and could be considered to over disclose. However, the communication is context bound and the information can only be considered to be an instance of over-sharing when taken out of context, or compared directly with FtF. It is likely that the norms and social contracts of CMC discussions are to operate in a more direct and intimate manner than FtF at early stages of relationships to overcome cues to identity and reach a lower level of cognitive dissonance. Therefore in new environments such as SNS, research is required to address the effects of disclosure on relationships *in context*, i.e. it cannot be presumed that the same patterns as text-based CMC or FtF communication occur.

In a review of CMC, self-disclosure and message content across different CMC platforms, Walther (1996) suggests three types of interaction, each relating to a different process of disclosure in CMC. *Impersonal* communication is argued to be more suited to task oriented CMC use. Walther suggests that features of CMC, such as reduced cues to identity, lend themselves more favourably to impersonal interaction. *Interpersonal* communication is suggested as most suitable for reaching out to somebody, proposing that some CMC environments favour this type of communication, i.e. the rate of social cues delivered is much slower than in FtF environments and may help build an impression more gradually. It is further suggested that anticipated future interaction may help to remove the differences between FtF and CMC interaction (Walther, 1996; Walther & Burgoon, 1992). The third type of interaction, already identified in the work of Tanis & Postmes (2007) and Tidwell & Walther (2002), is *hyperpersonal* interaction. Here, Walther (1996) suggested that intimacy, solidarity and liking in CMC reach higher levels than expected in parallel FtF communication. One reason for this could be that the asynchronous nature of text-based CMC compared with FtF allows people more time to carefully construct their responses (Joinson, 2003; Walther, 1996). However, hyperpersonal interaction could lead to wrongfully reduced uncertainty as the individual is not as polarised as the interaction may suggest (Ramirez, Walther, Burgoon, & Sunnafrank, 2002).

Overall it is concluded that disclosure and uncertainty reduction in text-based CMC are implicated by several variables of note. Differences in the evaluation of a discloser in CMC can occur depending on the technology used, the rate of communication, available cues to identity and the information seeking strategy adopted by interactants. It is generally considered that in CMC more direct and intimate conversation takes place compared to FtF and it is not considered to be over-sharing, as

recipients evaluate senders more positively and as more effective communicators. SNS environments such as Facebook utilise text, visual, audio and video communication and could lend themselves favourably to each of the three information seeking strategies: active; passive; and, interactive. Although each of the channels of communication in SNS are not new, their combination and implication in a largely social environment, is. Therefore, to investigate the effects of disclosure on relationships it is necessary to have understood that the platform originated in pre-SNS CMC and that the findings may be applicable, but the assumption that the results of interaction are the same should not be made.

2.6.5. Interpersonal communication and contemporary issues in SNS

This section outlines the research in SNS environments relevant to self-disclosure, uncertainty reduction, liking and interpersonal interaction. This marks the step beyond initial CMC research to begin to understand relatively new SNS environments. As Ellison and colleagues note, “much of the existing academic research on Facebook has focused on identity presentation and privacy concerns” (Ellison, Steinfield, & Lampe, 2007, p. 1145). While concerns over identity management and privacy of information sharing on profiles are undoubtedly important, this section will first focus on the uses of SNS, and effects of disclosure on relationships. Then, contemporary issues of SNS environments are presented including privacy and information management, and the problem of multiple audiences within a single SNS environment.

Humans strive to fulfil the need to belong and connect with others (Alderfer, 1969; Maslow, 1954). As defined earlier, SNS allow people to connect with others and browse interconnected social networks openly. Previous academic work has

demonstrated that users can successfully fulfil the need to connect within SNS, and that SNS can facilitate the creation of offline connections, relationship development and relationship degradation generally (e.g. Binder, et al., 2009; Chen, 2011; Ellison, et al., 2007; Joinson, 2008; Lampe, Ellison, & Steinfield, 2006, 2007; Marwick & Boyd, 2011; Sibona & Walczak, 2011; Skeels & Grudin, 2009; Steinfield, Ellison, & Lampe, 2008).

A uses and gratifications framework has been applied to Facebook and Twitter. However, research in this area is limited so sound conclusions cannot be drawn. Significant factors of Facebook use are social connection, shared identities, photographs, content, status updates, social network surfing and social investigations (Joinson, 2008). The most common uses of Facebook Joinson found were to look people up, keep in touch with friends who were away from home, to re-acquaint past friendships, to communicate with others via direct messages (akin to email), posting messages on others' walls and 'poking' them, and the use of photographs for sharing and tagging with other users. When deciding to share photographs in Facebook users considered the strength of their network connections, which social circles were able to view the photographs, geographical locations, organisational boundaries, temporal episodes, photograph content and whether the photograph achieved a purpose, amongst others (Jones & O'Neill, 2011). Factors that influenced the decision not to share included whether the picture was taken at work, a pub/club, showed themselves being seen with a stranger, or if their network ties were weak (Jones & O'Neill, 2011). The results of these two studies suggest that Facebook users are motivated to disclose information in the form of personal messages, public messages, photographs, and their identity and group status. However, their motivations to share information, at least for photographs, differ depending on their audience, photograph content, the strength of

their friendships and considerations of time and place. The gratifications of Facebook suggest the purpose of Facebook use are to connect with others, make new friends and to re-establish old friendships, which may successfully fulfil the need to connect with others and belong to a social group.

Students were found to use Facebook most likely to keep in touch with old friends or school friends, check the profile of somebody they met socially, somebody who lived in halls or other class-mates, and to find information about a party or event (Lampe, et al., 2006). Lampe and colleagues labelled the use of the SNS to find information out about somebody specific with whom the user already has an offline connection as *Social Searching*. The least likely uses of Facebook identified by Lampe et al. were to initiate a FtF encounter with somebody they met through Facebook, to find people to date, and to find casual sex partners. Such behaviour has been termed *Social Browsing* by the authors. Student users of Facebook are more likely to perform social searching than social browsing (Ellison, et al., 2007; Lampe, et al., 2006).

Ellison and colleagues found that Facebook supports the development of new strong and weak network connections, as well as the maintenance of pre-existing offline relationships (Ellison, et al., 2007). However, students believed their primary audience would be those with whom they have an offline connection, and were more likely to use it to maintain existing connections than to seek new ones. However, newer students did show a slight, but non-significant tendency to look for new connections (i.e. social browsing). The maintenance of pre-existing relationships was predicted by both Facebook use and general Internet usage (Ellison, et al., 2007), suggesting that similar components of Facebook and broader Internet applications can facilitate relationship maintenance. In the same study, the intensity of Facebook use was also shown to increase the strength of close relationships. In relation to self-disclosure research, it is

necessary to identify which features of Facebook facilitate the maintenance of relationships, i.e. determine the process of disclosure used to maintain relationships, as well as the content of the disclosure. For example, identifying the features that may be considered intense and subsequently help users become closer.

An additional study using the MySpace platform found that it was used to find new friends and re-connect with old friends (Raacke & Bonds-Raacke, 2008). They found no differences in engagement with SNS for gender or race, but males and females did use MySpace differently. Furthermore, men logged in more frequently than women, women changed the appearance of their profile page more often than men, men had significantly more friend connections than women, and women were significantly more likely to set their account to private compared with men. With regard to the specific uses of SNS, Raacke & Bonds-Raacke found that men were significantly more likely to use MySpace for dating and to learn about events than women. Further findings for gender differences in the use of SNS were found when investigating the motivations for using fan pages in Facebook, where females were more likely than males to use Facebook fan pages to obtain information (Park, et al., 2009).

Within Twitter a sample of 317 users showed that the longer a user had an active account and the more hours they spent per week using Twitter were related positively to the gratification of an informal need to connect with others (Chen, 2011). Demographic variables including gender and age did not lessen this effect. However, the frequency of tweeting and making public replies (@user command) both mediated the effect of Twitter use on the gratification of the need to connect to others, such that fewer tweets and public replies resulted in less fulfilment of the need to connect.

Within SNS in general, *interactive* strategies of uncertainty reduction originate from direct communication opportunities, both publicly e.g. on profile walls, or

privately, e.g. using a direct message. *Active* information strategies are involved in social searching, and *passive* strategies utilised in social browsing. Social network users often have a profile where information is browsed passively. It is argued that because several types of CMC are amalgamated in SNS platforms that facilitate all three uncertainty reduction strategies, users of SNS have greater opportunities to develop and maintain relationships than the use of any singular CMC channel or information seeking strategy would allow.

A recent study on the effects of uncertainty on social attraction amongst new network connections suggests that all three information-seeking strategies are utilised (Antheunis, et al., 2010). Interactive strategies were observed to be the most effective at reducing uncertainty. A mediation effect was also found. Uncertainty levels mediated the relationship between interactive information searching and a user's perceived similarity of a new friend with their self, and between interactive strategies and social attraction. Furthermore, Antheunis and colleagues found that the relationship between uncertainty and social attraction was moderated by the valence of obtained information about others. However, because their study was limited to new friends on Facebook it is difficult to generalise the findings to all relationships. As Facebook use is generally considered to focus on connecting with existing friendships (e.g. Ellison, et al., 2007; Joinson, 2008; Lampe, et al., 2007), Antheunis et al's. study may only cover a small sample of Facebook users. However, it is possible for new friendships to be developed via Facebook. Therefore, the present research must consider the investigation of interpersonal communication at different stages of relationships, i.e. interpersonal communication with a new and old friend, as well as the mediation effects of uncertainty between information disclosure and liking.

2.6.5.1. *Privacy: A contemporary issue of CMC and SNS.* This section will briefly outline the privacy issues brought by modern communication platforms. The present research focuses on one area of privacy: information control and the effects of disclosing or withholding on personal relationships. Specifically, information that is shared by the user with the intentions of using site features to communicate and share information with chosen others. This marks a movement from the pre-web 2.0 era, privacy as a protection of basic personal information in e-commerce sites, and security settings of email (e.g. Ackerman, Cranor, & Reagle, 1999; Acquisti, 2004; Dinev & Hart, 2006; Miyazaki & Fernandez, 2000) towards an understanding of privacy concerns and disclosure decisions raised through interpersonal communication. However, it is necessary to briefly revisit the literature from pre-SNS environments to understand the general issues of data aggregation, secondary processing and record permanence, before highlighting the issues in SNS and how they can affect interpersonal communication.

The second most common keyword identified in the literature search for this Modern Communication Technology section was privacy. It represents one of the larger researched areas of CMC and SNS communication. Privacy has been discussed in relation to posting personal demographic and biographical information to SNS profiles and providing sites with this information in return for a 'free' service (e.g. Acquisti, 2009; Acquisti & Gross, 2006; Acquisti & Gross, 2009; Berthold & Boehme, 2009; Christofides, et al., 2009; Gross & Acquisti, 2005; Young & Quan-Haase, 2009), managing information sharing across different social connections (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Gilbert & Karahalios, 2009), data management in terms of credit card and security fraud of e-commerce sites (e.g. Ackerman, et al., 1999; Acquisti, 2004; Dinev & Hart, 2006; Metzger, 2006; Miyazaki & Fernandez, 2000;

Spiekermann, et al., 2001), potential ID fraud (e.g. Acquisti & Gross, 2009; Miyazaki & Fernandez, 2000), the ability to collect, store, process, disseminate and re-use information that was previously difficult to aggregate (e.g. Schatz Byford, 1996; Solove, 2006, 2007; Sparck Jones, 2003), collecting and protecting location data of consumers, users and their network contacts (e.g. Acquisti & Gross, 2009; Barkhuus & Dey, 2003; Thompson & Thompson, 2007), and trust and sharing in e-government sites (e.g. Dinev, et al., 2008; Krueger, 2005), amongst others.

Privacy has become one of the most important issues of modern social communication. In 1996 Schatz Byford argued that: -

“At no time have privacy issues taken on greater significance than in recent years, as technological developments have led to the emergence of an ‘information society’ capable of gathering, storing and disseminating increasing amounts of data about individuals” (Schatz Byford, 1996, p. 1).

Previously, embarrassing activities or potentially destructive occurrences were committed only to the memory of those who witnessed or experienced them (Solove, 2007). However, the ability of modern ICTs to permanently store all data that are entered and processed (record permanence) may be detrimental to interpersonal relationships or even an individual’s standing in society (Solove, 2006, 2007; Sparck Jones, 2003). Those aware of the privacy implications of using CMC may reduce the amount of information or the depth of information that they disclose in such platforms. Consequently, the reduction in available information for others and general levels of information disclosure may be detrimental to relationship development or maintenance.

Even if users are warned about potential privacy implications of having open profiles in SNS environments they may not act to restrict access to their information

(Govani & Pashley, 2005). However, it is further suggested that users may not be able to conceptualise consequences outside of their immediate context and environment because they cannot precisely identify all the variables within and between each information system as well as compensate for temporal variables of data release (Acquisti, 2004; Acquisti & Grossklags, 2004). Therefore, it is concluded that users may not be able to accurately identify what information to share within SNS environments to effectively encourage interpersonal communication, yet simultaneously protect it. In the present research, investigating appropriate, beneficial and harmful disclosure within SNS can help to inform theory and users of communication best practices, but cannot successfully ensure that users never release or conceal information appropriately in every circumstance.

A privacy concern often referred to is that of data aggregation (e.g. Introna & Pouloudi, 1999; Miyazaki & Fernandez, 2000; Solove, 2006; Sparck Jones, 2003). Within SNS it has been researched with reference to collecting pieces of frequently shared biographic and demographic information about users, and combining it with data from other sources to perform some act of privacy violation, i.e. fraud, identity theft or to construct a greater profile on an individual. For example, using data from the US Death Master File⁹ and Facebook, an algorithm has been calculated to successfully replicate a user's social security number in less than 1,000 attempts (Acquisti & Gross, 2009).

The concern over data aggregation, amongst other privacy violation methods, may discourage users to share information freely in SNS. However, by withholding information such as biographic and demographic information from their profile page

⁹ The Death Master File is a database of all the social security numbers of deceased US citizens made available to prevent fraud: <http://www.ntis.gov/products/ssa-dmf.aspx>

they may create profile ‘black spots’. It is currently unknown which pieces of information are beneficial or detrimental to personal relationships, or whether the method of disclosure is effective in improving or damaging a relationship in SNS. However, inferences can be made from SPT (Altman & Taylor, 1973). Finding out information about other users in SNS not only encourages users to return to the site (Beenen, et al., 2004; Burke, et al., 2009), but allows other users to gain more information about a user, potentially reducing uncertainty and increasing liking. However, this may be restricted to situations where the social connection is new and individuals utilise passive and active information seeking strategies. When social connections are long-term friends already, the need to identify more peripheral information on the profile is reduced as this information is arguably already known or unnecessary to their current relationship stage. Thus, demographic, biographic and more peripheral pieces of information may provide useful cues to reduce uncertainty amongst new friends. Between established friends interactional disclosure - that made at later stages using interactive information seeking strategies – may be more beneficial to uncertainty reduction and liking. At this stage concealing photographs depicting personal life may be detrimental. However as noted earlier, sharing all types of information is not necessarily the route to relational success (e.g. Afifi, et al., 2007; Altman, 1975; Derlega & Chaikin, 1977; Petronio, 2002). Therefore, support is added to the need of the present research to identify what pieces of shared information are useful or harmful to relationships with different types of people and at different relationship stages.

2.6.5.2. *Real and virtual social circles.* The use of privacy as a potential management tool for deciding to disclose information may be useful when identifying

areas where users do not disclose information. The control of conversation flow through audience management (Binder, et al., 2009; Marwick & Boyd, 2011; Tufekci, 2008), and the recent work on conflicting social circles (Binder, et al., 2009; DiMicco & Millen, 2007; Marwick & Boyd, 2011) are important. Furthermore, concepts of boundary management and information sharing from general privacy theories may be applicable to the decisions to disclose in SNS. Privacy as a boundary control mechanism for disclosure and revelation of information can be argued to be a fundamental process in deciding to disclose personal information to a group of network contacts (e.g. Altman, 1975; Derlega & Chaikin, 1977; Houghton & Joinson, 2010; Petronio, 2002, 2007).

It is proposed that the new connections are more likely to be harmed by the restriction of ‘profile information’ than old connections. However, information sharing to serve the function of interactivity and interpersonal communication is affected by conflicting boundary demands. Withholding some information is beneficial to relationships, and releasing other information may also be beneficial (Afifi, et al., 2007; Altman & Taylor, 1973). Social norms are also proposed for boundary management and self-disclosure generally (Altman, 1975; Altman & Taylor, 1973; Berger & Bradac, 1982; Margulis, 2003; Petronio, 2002; Westin, 1967). Generally it is concluded that although norms exist for information disclosure, many variables can determine if disclosure or concealment is the most appropriate choice.

Openness is encouraged in SNS to make the services interesting and attractive to other users (Beenen, et al., 2004; Binder, et al., 2009; Burke, et al., 2009). Open sharing is also a norm of SNS and a lack of information available to browse can result in a poor user experience. In SNS naturally occurring boundaries merge into one large group of ‘friends’ (Binder, et al., 2009; Marwick & Boyd, 2011). Communication between dyads

can also be viewed by other network connections and their connections (i.e. other friends and friends-of-friends) (Binder, et al., 2009; Boyd & Ellison, 2008). Furthermore, it is suggested that an increase in the numbers of kin in the collapsed 'friend' group in SNS is related to increased tension due to the potential for information to leak across boundaries (Binder, et al., 2009). It is the blurring of these otherwise distinct relationship boundaries that causes social tension and necessary alternative behaviour, such as flattening the intimacy or sensitivity of a post to make it suitable for most recipients (Binder, et al., 2009; DiMicco & Millen, 2007; Handy, 1995; Houghton & Joinson, 2012; Marwick & Boyd, 2011). The merging of two or more heterogeneous networks into one homogeneous environment is akin to stretching the self boundary over all of a person's social connections allowing information to flow freely amongst everyone. Awareness of the conflicting demands of different social circles is disputed. Some authors claiming users are unaware of the potential audience (e.g. Acquisti & Gross, 2006), and more recent work suggesting that users are aware and alter their posts to become more mundane (e.g. Marwick & Boyd, 2011).

Facebook has a strict 'real names' policy embedded within its Terms of Service (Facebook, 2012). Users are therefore no longer anonymous, which has often been discussed as one of the reasons interaction pairs become hyperpersonal in pre-SNS CMC environments (e.g. Joinson, 2001; Kraut, et al., 1998; McKenna & Bargh, 1998). A lack of anonymity may act to reinforce control over what a user posts in SNS, as they know it is easily attributed to them. As such, relationships are argued to be 'anchored in reality' (Zhao, Grasmuck, & Martin, 2008).

A qualitative analysis of 27 SNS users showed that there are several strategies for controlling data: *Individual Preventative*, *Individual Corrective*, *Collaborative Preventative* and *Collaborative Corrective* (Lampinen, Lehtinen, Lehmuskallio, &

Tamminen, 2011). *Individual Preventative* are measures that the individual can take to prevent information disclosure or leakage and includes creating separate audience groups, adjusting personal privacy settings to restrict disclosure and using a private communication channel such as direct messaging. *Individual Corrective* measures include deleting comments once they have been posted, detagging photographs and interpreting a potentially problematic situation as non-serious. *Collaborative Preventative* techniques include negotiating ‘rules of thumb’ about sharing with other SNS users, and asking for specific approval before disclosing content of others, akin to boundary negotiation in CPM. *Collaborative Corrective* measures taken can involve asking another person to delete a comment/post, reporting content to site administrators and supporting an individual’s non-serious interpretation (e.g. adding smileys to the comments of a potentially problematic status update of another).

Knowing what is acceptable to disclose to different audiences can be a difficult decision. Communication Privacy Management suggests that disclosure decisions are based on implicit or explicit rule negotiation, such that individuals choose to disclose to those who they perceive will manage the information according to a common set of rules or values (Petronio, 2002). Within both the privacy theories of Altman and Westin, disclosure and what is considered acceptable are governed by cultural values and norms, both theorists outlining different nomadic tribes to demonstrate that each have differences in how they choose to enact privacy (Altman, 1975; Westin, 1967). However, both Altman and Westin also agree that privacy decisions and behaviours are culturally universal, but it is their manifestations that differ. Berger & Calabrese also identify that cultural norms can dictate the decision to disclose to particular individuals, based on the appropriateness of the situation, again a cultural norm development (Berger & Bradac, 1982). Work in online environments suggests that cultural norms are

used to determine if disclosure content could be appropriate for one audience but inappropriate for other audiences, often post-hoc, but suggests that users have difficulty in managing the information online when deciding to post initially (Binder, et al., 2009). A final consideration of how users choose what to disclose and to whom, is found in the qualitative work of Marwick & Boyd (2011). They commence their work with the suggestion that when users choose to disclose or engage in any form of communication, they have a particular audience in mind, and posting for one audience in a collective environment may alienate other audience members. Furthermore, they found that users of Twitter know there are different audiences and that some information may not be appropriate across all relationship types, and thus take a common denominator approach to posting. Marwick & Boyd find that users are concerned more with posts seeming genuine and credible within this common denominator approach to disclosure than risking violating expectancies of different audiences (Marwick & Boyd, 2011). It is therefore argued here that individuals base their decision to disclose online, and decide what is appropriate for different audiences, based on their relationship with the same set of individuals in offline environments. For example, avoiding disclosure of intimate information to a colleague offline is transferred into considerations of disclosure in an online environment.

Regardless of awareness and the mechanisms used to control information, it is not currently understood how this mundane information sharing, *intended* for all network connections, may interfere with relationships of different types and when control should be operated to allow or prevent information sharing. For example, a user may *deliberately* share photographs of their pets, which may not necessarily be considered to be detrimental to their relationships. However, when received by different recipient types such photographs could have an impact because some contacts are

expecting less mundane information, some contact types may not care about pets and other contact types may wish to see pets. Furthermore, depending on the stage of a relationship, different pieces of seemingly mundane information may be considered useful or dull.

The approach taken in the current research is that users *are* aware of their different audiences. While the sharing of potentially polarised or socially damaging information may cause tension amongst SNS users, little is known about the effects on relationships of sharing ‘everyday’, socially benign information. Some inference can be gleaned from the literature on disclosure, SET, SPT and URT. Benign information may typically encourage relationship development, particularly at early relationship stages, but hinder the progression to more intimate interpersonal communication and thus closer friendships.

2.7. Research Focus: Effects of Sharing in SNS on Relationships

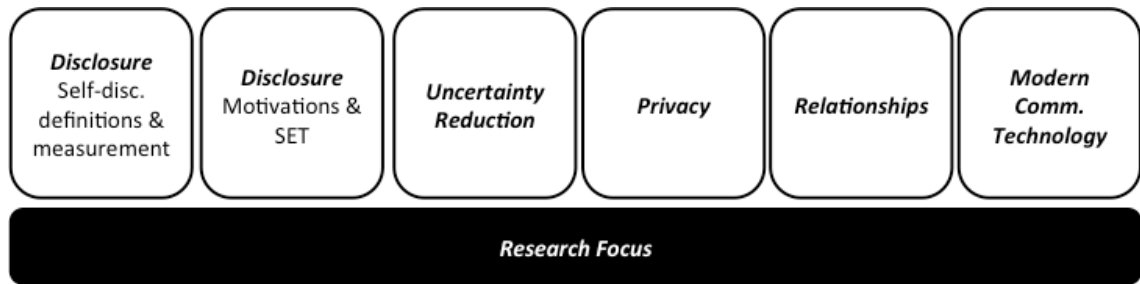


Figure 2.15: Research Focus Section

2.7.1. Literature Conclusion

Throughout the literature review the definitions, measurement and utility of self-disclosure, URT, privacy, friendship and liking have been expressed in many ways, with partial agreement on the results. For self-disclosure, agreement is found between social exchange theory, relational development, degrees of intimacy (or depth) and interdependence, as well as the general link between disclosure and liking. Uncertainty is generally considered to increase *with* liking and disclosure, as demonstrated by the axioms of URT. However, it is proposed that an effect must be observed in either certainty, liking or disclosure before the other is affected, thus self-disclosure, liking and certainty influence one another but the sequence may be circular rather than simultaneous, or linear. However, opposition to both the self-disclosure and liking, and uncertainty and liking hypotheses exists. It is possible to be certain about somebody yet still dislike them, i.e. certainty in disliking them, their attitudes or behaviours. It is possible to disclose information to another and still be disliked. That is, variables including timing, stage of the relationship, gender, message personalism, message content, recipient effects and the environment may interact with the direct and mediated relationships of self-disclosure and uncertainty with liking. With the additional error introduced from variables such as the way that self-disclosure is measured,

conceptualised or defined it is difficult to be certain of the general relationships involved. Contradictorily, reviews from Collins & Miller (1994), Cozby (1973) and Dindia & Allen (1992), alongside this literature review discuss a general disclosure-to-liking relationship, but suggest that it may peak, or plateau, depending on the stage of the relationship.

In some situations withholding information has been argued to be beneficial to the self and relationships in general (Afifi, et al., 2007; Altman, 1975; Westin, 1967, 2003). However, this may be for a different underlying need than that motivates self-disclosure and uncertainty reduction - the need for seclusion. However, it is argued that this need is often temporary rather than a general underlying motivator like the need to belong and so may vary more readily with the environment, disclosure topic and information recipient. As such, privacy is introduced into this work as a potential explanation for information concealment in particular circumstances that may add to the relationship between disclosure and liking.

The need to connect to others has been argued to motivate the need to gather information about others and build a personal database of information about them, their attitudes and the way they behave, tying together disclosure, certainty and the need to belong. Relationship qualities as proposed by Furman & Buhrmester (1985, 1992, 2009) may alter with the need to belong to a social group as well as the information shared between them. Liking in general is said to require similarity in attitudes, interests and needs between interaction partners, strengthening the argument for the need to reduce uncertainty about others to determine if similarities exist with them. One of the simplest methods of obtaining information about others is from their self-disclosure of information, which may be elicited actively, passively or indirectly.

Of the concepts introduced, this work aims to identify the links between disclosure, certainty and liking in SNS. Although the concepts are not distinct or exhaustive in research in offline environments, new communication technology platforms require new research to see if similar processes exist or new processes are derived for communicating within them (Joinson, 2003). With much work in SNS environments pertaining to privacy and extremities of disclosure and consequence, the present work looks at the effects of sharing on relationships when the information shared is a lowest common denominator – mundane, everyday information that is not intended, nor perceived to be offensive yet may still be detrimental due to the unknown underlying processes involved.

Furthermore, the general relationship of self-disclosure leading to perceived liking by others is tested in this work. Additional components may be suggested throughout the development of this research and the interactions with uncertainty, privacy, the environment, recipients and relationship stage are investigated.

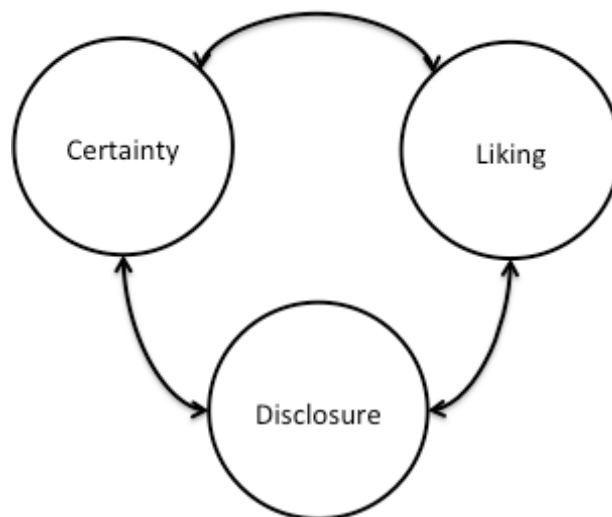


Figure 2.16: Cyclical model of disclosure, liking and certainty.

The relationships between self-disclosure (sharing), certainty and liking are investigated within SNS communication (see Figure 2.16). For this it must be observed that liking and certainty are not manipulated, but measured, therefore constituting dependent variables throughout, whereas different stages of the relationship, amounts of disclosure and types of disclosure are manipulated throughout the studies, rendering them independent variables. The SNS environment used will be Facebook, currently the most popular globally and within the UK. Facebook is used across all the studies in this research to control the environment, reducing the confounding variables of investigation. The effects on liking within a relationship require similar and dissimilar relationship types to provide a method of data triangulation. Therefore, relationship type will be manipulated and controlled throughout the studies to determine its position relative to the main constructs.

2.8. Research Questions & Hypotheses

An overarching research question is derived: *How does the use of SNS affect our relationships?* This can be further segmented to the following group of research questions and hypotheses:-

1. SNS use and relationships:
 - a. How does information sharing in SNS environments strengthen or weaken our relationships?
 - b. How do the features of SNS affect the qualities of our relationships?
 - c. How does the sharing of information in SNS affect our relationships with different types of recipient?
2. Relationship progression and uncertainty:

- a. Is there a relationship between stage of relationship and sharing information in SNS?
 - b. Is there a relationship between certainty and SNS use with others?
3. Balancing disclosure and privacy for successful outcomes:
- a. How are privacy and self-disclosure balanced in SNS to manage relationships?

H1: Different relationship types will have different levels of relationship qualities to each other.

H2: Different targets have different uses of Facebook.

H3: There will be an association between the information shared (both type and frequency) and relationship quality.

H4: There will be an interaction between the relationship type, the type and frequency of information shared, and the relationship qualities held with that relationship type.

H5: Participants will communicate with Old friends more frequently than New friends across all mediums.

H6: Certainty will correlate positively with liking for all participants (sample validation).

H7: Sharing (information seeking and interaction) will lead to greater certainty.

H8: Sharing (information seeking and interaction) will lead to greater liking.

H9: The relationship between Sharing (information seeking and interaction) and liking will be mediated by certainty.

3. Methodology

This chapter examines the choice of research methods within this thesis and identifies the philosophical influences on the nature of the research and the decisions made throughout the study designs. Depending on the literature examined, different approaches are taken to understanding how researchers make methodological decisions. This chapter will follow the discussion structure of Bryman (2008) and Easterby-Smith et al. (2008) where epistemology is examined prior to the decisions of design, strategy and methods, with additions from broader literature (see Figure 3.1). This approach will separate the logic of justification from the methods used to conduct research, two concepts that are often considered irrevocably integral (Bryman, 1984; Johnson & Onwuegbuzie, 2004).

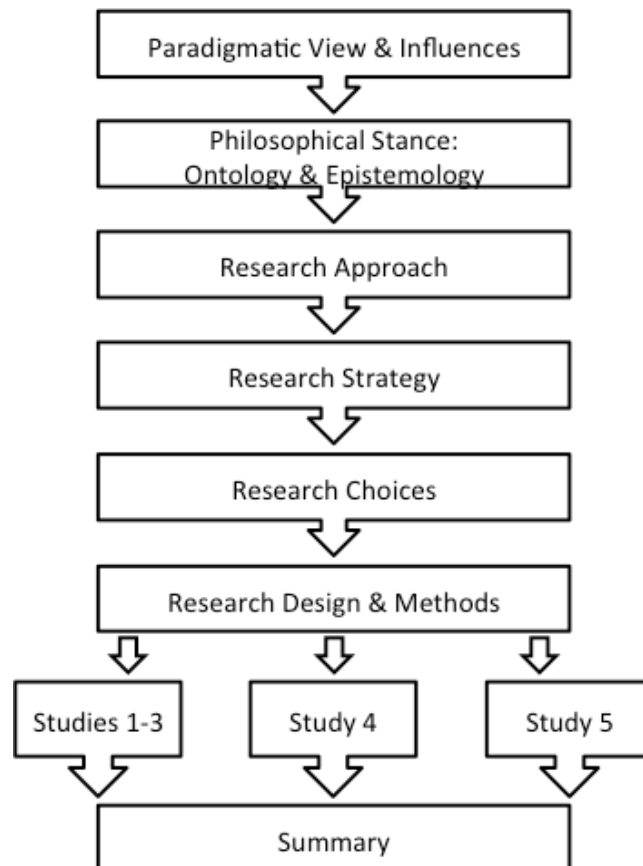


Figure 3.1: Chapter Outline, adapted from Easterby-Smith et al (2008) & Bryman (2008)

3.1. Paradigmatic Views & Influences

It is important to identify the paradigms and fields influential to this research due to its multi-paradigmatic, inter-disciplinary nature. Research from social and behavioural psychology, (e.g. Altman, 1975; Altman & Taylor, 1973; Fishbein & Ajzen, 1975; Homans, 1958; Sherif, 1958; Skinner, 1938), communications science (Berger, 1993; Berger & Calabrese, 1975; Burgoon, et al., 2000; Chelune, 1979a; Clatterbuck, 1979; Douglas, 1990; Wheelless, 1978), a combination of Information Systems and Human Computer Interaction/Computer Science, (Bhattacharjee & Premkumar, 2004; Boyd, 2004; Boyd & Ellison, 2008; Jarvenpaa, et al., 1998; Markus, 1994; Marwick & Boyd, 2011) and more specifically a combination of any of these fields, e.g. (Boneva, et al., 2001; Cummings, et al., 2002; Kraut, et al., 2002; Shklovski, et al., 2008; Tanis & Postmes, 2007; Tidwell & Walther, 2002; Walther, 1992, 1996; Walther & Burgoon, 1992), have driven the theoretical approach to this work. This is outlined in Figure 3.2 to show how the paradigms and fields have formed a unified approach in this work.

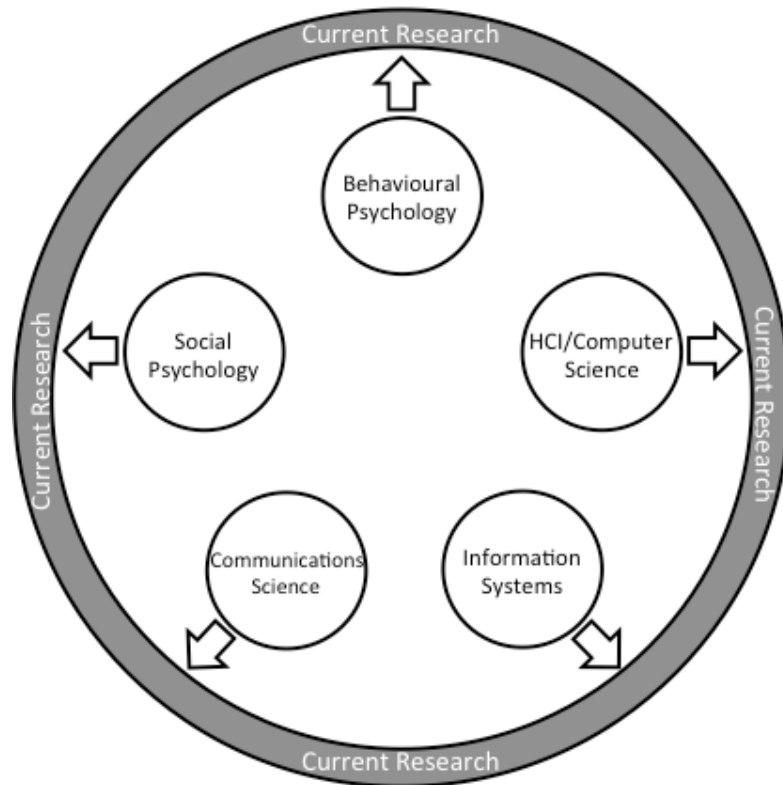


Figure 3.2: Paradigmatic/Field Influences on this Research

The paradigm of behavioural psychology in humans is considered to have originated in American psychology with the work of Watson in 1913, influenced by the work of Jacques Loeb in Chicago (Thorne & Henley, 2005). Watson’s view of behavioural psychology was as follows:

“Psychology as the behaviorist views it is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behaviour” (Watson, 1913, p. 158).

Watson’s (1913) stance was that of a pure positivist, and expressed that consciousness does not play a part in the observations of his participants. Behaviourism saw the gradual decline of instinctive, psychodynamic psychology and began to introduce the influence of external stimuli, as opposed to the powers of the id (Thorne

& Henley, 2005). The study of behavioural change in “Little Albert” (Watson & Rayner, 1920) is the first notable example of humans as programmable entities. Although Watson’s work relied on automatic responses to stimuli and negated the decisions made by humans in their behavioural outcome, it is of influence to this work on disclosure behaviour, which is viewed objectively to determine the responses to social stimuli.

A second influential behaviourist is Skinner, known for his work with rats and pigeons in a “Skinner Box” (Thorne & Henley, 2005). This was a progressive step in behaviourism in beginning to establish the consciousness in decision making. Through operant conditioning, rats inside a box would learn to press a lever to receive food pellets that were not given at every press of the lever but for a changeable number of lever presses (Skinner, 1935, 1938). This is a similar mechanism to that which makes gambling addictive, and arguably a similar pattern within Facebook notifications may encourage continual use and checking for notifications and updates about friends.

Within the paradigm of social psychology the processes and predictive patterns of the behaviour of individuals is of interest to this work. Arguably social psychology can be traced back to philosophers such as Plato, but its form in modern psychology came after World War Two, particularly in Europe and amongst European psychologists then re-located to America (Thorne & Henley, 2005). Of particular influence to this work is the understanding of an individual’s behaviour amongst a group, the way that dyads interact, and the relationship between attitudes and behaviour. LaPiere’s (1934) field experiment was the first to identify attitudes as affecting behaviour, and that other factors may influence the behavioural outcome. The preconditions to behaviour are prominent throughout this thesis, where behavioural

outcomes are explained by preceding stages of relationships, preconceptualisations and general attitudes towards interaction, yet other factors may influence the final outcome.

It is the combination of social and behavioural psychology that largely informs this research. The work of Altman (1975) and Berger (1975) on SET and URT are of particular interest. Both authors and theories identify human interaction as needing prerequisites to disclose information and recognise the importance of the external environment, the internal predispositions and beliefs of an individual, and the fundamental needs to communicate (see Altman, 1975; Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975). In the current work, the environment is represented by other people in Facebook and the inputs to the behavioural outcomes are the need to connect with others (Alderfer, 1969; Maslow, 1954), as well as an individual's beliefs and predispositions.

Communication science overlaps with the influence of social psychology. The identification of communication methods, patterns and outcomes between individuals is key to understanding the nature of this research. For example, URT and EVT were both born from nonverbal communication (e.g. Berger & Calabrese, 1975; Burgoon & Hale, 1988; Burgoon, et al., 1989), and adapted to communication more generally (e.g. Berger & Bradac, 1982; Burgoon, et al., 2000; Hogg, 2000). SET overlaps communication science, social psychology and behavioural psychology. However, communication science relates more to understanding the driving forces of communicating as well as the results of communicating. For example, the decision to disclose is suggested to involve issues of reciprocity, target similarity and familiarity, as well as the personal motivations and rewards for exchange, as proposed by behavioural economics (Acquisti, 2009; Acquisti & Grossklags, 2004; Cozby, 1972; Derlega, et al., 1973;

Homans, 1958; Kandel, 1978; Kleinke, 1979; Odlyzko, 2003; Secord & Backman, 1964; Solano & Dunnam, 1985; Taylor, 1979; Worthy, et al., 1969).

The remaining influential work consists of studies and experiments in the fields of human computer interaction/computer science and information systems. These will be discussed together due to the overlapping nature of their application to the social and behavioural understanding of this work. Information systems have been suggested to have progressed from using reference disciplines, such as psychology, sociology, management, engineering, computer science and mathematics to becoming a reference discipline in its own right (Baskerville & Myers, 2002). Therefore, the inclusion of information systems involves each of its influencing disciplines. However, the Information Systems literature influential to this work overlaps more with psychology of information systems, i.e. CMC and HCI - communicating via computer interfaces - than with mathematics, engineering or strict computer science. In particular, the influence of Information Systems is primarily based on Application Systems, including collaborative work and virtual team systems and the processes involved in generating successful relationships for efficient communication and productivity (e.g. Anawati & Craig, 2006; Huysman, et al., 2003; Jarvenpaa, et al., 1998; Ridings, et al., 2002; Shachaf, 2008). Furthermore, the inclusion of representations in the field of information systems, such as representing real-world environments (Baskerville & Myers, 2002), is similar to the “real-world” nature of connecting to others in online social networks, designed to connect users in similar ways to offline environments. However, this is as far as the influence of information systems overlaps with this work.

HCI and computer science disciplines are more informative to the background and study development of this work. Using chat systems and cues to identity in online environments to test the development of certainty in pairs of strangers (e.g. Tanis &

Postmes, 2007; Tidwell & Walther, 2002), the identifying of social networks and relationship connections for early Internet communities (e.g. Haythornthwaite, 1996; Wellman, et al., 1996), and investigating the use of SNS to communicate with others (e.g. Binder, et al., 2009; Boyd, 2004; Chen, 2011; Ellison, et al., 2007; Gibbs, et al., 2006; Joinson, 2008; Lampe, et al., 2007; Marwick & Boyd, 2011; Steinfield, et al., 2008), each overlap with behavioural and social psychology and communication science. Although no particular paradigms of HCI, computer science, and communication science are evidently embedded within the nature of this work, each field is influential to the phenomenon investigated throughout.

3.2. *Philosophical Stance*

“The relationship between data and theory is an issue that has been hotly debated by philosophers for many centuries. Failure to think through philosophical issues such as this, while not necessarily fatal, can seriously affect the quality of management research, and they are central to the notion of research design”
(Easterby-Smith, et al., 2008, p. 56).

The philosophical stance of this thesis will now be discussed with reference to ontology and epistemology. Where necessary, examples from work in similar fields will be given to demonstrate the foundation and motivation of the approach. Amongst the literature on philosophical stances of research, several terms are used relatively interchangeably (Easterby-Smith, et al., 2008), or at different stages of the model represented in Figure 3.1, above. For example, constructionism is also referred to as subjectivism (e.g. Goles & Hirschheim, 2000), and Bryman’s (2008) consideration of ontology (constructionism and objectivism) differs to that of Easterby-Smith et al. who

use Representationalism, Relativism and Nominalism, which Bryman labels ‘epistemologies’. The structure of understanding here will parallel Bryman’s and offer a distinction between the broader concepts of reality (ontology) and the philosophies fastened to a research enquiry (epistemology).

3.2.1. *Ontology*

Ontology is defined as the “philosophical assumptions about the nature of reality” (Easterby-Smith, et al., 2008, p. 60) and is concerned with the way that reality is conceptualised, i.e. what truth is (Bryman, 2008), and “how do we know what we know” (Goles & Hirschheim, 2000, p. 250). Broadly speaking there are two forms of ontology, *objectivism* whereby reality is not affected by an organism’s interpretation, and *constructionism*, which considers experience to be constructed by the observer (Bryman, 2008). These are outlined in Table 3.1.

Table 3.1: Ontologies, adapted from Bryman (2008)

Ontology	Definition
Objectivism	Social phenomena and their meanings exist outside of human behaviour and control.
Constructionism	Researchers use a specific definition of social reality depending upon the phenomenon researched, rather than an overarching definitive version. Social phenomena exist under the control and influence of human behaviour.

The objectivist view of reality is considered similar to that of the natural sciences (Johnson & Onwuegbuzie, 2004), whereby elements of an experiment are expected to react to stimuli regardless of human interaction. Using an aphorism to illustrate the point, if a tree falls in a forest and nobody is around to hear it, does it produce sound? Objectivists would argue it does, because regardless of human

existence or presence the tree and its collisions will compress airwaves and produce noise.

The constructionist view of reality considers phenomenon to exist as part of the context or environment within which it is experienced, and cannot be extracted from its context (Bryman, 2008; Johnson & Onwuegbuzie, 2004). For example, the falling tree is not heard because sound is only interpreted, without an interpreter or receiver then a sound does not exist, yet the mechanisms by which a sound is created, technically, are still governed externally. A pure constructivist would not acknowledge the external structure or mechanisms by which a sound is created (Bryman & Bell, 2003) and therefore argue that not only does the tree not make a sound, but without interpretation and social construction the tree does not exist.

3.2.2. Epistemology

Epistemology is defined in the Oxford Dictionary as “the theory of knowledge, especially with regard to its methods, validity, and scope, and the distinction between justified belief and opinion”¹⁰. It differs from the ontological perspective as it forms the general assumptions regarding the most appropriate way to test elements of the understood reality (Easterby-Smith, et al., 2008). Broadly speaking there are three types of epistemology: *positivism*, *social constructionism* (also referred to as *interpretivism* and *constructivism*), and *Realism* (Bryman, 2008; Bryman & Bell, 2003; Creswell, 2009; Easterby-Smith, et al., 2008; Saunders, Lewis, & Thornhill, 2000). Table 3.2 outlines a more comprehensive spectrum of epistemologies adapted from the literature.

¹⁰ Oxford Dictionary Online,

<http://oxforddictionaries.com/definition/epistemology?q=epistemology>

Table 3.2: Adapted from Bryman (2008), Easterby-Smith et al. (2008), Saunders et al. (2000), Creswell (2009), and Bryman & Bell (2003).

Epistemology	Definition
Positivism	Imitation of the natural sciences. Requires empiricism, uses deductive theory, observations are objective, and conceptualisations of reality directly reflect reality as it is. Reality still exists regardless of human existence, influence, or interpretation.
Realism	Identifies links between the ‘real’ world and the research conducted. <i>Internal realism</i> suggests it is only possible to gather indirect evidence and support for studied phenomena (physical & social). <i>Naïve realism</i> ignores the un-testable elements of social research but acknowledges they may exist. <i>Critical realism</i> conceptualises reality as a way of understanding what is happening in the social world, and acknowledges and embraces the un-testable elements between the research conducted and the real world.
Relativism	Similar to internal realism but acknowledges that people/social groups are the subject matter, not physical/natural science elements. Different observers have different points of view thus affecting the derived knowledge/value/truth
Nominalism	The labels, names, and categories to which experiences and events are attached are crucial in the understanding of phenomena
Postmodernism	Aims to redress the excesses of modernism. Typically concerned with an eclectic approach, arguing scientific progress is discontinuous and contestable. It is against systematic control and supports flexibility.
Pragmatism	There are no pre-determined theoretical frameworks that determine knowledge and understanding, within the social world. Structure is derived from an individual’s experience. Decisions & reality are assumed on a case-by-case basis.
Interpretivism (phenomenology)	Identifies the social sciences as fundamentally different to the natural sciences. Interpretivism embraces an empathetic approach to human behaviour, interpreting observations of research, acknowledging that the core elements of such are directly un-testable.

Management and psychological research as broad concepts include work stemming from most epistemological world views, as demonstrated by their inclusion in most general research methods books in their respective fields and general social sciences (e.g. Bryman, 2008; Bryman & Bell, 2003; Coolican, 2004; Creswell, 2009; Creswell & Plano Clark, 2007; Easterby-Smith, et al., 2008; Johnson & Duberley, 2000;

Malhotra & Birks, 2007; Saunders, et al., 2000). Within the Information Systems field under the broad umbrella of social sciences and management research, all types of work are considered in the related journals as long as they are of a good quality (Baskerville & Myers, 2002). However, the influential theories and conceptualisations to this work stem from positivist research. As such, this work is considered to belong to the positivist rationale.

Social sciences research is predominantly positivist (Johnson & Duberley, 2000). Within the paradigms and general fields that influence this thesis work a positivist approach is typical, yet other approaches are also considered, i.e. interpretivism and realism. Work from the behaviourist period of psychology, that of Watson (1913; 1920) and Skinner (1935, 1938) amongst others, demonstrates a clear link to positivism. Organisms are subjected to experimental conditions, introduced to stimuli, and the responses recorded with the assumption that these responses would occur with or without the experimenter's presence. A black box approach to behaviour. A stimulus is introduced, processing in the black box (brain) occurs, and a response is observed. The experimenters are not concerned with the innards of the black box, but the relationships of their input (Independent) and output (Dependent) variables, with strong parallels to experimentation in the natural sciences.

The social psychological research that informs this work is based in the positivist tradition. For example, the bystander effect (e.g. Darley & Latane, 1968) was observed as a series of variable manipulations, such as observing the responses amongst participants to intervene when trouble is observed, altering variables such as the number of bystanders. The findings are then extrapolated to generalise what is known as "bystander intervention". Similarly, the observations that a common goal amongst groups of children can help reduce ingroup-outgroup effects and improve collaboration

for the achievement of that goal (e.g. Sherif, 1958) relies on observations and manipulating conditions to generalise to a general theory, akin to a natural science experiment. The work on privacy and the social environment suggests that privacy and communication are embedded within social norms, which are arguably socially constructed (Altman, 1975; Westin, 1967). However, when describing the effects of a given context on privacy behaviour, the experiences are objectified to suggest that the environment and social norms interact with the individual to produce behaviour, much like adding variables to an input-process-output model.

The communications and CMC literature can be considered largely positivist. The experimentation with different communication cues, and environments for interaction (e.g. Altman & Haythorn, 1965; Cozby, 1972; Tanis & Postmes, 2007; Tidwell & Walther, 2002; Walther, 1992, 1996; Walther & Burgoon, 1992), as well as the observation of online and offline network connections (Ellison, et al., 2007; Kavanaugh, et al., 2005; Lampe, et al., 2007; Steinfield, et al., 2008) are observed with a separation of the participant from the object. Although the context of interaction and the environment for that interaction are linked, the work identifies the participant as responding in generalisable ways to the environment and its cues.

The use of a positivist approach in this research ensures that variables are operationalised as external to the influences of human participants, that is, the social world operates according to fixed laws. The objectivity akin to positivist research will ensure that the phenomenon investigated in this work remain free from social construction, and be observable, replicable and generalisable to broader populations of interest. Hypotheses are developed in each quantitative research chapter, and qualitative research phases are used to draw conclusions in an objective manner, echoing the

fundamental belief that the truth exists without our subjective experience and interpretation of its related occurrences.

3.3. *Research Approach*

The research approach represents how theory is used in relation to research and can be either *deductive* or *inductive* (Bryman & Bell, 2003; Saunders, et al., 2000). The deductive approach is often associated with objectivism, positivism and a quantitative research strategy, whereas the inductive approach is typically associated with interpretivism, social constructionism and a qualitative research strategy (Easterby-Smith, et al., 2008; Johnson & Onwuegbuzie, 2004).

Deduction can be defined as, “a form of reasoning in which a conclusion is validly inferred from some premises, and must be true if those premises are true” (Malhotra & Birks, 2007, p. 160). The *deductive* approach starts by developing a theory from previous research and current understanding of a phenomenon. The research criteria are narrowed from a broad problem, through research questions to testable hypotheses (Malhotra & Birks, 2007; Saunders, et al., 2000). A research strategy is then used to test the theory by supporting or refuting these hypotheses (Malhotra & Birks, 2007; Saunders, et al., 2000). The developed hypotheses must be expressed in operational terms, i.e. indicating how the variables are to be measured (Robson, 1993; Saunders, et al., 2000). Subsequently, a new theory or support for the current theory is found in the collected data and the interpretation of results (Robson, 1993; Saunders, et al., 2000). This approach can be considered a top-down approach to theory development. Figure 3.3 shows the deductive approach.



Figure 3.3: The Deductive Approach, adapted from Saunders et al (2000), Robson (1993), and Malhotra & Birks (2007)

An *inductive* approach can be argued to work in opposition to deduction, and is defined broadly as “a form of reasoning that usually involves the inference that an instance or repeated combination of events may be universally generalised” (Malhotra & Birks, 2007, p. 161). This approach starts with very little theory and is data-driven (Malhotra & Birks, 2007; Saunders, et al., 2000). Typically, an inductive approach is used for exploratory research, identifying the general area of investigation and collecting data, from which a theory is developed (Bryman, 2008; Malhotra & Birks, 2007; Saunders, et al., 2000). The approach represents a bottom-up development of theory.

However, it must be noted that deductive research relies upon a degree of induction to feed back into theory (Bryman, 2008). Similarly, inductive research requires a degree of deduction to determine the areas of a topic to investigate to develop theory (Bryman, 2008). Research approaches may be iterative. An *iterative* approach utilises both deduction and induction to inform theory and methodology, often resonating from one to the other (Bryman, 2008; Malhotra & Birks, 2007).

This work utilises a deductive research approach as it tests a theory generated from previous literature on disclosure, privacy, friendship and CMC using research questions and hypotheses. Support for hypotheses confirm the findings of previous work in offline environments and help to develop a model of disclosure and liking in

SNS environments. The refuting of hypotheses will determine if the broad conceptual model of disclosure, liking and certainty within offline environments is different within SNS.

3.4. Research Strategy

There are three distinct research strategies available to researchers: *quantitative*, *qualitative*, and *mixed methods* (Bryman, 2008; Bryman & Bell, 2003; Creswell, 2009; Easterby-Smith, et al., 2008). Quantitative research typically uses a deductive approach and the use of numerical data, utilising natural science practices (Bryman, 2008; Bryman & Bell, 2003; Easterby-Smith, et al., 2008). The quantitative strategy relates observed outcomes directly to conceptualised reality, resonating strongly with a positivist rationale (Creswell, 2009; Johnson & Onwuegbuzie, 2004). Qualitative research can be loosely described as that which utilises words rather than numerical data (Easterby-Smith, et al., 2008). Qualitative research does not aim to quantify the observed phenomenon but to embrace the use of words and other forms of relative representation (Johnson & Onwuegbuzie, 2004). Qualitative strategies are often used alongside the inductive approach to generate theory from data (Johnson & Onwuegbuzie, 2004), and in recent history processes of qualitative work have been developed for ethnography and case studies, typically associated with inductive research philosophies (e.g. Stake, 1995; Wolcott, 1999). Often it is concluded that methods are driven by the researcher's epistemological approach (Bryman, 1984; Easterby-Smith, et al., 2008; Johnson & Duberley, 2000).

However, it is increasingly argued that qualitative and quantitative research strategies should not be tied to any one research philosophy or approach, or be viewed as dichotomous (Bryman, 1984; Easterby-Smith, et al., 2008; Goles & Hirschheim,

2000; Johnson & Duberley, 2000; Johnson & Onwuegbuzie, 2004). In a review of literature that typically align strategy with philosophy of research, Bryman states, “the conclusion is sceptical about the extent to which a neat correspondence can currently be established” (Bryman, 1984, p. 75). In recent research history, a strong case for mixed methods has arisen (Creswell, 2009; Jick, 1979).

Arguably, *mixed methods* research can be traced back to Campbell & Fiske (1959) who discussed the use of a multimethod or multitrait research strategy (Creswell, 2009; Jick, 1979). Again, multiple terms have been used to describe relatively similar concepts, such as triangulation (Jick, 1979), multimethod and multitrait (Campbell & Fiske, 1959), convergence, integration, and combined methods (Creswell, 2009; Creswell & Plano Clark, 2007), and convergent validation (Jick, 1979), amongst others. The overall concept is that qualitative and quantitative methods should complement one another, such that the weaknesses of one method are balanced by the strengths of the other (Campbell & Fiske, 1959; Creswell, 2009; Easterby-Smith, et al., 2008; Jick, 1979). If a phenomenon is truly demonstrating a distinct pattern it should be observable regardless of the method used, but is more likely captured by observing the variances using both qualitative and quantitative methods (Jick, 1979). Bouchard states that a mixed approach, specifically triangulation, “enhances our belief that the results are valid and not a methodological artefact” (Bouchard, 1976, p. 268). Figure 3.4 outlines the three research strategies.

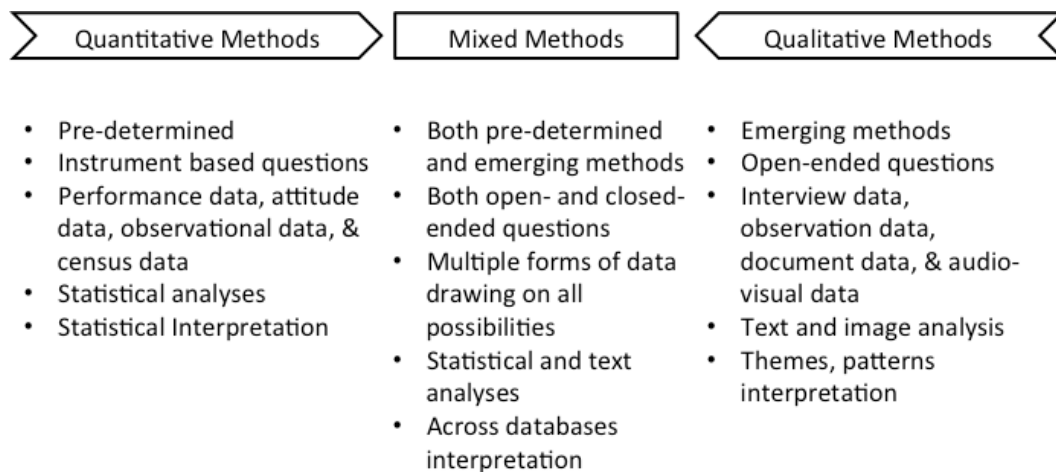


Figure 3.4: Quantitative, Qualitative and Mixed Methods, adapted from Creswell (2009, p. 15)

Table 3.3 shows the predominant strategies used in the area of CMC research. Acknowledging that a range of research paradigms and fields influences this work, CMC research directly identifies with the nature of the work in this thesis, i.e. the Facebook environment is investigated for patterns of communication disclosure and relationship development. Therefore, a small sample (N=109) of CMC research papers and books were chosen from the references given in the literature review of this document, and their respective strategies and methods were tallied to give a rough indication of the type of research undertaken. It is acknowledged that this is neither conclusive nor exhaustive, and can act only as a guide.

Table 3.3: Research Strategies Identified in a Sample of CMC and Related Literature

	Quantitative	Qualitative	Mixed Methods	Theoretical
TOTALS	63	12	9	25

The view is taken that the epistemology and ontology of research is distinct from the strategy used, (e.g. Braun & Clarke, 2006; Bryman, 1984; Creswell, 2009; Johnson & Onwuegbuzie, 2004), thus enabling qualitative as well as quantitative data

collection under the positivist rationale. Within mixed methods research there are six concepts for conducting data collection and analyses (Creswell, 2009). This thesis adopts a specific form of mixed methods research, a *Concurrent Triangulation Strategy*.

Table 3.4 gives an overview of the six choices available.

Table 3.4: Six Mixed Methods Strategies, adapted from Creswell (2009, pp. 211-216)

Strategy	Definition
Sequential Explanatory	Elaborate on the findings of one strategy using the second. Data collection and analysis performed in sequence within each phase of research. Explanatory approach typically starts with quantitative data and uses qualitative data to verify. Weight is typically given to the quantitative phase.
Sequential Exploratory	Similar to <i>sequential explanatory</i> , however the qualitative phase typically comes prior to the quantitative phase. Quantitative data are used to verify qualitative findings and developed theory, and help generalise the results to a broader population of interest.
Sequential Transformative	A similar sequential process is taken to the first two strategies. However, rather than aiming to be explanatory or exploratory and confirm or develop a theory, an overall theoretical lens is used throughout the research analyses to answer a problem (or confirm a theory). The theoretical perspective guides the research. Weight can be given to either the qualitative or quantitative phase, or distributed evenly amongst both.
Concurrent Triangulation	Quantitative and qualitative data are collected simultaneously, then interpreted side-by-side to compare the results to identify convergence, differences or a combination of the two. Identified by use of one data collection phase.
Concurrent Embedded	Quantitative and qualitative data are collected simultaneously, as with <i>concurrent triangulation</i> . Either quantitative or qualitative research is the primary method, and the secondary method is conducted within the primary method. For example, a large quantitative survey is conducted (primary) with a small section of open-ended, qualitative questions (secondary) included within the quantitative data collection. The secondary data collection can be a different method, i.e. switch from large survey, to a short interview.
Concurrent Transformative	Similar to the <i>sequential transformative strategy</i> , a theoretical lens is used to guide the research problem. However, both qualitative and quantitative data are collected within the same research phase.

Mixed methods research involves philosophical assumptions, as do quantitative and qualitative work (Creswell, 2009). However, where qualitative and quantitative

designs typically stem from different philosophies (Bryman, 1984; Johnson & Onwuegbuzie, 2004), mixed methods requires a unified approach of both the quantitative and qualitative designs (Creswell, 2009) to keep with the positivist epistemology of this work. Mixed methods are suggested to create stronger studies, better informing the knowledge of the research topic, than using either qualitative or quantitative work individually (Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004).

Within the triangulation and mixed methods approach, it is argued that there is no prescriptive triangulation method (Jick, 1979), and therefore the descriptions by Creswell (Table 3.4) are used to develop a platform by which the data are analysed, without being too rigid so as to lose the benefit of mixed methods. Research questions are developed and studies are designed to test several of the research questions within each phase. Research questions can be investigated more than once by different research phases using different operationalisation of independent and dependent variables.

The decision to use a form of triangulation research is derived from the nature of the research model and questions that are tested. The research model proposed is generated from the literature review. The relationships between certainty, liking and disclosure were identified and a base model was developed for testing these relationships in the environment of Facebook. However, due to the disagreement amongst scholars of the disclosure studies identified, but simultaneously the general acceptance that disclosure and liking interact (e.g. Chelune, 1979b; Collins & Miller, 1994; Cozby, 1972, 1973; Dindia & Allen, 1992), this research aims to explain the model yet seeks to explore the peripheries of the components to identify any updates beyond simple refuting of the testable components.

It is important to decide how distinct each of the qualitative and quantitative methods will be, as well as the weighting (priority) of the quantitative and qualitative phases (Creswell, 2009; Creswell & Plano Clark, 2007). The weight in this mixed methods strategy is equal between quantitative and qualitative. Although an element of induction is used within the interpretation of the qualitative phase, it is primarily designed to test the research questions developed from the literature and thus contributes to the broader research focus through deduction.

The mixed methods approach used in this work is an *independent* level of interaction, where qualitative and quantitative phases of research are conducted, analysed and interpreted distinctly (Creswell, 2009; Creswell & Plano Clark, 2007). A researcher that combines the results of both qualitative and quantitative phases before a final interpretation is operating at an *interactive* level (Creswell, 2009; Creswell & Plano Clark, 2007).

3.5. Research Choices

This section summaries the above choices in Table 3.5, which communicates the intentions of the research and the background and philosophical influences on the theorising, testing and interpreting of the research model.

Table 3.5: Research Choices

Decision to be made	Choice
Ontological Stance	Objectivism
Epistemological Stance	Positivism
Approach to Research	Deductive, Theory Driven
Research Strategy	Mixed Methods: Sequential Triangulation of results, Mixed <i>Model</i> in phases 1 & 2
Weighting*	Quantitative and qualitative phases are equal
Level of Interaction*	Independent

*These decisions must be made due to utilising a mixed methods research strategy

3.6. *Research Design & Methods*

Within the literature on research methods, conflicting terms are once again used to describe what can be typically called the *methods* of research. Saunders et al. discuss experiments, surveys, case studies, ethnography, action research, cross-sectional and longitudinal studies as “the different research strategies” (Saunders, et al., 2000, p. 91). Whereas Easterby-Smith et al. use the term “qualitative and quantitative designs” (Easterby-Smith, et al., 2008, p. 82). However, Easterby-Smith and colleagues tie them to research philosophies, i.e. experimental designs to positivism, and survey research designs to relativism. As outlined earlier, it is considered that research methods and designs are independent of philosophical stance. Within the boundaries of quantitative, qualitative and mixed methods research are several research methods including experiments, surveys, case studies, ethnography and action-research (see Table 3.6 - Bryman, 2008; Creswell, 2009; Saunders, et al., 2000).

Table 3.6: Research designs considered, adapted from Saunders et al. (2000), Easterby-Smith et al. (2008), Bryman (2008), Bryman & Bell (2003), and Malhotra (2007).

Research Design	Description
Experiment	A classic approach to research, typically found in psychological roots of management research. Involves the definition of hypotheses; a selection of samples from broader populations, conducted using a sampling method such as simple random sampling, quota sampling or stratified sampling; different experimental conditions; planned change of one or more variables to observe the effect of these changes in another, dependent variable; measurement of a small number of variables (manipulated and outcome); and, control of other variables.
Survey	Typically embedded within the deductive approach, but can be used for inductive research. Allows the collection of a large sample of data and often uses a questionnaire, typically standardised to allow comparison. Easily understood in wider population. Can involve structured observation and structured interviews.
Case Study	Gathering of data from a single case, or several similar cases, to give detailed and informative knowledge. Defined as “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (Robson, 2002, p. 178). Can give responses to questions of ‘why’, ‘what’, and ‘how’. Those advocating single cases tend to stem from a constructionist approach, whereas those involving multiple cases associate with a positivist rationale.
Ethnography	To interpret the social world in the way in which it is experienced. Immersion of the researcher into the setting in which they wish to study. Developing the process of participant observer to ensure the researcher completely experiences the conditions they are testing. It is suggested that only when fully immersed can conclusions accurately be drawn on the phenomenon investigated. Conducted over longer periods. Can generate developing patterns that change throughout the research. Firm rooting in the inductive approach.
Action-research	Several interpretations have developed as to the process undertaken within management research. Emphasis is on the management of change. The researchers are often involved in the research and data collection, collaborating with practitioners. Action-research aims to identify implications outside the investigated project, i.e. aims to generalise the results of the immersive research conducted.

An important choice to establish is the time-horizon that the research will capture (Saunders, et al., 2000). There are two general categories of time-horizon: *cross-sectional*, and *longitudinal* (Table 3.7). Due to time-constraints on this research, a cross-sectional design is utilised in each of the five studies conducted.

Table 3.7: Time-horizons of research, adapted from Saunders et al. (2000).

Time-horizon	Description
Cross-sectional	Data gathered represents a short “slice” of time, a snapshot of the phenomenon.
Longitudinal	Data gathered over a selected period of time, either as two or more cross-sections or through immersive ethnography. Identifies changes in the phenomenon over time.

Different researchers and fields use different terms to refer to the methods used. For example, some authors used the term *survey* to identify a *questionnaire* where it may also be considered a broader research design choice. Several data collection methods are available to the researcher. Three broader methods are outlined: *observation*, *interviews*, and *questionnaires*. Each of these broad data collection methodologies contains sub-types. For example, observation includes covert, overt, and participant observation. An overview is given in Table 3.8 of the specific methods available.

Table 3.8: Data collection methods, adapted from Saunders et al. (2000).

Data Collection Method	Description
Observation	Used when research questions are concerned with what people do. Observation should be systematic and leads to behavioural interpretations. The researcher can be covert, overt, complete participant, or complete observer. Additionally, participants may perform the observation.
Interviews	Interviews can be conducted through a variety of media, including face-to-face, online, and the telephone. Interviews can be conducted with individuals or groups. The format can be structured, semi-structured, or unstructured.
Questionnaires	Questionnaires can be self-administered or researcher administered. They can be conducted online, by post, in person, be delivered and collected, via telephone, or as part of a structured interview. Questions can be closed, often yielding quantitative data, or open, often yielding qualitative data. Questionnaires can involve multiple-choice, rating, or open responses.

Using the same sample that identified the research strategies in the field of CMC research (Table 3.3), a further tally was made based on the data collection method or design. Table 3.9 demonstrates that surveys and experiments are the most popular application (the term survey here is ambiguous due to the terms used within the literature identified, it was used to represent questionnaires and a general survey approach). Outside of a theoretical paper, interviews were the next most common data collection method.

Table 3.9: Design & Methods used in CMC Research

	Survey	Experiment	Case Study	Focus Group	Interview	Ethnography	Theoretical/ Overview
Tally	55	21	3	1	11	2	27

3.7. Research Phases and Study Designs.

This mixed methods research is conducted in three phases, a quantitative phase, a qualitative phase, and a second quantitative phase. The weighting is equal between the quantitative and qualitative phases, using the interviews to add to the quantitative results, to inform the research model and provide initial exploration. This section will provide a brief overview of the phases, noting the design and data collection methods (see Figure 3.5 and Table 3.10). Each quantitative study is outlined in more detail within its representative chapter (chapters 4 and 6), as well as being summarised in Table 3.10, below. The research design for the qualitative phase is found in section 3.9 due to the necessary choices to consider regarding analysis and interpretation.

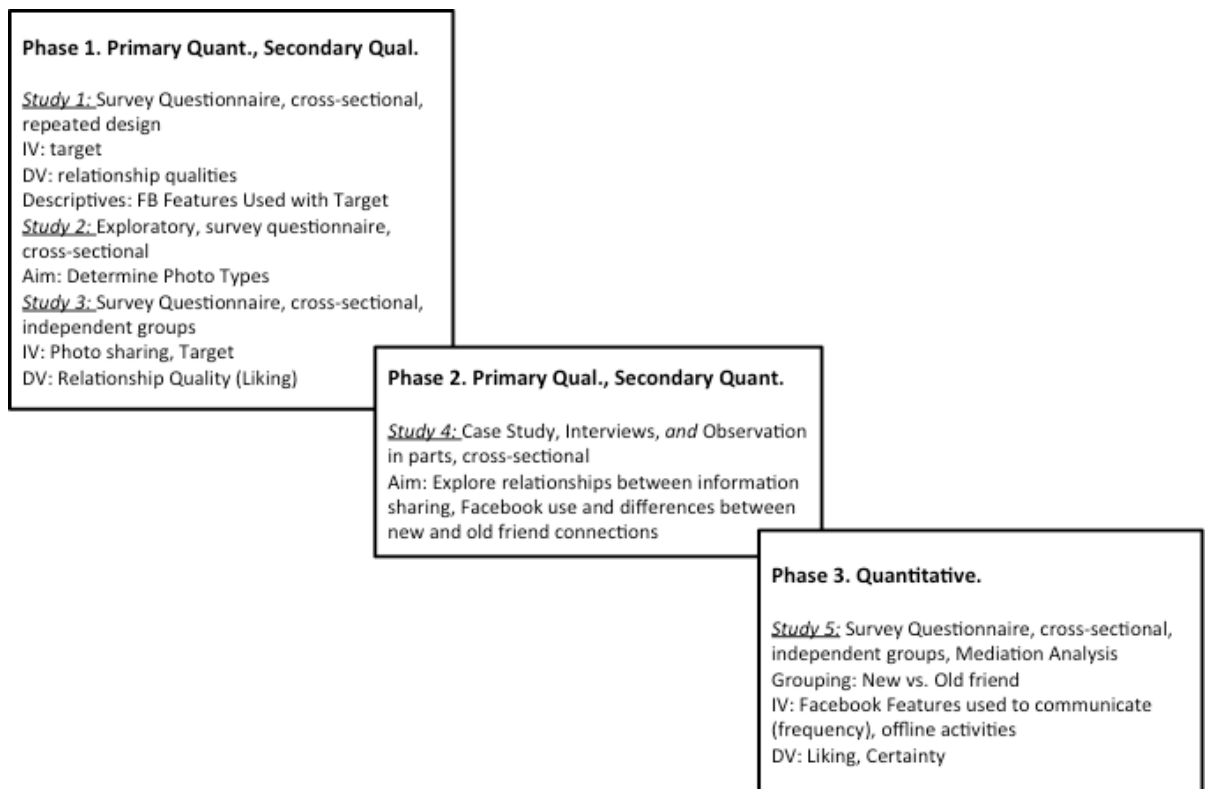


Figure 3.5: Phases of this research

The concurrent triangulation strategy adopted in the current work uses five studies. Studies 1 and 2 inform the design and data collection method of Study 3, whilst partially providing support for their respective research questions. Studies 3, 4 and 5 investigate the relationship between disclosure, certainty and relationship quality using different methods and operationalisation of the investigated variables. Figure 3.6 illustrates the overlap and distinction amongst studies 1-5 with regards to the research questions.

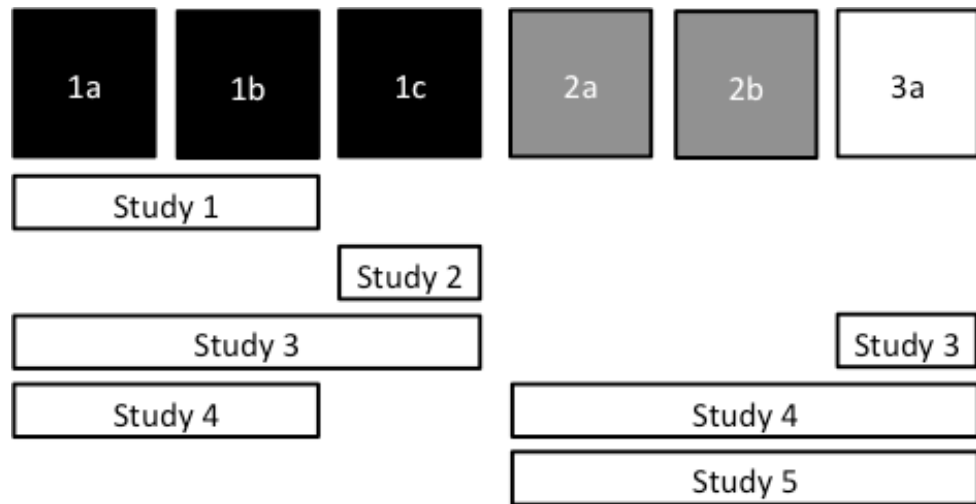


Figure 3.6: Study plan to inform answers for research questions

Within the concurrent triangulation strategy, the individual studies were designed to assess the key variables of interest to this work – disclosure, liking and certainty - from a variety of perspectives. An overview of the design, sampling and variables investigated in all studies is given in Table 3.10. Phase 1 represents a large proportion of the quantitative research, with Study 2 as a qualitative design to capture the qualitative aspects of photograph content. Studies 4 and 5 are designed to explore the depths of the disclosure practices of Facebook users, and begin to identify the differences in liking, disclosure and certainty for dyads at two distinct relationship stages. Study 4 utilises a qualitative research strategy and Study 5 adopts a quantitative strategy.

3.7.1. Phase 1.

3.7.1.1. *Study 1.* Study 1 is designed to assess the suitability and reliability of the Network of Relationships Inventory, as it identifies different individuals within a participant's social network and measures their relationship quality across several components of liking. That is, for four targets (relative, partner, close friend and

colleague) within this research, their relationships are assessed in components of liking rather than using an overall scale of liking, e.g. Rubin's scale. The second part of Study 1 is to identify the most frequently used features of Facebook with the four targets for the purpose of determining which feature to investigate further in Study 3. As Study 1 is a pilot for Study 3, it was found that a repeated measures analysis is inappropriate for the aims of the Study 3, as direct contrasts cannot be drawn between all variables.

3.7.1.2. *Study 2.* Study 2 is conducted after Study 1 to utilise the findings of the most frequently used feature of Facebook and explore differences within this category. Study 2 is designed to assess the differences within the photographs posted to Facebook, as photographs can contain distinctly different images that could impact on the recipient's evaluation of the discloser. A qualitative approach is utilised so that any content not previously identified by the researcher could be expressed, and later coded to create photograph categories for Study 3.

3.7.1.3. *Study 3.* Study 3 is designed to assess the relationship between photograph posting of different photograph types, by different relationship targets, and the different levels of relationship quality participants hold with these targets, i.e. Photo Type X Target Type = Relationship Quality. A fifth target is added from those used in Study 1 to act as a control group for the necessary dummy variables required to assess target type as a moderator. The additional group added is General Facebook Friend to contrast with the four targets: Relative, Partner, Close Friend and Colleague. In line with the additional target for a control group, an independent design was adopted to reduce the length of the survey for participants and to enable a more thorough analysis between variables in Study 3. Participants are randomly assigned to one of the five conditions using a randomising URL redirector for the online surveys. Five of the NRI relationship quality variables were selected for Study 3, cf. 11 in Study 1, drawn more

closely from the literature on friendship, liking and human needs (see section 2.5, above for a full breakdown), and from the output of Study 1. Support, Intimacy, Companionship and Affection were selected to represent positive qualities of relationships and Conflict was chosen to represent a negative relationship quality, to assess directly the possible positive and negative impacts of sharing day-to-day information via Facebook.

3.7.2. Phase 2.

3.7.2.1. Study 4. A qualitative approach is taken in Study 4 to explore the differences in Facebook communication at two distinct relationship stages. Interviewees are first asked about a friend they had just added to Facebook, and one that they have been Facebook friends with for between 3 and 6 months. This is to determine the practices users implement when deciding to add other users (or accept friend requests), and their initial interactions within the site (new friends), and contrast to their interactions with friends with whom they communicate more frequently in Facebook (old friends). However, it is more critical in the old friend condition that interviewees use Facebook frequently to be able to identify differences between communication with new and old friend. Therefore, if the network connection they choose to discuss is known for a longer period, it is accepted and the interview commenced. Differences in target type (i.e. relation to a Facebook user) are drawn from studies 1 and 3. Study 4 identifies differences in sharing across the range of available Facebook features - i.e. is not restricted to photographs - at different relationship stages, but also probes deeper participants' use of photographs in their relationships. Study 4 utilises a semi-structured interview method with observation of participants using their Facebook account. The semi-structured interview allows the exploration of users' relationships and adds depth

to the quantitative phases of the present research, while maintaining enough structure so as to remain on topic and fit within the positivist framework adopted. Observation of interviewees using Facebook is conducted to determine which elements of the Facebook site interviewees immediately look at to and establish their immediate and natural practices when browsing for information in this environment. In parts, interviewees are asked to give a rating on a simple one-item scale (derived from an overview of the CL7 scale) about their certainty of the focal target of the interview. To determine if participants' privacy settings differ for new and old friends – and thus the information available on profiles and their level of information disclosure on the profile - two scripts are used to establish the level of access available to others of their own Facebook profile. More details of the scripts are given in Chapter 5.

3.7.3. Phase 3.

3.7.3.1. Study 5. Study 5 is designed as a validation study, in the main for Study 4, but for the overall application of uncertainty reduction to disclosure and liking within Facebook. The literature review suggests that uncertainty reduction interacts with disclosure and liking, and potentially mediates the relationship. Therefore using an independent groups design, participants in Study 5 will self-report via questionnaire on their uses of Facebook features with either a new or old friend. A new friend is one that the participants have just met (as the participants were all newcomers to the University of Bath, thus not knowing their friend previously), and an old friend is a friend that they've known for approximately 6 months. Participants are randomly assigned to one of the two group conditions, new or old friend. Both conditions require that the participant is connected with their friend via Facebook. Participants are asked how frequently they use different methods of communication, both traditional and online

including SNS, with their friend. In addition, the participants report the frequency they use the different features of Facebook with their friend, their level of certainty about their friend using the CL7 scale, and their liking of their friend using a condensed version of Rubin's liking scale. The use of Rubin's liking scale ensures that a single measure of liking is used to simplify the questionnaire and analysis, and in part because the components were addressed in studies 1 and 3. Informed partly by the outcome of Study 4, mediation analysis is conducted for an instance of passive information sharing – typical of early relationship stages in Facebook – viewing photographs, and liking with certainty as the mediating variable. A second mediation analysis is conducted with frequency of commenting – typical of later stages of friendship development in Facebook and representing more interactive information seeking strategies - as the IV on liking, mediated by certainty.

Table 3.10: Overview of Studies: Sample, Study Design and Operationalisation.

	Study 1	Study 2	Study 3	Study 4	Study 5
Sample Size	113	34	508	17	113
Mean Age (±S.D.)	24.19±7.60	30.79±9.35	23.92±8.33	N/A	18.68±1.34
Age Range	17-58	20-58	16-62	18-23 (approx.)	17-27
Gender	20 Male 93 Female	25 Male 9 Female	98 Male 410 Female (weighted to 50:50 for analysis)	8 Male 9 Female	58 Male 55 Female
Education Level	N/A	1 GCSE; 2 A- Level; 7 Undergrad.; 22 Postgrad.; 2 Other.	132 GCSE; 18 A-Level; 251 Undergrad.; 77 Postgrad.; 3 Other.	17 Undergrad.	107 Undergrad.; 5 Postgrad.; 1 Other.
Research Strategy	Quantitative	Qualitative	Quantitative	Qualitative (Part Quantitative)	Quantitative
Sampling Technique	Convenience	Convenience	Convenience	Convenience	Convenience
Reward for Participation	No	No	No	Yes – Course Credit	Yes – iPod Raffle
Time-horizon	Cross-Section	Cross-Section	Cross-Section	Cross-Section	Cross-Section
Data Collection Method	Questionnaire	Questionnaire	Questionnaire	Semi- Structured Interviews & Observation	Questionnaire
IV(s)	<ul style="list-style-type: none"> • 4 Target Types • 16 Facebook Features 	Exploratory – Photo Depictions	<ul style="list-style-type: none"> • 7 Photo Types (Freq. Shared) • 5 Target Types 	<ul style="list-style-type: none"> • Facebook Use - explore • New vs. Old Friend Groups • Certainty (for Quant. Part) 	<ul style="list-style-type: none"> • Online & Offline Comms. Methods & Freq. • Facebook Feature Use (Photo View Freq. and Commenting Freq.)
DV(s)	11 NRI Relationship Qualities	N/A	5 NRI Relationship Qualities	Exploratory - Liking & Certainty	
Independent / Repeated Design	Repeated	Independent	Independent	Repeated	Independent
Facebook Friends Known Already	Yes	Yes	Yes	Yes	Yes
Privacy Settings Data Collected	No	No	No	Yes – 2 Scripts generating scores for privacy	No

Info on Facebook Features participants used	Yes	Categorising Photos	Only Photos	Yes – Exploratory	Yes
Certainty Measured	No	No	No	Yes – In Interview & Overall question relating to CL7 Scales	Yes – CL7
Liking Measured	Yes – 11 NRI	No	Yes – 5 NRI	Yes – exploratory; manipulated in grouping	Yes – Custom Rubin Liking Scale

3.7.4. Sample Restrictions

The target sample of this research is users of Facebook. There are no restrictions on the broader differences between individuals who are eligible to participate, an approach which encourages greater generalisability. Participants must be at least 16 years of age for the purpose of consent. However, within each study some restrictions to the sample apply. The individuals who complete the survey for Study 1 must have each of the four target relationship types added as a network connection in Facebook. Study 2 was restricted only to those who use Facebook. Study 3, as with Study 1, was restricted only to those who have one of the allocated target types as a network connection in Facebook. Study 4 was not restricted other than users needing to be users of Facebook. However, with Study 4, a credit reward scheme was used to attract participants and the sample consisted only of undergraduate students. Study 5, using a convenience sample and access to a large class of first year undergraduates (and five postgraduate students individually) was only restricted to Facebook users, requiring that the participants were connected with the new or old friend via Facebook.

As demonstrated in Table 3.10 there is a range of ages collected throughout the studies in this research. Studies 1-3 in particular have greater age ranges than studies 4

and 5. This may impact the findings of the research and the comparisons drawn between Phase 1, and Phases 2 and 3. For example, it could be that older participants are more restrictive with their information sharing via Facebook due to a lack of trust in technology in general. However, a broader age range is likely to increase the generalisability of this research, but differences should be taken into consideration in the overall interpretation of results.

Across the samples of each of the studies herein, differences in the gender balance are observed. Throughout Phase 1, particularly studies 1 and 3, there is a higher proportion of female participants than male participants. This is likely to be due to the locations that the survey URL was posted in order to collect data: John Krantz's psychology survey website¹¹, where users interested in psychology surveys can go to participate in research, and the Psychology Postgraduate Affairs Group mailing list. Samples from psychology undergraduate and postgraduate courses are traditionally biased towards females. For Study 1, the pilot study informing Study 3, gender differences are not found to impact on the way participants use Facebook features with others. As the most commonly used feature of Facebook is found to be photographs, and this is in keeping with previous research findings (e.g. Binder, et al., 2009; Joinson, 2008; Jones & O'Neill, 2011), the female biased sample is not adjusted and the findings used to inform the design of studies 2 and 3. In Study 2, there is a bias towards male participants, however, as long as the different types of photographs are expressed across the sample, this bias is worth considering, but not concluded to be significant. Study 3 has a large bias towards female participants. Study 3 used the same data collection locations as Study 1, which may account for this. However, Study 3 forms a significant

¹¹ John Krantz's Psychological Research on the Web:

<http://psych.hanover.edu/research/exponnet.html>

part of this research and so in keeping with recommendations (see de Vaus, 2002, p. 85; Malhotra & Birks, 2007, pp. 488-489), the sample is balanced to an expected gender ratio of 50:50. Within Phases 2 and 3, gender is close to an expected 50:50 ratio and so presents no implications of bias. Therefore, caution of interpretation is necessary for the findings of Study 1 and Study 3, suggesting generalisation is less robust. Large samples within each of these two studies help to reduce any concern, as the behaviour of males is likely to be captured across the samples.

Final considerations for the sampling method used throughout the current research are the issues of convenience sampling and a self-selecting vs. non-self-selecting sample. Using a convenience sampling method can restrict the type of individuals participating in the research to those generally available to the researcher and can reduce the generalisability of the findings. The present research operated without restrictions other than the requirement of the participant and their focal target to be Facebook users and connected to one another in Facebook. The convenience sampling of research conducted within a university environment resulted in a bias towards the use of student populations; however, broader populations were used in studies 1 and 3. A bias towards student populations can impact on the level of disclosure observed in Facebook. Social network site use amongst current students is frequent and immersive within their social lives, often using the site to document social events and connect with geographic others from their lives before moving to a university. Therefore, a natural predisposition for disclosure via Facebook and familiarity with its environment may impact on the findings of the results and restrict the generalisability of the findings.

The second sampling method consideration is that of a self-electing sample and voluntary participation. Throughout this research, individuals were placed into group

conditions using randomised or simple systematic sampling. For example, in Study 3 participants were randomly redirected to one of five surveys, one for each target condition. In Study 5, participants in a classroom were handed surveys systematically such that every other person was allocated to one of the two group conditions, new or old friend (thus an equal chance of being selected for either condition, outside of their own control). This was designed to ensure that participants were not choosing the target that they are discussing and controlling for selection bias. However, within the surveys (studies 1, 3 and 5) or interview (Study 4), participants could choose *who* the target was within their assigned category, except for new friends in Study 4 who were the last friend that was added according to the relevant Facebook information. For example, for a relative participants could choose any relative, which allows some variation and could impact the findings of the study such that only those individuals with whom the participant has a good relationship will be assessed. Self-disclosure with those the participants have poorer relationships with may differ, and will not be accounted for in this thesis. In addition, every survey was fulfilled on a voluntary basis, including the class accessed for Study 5, and participants were not coerced into participating. The nature of those volunteering may be indicative of a higher predisposition to self-disclosure compared to the mean value for all types of individual in the target population. Therefore, the results of this thesis may be heightened due to the participants' natural tendency to disclose. However, a higher predisposition to disclosure may benefit the findings herein due to the ease of identifying small changes in behaviour or outcome in amplified samples (amplified compared to the target population mean). Last, there is a potential impact of the reward schemes used in Study 4 (course credit) and Study 5 (iPod raffle). Participants, whilst voluntary, may also be different in nature to those participating without reward, such as the participants in

studies 1-3. Throughout the studies within the present work, the effects of the differences in sampling are considered negligible and necessary in order to collect over 780 participants across the five studies conducted.

3.8. Validity & Reliability

Validity refers to an instrument or study measuring or testing what it proclaims to measure (Coolican, 2004). For example, a scale of Liking is valid if it measures liking and not other relational traits. Reliability reflects the ability of the instrument or study to be internally consistent (Creswell, 2009), i.e. scores within a study would be the same if the study were replicated. Measures of validity and reliability will now be discussed. Validity measures differ for quantitative and qualitative research (Creswell, 2009). Table 3.11 identifies the different types of validity associated with quantitative research.

Table 3.11: Measures of validity, adapted from Cool can (2004)

Validity Type	Definition
Concurrent	How well results conform to those from another valid measure – taken simultaneously
Construct	How well results support a series of experimental hypotheses using the assumed properties of a theoretical variable
Content	How well a test covers the entire topic area as assessed by experts
Criterion	How well results can be used to predict future behaviour or attitude(s)
Face	How self-evident the validity of a test is
Known Groups	Uses criterion validity to determine if groups known to differentiate provide different test results
Predictive	How well a test can predict a score of some other variable(s)

In addition, several authors have identified six threats to validity when conducting research that the researcher should take care to avoid. These threats are, *history, testing, instrumentation, mortality, maturation, and ambiguity about causal*

direction (Creswell, 2009; Robson, 1993, 2002; Saunders, et al., 2000). *History* threats are those whereby recent or past events may affect the results of a study. For example, collecting data on anxiety from students 15 minutes prior to an exam is likely to lead to higher scores than baseline. *Testing* threats are those that occur as a result participants being aware of the phenomenon measured. If a participant feels they may be disadvantaged by the research outcomes their behaviour may be altered to affect the natural pattern of results. *Instrumentation* threats are those where the measurement instrument fails to identify an extraneous variable, or falsely measures the variable of interest. *Mortality* threats are those where participants drop out of a study. *Maturation* threats are similar to history threats, whereby an event that happened a while back has matured resulting in different outcomes than normal over a long period of time, and therefore would not be immediately visible to researchers. Similarly, the participants themselves may change throughout or between studies. *Ambiguity about causal direction* can arise when studies are not manipulated to ensure that the IV is directly responsible for the outcomes measured. For example, in this work sharing and liking are both measured at a fixed point in time. If liking were to show a positive correlation with sharing it is not clear whether liking causes increased sharing, increased sharing causes liking or whether the two are increasing by either coincidence or because of the effect of some other variable. Control groups are used to ensure causality can be inferred from the experimental manipulations.

Two other validity types may be compromised: *external*, and *internal*.

Generally, *external* validity relates to the ability to generalise the results of a study to a broader population (Campbell, 1986; Johnson, 1997; Saunders, et al., 2000). *Internal* validity is the ability to determine cause and effect relationships within data sets (Campbell, 1986; Johnson, 1997). Validity in qualitative research is measured

differently. This is discussed in section 3.9.1. Table 3.12 briefly highlights the three main validity types concerning qualitative research.

Table 3.12: Three main validity concerns in qualitative research, adapted from Johnson & Onwuegbuzie (2004)

Validity	Description of main concerns
Descriptive	Defines the factual accuracy of the accounts given by the researchers of the data.
Interpretive	Validity is achieved through understanding the participant's views, expressions and descriptions and interpreting them as they were intended.
Theoretical	Achieved through the alignment of the data/findings and the theory developed or tested, providing a best-fit.

Reliability of results and data sets refers to their consistency over time (Creswell & Plano Clark, 2007). When discussing items and constructs within scales, reliability is assessed using Cronbach's alpha to determine the agreement between scores on one item with scores on another item supposed to measure the same construct (Creswell, 2009). Similarly, reliability of scores given by raters or participants can be determined using Cronbach's alpha.

3.9 Qualitative Phase – Design Choices

Within the qualitative phase several choices are required regarding the study design, method and analysis. Mixed methods will ensure that where the links between elements of the research models are verified using quantitative methods, the subtle changes and depths of the relationships are obtained using qualitative methods. Drawing largely from two sources of mixed methods and qualitative research design (Braun & Clarke, 2006; Creswell, 2009), the qualitative phase remains within the positivist epistemology while utilising the inductive benefits of a qualitative study. Simultaneously, data collected from structured sections of the interviews allow

quantitative data comparisons, forming a minor, descriptive part of the analyses using a t-test and Pearson's correlation for confirmation of research design success.

3.9.1. Interview Design

There are three types of Interview associated with qualitative and mixed methods research designs: Structured, Semi-structured and Unstructured (Saunders, et al., 2000). If viewed on a spectrum, one end situates structured interviews that involve closed questions with a rigid pre-defined format (Bryman, 2008). Opposing are unstructured interviews which use an open, format-free approach to interviewing and do not focus on an interview structure but use outlines and discussion points which allow researchers to take the topic where interviewees may lead them (Bryman, 2008; Malhotra & Birks, 2007; Saunders, et al., 2000). Unstructured interviews are suited more toward exploratory research where there are no pre-defined ideas about the topics under investigation. Semi-structured interviews are placed between structured and unstructured interviews, containing closed, rigid questions as well as open, free flowing questions (Bryman, 2008). Semi-structured interviews use an interview schedule which contains topics for discussion that are more rigidly formed than unstructured interviews, but less prescriptive than structured interviews. Such flexibility allows probing of responses around predefined areas of interest (Bryman, 2008; Creswell, 2009; Malhotra & Birks, 2007; Saunders, et al., 2000).

Study 4 (Chapter 5) utilises a semi-structured interview design. The aim is to understand in richer detail the relationships between sharing, liking and certainty within Facebook, and keep within a positivist understanding of experiences. That is, the model and research questions developed from the literature review will guide the interviews to find support and answers. Simultaneously, a semi-structured design ensures that the

structure is not so rigid as to miss critical points expressed by interviewees, but allows the researcher to probe for more detail where necessary, adding to the understanding of the body of knowledge.

Obtaining useful measures of validity in qualitative research is considered difficult due to the conflicting need to be rigorous as well as free-flowing when designing studies, collecting data or analysing results (Whittemore, Chase, & Mandle, 2001). It has been suggested that while several methods for judging the quality of qualitative research have been proposed, e.g. authenticity, goodness and truthfulness, few have received overwhelming support and unanimity (Whittemore, et al., 2001). Three types of validity are considered for this qualitative research: *descriptive*, *interpretive*, and *theoretical* validity (Johnson, 1997). *Descriptive* validity defines the factual accuracy of the qualitative analyses and conclusions given by the researcher. To achieve *interpretive* validity the interviewees' views, attitudes, thoughts, beliefs and experiences must be understood by the researcher, accurately representing them through his/her own account. *Theoretical* validity is achieved when the data and theory are aligned to provide a best-fit. Johnson also suggests that quantitative measures of *internal* and *external* validity are relevant in qualitative research. A brief discussion follows with reference to the precautions taken in this research to obtain each of the five validity types.

External Validity refers to the ability to generalise results to other studies and scenarios in which they may be expected to be useful (Campbell, 1986; Johnson, 1997). To ensure external validity, this study provided a PC for the interviewee to use. A desktop computer setup ensures that the environment is similar to how interviewees use Facebook in their own homes. With background noise unavoidable this adds an element of randomisation best suited to extrapolate results to differing environments in which a

typical Desktop PC is used and Facebook sessions are held, i.e. a bedroom, home-office or open-plan office. In terms of the data structure and interview questions, direct and indirect questions, and active Facebook browsing were utilised to make it more comfortable for interviewees, therefore less like a laboratory.

Internal Validity refers to the ability to determine cause and effect relationships within data sets (Campbell, 1986; Johnson, 1997). It is suggested that when qualitative researchers are interested in causal relationships that similar process to quantitative research should be used (Johnson, 1997). In quantitative research inferential statistics are used to determine if the null hypothesis can be accepted or rejected beyond a certain level of confidence (typically 95%). Although it is often not possible to run statistics on qualitative data sets and interviewee accounts, the researcher can act as a detective, searching for clues and gathering evidence towards a causal relationship (Johnson, 1997, p. 287). Thus, causality can be inferred with repetition of events within data sets (Johnson, 1997). The researcher can determine significance, but can also use an arbitrary cut-off to signify whether an event has occurred enough times to be counted as a theme (Braun & Clarke, 2006). Thus, causality relationships can be deduced through repetition of certain patterns. In this work, internal validity is obtained by using caution before determining what constitutes a causal relationship, as well as the number of occurrences a particular data pattern has. For example, if *several* interviewees were to say “I share lots of photos with them because we are good friends” then causality may be inferred by the interviewees’ statements. However, if participants were to state they are good friends, and later describe a high frequency of photo sharing with this person, then causality may be difficult to establish, but a correlational relationship may describe the data sufficiently.

Interpretive Validity is obtained in this research using a semantic level of understanding interviewees' accounts. That is, in parallel with the positivist approach the interviewee's expressions of how they use Facebook, describe their relationships and their behaviours will be interpreted as they are expressed. Fewer latent interpretations will be utilised but context and understanding of the semantic content relies on the researcher's point of view. However, when colloquialisms are used it is important that the researcher and interviewee mean the same thing. Therefore, cultural similarity is important. To avoid issues pertaining to cultural and latent misunderstandings, the interviewer will probe interviewees further if a statement is ambiguous. A well-established method of improving validity is to use investigator triangulation (Johnson, 1997). Where meanings are ambiguous, the data will be discussed with colleagues, fellow researchers (of other work in a similar field) and the PhD supervisors. Preferably, the data are given to multiple researchers for interpretation and classification regardless of ambiguous excerpts. However, due to resource and time constraints, as well as the need for this work to be entirely the author's, this was not practically possible.

Descriptive Validity is how accurate the researcher's account of the data is, i.e. did what is said by the researcher to have happened, actually happen (Johnson, 1997). Descriptive validity is obtained in this study by using rigorous coding. Excerpts are taken and categorised based on what is said by the participant, using surrounding text to support the context to which it refers.

Theoretical Validity is obtained when the data set and subsequent theory, or theory and subsequent analysis, are a good fit (Johnson, 1997). The theory is already developed, however, using a method of falsification, the qualitative data are analysed on a semantic level and are used to either support, or refute a particular aspect of the

theoretical model and understanding. If the data are supportive, the theory is considered to stand. If the data find no support, then theory can be updated and future work can be suggested to test that new model. However, a confirmation bias can occur easily. Should an interviewee state “I look for information about them” it could be interpreted as them seeking certainty about that individual, thus supporting theory, but it could mean they are bored and so look for information without processing it. Therefore, excerpts from around the quote, and interviewer recall on the tone and structure of the sentence or paragraph will be used to guide interpretation.

3.9.2. Analysis Choice

Thematic analysis is a widely used qualitative technique (Braun & Clarke, 2006). Providing a method for identifying patterns within data sets, thematic analysis (TA) is suggested to be free from ties to any one particular theoretical or epistemological approach (Braun & Clarke, 2006), as such is a suitable analytical tool for this work based in positivism. TA can provide detailed descriptions of data sets or provide depth to interpretation behind the observed data (Boyatzis, 1998 cited in Braun & Clarke, 2006).

There are decisions to be made before conducting TA that are suggested to be updated through reflexive practice of the researcher throughout data collection and analysis (Braun & Clarke, 2006). Clarity of these decisions will ensure that data collection and analysis can be replicated and provide a framework for other researchers to understand the conclusions drawn from analysis (Braun & Clarke, 2006). According to Braun & Clarke (2006, pp. 82-85) there are essentially four critical decisions to be made:

1. What counts as a theme?
2. Inductive vs. theoretical TA?
3. Semantic or latent themes?
4. Epistemology: essentialist/realist versus constructionist TA?

Deciding what counts as a theme is important. The size or pattern ‘chunk’ may alter the emerging themes (Braun & Clarke, 2006). For example, a theme could constitute a whole response to a specific question, a couple of lines, or refer to the main understood point of the utterance. Braun and Clarke emphasise that the word ‘understood’ is crucial as it demonstrates that themes and coding categories are implicitly entwined with researcher subjectivity. However, being clear as to what constitutes a theme can help to reduce this subjectivity. Furthermore, they state that what counts as a theme *occurrence* is important to establish. A point may be coded each time it is mentioned, implying that more mentions makes a category more important, by the number of different people that mention it overall, or by its considered importance by the researcher. For the current work, category (theme) importance is established by a combination of the number of individuals (sources) mentioning a topic and whether an utterance has significant importance to the research. One-word answers to questions may be supportive of themes but cannot comprise a theme alone, i.e. theme construction requires a rich description of the topic.

Choosing whether the analysis is inductive or theoretical is also of importance. Inductive analysis means the themes derived are closely linked to the data set and descriptions (Patton, 1990), and may not be directly or strongly linked to the research questions and questions put to interviewees (Braun & Clarke, 2006). Theoretical analysis prescribes a theoretical or topical interest of the researcher and patterns within the data are matched based on their ability to answer, support or refute these

frameworks (Braun & Clarke, 2006). Due to the positivist approach taken within this work, theoretical analysis is used.

The third decision is whether themes are semantic or latent (Boyatzis, 1998 cited in Braun & Clarke, 2006). Semantic TA remains at one level, understanding the text excerpts to mean what is expressed, and does not look beyond this level of analysis. Latent analysis refers to underlying meanings of excerpts and how it shapes the manifest (semantic) level. Clarifying this decision ensures the researcher and readers of the TA report understand how data were analysed and where possible interpretation differences may occur (Braun & Clarke, 2006), however, it is impossible to remove all researcher interpretation or subjectivity bias. Within the current research, analysis is conducted at the semantic level. How interviewees communicate with, like and gain certainty about Facebook friends must be established *before* the interpretations of interviewees' unconscious connections are analysed or deemed relevant. Underlying motivations are addressed, but only once the theme structure is determined.

The last decision is made easily. Choosing which epistemology the analyses are bound to stems directly from the positivist understanding outlined throughout, aligning with an essentialist epistemology as described by Braun & Clarke.

To perform TA once these decisions are made a six stage process has been developed (Braun & Clarke, 2006). However, it should be noted that these stages are flexible; as a rigid process would destroy the advantage of flexibility synonymous with TA (Braun & Clarke, 2006). Data were entered into NVivo for thematic analysis following the six steps outlined in Table 3.13.

Table 3.13: Phases of Thematic Analysis - adapted from Braun & Clarke, (2006)

Phase	Description of Process
1. Familiarise with the data	Transcribe, read (and re-read). Make notes of initial ideas
2. Generate initial codes	Code interesting features/patterns across data set systematically
3. Search for themes	Collate codes into themes
4. Review Themes	Check themes "work" in relation to coded extracts
5. Define and name themes	On-going process to refine the specific details of each theme
6. Produce Report	Selection of extracts and final analysis of these extracts relating back to literature and research questions/models

3.10 Ethical Considerations

The ethical procedure of the University of Bath, School of Management was followed accordingly for all research conducted in this thesis. Further guidance was sought, and strictly adhered to, from the British Psychological Society's guidelines on conducting research with human participants.

Participants gave informed consent via an introduction page on the survey, or via a consent form for studies conducted in offline environments (Study 4 and Study 5). Participants were informed of the purpose of each study, the risks involved and their right to withdraw at any time without risk of judgement, even after the survey/interview had been conducted. By clicking "Next" at the bottom of the consent page (online surveys), or by signing their name or marking with an 'X' on consent forms (offline surveys), participants agreed to the use of their data and indicated that they understood the research brief and expected outcomes. Data were collected anonymously. Furthermore, participants were informed that their data would not be used outside of the context of this PhD research or subsequent publications. Participants were not deceived. At the bottom of the consent form contact details were given and participants were encouraged to contact the researcher should they have any enquiries. It was deemed that there were no risks to the participant(s) outside of their day-to-day lives, either

physically or psychologically. Participants were also given a debrief including the researcher's contact details should they wish to ask any questions after the survey/interview.

For Study 4 where course credit was awarded for participation, if an interviewee chose to withdraw at any time after the interview had commenced, or did not wish to provide an answer to any question, they were informed that they would still be awarded course credit. Data collected were anonymous using only first names in recordings to maintain a relaxed, informal atmosphere. When transcribed, all first names were removed and replaced with pseudonyms. If an interviewee were to become upset at any time, the interviewer would stop the interview and, if needed, ensure they were able to get help regarding the issue from NHS direct or local NHS services.

For Study 5 where participants were recruited via University classes, consent was gained from the Dean of Studies to ask class members to participate.

3.11. Summary

This chapter has outlined a brief history of the psychological paradigms and key work from the fields of HCI/CS, Information Systems and Communication Science that influences this work. These research fields influence the current work as shown in Figure 3.2. The research strategies and methods adopted are considered to be independent of the researcher's philosophical stance. The research is conducted with an overarching positivist philosophy, regarding behaviour as objective and distinct from the interpretation of the human mind. A mixed methods strategy is employed with three phases operating a *concurrent triangulation strategy*, utilising both quantitative and qualitative strategies between and within phases. The research is deductive, identifying theory and research questions to be tested, while maintaining a degree of exploration for

the application of the model to the new communication environment, Facebook. The higher level variables investigated are sharing, liking and certainty, operationalised within each study to investigate them from different and complementary research angles. The operationalisation of each of these is given in each study chapter.

4. Phase 1: Effects of information sharing with different people in Facebook

The following set of studies will address the research model within the context of day-to-day Facebook interaction to assess the relationship between sharing and liking. Specifically, this set of studies will look to identify the differences in sharing similar information across audience types, while controlling the type of disclosure involved (design overview available on the right side of Figure 4.1).

From the basis of the literature review the proposed theoretical model predicts an interaction between sharing in SNS, uncertainty levels and perceived level of liking by the recipient. This chapter aims to identify the highlighted section of the model shown on the left in Figure 4.1. However, due to the conflicting results found in both pre-Internet communication and the more recent CMC literature outlined, the direction of liking based on information disclosure is not predicted. The impact of disclosure on liking can be positive or negative, i.e. liking could be increased or decreased.

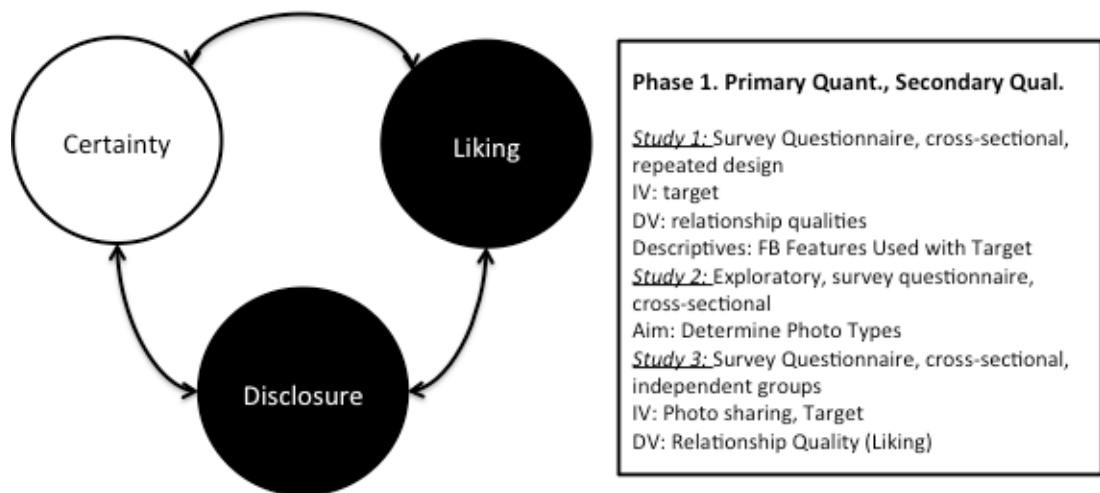


Figure 4.1: Disclosure-Liking section and Study Plans

4.1. Relevant Literature

Before conducting this research a brief overview of the literature is given to identify the components to measure and improve the understanding of the sharing and liking relationship in the Facebook environment.

4.1.1. Disclosure definition

Throughout the literature review (Chapter 2), self-disclosure has been demonstrated to have inconsistent effects on liking and communication between interaction partners (e.g. Chelune, 1979b; Collins & Miller, 1994). Multiple definitions, motivations and measurements have been used throughout the different studies highlighted in the literature (e.g. Chelune, 1979a; Cozby, 1972; Jourard & Lasakow, 1958; Worthy, et al., 1969). A combination of these definitions identifies the broad concept of self-disclosure as the sharing of information from one person to another. The definition developed for this thesis is: -

“Information intentionally communicated about person A to any person(s) via any form of communication and interaction by person A”.

Taking this definition, sharing in Facebook will be identified as information received from others or shared to others intentionally.

4.1.2. Environment & Methods of Communicating

The disclosure, privacy, liking and URT literature suggest the environment to be influential in the decision to disclose, or in the development of liking with another person (Altman, 1975; Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Chelune, 1976b; Derlega & Grzelak, 1979; Westin, 1967, 2003). To

control for environmental effects, and therefore context, a single SNS will be the focus of these studies, Facebook.

SNS require sharing for them to be successful and attractive to users (Burke, et al., 2009; Markus, 1987). Within SNS users post information about their age, hometown, date of birth, the university they attended, their occupation and place of work, photographs, messages to other users both publicly and privately, share videos, and comment on other users' uploads and content (Acquisti, 2009; Acquisti & Gross, 2006, 2009; Christofides, et al., 2009; Dwyer, Hiltz, & Passerini, 2007; Goettke & Christiana, 2007; Govani & Pashley, 2005). Currently there are over 955 million active Facebook users¹². At the time of data collection there were 16 Facebook features that could be used to interact with an interaction partner. It is therefore necessary to establish which features are used most frequently to disclose information within dyads. The following objective for Study 1 is established:

Objective 1: What are the most used features of Facebook between interaction partners?

4.1.3. Targets of Disclosure

To determine the effects of information sharing in Facebook on the different types of relationships held it is necessary to identify which features of Facebook are most used with each target type. Therefore, objective two is identified as:

Objective 2: With whom are the features of Facebook used?

¹² Facebook news room, accessed June 2012.

<http://newsroom.fb.com/content/default.aspx?NewsAreaId=22>

Differences in the self-disclosure and liking model may occur depending on the relationship type of an interaction pair. Previous research identifies differences in disclosure patterns based on the type of target and their expected relationship (e.g. Binder, et al., 2009; Chelune, 1979b; DiMicco & Millen, 2007; Furman & Buhrmester, 1985; Jourard, 1959; Jourard & Lasakow, 1958; Marwick & Boyd, 2011; Rubin, et al., 1980; Skeels & Grudin, 2009). Targets previously identified include mother, father, best same-sex friend, best opposite-sex friend, partner (romantic, boy/girlfriend), spouse, sibling, colleague and grandparents.

The focus of this research will combine several of the above target types, similarly to Furman & Buhrmester (1985). This approach allows for variation in the labelling of target types to aid generalisability. Research on the use of Facebook with different social groups is also used to select target types that are communicated with on Facebook (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Marwick & Boyd, 2011; Skeels & Grudin, 2009). In the present research, the groups of mother, father, sibling, and grandparent are collapsed under the term *relative* for two reasons. First, previous research identifying differences in network behaviour and interpersonal closeness with a CMC perspective identify *kinship* as fundamentally different to *friendship* (e.g. Binder, et al., 2009; Roberts & Dunbar, 2010, 2011), but do not distinguish within kinship, allowing the present findings to contrast with such work while adding the perspective of relationship quality changes based on sharing and relationship types more broadly. Effects within each of the broader categories identified in the current research can be identified in future work once the initial effects are established here. Second, it is necessary to identify different relationship types without adding too many categories and significantly increasing the length of the survey.

Therefore, four target types are investigated: a *relative* (to include a parent, grandparent, or sibling), a *partner* (to include spouse or boy/girlfriend), a *friend* (to include close friends regardless of gender) and a *colleague*.

4.1.4. Liking & Network Relationship Inventory

A necessary component of this research is to measure liking to determine its relationship with sharing in Facebook with different targets. Maslow (1954) and Alderfer (1969) propose that humans have a need to connect to others socially once more primitive needs are fulfilled. It is suggested that there are two over-arching constructs of liking: affection and respect (Rubin, 1973). Affection is experienced as warmth and an emotion, and respect is expressed towards others based on their commendable characteristics (Rubin, 1973, 1974). This research uses the Network Relationship Inventory (NRI) to measure liking.

The NRI (Furman & Buhrmester, 1985) can identify the levels of different relationship qualities individuals hold with different relationship targets. This provides a more in-depth view of perceived Liking by identifying different constructs of relationships rather than a single broad concept. The NRI scale items were developed from the work of Weiss (1974) who proposed measurements of social provisions provided within different relationships (Furman & Buhrmester, 1985). The NRI and instructions were obtained by emailing the authors (Appendix 1).

4.1.5. Hypotheses tested in this chapter

The aim of this chapter is to identify the effects of day-to-day information disclosure in Facebook on the relationship qualities held with different relationship types. The following hypotheses are developed: -

H1: Different relationship types will have different levels of relationship qualities to each other.

H2: Different targets have different uses of Facebook.

H3: There will be an association between the information shared (both type and frequency) and relationship quality.

H4: There will be an interaction between the relationship type, the type and frequency of information shared, and the relationship qualities held with that relationship type.

Study 1 investigates differences in relationship qualities with different targets and identifies the most used feature of Facebook. Study 2 classifies the differences within the most used feature of Facebook. Study 3 is informed by studies 1 and 2 to identify the impact of relationship type, differences *within* Facebook feature content, and the frequency of disclosure on relationship qualities.

4.2. Study 1 – Relationship Qualities, Relationship Types and Facebook Uses

4.2.1. Design

Study 1 is designed to test H1 & H2. A survey was constructed to gather information about the relationship qualities held with different ‘friends’ available on Facebook (*Relative, Partner, Friend (close), and Colleague*) and identify the features of Facebook that participants use with these targets. Demographic data are collected from participants including age and gender. The survey utilises a repeated measures design whereby each participant answers the NRI with regard to each type of target, as per the original NRI questionnaire. The NRI consists of 11 scales for relationship qualities.

Each participant’s score is determined using a mean average of three component items. The 11 qualities investigated are *Support*, *Companionship*, *Conflict*, *Instrumental Aid*, *Antagonism*, *Intimacy*, *Nurturance*, *Affection*, *Admiration*, *Relative Power*, and *Reliable Alliance*. The instructions obtained from the authors indicate that (other than *support*) these are the most common scales used currently in the NRI. *Support* is added as a general measure from one of the supplementary predefined scales of the NRI that could be included and is chosen as it may be of interest to this research. The survey can be found in Appendix 2. Scale reliability for all 11 relationship qualities is given in Table 4.1.

Table 4.1: Study 1, NRI Scale Reliability

Relationship Quality	Cronbach’s α
Support	.935
Companionship	.913
Conflict	.893
Instrumental Aid	.832
Antagonism	.875
Intimacy	.949
Nurturance	.853
Affection	.949
Admiration	.862
Relative Power	.786
Reliable Alliance	.948

The questions are responded to in the format of a five-point scale weighted one (little or none), two (somewhat), three (very much), four (extremely much), and five (the most). The questions are asked once for each target such that all items are completed for a relative, then a partner, then a friend, and last a colleague.

Participants are prompted with questions about each target to help them focus on a specific individual. For a relative participants are asked to “choose a relative with whom you are closest who is also on Facebook, from the following: parent, sibling, grandparent, other (please specify).”

For a partner, participants are told to “choose a boy/girl friend (partner) whom you are dating or have dated. You may choose someone you are seeing now, or someone you went out with previously. If you choose a past boy/girl friend, please answer the questions as you would have when you were in the relationship.”

For a friend, participants are asked to “choose the most important friend you have had. You may select someone who is your most important friend now, or who was your most important friend previously. Do not choose a sibling. If you select a person with whom you are no longer friends, please answer the questions as you would have when you were in the relationship.” The previous question given to participants asks them to report if they have a friend that uses Facebook with them, ensuring that they do not think of somebody who is not available on Facebook. For both a partner and friend participants are asked to supply their name to help them think about this person when answering the questions regarding their relationship. The answers to these focussing questions were not used in the analyses and serve no further purpose.

For a colleague participants are asked to “choose the person who is a colleague of yours but not somebody with whom you would typically socialise.” This enables a distinction between a good friend and somebody they work with, as it is apparent that some colleagues are also friends and confidants with whom participants may socialise to a similar level as a good friend.

Participants were asked which features of Facebook they used with the four different targets after completing the NRI for that target, e.g. participants answered the NRI for a relative, then the use of Facebook features with a relative before moving to questions about a partner. At the time of conducting the survey (spring of 2010) there were 16 different features: posting & looking at photographs, status updates, relationship status, direct message, post on their wall, poke, play games & applications,

share links, write notes, posting & watching videos, inviting & joining groups, chat, fan pages (renamed to ‘liked pages’), use of events feature, commenting on photos, and commenting on status updates. Participants were asked if they used each of the Facebook features with a respective target, responding either yes or no.

4.2.2. Participants

Participants were obtained from a number of sources. A convenience sample of Facebook users was obtained through the Psychology Postgraduate Affairs Group (PsyPAG) email list, an academic research group held on Facebook, a website of available online psychological research¹³, advertising on the University of Bath news page, and snowballing by posting links on Facebook. After cleaning, the sample consisted of 113 participants (N=113), of whom 20 were male (n=20), and 93 female (n=93). The sample (n=112, 1 missing case) was aged between 17 and 58 years (range=41 years), with a mean age of 24.19±7.60 (mean±SD) years.

4.2.3. Procedure

Participants were gathered from the aforementioned sources and directed to the survey URL. The link pointed them to an online survey where participants responded to the survey. Responses were then downloaded, and cleaned before analyses. Data points were removed if they were incomplete or contained obvious repetitive answering patterns. The individual NRI scale items were averaged to give a mean score for each relationship quality, as per the NRI instructions. Data were then entered into SPSS for analysis.

¹³ John Krantz’s Psychological Research on the Web:

<http://psych.hanover.edu/research/exponnet.html>

4.2.4. Results – Targets and Relationship Qualities

A repeated general linear model (RGLM) was used to analyse the data (raw data and output files in Appendix 2). Two independent variables (IVs) were created. Relationship Type (Target) consisted of four levels, and Relationship Qualities (Rqual) consisted of 11 levels. The entire sample was valid, with no missing data (N=113). Mauchly's Test of sphericity was significant for Target (Mauchly's $W=.857$, $p=.004$), Rqual (Mauchly's $W=.017$, $p<.001$), and Target*Rqual (Mauchly's $W=<.001$, $p<.001$), therefore the more conservative Greenhouse-Geisser correction for sphericity is reported across the model. There was a main effect of Target ($F_{(2.74, 306.90)} = 113.26$, $p<.001$), Rqual ($F_{(4.59, 514.50)} = 150.17$, $p<.001$), and the interaction of Target and Rqual ($F_{(9.27, 1038.31)} = 34.55$, $p<.001$). Mean values for the NRI scores for the interaction term are shown in Table 4.2.

Table 4.2: Mean NRI scores for the Interaction Term Target*Rqual

	Relative	Partner	Close Friend	Colleague
Support	2.96	3.68	3.45	1.56
Companionship	2.89	3.81	3.23	1.64
Conflict	2.19	2.18	1.52	1.21
Instrumental Aid	2.79	3.17	2.76	1.86
Antagonism	2.27	2.22	1.65	1.40
Intimacy	2.86	3.77	3.55	1.50
Nurturance	3.24	3.48	2.98	1.74
Affection	4.15	5.02	3.68	1.94
Admiration	3.34	3.65	3.42	2.34
Relative Power	2.38	2.23	1.85	1.53
Reliable Alliance	4.41	3.22	3.70	1.90

Pairwise comparisons (Table 4.3) showed that relatives were scored significantly higher than colleagues overall ($p<.001$), but not significantly different to partners ($p=.453$), or friends ($p=.326$) for overall relationship qualities. Partner scores

were significantly higher than friend scores ($p=.005$), and colleague scores ($p<.001$).

Friend scores were significantly higher than colleague scores ($p<.001$).

Table 4.3: Pairwise Comparisons for Target

Target Comparisons (a vs. b)			
Target (a)	Target (b)	Mean Difference in RQ Score	Significance
Relative	Partner	-.178	.453
	Friend	.153	.326
	Colleague	1.352	<.00
Partner	Relative	.178	.453
	Friend	0.331	.005
	Colleague	1.53	<.001
Friend	Relative	-.153	.326
	Partner	-0.331	.005
	Colleague	1.199	<.001
Colleague	Relative	-1.352	<.001
	Partner	-1.53	<.001
	Friend	-1.199	<.001

There are different relationship qualities present in different types of relationship. Table 4.2 shows differences between each relationship quality for the four different targets. The main effect shown in Table 4.3 proposes that the differences in relationship qualities between relative and colleague, partner and friend, partner and colleague, and friend and colleague are significant. However, more detail can be ascertained using within-subjects contrasts, presented later (Table 4.4).

Using the graph in Figure 4.2, the pattern of mean Rqual scores for each target can be determined descriptively. Initially the pattern for each relationship quality appears similar across the four roles. The scores for relative, partner, and close friend are higher across the range of relationship qualities compared to colleague scores, confirmed by the significant main effect of target. However, there are differences between relative, partner, and close friend in both score and direction for some Rquals.

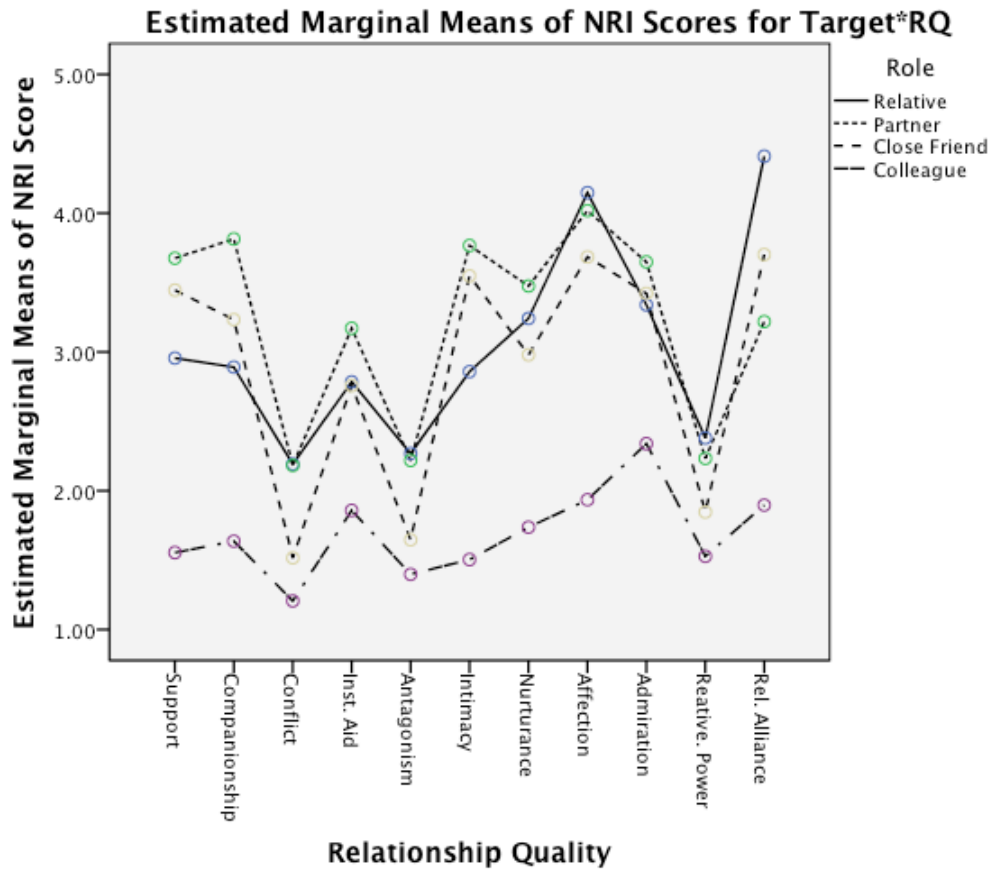


Figure 4.2: Estimated Mean NRI Score for Target*Relationship Quality

In particular, there are differences for the four roles between scores and direction of support, companionship, conflict, antagonism, intimacy, and affection. The graph shows that support is highest for partners, close friends, relatives, and colleagues in descending order. Scores of conflict are similar for partners and relatives, with less conflict between participants and their friends and colleagues. Similarly with antagonism scores, relatives and partners scored approximately the same but higher than both close friends and colleagues. Intimacy is much higher for partners and close friends, than for relatives and colleagues. Relatives and partners give the highest and similar scores for affection compared to close friends or colleagues.

Due to the necessary requirement of the design to conduct a RGLM, tests of within-subjects contrasts can only be given between each of the ascending levels for both Target and Rqual, i.e. comparisons can only be made sequentially and are restricted to the sequence of data input for analysis. For the interaction term (Target*Rqual) the comparison of relative with partner demonstrates that all 11 Rquals differ significantly ($p < .05$) within their contrasts.

Table 4.4: Within-subjects contrasts for Target by Relationship Quality

Target	Relationship Quality	F	Sig.
Relative vs. Partner	Support vs. Companionship	4.569	.035
	Companionship vs. Conflict	24.729	<.001
	Conflict vs. Instrumental Aid	4.308	.040
	Instrumental Aid vs. Antagonism	5.463	.021
	Antagonism vs. Intimacy	23.599	<.001
	Intimacy vs. Nurturance	35.003	<.001
	Nurturance vs. Affection	14.212	<.001
	Affection vs. Admiration	30.624	<.001
	Admiration vs. Relative Power	8.857	.004
	Relative Power vs. Reliable Alliance	41.444	<.001
Partner vs. Friend	Support vs. Companionship	16.676	<.001
	Companionship vs. Conflict	.218	.641
	Conflict vs. Instrumental Aid	1.934	.167
	Instrumental Aid vs. Antagonism	.866	.354
	Antagonism vs. Intimacy	3.440	.066
	Intimacy vs. Nurturance	8.036	.005
	Nurturance vs. Affection	4.654	.033
	Affection vs. Admiration	1.834	.178
	Admiration vs. Relative Power	1.399	.239
	Relative Power vs. Reliable Alliance	25.053	<.001
Friend vs. Colleague	Support vs. Companionship	13.891	<.001
	Companionship vs. Conflict	87.482	<.001
	Conflict vs. Instrumental Aid	17.667	<.001
	Instrumental Aid vs. Antagonism	19.023	<.001
	Antagonism vs. Intimacy	131.057	<.001
	Intimacy vs. Nurturance	82.460	<.001
	Nurturance vs. Affection	31.659	<.001
	Affection vs. Admiration	61.140	<.001
	Admiration vs. Relative Power	36.951	<.001
	Relative Power vs. Reliable Alliance	109.176	<.001

H1 is therefore accepted and the null hypothesis rejected. For each of the four relationship types there are significantly different scores of relationship qualities. However due to the design of the study and necessary analyses, meaningful contrasts and their direction are not obtainable in their entirety using inferential statistical tests.

The graph of mean scores for each Rqual by target (Figure 4.2) demonstrates the results descriptively, and the within-subjects contrasts shown in Table 4.4 show differences between relationship qualities for sequential targets. The design for Study 3 can use the assumption that differences between relationship types exist, allowing a focus on testing hypotheses 3 and 4.

4.2.5. Results – Facebook Features

Frequencies were calculated for the features of Facebook each participant reported they had used with each target. A combined group including all four targets was used to identify the general nature of Facebook use for the 16 features (see Table 4.5).

Table 4.5: Percentage of participants that used each Facebook feature with a target

Facebook Feature	Participants used (%)
Photos	79.6
Status	71.0
Wall Posting	65.5
Comment on Photos	64.6
Comment on Status	62.6
Direct Message	49.3
Chat	39.6
Relationship Status	36.3
Share Links	31.0
Events	30.3
Groups	29.2
Videos	27.7
Games/Apps	19.9
Poke	16.4
Fan Pages	11.1
Notes	10.0

Looking at and posting photographs was the most common use of Facebook with 79.6% of users reporting they had done so with an interaction partner. The second highest use of Facebook was status updates, with 71.0% of users reporting they had

done so. Commenting on photographs also ranked high in fourth place with 64.6% of users having done so. Commenting on status updates was the fifth most used feature with 62.6% of users having reported doing so with one of the targets. Using multiple t-tests to establish differences in Facebook feature use based on gender, it was found that only the use of events and fan pages differed significantly. Events were used significantly more frequently by females compared to males across all target types (Levene's = 37.941, $p < .001$; $t = -2.797$, $df = 132.49$, $p = .006$), and fan pages were used significantly more frequently by males across all targets (Levene's = 14.777, $p < .001$; $t = 1.722$, $df = 100.33$, $p = .043$). The top three features of Facebook used by participants with each target are shown in Figure 4.3.

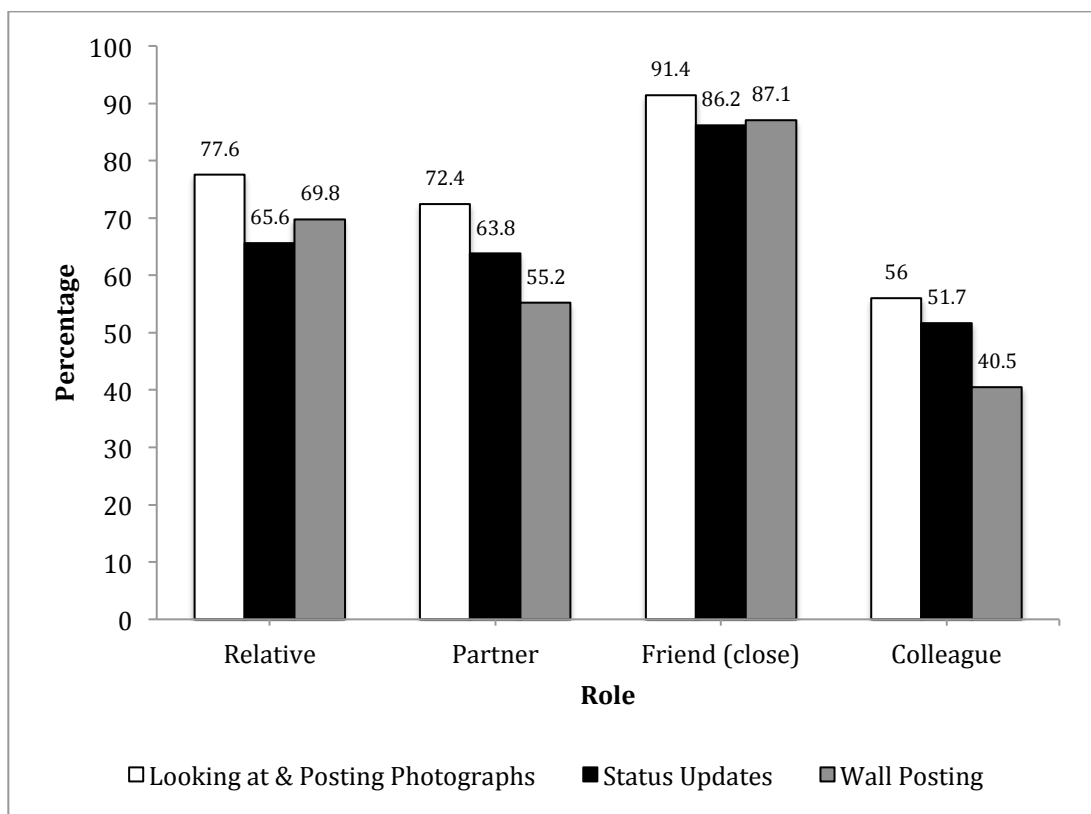


Figure 4.3: Top three Facebook features used by percentage for each target

Photograph viewing and sharing on Facebook was the most used feature across all targets and for each target individually. Therefore H2 is accepted. However, photographs can contain a wide range of content and so comparing the frequency of photographs shared between individuals will not capture the entirety of the information that's shared when photographs are uploaded to Facebook. Therefore, Study 2 is designed to determine the different types of photograph typically shared. The classification of photographs allows the investigation of differences *within* a single category of information sharing in Study 3.

4.2.6. Study 1 Discussion

4.2.6.1. *NRI*. The results of Study 1 accept H1 and reject the null hypothesis: different relationship types have different levels of relationship qualities to each other. The critical finding was that the interaction term (Target*Rqual) was significant. This suggests that participants scored each target differently for each relationship quality.

The significant main effect of Rqual suggests that participants in this sample had different scores for each of the relationship qualities tested in the NRI. These include support, companionship, conflict, instrumental aid, antagonism, intimacy, nurturance, affection, admiration, relative power and reliable alliance. However, upon closer inspection the main effect does not transfer to all 11 needs, and so a selection of needs shall be used in Study 3 based on these results and implications from the literature.

The significant main effect of Target suggests that participants had different scores across all 11 relationship qualities combined for each of the four targets they use Facebook with. However, when identifying which targets participants had different Rqual scores with, the main effect suggested that relatives were only significantly different across the Rquals than a colleague. Partners were scored higher than both a

friend and a colleague, but not significantly differently to a relative. Friends were scored higher across all Rquals than colleagues, and lower than partners were. Colleagues were scored lower than relatives, partners, and friends.

The Rqual scores of the participants were related to their relationship with the four targets. However, the relationship quality scores cannot be attributed to their relationship with each of the targets alone. The survey did not ask participants to give details of their relationships with the targets in Facebook only. Specifically, Study 1 was designed to ascertain differences in relationship types and relationship qualities in general (both in their relationships online and offline), and the context of Facebook communication will be addressed in the remaining study sets. Overall it is concluded here that there are differences in a number of relationship qualities for some relationship types.

The overall results from Study 1 suggest that there are different components of relationships, or liking, that are scored differently by participants when reflecting on these properties with different targets. The results support previous research that suggests there are different targets communicated with in Facebook, which may have different requirements or expectancies of their network connections depending on their relationship (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Handy, 1995). The results of Study 1 highlight that differences exist in relationships with different targets available in Facebook, but do not suggest that sharing information with them via Facebook will strengthen or weaken their relationship.

4.2.6.2. Feature Use. Objectives 1 and 2 are achieved in Study 1: (1) the most used features of Facebook are photographs followed by status updates and wall posting; (2) feature use differs across targets, with participants using wall posting slightly more

with friends and relatives than status updates, and using status updates slightly more with partners and colleagues. Overall, photographs are the most used feature regardless of target type. The acceptance of H2 supports previous research that identifies photographs as the most used feature of Facebook (e.g. Burke, et al., 2009; Joinson, 2008). The results of Study 1 and support from previous literature identify photograph sharing as the Facebook feature to investigate in studies 2 and 3.

4.2.6.3. Limitations & Improvements for Study 3. The degree to which H1 and H2 are accepted may be limited due to the sample population characteristics and the repeated design used. Gender effects were investigated within this preliminary study for differences in Facebook feature use, but gender was not entered into the regressions as a manipulation variable. There were no differences found for all but two of the Facebook features used, with males using fan pages more frequently and females using Facebook events more frequently across all targets. The bias towards female participants is likely to have occurred from the sampling locations - websites and discussion fora of psychology networks and for psychology experiments. For consideration, effects of disclosure for male and female subjects have generally been found to differ depending on the research methods and environments used, with a slight but non-significant trend towards females disclosing more overall (e.g. Brooks, 1974; Collins & Miller, 1994; Dindia & Allen, 1992). Therefore, in Study 3 gender of participant will be added as a control variable for the different relationship qualities investigated, and case weighting based on an expected gender balance of 50:50 will also be used (if the sample collected are not balanced) to ensure that any gender effects on relationship quality – not tested in Study 1 - are addressed, but no differences are expected in the use of photographs in Study 3 (see Design section of Study 3).

The age range of participants shows a strong peak in distribution for those aged 24.19±7.60 (mean±SD) years. The standard deviation suggests that most participants were around 24 years of age as more than 2 negative standard deviations would identify participants as 8.99 years old or less, and participants were not younger than 16 years.

Due to the repeated design of this survey and the necessary RGLM, contrasts for the interaction Target*Rqual could not be drawn for each level of interaction. Comparisons could be made only between sequential interaction variables. Therefore, Study 1 has demonstrated the need to use an independent design in Study 3 to allow comprehensive contrasts to be drawn. This requires four times as many participants, but each survey will be about 25% of the length used in Study 1. Substantially fewer questions asked of each participant will help restrict repetitive or fatigue answering throughout the survey. Direct feedback from participants and drop out rates for the latter questions indicated that the survey was overly time-consuming.

A further requirement of an independent design in assessing the use of a Facebook feature on the relationship quality of an individual target is that of a dummy variable to form the manipulation and perform inferential statistics. For example, frequency of a Facebook feature used with a particular target will need to be combined with the score of each relationship quality for each target. A control variable will be required to be used as a contrast for dummy variables. As neither of the current variables, relative, partner, friend or colleague would be a reasonable control in a Facebook environment, the condition of a general Facebook friend will be added allowing a contrast with a relative, partner, close friend, and a colleague to be coded. This addresses the ambiguity of the term 'friend', and the potential for it to be interpreted in Facebook to cover all types of network connection.

4.3. Study 2 – Photograph Types Shared on Facebook

4.3.1. Design

Study 2 identifies the different types of photograph that users of Facebook typically upload. The materials used are available in Appendix 3. First, a series of demographic questions asks participants for their age, gender, education level, nationality and occupation status. Using an independent groups design, participants are then asked to, “Think back to the last photo(s) you uploaded to Facebook. What and/or whom did it depict? If you are describing multiple photographs, please provide an explanation for each one individually.” The response field consists of a large text box allowing for an open response and to encourage free-flowing and unconstrained answers. The open responses are then analysed using content analysis to form categories of photograph type.

4.3.2. Participants

Participants were collected through an opportunity sample of Facebook users through Facebook, and the PsyPAG mailing list. After cleaning the data for incomplete responses the sample consisted of 34 participants (N=34), of which 25 were male (n=25), and 9 were female (n=9). The participants were between 20 and 58 years of age (range=38 years) with a mean of 30.79±9.35 (mean±S.D.) years. The education level of the sample were 1 achieving GCSE level (High School), 2 achieving A-Level, 7 Undergraduates, 12 Masters students, 10 PhD Students, and 2 ‘Other’ (e.g. postgraduate diploma). The occupations of the sample were 12 Full-time students, 1 Part-time student, 16 working full-time, 2 working part-time, 3 unemployed, and 1 ‘Other’ (N=35, participants could belong to more than 1 category).

4.3.3. Procedure

Participants were collected from an opportunity sample of Facebook users from Facebook and the PsyPAG mailing list, and were directed to a surveymonkey.com questionnaire. Participants completed the demographic questions first and then the open response question regarding their photograph uploads to Facebook. Data were then cleaned for incomplete responses and collated for content analysis to develop photograph categories.

4.3.4. Results

Content analysis conducted on the data found seven types of depiction in the photographs typically uploaded. Participants would often upload more than one type of photograph, resulting in 64 utterances used for categorisation. Categories with no more than one mention across all participants were excluded. Therefore 60 utterances produced seven categories of photograph content (type): *self, family, scene, friend, event, object, and animal* (Table 4.6; for raw data see Appendix 3).

Table 4.6: Photograph type by utterance frequency

Photograph Content (Type)	Utterances
Self	15
Friend	12
Event	12
Family	9
Scene	6
Object	4
Animal	2

It is established that there are a variety of photograph types uploaded and shared on Facebook. This allows the further granulation of information shared on Facebook via photographs. These feature classifications will be used in Study 3 to control for the type

of information shared. However, there exists potential overlap of photograph types. For example, a photograph of an event may depict the self, friends and family, depending on who was present at the event.

4.4. Study 3 – Effects of photograph sharing on different relationship types

This study aimed to investigate the effects of sharing in Facebook on relationship qualities with different targets. Therefore, suggestions are developed for research questions 1a, 1b, 1c and 3a, and hypotheses H3 and H4 are tested.

H3: There will be an association between the information shared (both type and frequency) and relationship quality.

H4: There will be an interaction between the relationship type, the type and frequency of information shared, and the relationship qualities held with that relationship type.

4.4.1. Design

Study 3 aims to identify the differences in Rquals according to an interaction between relationship type and photograph type with five targets. Based on the pairwise comparisons, contrasts, and general model and interactions in Study 1, the choice of targets and relationship qualities are adjusted for Study 3. For target, a control group is necessary for comparison of the four targets to a baseline. This is required by the nature of the manipulation planned to assess the association of the interaction term Target*RQ*PhotoType. The relationship type ‘General Facebook Friend’ is added. To avoid the use of repeated measures to make contrasts independent groups are used in

Study 3. This benefits participant recruitment as the survey is reduced by approximately 75% of its length per participant (for questionnaires see Appendix 4).

The NRI relationship qualities investigated in Study 3 are: Conflict, Support, Intimacy, Affection and Companionship. Figure 4.2 of Study 1 (section 4.2.4) suggests differences across the four relationship targets investigated for these qualities as well as antagonism. Furthermore it can be argued that each of the selected Rquals relate to properties of Liking. Antagonism is not selected due to its similarity with conflict, as represented by non-significant findings for contrasts of conflict and antagonism in Study 1 (Appendix 2). Conflict is chosen as it represents a potential negative attribute of a relationship, which is critical to measure to determine any effects of sharing on negative relational outcomes. Affection is chosen as it is an attribute of the components of loving and liking in Rubin's scales (Rubin, 1973). Intimacy was chosen due to its links with SET and interpersonal closeness. Specifically, intimacy is suggested to increase as a relationship develops and may be considered a component of success for relationship development, as it has been identified that over and under disclosing for a particular relationship stage may hinder relationship development (Altman & Taylor, 1973; Berger & Bradac, 1982; Derlega, et al., 1973). Links between intimacy and relationship development have been identified in the closeness of two individuals, suggesting that closer individuals develop intimacy more quickly (Altman & Taylor, 1973). Furthermore, many early studies compared disclosure with ratings of intimacy (e.g. Chelune, 1976b; Collins & Miller, 1994; Cozby, 1972; Dindia, et al., 1997; Jones & Archer, 1976; Worthy, et al., 1969). Support is included to provide a general measure of support between individuals based on their information sharing practices in Facebook. Companionship has direct links to the extent to which others like one another, suggesting the degree to which another person provides feelings of friendship

to participants. Support and companionship have also been included in definitions of friendship (e.g. Santrock, 1987 cited in Lee, Moore, Park, & Park, 2012) and companionship is used in a scale of motivations for friendship connection (Rempel, et al., 1985).

Individual properties of some of the Rquals are not within the confines of this research. These include Relative Power, as this research is not looking at the general relationship of power between individuals neither is the utility of interactants under investigation, thus Instrumental Aid was not included. Nurturance was not investigated, as this was considered relevant only to the original application of the NRI in the development of adolescents and children. Reliable Alliance was not different to either Affection or Admiration, and therefore reliable alliance and admiration are not included¹⁴. For NRI scale reliability for the selected relationship qualities see Table 4.7.

Table 4.7: Study 3, NRI scale reliability

Relationship Quality	Cronbach's α
Conflict	.894
Support	.911
Intimacy	.935
Affection	.937
Companionship	.874

The survey is an independent groups design with five conditions: *Relative*, *Partner*, *General Facebook Friend* (control condition), *Close Friend*, and *Colleague*. Participants are asked to answer the NRI questionnaire with regard to the condition to which they were randomly assigned. Beforehand, participants indicate how often this

¹⁴ Data are collected for all 11 Rquals of the NRI to allow exploration at some later stage should it be required.

target shares each of the seven categories of photograph type (*self, friend, event, family, scene, object* and *animals*) on Facebook.

4.4.2. Participants

Participants were recruited using opportunity and convenience sampling on Facebook, John Krantz's psychology experiment website¹⁵, and the PsyPAG mailing list. Criteria for participant selection required that they are both a Facebook user and have the target as a 'friend' (connection) on Facebook. Care was taken to ensure the same sampling locations and target sample as Study 1. The data were cleaned to remove incomplete responses and those with obvious patterns of response fatigue, such as continual selection of extreme answers on Likert scales. After data cleaning the sample consisted of 508 participants (N=508), of which 410 were female (n=410, 80.7%), and 98 were male (n=98, 19.3%). The sample age range was 46 years, ranging from 16 to 62 years, with a mean of 24.04±8.03 (mean±S.D.).

Due to the gender bias in this sample; cases were weighted based on an expected gender balance of 50:50 (see de Vaus, 2002, p. 85; Malhotra & Birks, 2007, pp. 488-489). Therefore, male cases were weighted at 2.59 and female cases at 0.62 resulting in 254 representative cases for male and female participants. Therefore, the values for the age variable were adjusted to 23.92±8.33 (mean±S.D.) years.

Participants had a range of education levels with 132 achieving up to GCSE (High School) level, 18 achieving up to A-Level standard, 251 Undergraduates, 45 Masters students, 32 Doctoral students, and 30 at 'Other' levels (e.g. diploma, and postgraduate diploma). The occupations of the sample were 288 (56.69%) full-time students, 22 (4.33%) part-time students, 27 (5.31%) working full-time only, 4 (0.79%)

¹⁵ <http://psych.hanover.edu/research/exponnet.html>

working part-time only, 33 (6.50%) in full-time employment and part-time education, 100 (19.69%) in full-time education and part-time employment, 18 (3.54%) in part-time education and part-time employment, 8 (1.57%) unemployed or not working, and 8 (1.57%) 'Other'.

4.4.3. Procedure

Participants were directed to a URL hosted on the university account of the researcher via email, Facebook message, or alternative website link. This URL redirected the participant randomly to one of five surveys respective of the five conditions. Each survey followed the same format, requiring participants to provide demographic information, asking the frequency of each photograph type that the target posted to Facebook, and requiring them to complete the NRI with respect to that target. Thus the data used in this study regarding photograph frequency was how often the participant considered the target to share photographs, i.e. the participant's reception frequency of photographs. Data were then cleaned and analysed using SPSS.

4.4.4. Analysis

Using the five relationship qualities (Conflict, Support, Intimacy, Affection, and Companionship), multiple linear regressions were performed for each with the RQual as the dependent variable (DV) and the interaction terms as IVs. The interaction terms were created by first generating dummy variables for Target, using General Facebook Friend as a control (i.e. all zeros), and computing new variables by multiplying these dummy variables with the (standardised) seven photograph types (answered as a 1 to 7 scale of frequency of posting by the target). This resulted in 28 interaction terms (IVs). Using General Facebook Friend as a control will determine differences between a

typical Facebook friend and a close friend, relative, partner, and colleague. Age and Gender were forced into the regressions at steps 1 and 2, respectively, photograph sharing frequency was entered at step 3, and the four Target variables were forced at step 4, controlling for their effects. The 28 interaction variables were then entered into step 5. Due to the nature of the dummy involved in the target variables and the interaction terms, all variables were entered in the regression using the ENTER command. For raw data and output files see Appendix 4.

4.4.5. Results

4.4.5.1. *Conflict.* For Conflict the model was significant at five steps ($F_{(41,466)}=2.457, p<.001$), and accounted for 10.5% of the variance observed (adjusted $R^2=.105$). Although the model is significant at step 5, it was not a significant step change (R square change was positive, .123 to .178, but not significant, $p=.313$). This suggests that the interaction term was not a significant improvement in the model compared to its component variables as predictors (Target and Photograph Types). However, the data are included for completeness as the model was significant.

The Durbin-Watson test could not be computed due to the case weighting used. Skewness calculations showed a positive skew for the DV ($z=10.04$), which is larger than the expected value of 3.29 (large sample). Kurtosis calculations showed a leptokurtic pattern ($z=1.78$), which is within the expected boundary of small sample sizes (1.96). However, with 508 participants this regression is assumed to contain a large sample (>200) and so no boundaries are enforced and normality is assumed (see Field, 2009).

The significant IVs in the equation at step 5 were (standardised coefficients): Age ($t=-2.615, B=-.120, p=.009$), Gender ($t=3.078, B=.145, p=.002$), Relative ($t=3.615,$

B=.257, $p<.001$), Partner ($t=4.525$, $B=.350$, $p<.001$), and Colleague*Photos of Objects approached significance ($t=-1.925$, $B=-.178$, $p=.055$). This suggests that older participants hold lower scores of conflict with others in general, and males have higher scores than females for conflict overall. Amongst relationship types, Relatives and Partners have increased scores of conflict in comparison to a general Facebook Friend. The non-significance of the F-change for the moderation term results in no significant predictors. However, increased sharing of photographs of objects by colleagues was related to reduced scores of Conflict at a confidence interval of 94.5%.

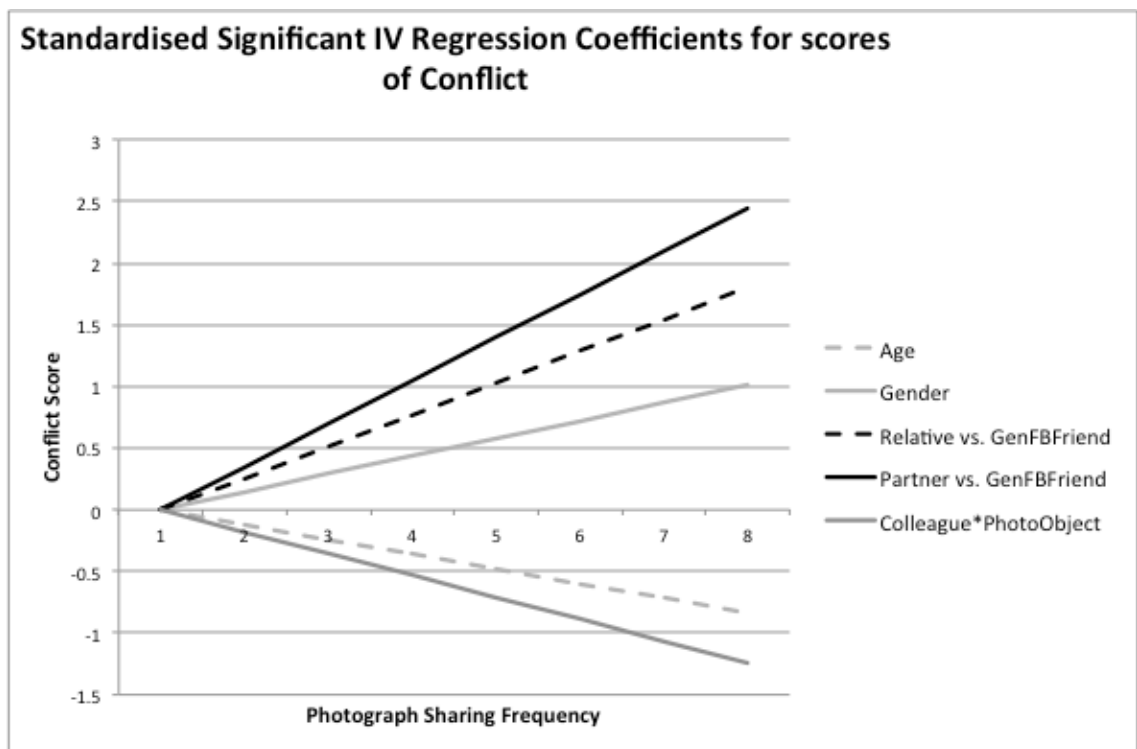


Figure 4.4: Coefficients of Conflict scores

4.4.5.2. *Support.* For the relationship quality of Support the model was significant at five steps ($F_{(41,466)}=4.427$, $p<.001$), and accounted for 21.7% of the variance observed (adjusted $R^2=.217$). The Durbin-Watson test could not be computed due to the case weighting used. Skewness calculations showed a slight positive skew for

the DV ($z=0.36$), which is smaller than the expected value of 1.96 for small samples. Kurtosis calculations showed a platykurtic pattern ($z=2.23$) which is above the expected value of small sample sizes (1.96) and smaller than the expected value for moderate samples (2.58). However, with 508 participants this regression is assumed to contain a large sample and so no boundaries are enforced and normality is assumed (see Field, 2009).

The significant IVs in the equation at step 5 were (standardised coefficients): Age ($t=-2.925$, $B=-0.126$, $p=.004$), Gender ($t=-3.542$, $B=-.156$, $p<.001$), Photos of Self ($t=-3.474$, $B=-.526$, $p=.001$), Photos of Friends ($t=2.101$, $B=.325$, $p=.036$), Colleague ($t=-5.002$, $B=-.333$, $p<.001$), Relative*Photos of Self ($t=2.123$, $B=.184$, $p=.034$), Relative*Photos of Family ($t=2.736$, $B=.196$, $p=.006$), Partner*Photos of Family ($t=3.113$, $B=.239$, $p=.002$), Partner*Photos of Friends ($t=-4.696$, $B=-.493$, $p<.001$), Partner*Photos of Events ($t=2.305$, $B=.225$, $p=.022$), Close Friend*Photos of Self ($t=2.582$, $B=.219$, $p=.010$), and Close Friend*Photos of Friends ($t=-2.220$, $B=-.224$, $p=.027$).

This suggests that older participants have lower scores for support than younger participants across all target types. Males have lower scores of support than females overall. Colleagues have significantly lower scores of support than a General Facebook Friend. Furthermore, significant predictor variables suggest that increased sharing of photos of the self is related to decreased scores of support, whereas more frequent sharing of photos of friends is related to increased scores of support, regardless of the type of target sharing the photograph. Increased frequency of sharing photographs of the self and of family by a relative was related to an increase in support. A partner sharing more photographs depicting family or events was related to increased scores of support, whereas a partner sharing more photographs of friends was related to a decreased score

of support. Close friends sharing more photographs of the self was related to increased scores of support whilst close friends sharing more photos of friends was related to decreased scores of support.

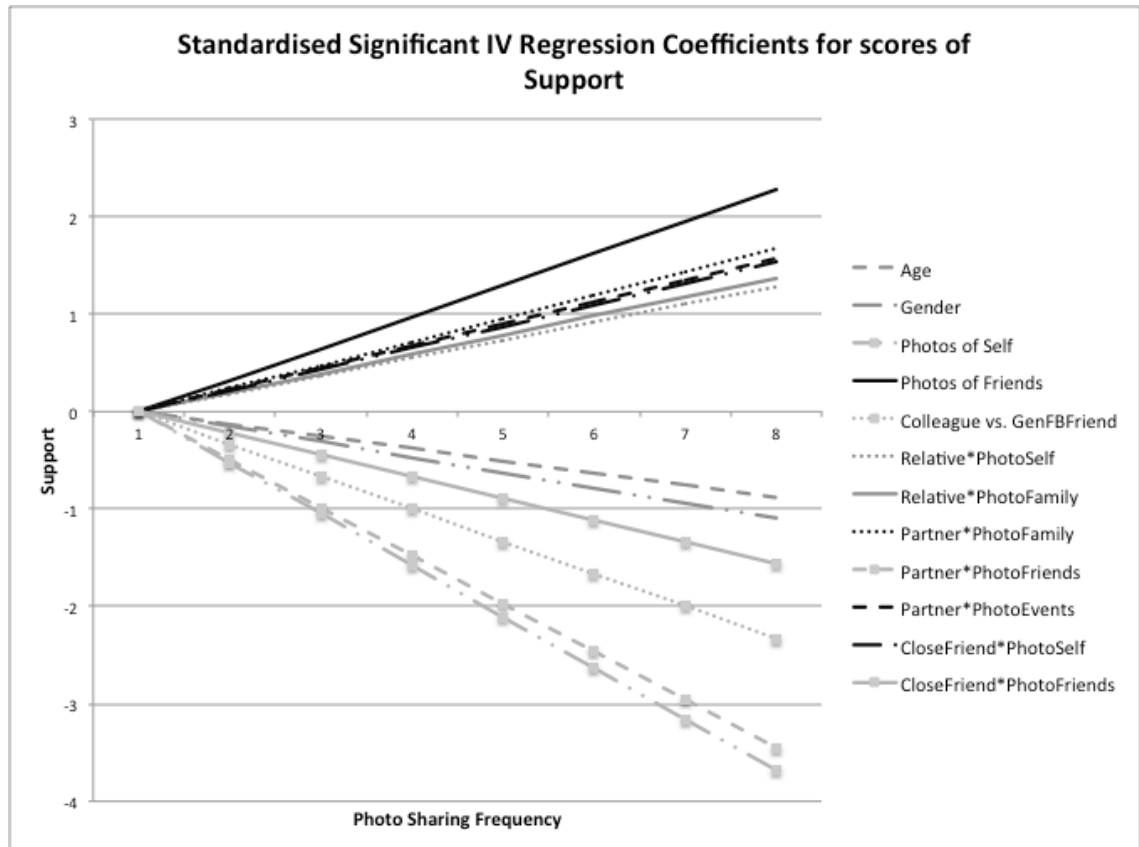


Figure 4.5: Coefficients of Support scores

4.4.5.3. *Intimacy*. The model for the relationship quality Intimacy was significant at five steps ($F_{(41,466)}=3.855, p<.001$), and accounted for 18.8% of the variance observed (adjusted $R^2 = .188$). The Durbin-Watson test could not be computed due to the case weighting used. Skewness calculations showed a negative skew for the DV ($z=-1.50$), which is smaller than the expected value of 1.96. Kurtosis calculations showed a platykurtic pattern ($z=2.34$), which is above the expected value of small sample sizes (1.96) and below the expected value for moderate samples (2.58).

However, with 508 participants this regression is assumed to contain a large sample and so no boundaries are enforced and normality is assumed (see Field, 2009).

The significant IVs in the equation at step 5 were (standardised coefficients): Age ($t=-2.483$, $B=-.109$, $p=.013$), Photographs of Self ($t=-2.603$, $B=-.402$, $p=.010$), Colleague ($t=-4.521$, $B=-.307$, $p<.001$), Partner*Photos of Friends ($t=-3.295$, $B=-.352$, $p=.001$), Partner*Photos of Events ($t=2.204$, $B=.219$, $p=.028$), Close Friend*Photos of Self ($t=2.545$, $B=.220$, $p=.011$), and Close Friend*Photos of Friends ($t=-2.330$, $B=-.240$, $p=.020$). There were no significant effects of gender.

These findings suggest that older participants have lower scores of intimacy with a target regardless of target type or frequency of sharing photographs on Facebook. Colleagues are scored significantly lower for intimacy than a General Facebook Friend. Increased frequency of sharing photographs of the self, regardless of the type of target sharing the photographs, is related to a decrease in intimacy. Increased frequency of sharing by a partner of photographs of friends is related to a decrease in scores of intimacy, whereas an increased sharing of photographs of events by a partner is related to an increase in intimacy. Close friends sharing an increasing number of photographs of the self is related to increased scores of intimacy, whereas Close Friends sharing photographs of friends is related to decreased scores in intimacy. The finding of Close Friends sharing photos of the self relating to increased intimacy scores shows the impact of the moderation term, as sharing photographs of the self across relationship targets is negatively related to intimacy.

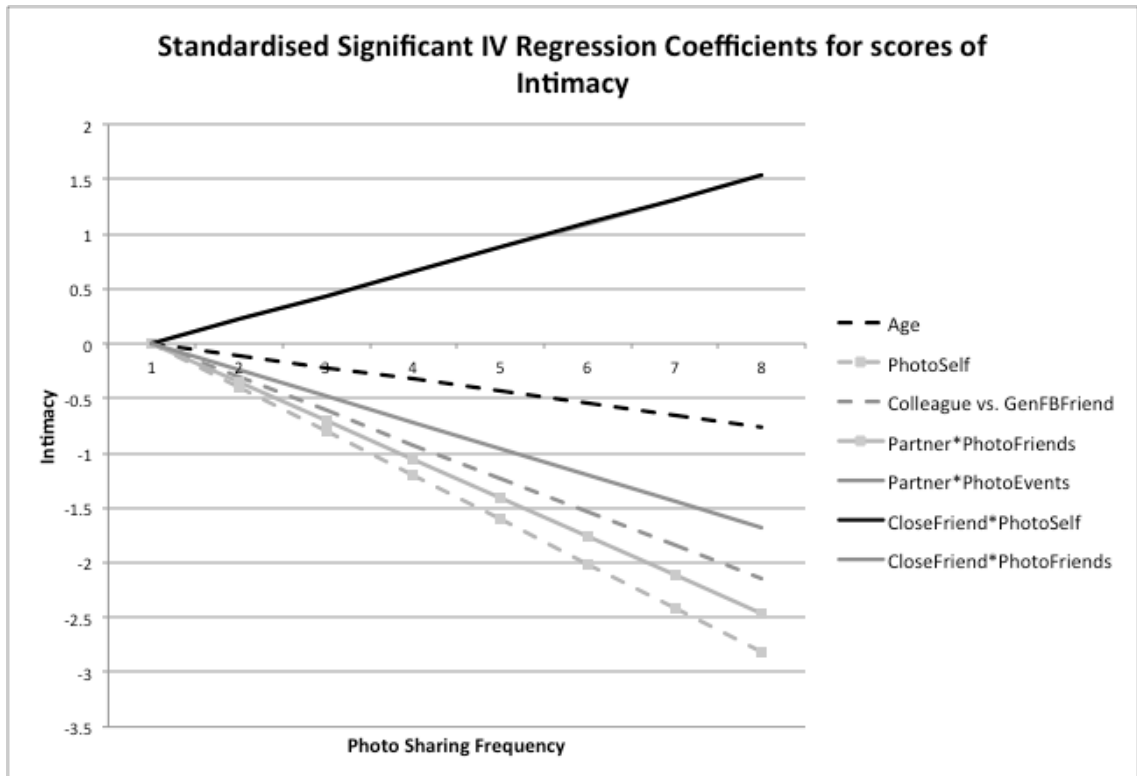


Figure 4.6: Coefficients of Intimacy scores

4.4.5.4. *Affection*. For the relationship quality of Affection the model was significant at five steps ($F_{(41,466)}=6.915, p<.001$), and accounts for 32.4% of the variance observed (adjusted $R^2=.324$). The Durbin-Watson test could not be calculated due to the case weighting used. Skewness calculations showed a negative skew for the DV ($z=-3.75$), which is just greater than the expected value for larger samples of 3.29. Kurtosis calculations showed a platykurtic pattern ($z=2.12$), which is smaller than the expected value for moderate samples (2.58). However, with 508 participants this regression is assumed to contain a large sample and so no boundaries are enforced and normality is assumed (see Field, 2009).

The significant IVs in the equation at step 5 were (standardised coefficients): Age ($t=-3.168, B=-.127, p=.002$), Photos of Self ($t=-2.058, B=-.290, p=.040$), Relative ($t=4.046, B=.250, p<.001$), Partner ($t=2.554, B=.172, p=.011$), Colleague ($t=-5.598, B=-.346, p<.001$), Relative*Photos of Self ($t=2.580, B=.208, p=.010$), Relative*Photos of

Family ($t=2.680$, $B=.178$, $p=.008$), Partner*Photos of Family ($t=2.534$, $B=.181$, $p=.012$), and Partner*Photos of Objects ($t=-2.656$, $B=-.185$, $p=.008$). There were no significant effects of Gender.

These results suggest that older participants had lower scores of affection than younger participants across all targets. Gender had no affect on scores of affection. The more frequently other users of Facebook share photographs of himself or herself was related to decreased scores of affection. The overall scores of affection were significantly higher for relatives and partners, and lower for colleagues, than the control group, General Facebook Friend. An increase in sharing of photographs of the self and family by a relative was related to increased scores of affection. Increased sharing of photographs of family by partners was related to increased scores of affection, whereas more frequent sharing of photos depicting objects by partners was related to a decreased score of affection.

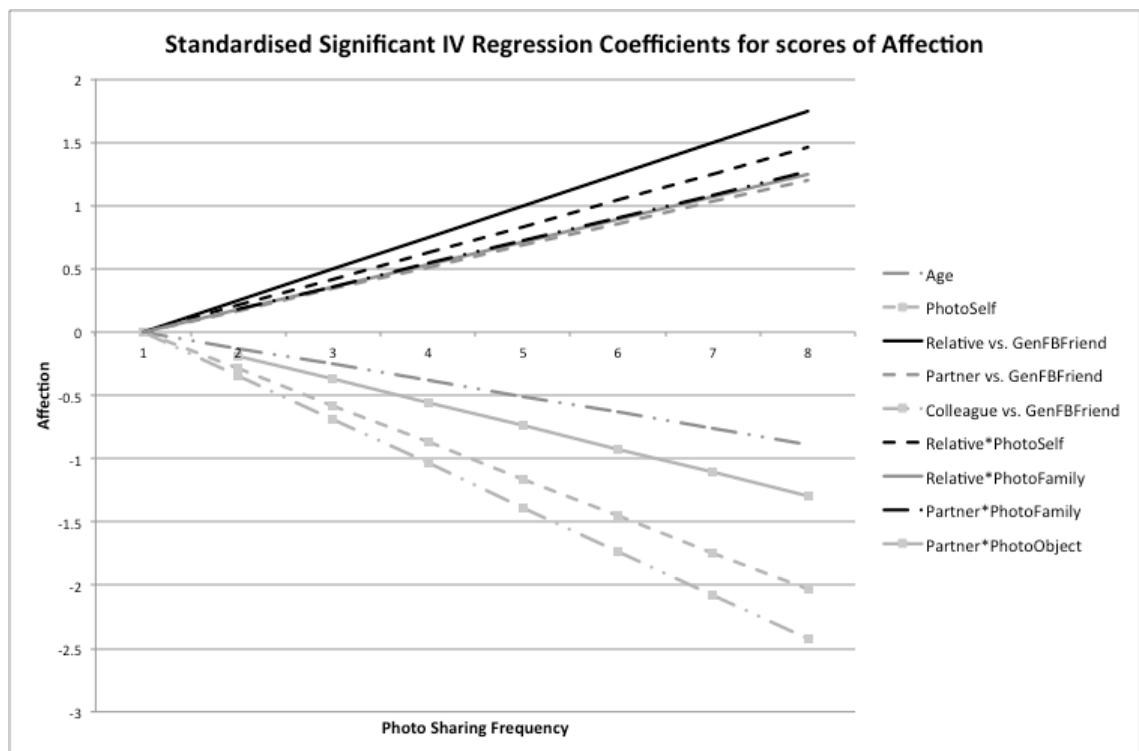


Figure 4.7: Coefficients of Affection scores

4.4.5.5. *Companionship*. The model for the DV Companionship was significant at five steps ($F_{(41,466)}=5.666, p<.001$), and accounted for 27.4% of the variance observed (adjusted $R^2=.247$). The Durbin-Watson test could not be calculated due to the case weighting used. Skewness calculations showed a slight negative skew for the DV ($z=-0.98$), which is smaller than the expected value of 1.96. Kurtosis calculations showed a platykurtic pattern ($z=2.10$), which is below the expected value of moderate sample sizes (2.58). However, with 508 participants this regression is assumed to contain a large sample and so no boundaries are enforced and normality is assumed (see Field, 2009).

The significant IVs in the equation at step 5 were (standardised coefficients): Age ($t=-3.155, B=-.131, p=.002$), Photographs of Family ($t=-3.615, B=-.390, p<.001$), Photographs of Friends ($t=2.560, B=.381, p=.011$), Colleague ($t=-5.518, B=-.354, p<.001$), Relative*Photos of Family ($t=4.288, B=.295, p<.001$), Partner*Photos of Family ($t=2.779, B=.206, p=.006$), Partner*Photos of Friends ($t=-3.355, B=-.339, p=.001$), Partner*Photos of Objects ($t=-2.387, B=-.173, p=.017$), Close Friend*Photos of Self ($t=2.239, B=.183, p=.026$), Close Friend*Photos of Friends ($t=-2.660, B=-.259, p=.008$), and Colleague*Photos of Family ($t=2.314, B=.163, p=.021$). There were no significant effects of gender.

These results suggest that older participants had lower scores of companionship than younger participants with the four relationship targets, whereas gender had no effects. Sharing more photographs of family members, regardless of target, was related to decreased scores of companionship, and sharing photographs of friends more frequently was related to higher scores of companionship. Colleagues were scored lower than a General Facebook Friend for companionship. Relatives, partners and

colleagues sharing photographs of family more frequently were related to an increase in companionship scores. Sharing photographs of friends by partners and close friends was related to decreased scores in companionship. Partners sharing photographs of objects more frequently was related to decreased companionship scores, suggesting this moderation to be detrimental to interpersonal relationships. Close friends sharing more photographs of himself or herself was related to increased scores of companionship. Therefore, while photographs of friends when shared by friends results in negative scores of companionship, when the photo contains an image of the close friend themselves, it is related to increased scores of companionship.

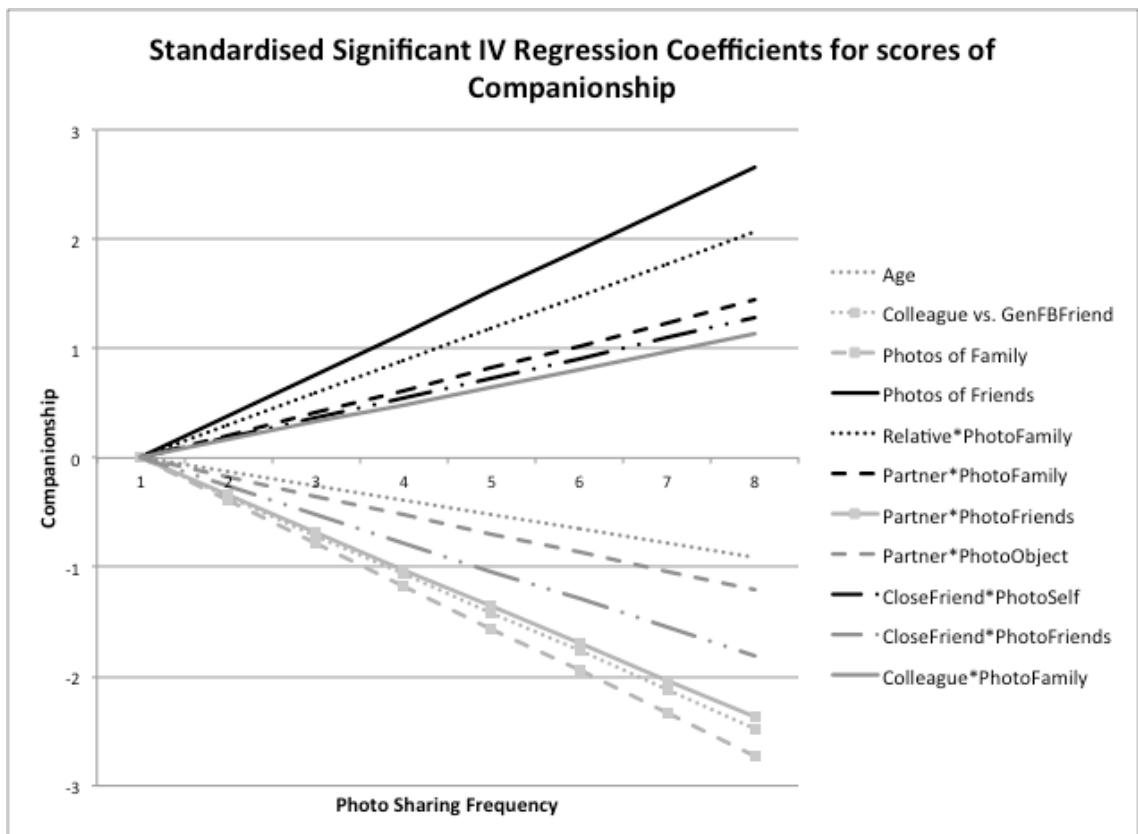


Figure 4.8: Coefficients of Companionship scores

4.4.5.6. *Comparison across all Relationship Qualities.* It should be observed that for each of the above regressions, the strength of the coefficients for the interaction

terms (i.e. Target*PhotoTypeFrequency) are in comparison to the control group 'general Facebook friend' with the relevant Photograph Type. Each of the Targets entered as IVs are in contrast to the control group, General Facebook Friend, due to the dummy variable used. The variables Age, Gender and the seven Photograph Types (without interaction applied) are not in comparison to a control group but compared across all Target types. The regression coefficients for the significant predictor variables of all five regressions are summarised in Table 4.8.

Table 4.8: Regressions results for all IVs on Relationship Qualities

Relationship Quality (DV)	Independent Variable	t-value	Standardised Beta (β)	Sig. (p-value)
Conflict\pm	Age	-2.615	-.120	=.009
	Gender	3.078	.145	=.002
	Relative vs. GenFBFriend	3.615	.257	<.001
	Partner vs. GenFBFriend	4.525	.350	<.001
	Colleague*PhotoObjects	-1.925	-.178	=.055 \pm
Support	Age	-2.925	-.126	=.004
	Gender	-3.542	-.156	<.001
	PhotoSelf	-3.474	-.526	=.001
	PhotoFriends	2.101	.325	=.036
	Colleague vs. GenFBFriend	-5.002	-.333	<.001
	Relative*PhotoSelf	2.123	.184	=.034
	Relative*PhotoFamily	2.736	.196	=.006
	Partner*PhotoFamily	3.113	.239	=.002
	Partner*PhotoFriends	-4.696	-.493	<.001
	Partner*PhotoEvents	2.305	.225	=.022
	Close Friend*PhotoSelf	2.582	.219	=.010
	Close Friend*PhotoFriends	-2.220	-.224	=.027
	Intimacy	Age	-2.483	-.109
PhotoSelf		-2.603	-.402	=.010
Colleague vs. GenFBFriend		-4.521	-.307	<.001
Partner*PhotoFriends		-3.295	-.352	=.001
Partner*PhotoEvents		2.204	.219	=.028
Close Friend*PhotoSelf		2.545	.220	=.011
Close Friend*PhotoFriends		-2.330	-.240	=.020
Affection	Age	-3.168	-.127	=.002
	PhotoSelf	-2.058	-.290	=.040
	Relative vs. GenFBFriend	4.046	.250	<.001
	Partner vs. GenFBFriend	2.554	.172	=.011
	Colleague vs. GenFBFriend	-5.598	-.346	<.001
	Relative*PhotoSelf	2.580	.208	=.010
	Relative*PhotoFamily	2.680	.178	=.008
	Partner*PhotoFamily	2.534	.181	=.012
	Partner*PhotoObject	-2.656	-.185	=.008
Companionship	Age	-3.155	-.131	=.002
	PhotoFamily	-3.615	-.390	<.001
	PhotoFriends	2.560	.381	=.011
	Colleague vs. GenFBFriend	-5.518	-.354	<.001
	Relative*PhotoFamily	4.288	.295	<.001
	Partner*PhotoFamily	2.779	.206	=.006
	Partner*PhotoFriends	-3.355	-.339	=.001
	Partner*PhotoObject	-2.387	-.173	=.017
	Friend*PhotoSelf	2.239	.183	=.026
	Friend*PhotoFriends	-2.660	-.259	=.008
	Colleague*PhotoFamily	2.314	.163	=.021

\pm Caution taken in interpretation, due to n.s. R-square change in affection model

4.5. Discussion

Study 3 was designed to test H3 and H4. The results from Study 3 support both these hypotheses. H3 states there is an association between photograph sharing (frequency and type) and relationship quality. The significant main effect of photographs in the linear regressions suggests the frequency of sharing each significant photograph type relates to changes in scores for Support, Intimacy, Affection and Companionship. Photos of Family were related to decreased scores in Companionship, Photos of Friends positively related to Support and Companionship scores, and Photos of Self related to decreased scores of Support, Affection and Companionship. However, not all relationship qualities are affected, and not all types of photographs relate to significantly different scores in relationship qualities.

H4 states that there will be an interaction between target, type and frequency of information sharing by that target and the relationship qualities that participants hold with them. Each of the four target conditions, when multiplied by at least one photograph type, had a significant relationship with at least one of the five relationship qualities studied. That is, the main effect of the interaction term, Target*PhotoType, is significant at least once for each target condition across all five RQuals (see Table 4.8). For example, Relative*Photos of Self has a significant positive relationship with Affection and Support. Partner*Photos of Objects has a negative relationship with both Affection and Companionship, thus is associated with reduced liking. Whereas Colleagues sharing more photos of Objects has a negative relationship with Conflict, thus evident of a positive relationship with liking. Partner*Photos of Family has a significant positive relationship with Support, Affection and Companionship suggesting that partners sharing increased amounts of photographs depicting family is a generally positive attribute in a relationship. Close Friend*Photos of Self has a positive

relationship with Support, Intimacy and Companionship, suggesting that sharing one's own image is received particularly well with close friends (and relatives), but has no correlation with relationships with partners or colleagues (compared to a general Facebook friend). Colleague*Photos of Family has a positive relationship with Companionship, suggesting that in comparison with a general Facebook friend, photos of family are useful to enhance relationships with colleagues, as well as relatives and partners. Overall, H4 is accepted and the null hypothesis rejected.

Study 3 adds support to H1. Colleague vs. General FB Friend has a significant negative relationship with Support, Intimacy, Affection and Companionship. The nature of the coding for the dummy variable suggests that regardless of photograph sharing participants hold stronger feelings of support, intimacy, affection and companionship with General FB Friends than with Colleagues. Participants also scored Partners with higher scores of Affection and Conflict than General Facebook Friends. This finding suggests that participants are more familiar with partners than general Facebook friends, but also have areas of tension with partners as shown by increased scores of conflict. Similar scores were expected with a Relative given the similar nature of the relationships between a Partner and a Relative. Relatives were also scored higher for Conflict and Affection than with general Facebook friends. This suggests that in comparison to all other relationship types, Relatives and Partners are more likely to be associated with conflict behaviour, while simultaneously maintaining affection for one another. Interestingly, close friends did not differ significantly for any of the five tested relationship qualities to a general Facebook friend, suggesting that friends overall have similar levels of each relationship quality. However, when in combination with information posting (i.e. Target*PhotoType), close friends are significantly positively and negatively related to relationship quality compared to general Facebook friends (see

Table 4.8). Thus, the data suggest that in comparison to general FB friends, particular outcomes may arise based on information posting, suggesting different expectations when compared with general friends.

4.5.1. Gender

Previous research suggests varying effects of gender for self-disclosure. Females have been suggested to disclose more to males, and males disclose more to females (Brooks, 1974). In a review of self-disclosure literature it has also been suggested that females disclose more to females and disclose more generally (Collins & Miller, 1994). Kleinke's (1979) review suggests that there are no gender effects of the recipient of a disclosure, and Dindia and Allen (1992) argue there are too many inconsistencies in the effects of gender on self-disclosure, but these may be explained by additional variables. In more technological based studies of disclosure, Boneva et al. (2001) found that women spent more time online communicating with friends and family, which would suit SNS platforms, but found no gender effect for general browsing behaviour. Rubin (1973) suggests differences in gender may be evident in scores of Liking and Loving. The results of phase 1 suggest differences in gender for scores of support and conflict, therefore suggesting that the outcome of gender on liking differs, but conclusions regarding disclosure cannot be drawn. However, the current research does not identify any significant gender differences for scores of affection, companionship and intimacy.

As there are many inconsistent findings for gender and self-disclosure in previous literature, there were no predictions made on the effects of gender on self-disclosure within this study set. Study 1 demonstrated that the majority of Facebook features were not used significantly different depending on gender, and the use of photographs (later used in Study 3) was not subject to gender differences. While gender

of the participant was controlled for in the linear regressions of Study 3, it was not included in the interaction term with information sharing. To determine the effects of gender in full it would have been necessary to gather information on the target's gender as well as the participant's (disclosure recipient's) gender and combine this with information sharing. However, since only the participant's gender was collected, it was entered as a control variable in the model. Thus, gender effects were not identified in the manipulations. Therefore, it is possible to conclude only that gender does not affect all of the relationship qualities participants hold with all types of target.

4.5.2. *Age*

Further support for H1 is found in Study 3 with the significance of a negative relationship between Age and all relationship qualities investigated. This suggests that at different ages participants' relationships have different scores of relationship qualities. The addition to H1 is that age as well as relationship type is a contributing factor to changes in relationship qualities.

Previous literature on self-disclosure and liking offers little on the effects of age on perceived liking or being liked. More often referred to is the stage of the relationship or similarity in age between interaction partners (e.g. Altman & Taylor, 1973; Kandel, 1978). Kandel's (1978) study found high similarity in age between naturally occurring adolescent friendship pairs, however, this is to be expected as most adolescents are at school where the majority of friendships will be age matched.

Conflict, Support, Intimacy, Affection and Companionship scores have a negative relationship with age. However, because Conflict is argued to be a "negative" relationship quality, whereas Support, Intimacy, Affection and Companionship are "positive" relationship qualities, it is not a simple situation whereby age makes a more

positive or negative impact on relationships. It could be argued that older participants generally have less agitated relationships with targets (i.e. use less extreme responding, are mellower in their approach to liking with others), therefore they are neither more positive or more negative in their relationship qualities, unlike younger participants.

Age was not tested in the manipulation of Study 3 as the number of variables would become too many, but was controlled for at step 1 of the regressions. Currently 41 variables were entered at step 5 of the regressions. To add age would require multiplying each interaction term by age, creating 69 variables overall. Alternatively, ANOVAs would need to be conducted using age as a covariate, but this would require a categorical DV whereas the DVs in Study 3 are Interval scales. Due to little direct research previously on the effects of age and information sharing on liking it is not considered a core part of this research. Additionally, the mean and standard deviation of Age in studies 1 and 2 suggests a young sample generally, with large standard deviations, restricting the validity of any measure of age.

Participants throughout this thesis work are collected using convenience and opportunity sampling of university students and therefore any investigation of age would be limited as participants would be generally of the same age. However, it can be concluded that age does affect liking overall in relationships as the relationship is uni-dimensional, i.e. a participant's age can affect their relationship qualities or perception of others, but the reverse is not true. Therefore, a causal relationship can be implied. An increase in age causes decreases in Conflict, Support, Intimacy, Affection and Companionship with others.

4.5.3. *Target*

The direct relationship between target type and the different relationship qualities in this work suggests that relatives, partners and colleagues are each scored significantly different to a general Facebook friend for particular relationship qualities. These relationships are independent of information sharing frequency, i.e. the relationship is not due to information sharing and is considered to exist at this level compared to a general Facebook friend on and off of Facebook. Study 1 supports this finding by demonstrating that targets are scored differently overall in the full NRI (11 relationship qualities). In Study 1, the main effect of target across all relationship qualities suggested that a relative, partner and friend were scored significantly higher than a colleague. Partners were scored significantly higher than Friends. However, no control group was used in Study 1. Study 3 shows the differences in the relationships and generally identifies relatives and partners as being scored more positively than general Facebook friends, and colleagues being scored less positively than general Facebook friends.

When target was combined with photograph posting frequency in Facebook, there were effects on perceived liking, or relationships (see Figures 4.4-4.8 above for specific directions). It is concluded that a relationship with a target that is at a certain level generally (offline and online – as shown by the main effect of Target in studies 1 and 3), can be affected by information sharing (main effect of Photograph types) in Facebook to improve or degrade the relationship. That is, sharing in Facebook may result in an alteration of general (offline) relationships. It can be considered that relationships in Facebook may exist as extensions of known offline relationships. Furthermore, when photograph sharing was moderated (interaction effect) by target type

results were also significant, showing that general relationship level, when interacting via Facebook, can be altered by information sharing.

These findings support previous literature that suggest users of Facebook look to connect with people they already know offline and use it to continue relationship development or general communication online (e.g. Ellison, et al., 2007; Joinson, 2008; Marwick & Boyd, 2011). The results also have implications for the understanding of tension in Facebook interaction. Previous work has suggested that having different types of relationship connections within the 'share to all' platform of SNS may cause tension based on some of the potential consequences of sharing information that may shock or offend one group of people but be considered appropriate with others (Binder, et al., 2009; Jones & O'Neill, 2011; Marwick & Boyd, 2011; Skeels & Grudin, 2009). The results of these three studies suggest that there is further reason to maintain different sharing practices with different people, or to flatten communication to an appropriate level for all participants. Information that is not deliberately extreme or offensive, i.e. day-to-day sharing of photographs, may have negative effects on the relationship, and it is not as simple as restricting access to photographs, but different types of photographs depending on the relationship. This may be difficult in practice as typical site settings at the finest granularity only restrict access to certain photo albums, whereas it may be necessary to have access control over individual photographs based on content. For sites that may offer individual photo access, this can be a tedious application, making it a less used option. Regardless of SNS settings, it is important to understand that sharing similar information may alter relationships based on the type of relationship held with recipients.

Previous research on the effects of discloser or recipient target type and self-disclosure are confounded. Research has either identified the target according to

relationship type, as with this research, attraction to target, intimacy with or how valued the target may be to recipients or disclosers, or the situation the discloser and target find themselves in (Collins & Miller, 1994; Jourard, 1959; Jourard & Lasakow, 1958; Rosenfeld, et al., 1979). Rosenfeld et al. (1979) suggests that if the target is a stranger, then the topic and situation of a disclosure are irrelevant. In the current study, the targets were all known to the participant and were connected via Facebook. As the disclosures occur in Facebook and it is considered normal for this to happen, the situation is constant. Therefore, the topic may be of importance to the interaction between sharing and the recipient's perception of the discloser. In Study 3 topic is altered by photograph content and different impacts are observed depending on the target type.

Other research on the effect of Target on disclosure has identified significant individuals to whom more sensitive information is disclosed. Jourard and Lasakow (1958) found that mothers were the recipients of more sensitive information compared to fathers, same sex friend and opposite sex friend. Although the results of studies 1 and 3 do not identify the sensitivity of different photograph types, an effect of Target is apparent for each of the relationship qualities when combined with the effects of photograph content and sharing frequency. The collapse of mother and father targets into the broad category of 'relative' and the collapse of same-sex and opposite-sex friend into the broader categories of close friend or general Facebook friend make it difficult to draw direct comparisons from Jourard's (1959) and Jourard & Lasakow's (1958) work. Furthermore, this work identifies disclosure *by* the target and not the participant's choice to disclose *to* the target. However, it is concluded here that the target type forms a significant part of an interaction with the information disclosed, which then affects a relationship.

4.5.4. Information Type

The broad category of information sharing in Study 3 was content of photographs. The results demonstrate that photograph sharing can alter the different relationships held in Facebook depending on the specific content of the photographs and how frequently the photographs are shared. Without the combined effect of Target, there were six instances of photograph type significantly related to relationship qualities. Photographs of self were negatively related to intimacy, affection and support, photographs of friends were positively related to support and companionship, and photographs of family were negatively related to companionship. These results support the general aim of this research, to identify the sharing to liking relationship in Facebook, but to identify any significance in the sharing of information in day-to-day interactions on the perceived liking of the discloser.

When identifying the multicollinearity values of significant predictor variables the results for the Intimacy model, for example, suggested some multicollinearity of photograph types. Photos of Self and Photos of Events correlated strongly ($r^2=.647$). However, Photos of Objects and Photos of Family correlated with $r^2=.315$. The difference may be that photographs of events may contain images of one self and so correlate strongly with photos of oneself. However, photographs of objects are substantially different to photographs of family. The moderate correlation observed for the latter pair ($r^2=.315$) is likely to arise from photograph content on Facebook being broadly similar, but the categories represent small deviations in content, i.e. a received photograph is influential *similarly* to another received photograph (cf. seeing a status update), but have different effects due to the variations in content. Photograph sharing was measured in frequency. Some photograph types may be shared at similar rates

resulting in an expected degree of correlation. It is when photograph sharing is combined with target effects that greater differences are found in relationship qualities.

Both target and photograph variables impact relationships individually. When in combination (interaction term) the effect on relationship qualities is considered to be *part* of the overall relationship (i.e. target represents a specific person online *and* offline) through interaction on Facebook. That is, relationships offline and online are affected by online interaction, which consists of a combined effect of target and photograph content. Offline interaction is also expected to have an influence on the relationship but such variables were outside of the scope of this study set.

4.5.5. Model Strength

The variance accounted for across the 5 linear regressions varies (Table 4.9). Although some of the models may be considered weak, it is expected that there are many other variables that could not be controlled for practically.

Table 4.9: Variance Accounted for by Regression Models (Percentage = *Adjusted R*² * 100)

Regression Model (by DV)	Variance Observed
Conflict	10.5%
Support	21.7%
Intimacy	18.8%
Affection	32.4%
Companionship	27.4%

As each of the models only included age, gender, photograph sharing frequency for seven photograph categories, four dummy variables for target type and the 28 combined interaction terms, it is expected that other variables will have an impact on the relationship qualities. For example, only 10.5% of the variance observed was accounted for by the model for conflict, however many variables (both offline and in the Facebook environment) may influence conflict scores. These may include offline

information sharing, a prior argument, stage of the relationship, or sharing of direct messages in Facebook. Therefore, although each of the adjusted R^2 values above are normally considered weak, for the limited number of variables investigated compared to the number of potential variables that could not be controlled for reasonably, the models are argued to be relatively strong.

Of the above regressions, Affection displayed the best fit to the real world with 32.4% of the variance observed being due to the model. This suggests that for affection there are fewer confounding variables. Such a strong model may be due to affection being an experience influenced by observation and the weaker models, such as conflict and intimacy, involve experience or interaction. Affection may be increased due to observing the way that a target interacts in general, or the photos that the target shares. Alternatively, the act of sharing and disclosure could be indicative of affection. Whereas conflict, for example, may require more experience of the other person, e.g. an argument or constant physical engagement, and so be less effected by sharing photographs on Facebook. One reason for this could be that it is easy to ignore those that may cause conflict by ignoring the photos and not paying much attention to them, whereas in person they may not be so easily ignored. Here it is shown that although negative effects may occur, such as decreased intimacy with a partner when they share more photos of friends, more variables that were not accounted for can influence intimacy than just increased sharing of photographs in Facebook. However, within the strong models, such as affection, it is possible to decrease the quality of the relationship by sharing photos of the self more frequently, for example. In this instance, a more 'passive' interaction may have a stronger impact due to the lesser need of interaction to alter affection scores.

While sharing is necessary in SNS to communicate and make use of the service (e.g. Burke, et al., 2009), the overall conclusion of studies 1-3 suggests that sharing (at least for photographs) may be beneficial to relationships, but simultaneously the same information is related to lower relationship quality. Studies 1-3 do not offer predictions as to *why* certain photograph types may relate to different relationship qualities. It could be that partners have had more discussions or interaction regarding a particular event, and so photographs depicting it help strengthen their bond. Relatives may be expected to share more interesting photographs of family members. However, these positions are mere speculation. To understand why certain information may be positive in some relationships deeper probing of meaning may be required in interviews. Some of the significant variables make sense without further probing of meaning, for example increased scores of intimacy are observed when close friends share photos of their self more frequently. Overall, it is concluded that recipients of information have different expectations of the information shared by different people in their lives.

4.5.6. Implications

Privacy theory suggests that individuals may conceal information to avoid negative consequences or to ensure not to violate social norms (e.g. Altman, 1975; Nov & Wattal, 2009; Petronio, 2002; Westin, 1967). Although sharing photographs in SNS is considered normal behaviour and photograph sharing is the most popular feature, it is not the norm to violate the personal boundaries of others such that a detriment to relationships may be caused. Sharing information is potentially turbulent to the personal boundaries of a relationship pair and as such may be considered a violation of privacy. For example, if it is known that a partner sharing photographs of friends may decrease

intimacy, then to share such photographs would break the expected boundaries of personal information exchange.

Study 3 is based on the assumption that sharing photographs is deliberate. However, the effects are not currently considered ‘norms’. Therefore exchanges that are damaging may occur knowingly but without the discloser being aware of the consequences of their behaviour. Thus, for privacy theory these data suggest that not being fully aware of the consequences of day-to-day information sharing can be detrimental to relationships more generally. The results also suggest that good personal information boundary management will help reduce the negative consequences of sharing information that could normally be considered benign.

For SET these results are partially supportive but demonstrate potential issues. In brief, SET and SPT suggest information is exchanged between individuals to develop a relationship from unknown strangers to more intimate stages of acquaintanceship and friendship (Altman & Taylor, 1973). The relationship expected is that more information is shared generally as the relationship progresses, and information becomes more intimate, and about deeper aspects of the self (Altman & Taylor, 1973). The results of Study 3 find that for some relationship qualities, increased sharing does relate to greater levels of liking, e.g. colleagues sharing photos of objects is related to decreased conflict (an overall positive outcome). Similar frequencies of sharing the same photograph type (photos of objects) can simultaneously relate to poorer relationships, e.g. similar sharing frequencies of photos of objects by a partner is related to decreased affection and companionship (an overall negative outcome). Alternatively, sharing more photographs of family overall is related to decreased companionship, yet when a partner shares more family photographs there is an increase in support, for example. Therefore, as theorised in the literature review it is possible to receive more information about an individual to

support a *disliking* for somebody. Thus relationship development may require additional variables (such as common interests, prior knowledge of the person and previous behaviour) as suggested by URT. It should also be noted that the increased sharing of information in SPT relates to both depth and breadth of disclosure, whereas the comparisons made in this study set are based on breadth.

Collins & Miller's (1994) meta-review of self-disclosure literature suggests there are three pathways to the disclosure-liking relationship: (1) Person A is liked by Person B because Person A has disclosed information to them, (2) Person A likes Person B initially so discloses to them, or (3) Person A likes Person B *because* Person A has disclosed to Person B. These studies support statement (1) as information disclosed has been demonstrated to increase liking. However, a decrease in liking has also been observed. Statement (2) is not tested but can be confirmed by the nature of the connections in Facebook, i.e. the interactants are 'Facebook friends' and so information disclosed by Person A goes to Person B. However, as aimed by these studies, it can also be shown that for statement (1), that Person A is liked by Person B because *Person A has disclosed a particular type of information more frequently*, or is disliked by Person B because *Person A has disclosed another type of information more frequently*.

4.6. Conclusion

This set of studies was designed to investigate research questions 1a, 1b, 1c and 3a. In investigating these questions some details and variables require subsequent research, for example, how certainty relates to disclosure and liking in SNS. From the results of studies 1-3, some details are provided with reference to the research questions. For question 1a, information sharing can strengthen and weaken relationships in SNS environments. Figures 4.4-4.8 and Table 4.8 give details of which types of photograph

affect the different relationship qualities investigated, as well as the types of photographs that affect relationships when shared by a particular Target.

For question 1b, it is generally shown that sharing photographs in SNS alters relationship qualities. However, the effects of other Facebook features were not investigated in these studies but their effects are identified in studies 4 and 5. For question 1c the findings to identify specifically are the interaction terms, i.e. when different targets share photographs (Table 4.8, Figures 4.4-4.8). For other information types later studies will investigate their effects. The results of Study 3 suggest implications for research question 3a. When sharing information, such as photographs, in Facebook, care should be taken to control the audience. Even within the everyday disclosure of photographs, i.e. photographs that are not considered extreme, depending on the discloser's relationship with the recipient (target type), the frequency of disclosing and the specific photographic depictions, relationships can be strengthened and weakened. Therefore, caution should influence the decision to disclose in Facebook.

Overall it is considered that the Sharing-Liking relationship (as highlighted in Figure 4.1) is more complex for information exchange in Facebook. Studies 1-3 support the previous literature and adapt the disclosure-liking relationship to instances of communication in Facebook. It has been established that disclosure does not always result in perceived liking by the recipient. Additionally, perceived liking has been related to variations in the relationship of the discloser to the recipient as well as the type and frequency of information shared. It has also been established that different relationships are scored differently across a variety of relationship qualities (studies 1 and 3, main effects of Target). Age was also negatively related to 4 of the 5 relationship qualities tested in Study 3, suggesting that older participants regardless of information

exchange in Facebook have lower scores of both positive and negative attributes of relationships. It is argued that older participants are mellower in their relationship scoring, so use less extreme ratings for positive and negative relationship qualities across the range of different relationships they hold.

Support was found for hypotheses 1-4. H1 was supported by the effect of the interaction between the 11 relationship qualities and the different targets in Study 1. Different types of relationship were related to different scores for each of the relationship qualities tested. There was a main effect of target present that suggested a colleague scored lower across all qualities than a relative, friend or partner, and a friend scored significantly different to a partner. However, it was not possible to determine which relationship qualities each relationship type scored significantly different due to the repeated measures design of the survey and the subsequent repeated GLM required.

H2 was supported in Study 1 through the identification of the features of Facebook participants used with each of the different targets. Therefore feature use was determined for each target type and all targets combined. For each target type and across all targets photograph posting was the most used Facebook feature. Further identification of photograph sharing was identified in Study 2 where the photograph feature was separated into different types of photographs based on content. These results also fulfil Objective 1 – the most used feature of Facebook between interaction partners is photographs. In addition, Objective 2 is fulfilled. Across each of the relationship types tested in Study 1, photograph sharing was the most common Facebook feature.

Support for H3 is found in Study 3. The type and frequency of photograph sharing is related to different levels of relationship qualities. Examples of these are

found in Figures 4.4-4.8, and Table 4.8. The interaction observed between photograph type and frequency with different target disclosers supports H4.

4.7. Limitations of studies 1-3

There are limitations to the results of studies 1-3. First, the effects cannot be traced solely to the use of Facebook, but may be part of the condition of sharing within Facebook with some external (offline) influences that were not controlled. Second, the effects observed from the use of targets to represent different relationships is limited to targets as *disclosers* of information and therefore the participant's decision to disclose is not established. Third, although planned, the frequency of photograph sharing represents breadth of disclosure, with depth not measured. To measure depth, independent ratings of individual photographs or photograph categories would be required to determine the effects of frequency*depth of information sharing. Fourth, these studies are limited to observe the effects of information sharing for photographs only. This was a deliberate design to ensure that effects can be observed in Facebook environments, and studies 4 & 5 will identify relationships with other information types. Fifth, the use of the NRI to investigate the effects of sharing on relationships presents complicated structures for analysis, partially remedied in study 3. As the effects of sharing on relationship qualities have been established, the more general Rubin Liking scales will be used to simplify analyses. Sixth, causality cannot be deduced from these studies. Questions regarding the frequency of photograph sharing by targets and the NRI scales were not manipulated experimentally. As such there are no before or after effects on the NRI, for example: (1) conduct the NRI at time zero with regard to a target type, (2) observe the target sharing photographs via Facebook over a controlled time period without exposure to other information or variables from the target, then (3) fulfil

the NRI to observe changes in the relationship quality scores. The cross-sectional nature of the surveys used means that only correlations, or relationships between variables can be observed. Although this limits the implications, such a study would be more time consuming than was possible, and conclusions can still be drawn about sharing and liking. The final limitation of these studies is the use of the term ‘relative’ or ‘partner’ when asking participants to respond. It was possible for participants to identify close friends as relatives, or cousins as their closest friends, as well as partners (such as wives or husbands) as relatives. However, as suggested above it is considered more important for the participant to think of somebody that *they* would consider a relative, partner, close friend or colleague.

The following studies in this thesis will control the type of relationship investigated, as the effects of Target have been established in studies 1-3. The relationship will be limited to friends, but there are a number of variables to investigate. These include the stage of the relationship, such as differences between information disclosure and evaluation of sender for a new or existing friendship. It is also necessary to investigate the effects of sharing in Facebook with different types of information. Studies 1-3 do not investigate the relationship of sharing and liking with certainty, as proposed in the overall working model (entirety of Figure 4.1). Therefore, it is necessary to investigate the decisions to disclose and identify what users of Facebook expect when sharing information with other connections.

5. Phase 2: Facebook Use and Relationship Progression

5.1. Introduction

This chapter examines the relationship between sharing, liking and certainty (see Figure 5.1). Sharing is identified in greater depth using a variety of Facebook features rather than photographs alone. The work in this chapter forms the qualitative phase of this mixed methods research and is structured as follows. First, a brief overview of the relevant literature is given. Second, the interview design and methods are detailed. Third, the results are presented and discussed with reference to the progression of relationship development. Fourth, a conceptual model relating to social penetration theory is developed.

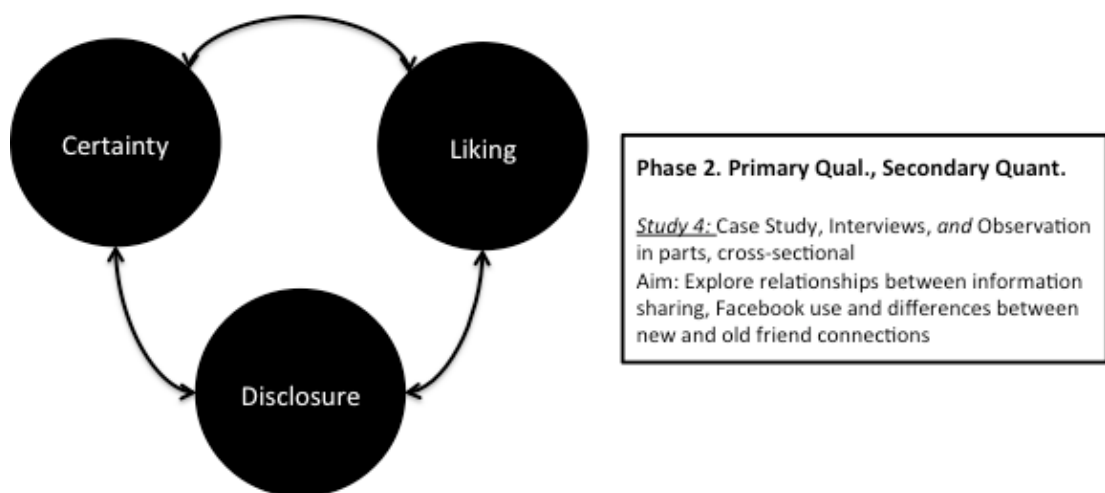


Figure 5.1: The investigation of certainty, liking and disclosure within this chapter.

5.2. Relevant Literature

Although reviewed comprehensively in the literature review, Chapter 2, it is necessary to provide a brief summary of the key areas of literature that directly influence the design and analysis of this study. The relationship between sharing and liking has been partially established, but can also be considered to be confounding with a relative lack of clarity based on the use of different definitions, variables and

processes of measurement (Chelune, 1976b, 1979b; Collins & Miller, 1994; Cozby, 1973; Dindia & Allen, 1992). Sharing information has been shown to be a motivator for reciprocation and to have a direct relationship to liking, while simultaneously liking is suggested to be needed before sharing can occur (e.g. Chelune, 1979b; Collins & Miller, 1994).

The general sharing, liking and certainty model is investigated and so the nature of disclosure is used as a reference for the behaviours observed and expressed by the interviewees. Liking, certainty and the depth and breadth of disclosure are expressed differently with particular targets and at different stages of a relationship (Berger & Bradac, 1982; Chelune, 1976b; Jourard & Lasakow, 1958; Rubin, 1970, 1973, 1974; Rubin, et al., 1980; Taylor, 1979). As suggested in the disclosure and URT literature, early stages of relationships are times of high uncertainty about others and involve the disclosure of more (frequency and category) shallow items about the self (Altman & Taylor, 1973; Berger & Calabrese, 1975; Ramirez, et al., 2002; Ramirez & Zhang, 2007; Rubin, et al., 1980). As certainty increases, the axioms of URT suggest that liking and reciprocal information sharing also increase (Berger, 1979; Berger & Calabrese, 1975), as well as the depth of disclosure. It is important to understand the established motives, processes and axioms of URT to determine if similar processes are found in SNS interaction.

To increase certainty about others, individuals can utilise different strategies of information seeking: passive, active or interactive (Altman, 1975; Antheunis, et al., 2010; Berger & Bradac, 1982). Over sharing is considered to be detrimental to the progression of a relationship, with those that over share evaluated negatively (Altman & Taylor, 1973). Contradictorily, under disclosure for a particular relationship stage or

type may see disclosers (or non-disclosers as it were) evaluated negatively, seen as reserved or shy (Altman & Taylor, 1973).

5.3. Methods

5.3.1. Approach

In this chapter the interviews conducted are designed to determine an interviewee's behaviour before, during and after adding a new friend to Facebook, as well as their communication patterns with an established friend. By doing so the interview will capture the initial meeting, adding, and development stages of interaction pairs as well as their established communication methods, inside and outside of Facebook. This will capture the different stages, strategies, critical patterns and saliences of relationship development with respect to certainty, liking and disclosure requirements and inform the research model. It is important to ask about other methods of interaction – offline, phone, and email – to avoid the assumption that Facebook is used for all communication purposes. Thus, this study identifies information disclosure of all types on Facebook, not limiting to photographs, and identifies two targets of discussion to inform the temporal component of relationship development in modern SNS environments, as well as potential external methods.

It is acknowledged that the researcher's aims and viewpoints may be expressed within the semi-structured interviews altering the interviewee's perception of topics and events. Precautions are taken to reduce bias. Avoiding the use of leading questions will help ensure data validity by reducing social desirability and interviewer bias. Probing will ask interviewees 'what do you mean?' or 'how would you describe?' so as to avoid any impression made by the interviewer. Furthermore, reducing the use of leading questions reduce *confirmation bias*. The interviewer will take care to mirror the

interviewee and speak ‘at their level’ to put them at ease and ensure they understand the questions. Interviewees will be reassured that if they did not wish to answer a question or give more detail when probed, that they have the right to withhold information without judgement.

Using an interview protocol as suggested by Creswell (2009) and Bryman (2008), an interview schedule is developed in keeping with a semi-structured interview design as follows (the schedule of the main discussion topics can be found in appendix 5):

1. Questions – typically an introduction or ice-breaker to begin, followed by questions as components of the research plan;
2. Probe for those questions to follow up the initial response with richer detail, and;
3. Final thank you statement to acknowledge the time interviewees spent.

The initial questions determine the gender of the participant, gender of the two individuals they will be discussing (focal targets), the number of Facebook friends they have, and their profile privacy settings using two freeware scripts (Privacy Score A¹⁶, and Privacy Score B¹⁷). Several direct questions will ask about participants’ certainty of their Facebook friend, how well they know their Facebook friend, how they would term the relationship and how they believe the relationship would progress. A data file will be created using the answers to some of the introduction and certainty questions given

¹⁶ Privacy A freeware script found at <http://www.rabidgremlin.com/fbprivacy/> and scale range is correct at time of data collection

¹⁷ Privacy B freeware script found at <http://profilewatch.org> and scale range is correct at time of data collection

by interviewees. The results of these quantitative questions describe the dataset and add weight to arguments and definitions of the main qualitative component of this study.

The main questions asked will be direct and indirect to elicit details of interpersonal interaction via Facebook. Interviewees will be asked about their Facebook use before and after adding a friend, what areas of the other's profile page they have looked at and which features of Facebook they use to communicate with their friend. These questions are designed to determine how interviewees use Facebook and gather finer detail about their information sharing and seeking.

The certainty scale consists of a general statement developed from the CL7 scale (Clatterbuck, 1979). The certainty question is as follows (allowing for small variations in question style due to the flow of the interviews):

“If zero was a complete stranger, somebody you might bump into on the street, and 10 was your best friend that you would lend money to or help in a difficult situation, how certain are you of their [interviewee's focal target] beliefs, attitudes or behaviours in given situations?”

Each interviewee will be asked to respond to the questions for two types of Facebook friend, thus the N interviewees provide 2N data points. This provides a *repeated design* for variable comparison between the two focal targets. First, questions will be asked with reference to the friend they last added to Facebook. Facebook provides a feature for this person to be identified. Second, similar questions will be asked with reference to a friend they have added between 3-6 months ago who they use Facebook a lot with (i.e. interviewees did not add them 3-6 months ago and no longer look at the profile or communicate with them). This distinction between friend types allows Facebook use, certainty levels and descriptions, and liking differences to be

investigated. Although this introduces a minor confirmation bias, it is intended to ensure that differences in stages of relationship are investigated. From hereafter, the last added friend will be known as a 'New' friend and the friend added earlier with whom the participant uses FB a lot will be labelled an 'Old' friend.

5.3.2. Participants

Participants were gathered via a course credit reward scheme for Management undergraduate students at the University of Bath, and interviews took place in November-December 2010. The sample consisted of 9 female and 9 male participants, in their first, second or final year of a three or four year undergraduate programme. Participants were aged between 18 and 23. Interviewees were given numbers to refer to them in the analyses and maintain anonymity, see Table 5.1. However, the digital recording file for interview 17 was corrupted and so could not be transcribed. Therefore, the sample were 8 male and 9 female participants.

5.3.3. Procedure

Interviews were conducted at the Interactions Lab at the University of Bath, School of Management. The interviewer and interviewee were sat next to the same desktop PC so that both could view the monitor. Interviews were recorded using the same workstation running Audacity for Mac (open source audio recording and editing software) in the background removing any visible presence of a recording device helping to relax interviewees and increase external validity. The same room, workstation and conditions were maintained for all interviews.

Interviewees were directed to their Facebook login page where two freeware software scripts were run to determine their privacy settings on Facebook, utilising

profile data to develop a scale score, similar to the method employed by Young & Quan-Haase (2009). Next, they were guided to the Facebook function that shows their last added friend. If interviewees had not browsed their last added friend's profile (thus unable to answer questions) they were asked during the first part of the interview to browse the profile as they would typically. The Facebook browsing was used to enable participants to develop an opinion of their new network contact, and could be used at any point in the interview to help remind them of communication patterns with either of the focal targets. Questions from the interview schedule were then asked and probing conducted where necessary, with the interviewer mirroring the interviewee to help create a relaxed and informal environment. Interviews lasted approximately 30 minutes each, allowing 15 minutes for discussion on a new focal target and 15 minutes on an old focal target.

Once the interviews were concluded, participants were thanked for their time and encouraged to ask any further questions that may have arisen throughout the interview. Participants were given the researcher's email address should they have any questions, as well as their ID number should they wish to withdraw their data from the study. Interview recordings were transcribed by the researcher (also the interviewer) for analysis.

5.4. Results and Analysis

5.4.1. Descriptive and Quantitative Results

Table 5.1 shows the gender the participants, their new Facebook friend, and their old Facebook friend. A tally identifies how many of the relationships consist of similar and dissimilar genders between the interviewee and focal target.

Table 5.1: Gender of Interviewees and Focal Targets

Interviewee No.	Interviewee Gender	New FB Friend Gender	Same Gender?	Old FB Friend Gender	Same Gender?
P1	Female	Male	No	Male	No
P2	Female	Male	No	Male	No
P3	Male	Female	No	Male	Yes
P4	Female	Female	Yes	Female	Yes
P5	Female	Male	No	Female	Yes
P6	Male	Male	Yes	Female	No
P7	Female	Male	No	Female	Yes
P8	Female	Male	No	Female	Yes
P9	Female	Male	No	Female	Yes
P10	Male	Female	No	Female	No
P11	Male	Female	No	Male	Yes
P12	Male	Female	No	Female	No
P13	Male	Female	No	Female	No
P14	Male	Female	No	Female	No
P15	Female	Male	No	Female	Yes
P16	Female	Female	Yes	Female	Yes
P18	Male	Male	Yes	Male	Yes
Total Male:	8 (47%)	Same Gender Total:	4 (23.5%)	Same Gender Total:	10 (58.8%)
Total Female:	9 (53%)				

Five variables were transferred into SPSS for parametric tests. Certainty scores (0-10) for both new and old Facebook friends, Privacy Score A (0-10, high score is more private) and Privacy Score B (0-21, high score is more private) obtained from the two freeware privacy setting scripts, and the number of friends each interviewee were connected to via Facebook.

A paired samples t-test was conducted to determine if interviewees had different certainty scores for each focal target. There was one missing case for certainty scores as it was not provided by the interviewee, therefore N=16. Normality tests for the difference between certainty scores (Old FB Friend Certainty – New FB Friend

Certainty) were also calculated, an appropriate measure of normality in paired samples t-tests (Field, 2009).

Certainty was scored significantly different for each of the focal targets. Old friends were scored higher than new friends ($t = -9.514$, $df=15$, $p<.001$ 2-tailed). The mean difference between scores of certainty for new and old Facebook friends was 3.86 ± 1.62 (Mean \pm S.D. 2d.p.), with a range of 5.50 (Min=2.00, Max=7.50). The Kolmogorov-Smirnov (K-S) test and the Shapiro-Wilk (S-W) normality tests were calculated using the differences between certainty scores (paired samples). The K-S test determined a (minor) significant deviation from normality (K-S = .215, $df=16$, $p=.045$) and the S-W test determined the sample to be normally distributed (S-W = .907, $df=16$, $p=.105$ n.s.). As $N<50$ and nearer 20 ($N=16$) which the S-W was validated with (Shapiro, Wilk, & Chen, 1968) *and* the S-W test is considered more conservative (see Field, 2009), the S-W test is used and the sample is considered normal.

The K-S and S-W Tests for number of friends (K-S=.150, $df=16$, $p=.200$ n.s., S-W=.938, $df=16$, $p=.329$ n.s.), and privacy scale A (Privacy A; K-S=.146, $df=16$, $p=.200$, n.s., S-W=.912, $df=16$, $p=.126$) were non-significant suggesting the data are normally distributed. Privacy scale B (Privacy B) violated the assumption of normality (K-S=.536, $df=16$, $p<.001$, S-W=.273, $df=16$, $p<.001$) and although general linear models are robust (Schmider, Ziegler, Danay, Beyer, & Buehner, 2010), where there is a normally distributed preferable alternative (Privacy A) it shall be used.

Based on the compliance to assumptions of normality, a Pearson product-moment correlation coefficient was computed to determine if there is a significant relationship between Number of Friends and Privacy. More private individuals (higher privacy scores) may have fewer friends (negative correlation) due to their lower likelihood of accepting 'anybody' as a Facebook friend to help protect their

information. However, those with more friends may have a greater need to utilise privacy settings (positive correlation) to stop different social spheres seeing the same information. Thus, a correlation is expected, but the direction and valence is unknown (two-tailed prediction).

There was no significant correlation between number of friends and privacy settings (Pearson's $r=.156$, $n=16$, $p=.565$). This suggests that regardless of number of friends a user has, their privacy settings are similar.

Table 5.2: Pearson Correlation Output for Privacy A vs. No. Friends

Correlations			
		Number of Friends	Privacy A
Number of Friends	Pearson Correlation	1	.156
	Sig. (2-tailed)		.565
	N	16	16
Privacy A	Pearson Correlation	.156	1
	Sig. (2-tailed)	.565	
	N	16	17

5.4.2. Qualitative Results

Interviews were given three passes for coding and thematic analysis. The first pass separated interview transcripts into New and Old sections to represent each of the focal targets of the interviews, i.e. whether interviewees were discussing new or established friends. Further to this, under each of the New and Old category structures, text snippets were added to three main categories of Liking, Information Sharing, and Certainty. Memos were created for the researcher to add thoughts and impressions regarding the categories and the text extracts.

The second pass categorised text extracts within each of the three main categories into subcategories, or sub-themes, which better described the phenomenon

expressed by the interviewee. However, it was noted throughout this pass that there was a relatively large degree of overlap between each of the broad categories. That is, when interviewees discussed certainty they often discussed it with reference to the information they were seeking, or information they would share to obtain this. Simultaneously, they may discuss their relationship with that person and give an impression of the degree to which they like that person. Therefore, it was concluded from the second pass that the pre-defined structure of assigning excerpts to subcategories within the three broad categories of Liking, Certainty and Information sharing was insufficient.

For the third pass, the subcategories of certainty, liking and disclosure were collapsed into a single broad category of Facebook interaction, still separated by New and Old relationships. Although it was expected from the nature of the model of sharing, liking and certainty that there would be an overlap, too broad an overlap produced unnecessary repetition. However, even with attempts to reduce the repetition, some excerpts could still be coded at two categories.

Table 5.3 shows the themes identified within the data. The general themes identified for both New and Old relationships were combined for clarity of discussion. For example, when discussing both New and Old focal targets, participants showed information seeking behaviour. The results are discussed as “Information Seeking Behaviour” and include excerpts from New and Old focal targets, but differentiations between focal targets are made within the discussion if necessary.

Table 5.3: Themes identified in the data set, and their description

Theme	Sub-Theme	Description
Certainty	Who are you?	Participants look for clues to who their Facebook friend is
	How do you fit in my social network?	Participants identify mutual friends and networks to see how they connect to their Facebook friend
	What are you Like/What are you up to?	Participants look to find out how a friend may behave, what interest they have, or for older friends, look to see how things are going, what they're now doing
	You're not important enough (yet)	Friends are added to Facebook but generally ignored. The relationships are on hold, waiting future development (normally offline)
Locus of Relationship	Offline Dominates	Facebook is useful for maintaining relationships and initial information searching, but relationships mainly develop offline, in groups and later in one-to-one activates
	Facebook Feature Use and Relationship Stage	Different Facebook features are used depending on the status of the relationship. More established friends tend to be communicated with using more features, and more private features.
	Mode Switching	For personal, intimate or private communication, participants tended to switch to another medium, leaving Facebook to be used to organise and connect
Impact on Relationships	Facebook Features/Signalling	Different feature use and other modes of communication signal the stage/intimacy of a relationship. Both the method of communication as well as the benefits the method adds for private/personal communication
	Social Awareness & Social Contract	Participants are aware that there is a social contract to be entered. Deep information is not shared too soon, activity on the wall is expected, and photographs are not expected to be too egocentric. Commenting, chatting and direct messaging are only used when it is appropriate with a friend (i.e. when a relationship develops to that point)

5.4.2.1. Certainty

Overall the expressions and descriptions given by interviewees in this theme suggest that Facebook is used as a connection tool. With new relationships interviewees rely more on ‘bumping into one another’ to talk than using Facebook, but Facebook proves a useful tool for providing information about new friends. In line with uncertainty reduction techniques, Facebook use with acquaintances is described akin to *passive* information seeking. Information searching was spoken about with reference to Liking (or relationships in general) as well as from a certainty perspective, and general information sharing perspective. For old friends, certainty is more established as demonstrated in the quantitative results (section 5.4.1.). However, interviewees would discuss their Facebook use with an Old friend with hindsight, recalling the early stages. In addition, some interviewees expressed reconnecting with old friends, and using Facebook to see what they are up to and what they are like now.

Within the broader category of certainty development, interviewees’ information searching practices comprised four sub-themes, each summarised below with supporting quotes in Table 5.4: *Who are you?; How do you fit into my social network?; What are you like?/What are you up to?; and, You’re not important enough (yet).*

5.4.2.1.1. Who are you?

In the process of adding a new friend or receiving a friend request, interviewees would look for cues to identity to determine who the person was. Information was sought using a passive strategy, identifying the new connection through profile photographs, mutual friends, activities and interests they engaged in and highlighted on their Facebook profile, tagged and uploaded photographs, and Facebook networks. The passive seeking of such information increased the interviewee’s certainty of their new,

or potential, connection and enabled them to determine if they knew the other person before accepting a friend request. Information was not sought and the new friend's profile not browsed if the interviewee had already developed certainty of who they were.

5.4.2.1.2. How do you fit in to my social network?

In developing certainty about others, interviewees looked to establish where a new friend fit into their social network, i.e. identifying the pair's mutual friends and the activities and interests they share. As well as looking through their friend's profile, interviewees would specifically look for activity on their friend's wall by mutual friends, or by others in general to ensure that the person was in line with social norms (see quotes from P3 & P7, Table 5.4). P15 discussed searching in detail for instances of common friends and interests. In some instances (e.g. P16) interviewees used mutual friend connections on Facebook to initially make the connection with a new friend, utilising their own social network to identify somebody they had met in a social group offline. Furthermore, interviewees met their new connections offline through mutual friends and social groups, which reinforced their identification of a new friend within their own social network. Communication with a new friend was expressed to be based around a common event or activity, with some interviewees using mutual friends as a talking point with their new friend.

Overall, with new friends interviewees expressed a tendency to look for the social network structure within their wider group of friends to see where new friends fit. There were more examples of this uncertainty reduction technique in new relationships. In instances where social network structures were identified with old friends, interviewees were either discussing the early stage of their now established friendship,

or were using mutual friends to identify discussion points relating to the wider social network. On a timeline of relationship development the searching for social network structures would be placed early on, just after adding a friend to Facebook. With more established friends, it is considered that the network structure is known but may be referred to periodically to identify discussion points.

5.4.2.1.3. What are you like? / What are you up to?

This theme represents excerpts where the interviewee expressed that they are looking to build up a picture of their friend. In addition, it is combined with looking through a profile to determine what a friend is up to, either to identify what a new friend does, i.e. who they socialise with, which university they attend; or to see how an old friend with whom they haven't communicated recently is doing. It broadly encapsulates the conversational concept of "tell me more about you", but from an information seeking perspective.

Photographs were key in identifying what a new friend is like, with interviewees saying that they had looked at profile, uploaded and tagged photograph albums to establish a blueprint of their new friend's personality. In particular, P1, P2, and P16 establish the difference between profile photographs and photographs that their new friend is tagged in. These excerpts suggest that profile photographs can give insight into how profile holders want to present themselves, whereas tagged photos may represent a more honest account of the profile holder as others post these with little control afforded to the profile subject. However, photographs were not the only Facebook feature interviewees used to find out what a friend is like (e.g. P2 & P5). Activity on walls, status updates and descriptive profile features were also utilised.

Interviewees also explored an older friend's profile to find out what they are like or what their life entails after a long period of disconnection, i.e. they look to see what an old friend is up to, such as a friend from secondary school. Other examples of utilising Facebook to find out what an older connection is currently up to are expressed when a friend moves away, geographically, and collocated communication breaks down, suggesting Facebook to be convenient (e.g. P1 [old focal target], Table 5.4).

At early stages of relationships or when reconnecting with old friends, evaluations are made based on profile photographs, how 'into themselves' their friends look, the activity on their friend's wall, activity with other friends and the number of friends they have. Interviewees are quick to assign negative evaluations at early relationship stages based on their friend's profile, but using photographs in particular (e.g. P1, P8, P14). This finding adds support to studies 1-3, where photographs can be beneficial to a relationship, but also detrimental.

P13 shows that part of his information seeking is to learn about what his older, less acquainted friend is now doing, and suggests that it helps to reduce anxious moments if he ever saw them again and so wants to be more certain about the other person. Similarly, P14 demonstrates the need to use Facebook to gather as much information as possible to develop certainty about the other person, but in this instance *before* deciding whether to move into a flat-share with them after university halls.

Therefore it is concluded here that when they first get to know their new friends, interviewees utilise many of the features of Facebook to help build up a picture to see what they were like and to reduce uncertainty about one another.

5.4.2.1.4. You're not important enough (yet): Placeholder for later development.

Excerpts in this category generally show interviewees connecting with others via Facebook then either not communicating, information searching or acknowledging their 'friendship', but putting it on reserve until the relationship is developed further elsewhere. For example, the description from P13 (see Table 5.4) suggests that he knows the focal target on a basic level, but has added her via Facebook to help maintain the connection with her, a connection that may be useful if the two begin to develop their relationship offline. With an old friend P13 reflects upon his use of Facebook as a placeholder until the relationship developed further. P16's expression of "yet" suggests that the relationship may build, but their fixation on offline discussions suggests that their relationship is based on offline communication with Facebook as a secondary tool that may be developed later if needed.

Most of the selected excerpts for this theme are drawn from discussion about a new friend, which suggests that with old friends interviewees use Facebook more frequently and there is no need to establish a placeholder, putting the relationship on pause.

Table 5.4: Certainty sub-themes and quotes to support theme descriptions

Sub-theme	Quotes
Who are you?	<p>P3: “I double-checked it was the same person, so I clicked on, all she had available I think was her photo, erm, and a bit of basic information, so from that I could tell it was the same person that I met”.</p> <p>P9: “if someone who I’m a bit unsure of, adds me, I always go to their profile to check out who they are, or if they’re, I look at what networks they’re from as well, cos’ sometimes you get really random people adding you, so I always go and have a look”.</p> <p>P10: “I looked who her friends were, to see who she was, then I linked it [made the connection mentally] and I was like ‘ahh, must be her”.</p> <p>P11: “not really [did not look]... because I knew him already”.</p> <p>P13: “I only looked at her profile pictures to see if it was someone I knew, I don’t... well I did look at her photos just to see, to make sure it was her, because that’s a pretty publicised photo. She does modelling for Abercrombie and Fitch, or something... so I just had to check and it’s definitely the girl I thought it was”.</p>
How do you fit in my social network?	<p>P1: “I normally look at people’s profile pictures, or, ones they’ve been recently tagged in maybe, and then, like on the wall, this is actually the friend I know them through who’s written on his wall, so like cos’ obviously I don’t know a lot of the other people but I know her, so I’d probably read that”. “I’m going out with him and some other friends this week, and I can see that I’m probably going to get to know him a bit better”. “I think my status was related to being hung-over and he’d been out with us the night previously, and so he made some comment about also being hung-over”.</p> <p>P9: “we have 24 friends in common, yeah they’re all on my course probably”, stating that “friends in common” was something she normally looked at.</p> <p>P10: “we both posted on there [Facebook Group] that we were in number one, and then we added each other because we knew we’d be in the same flat... I looked at, like, where she was from and who she was, like, with, her friends, just to see if there was any mutual friends”.</p> <p>P13: “I went through her [photo] albums cos’ sometimes it’s things I’ve actually been to, socials and stuff”.</p> <p>P15: Looked for common connections “cos’ he knows my housemate and he knows my brother and knows all the other people that we met,</p>

all my other friends, like, obviously all her [common friend of interviewee and focal target] friends were out for her birthday, her party thing”.

P16: “[looked for a new Facebook connection] because I’d gotten to know her a bit recently through mutual friends, so I went onto the mutual friend’s page, found [name], then just clicked add”.

What are you like? / what are you up to? (Picture Building)

P1: “Well, I guess everyone likes looking at pictures of other people and also the profile picture of someone is the photo someone’s chosen themselves so which I guess they think they look best in or, like, portrays the image they want to portray, whereas a lot of the time in tagged photos, so I know from my profile, that a lot of the photos I’ve been tagged in I would not like a lot of other people to see... I guess it’s just general curiosity if there’s anything interesting on there because sometimes people write something interesting, but sort of fairly standard”.

P1 [old focal target]: “well for the past few months cos’ they’ve been travelling [I’d check Facebook] probably, like, every week or so because they’ve been putting photos up, so, fairly frequently, at least once a week for the past few months, just to see if they have any updates, like, what they’ve been doing”.

P2: “Pictures is the first thing I’d probably look at, erm, and then maybe wall posts, information is sometimes quite a good thing to have a look at, but yeah. Generally pictures.... Yeah, I sometimes do profile pictures, then I might now go profile pic, and see as this is where people think they look best, or stupidest, you know it depends. Well it is definitely, as this is how you wanna be presented.... but yeah I’ve looked at those and then I might go like that [to the info page] and then like, I ‘spose, I know he’s single now but you’d look at relationship status”.

P5: “well his location, because he’s obviously, still not at home where I knew him from originally, erm his profile picture, that probably looks like he’s at uni, if he’s dressed up like that or something... maybe go on his information, yeah it says what university he’s at there, and, erm, what degree he’s doing.”... “It looks like he’s doing quite well for himself, it looks like he’s at university and having a good time, he still looks pretty much how he used to, just a bit older”.

P8: “In his profile pic. Erm, I guess his little caption about him, about the God of charm or something, is not something... he seem quite introverted, and I guess that is something an introverted person would say, but... yeah, it appeared more specific to an extrovert, so that was a bit unexpected... maybe he does have, like, a more extrovert side”.

P9: “Photos are a big thing of Facebook, they’re like a main part of Facebook, you can gather a lot about a person from a photos, I guess, more so than likes, or what groups they’re in. Cos they might just join a group, on a whim kind of thing, and I don’t think they really say all that much about you because people join stupid groups, so, yeah, you can kind of see a lot about a person, and all the pictures they think are best of them, they put as their profile pictures which is quite interesting”.

P11: “maybe his wall, because I’m looking more often at the walls of my friends just to see what kinds of things are happening in his life. Maybe a bit with comments”.

P13: “she seems to have changed quite a lot, and I just look to see... and it’s also a case of would I recognise you if I saw you in the street, cos’ I’ve had this before where people go ‘hi’ and I go ‘erm, good’ [laughs]”.

P14: “If there had been, not soft porn, but you know that kind of thing, really skimpy bikinis and guys kissing them and whatever... Yeah, then I might have thought, “oh right, she’s a party girl” or I don’t know, that might have changed my impression of her, or if she had had no kind of friends feed, then I might have thought she’d’ve been a bit of a loner type thing”.

P16: “I’ll look at her wall first, because... I just, because obviously we know a lot of the same people and I can see kind of, what she’s saying with other friends of mine and then what albums she’s been tagged in, cos’ I can see, because she’s at a different Uni to me, so it’s a way of just keeping an eye on... just kind of seeing what she’s been up to”.

You’re not important enough (yet)

P2: “a new add... I would probably look at it when I first add them at some point at the start, and then maybe not look at it again unless they talk to me or it comes up again on the news feed”.

P7: [Regarding writing on her wall, uploading photos or using the chat feature with her] “not as the relationship is at the moment I think I would do that if sort of the offline relationship developed first before I do it on Facebook”.

P9: “yeah, he’s on my marketing group. I might [talk with him], but I’d just go through the group, I wouldn’t go through his wall personally... I’d write on the wall of the group”.

P13: “I just knew her from swimming club. Erm, and I just chatted to her a couple of times we’re not massive friends as such, you know, chatting all the time, but whenever I see her it’s always ‘hi’ you know, erm the reason I added her is because it suggested her on the

side [Facebook suggested her as a friend connection].”

P13: [old focal target]: “since I said yes [to friend request], I do check her profile quite often... since we started talking properly, since she started the course, basically. We started talking a bit more as soon as I came back, I just happened to see her... I still said ‘hi’, so I thought I’ve known you for a year and I haven’t spoken to you, so, and then she started doing the course without us really realising either of us were doing it and we just chatted from there”.

P16: “[talk about] just general what’s going on, what our friends have been up to, how uni’s going, how job searches are going, the usual really, otherwise I’d say because we’re quite new friends it’s probably fairly superficial our conversations. We don’t sit there and chat about, you know, life, and we don’t go into the, you know, kind of deep conversations yet.”

5.4.2.2. Locus of Relationship

This theme captures the core aspects of communication within and outside of Facebook and the effects on interpersonal relationships. The impact of communicating via Facebook, offline and other electronic platforms on relationships depends on the stage of the relationship, whether the purpose is social or work/task oriented and the depth of the disclosure itself. Generally it is found that offline interaction dominates relationship development in most cases, with interviewees showing a strong preference and weighting to offline interaction compared with Facebook profiles and Facebook interaction. However, Facebook is expressed to be a useful tool for information searching and reinforcing impressions made offline. Facebook communication can be useful to maintain a relationship when friends are geographically distant. In addition, the ‘private’ channels of Facebook are used more frequently with older friends and for more personal communication, with interviewees showing a preference to mode switch for conversation involving deep disclosure. Mode switching allowed interviewees to use communication channels that were more personal, but the mode switch to a more personal communication channel also acted as a symbol for a desired increase in

intimacy. Within this broad theme, three sub-themes are identified and discussed in more detail with quotes presented in Table 5.5: *Offline Dominates; Facebook Feature use and Relationship Stage*; and, *Mode Switching*.

5.4.2.2.1. *Offline Dominates.*

Although Facebook is used to interact with their friends as well as search for information to build up their certainty of each other, the interviewees suggested that offline interaction is important for developing a relationship and establishing a strong connection with others. This theme identifies how Facebook is used in connection with offline interaction but how offline interaction dominates the relationship development and maintenance process.

In 31 of the 34 cases examined, interviewees met their friend offline before adding them (or accepting a friend request from them) on Facebook (e.g. P3 & P4 in Table 5.5), emphasising the importance of offline interaction. In general, interviewees emphasised the importance of offline events, locations and social groups for relationship development and maintenance (e.g. P7, P9, P14 & P16). Interviewees weighted offline interaction more heavily as several had stressed the need to know their new friends well enough before being able to interact via Facebook (e.g. P1, P7 & P12). Therefore, the requirement to know each other well enough before interacting via Facebook suggests that interactive strategies of information seeking occur at later relationship stages, cf. passive information seeking that occurs through browsing the profiles of friends that have just connected. The needs of interviewees for offline interaction and Facebook interaction suggest an interactive cyclical relationship between the two channels and relationship development, with a focus on offline interaction for deeper instances of disclosure.

If individuals are separated geographically for a sustained period, Facebook interaction is required to maintain the relationship as sustained periods without FtF or Facebook interaction were suggested to relate to relationships coming apart (e.g. P1, P2, P9 & P14), with Facebook suggested to act as a sustainable link between interaction pairs. Furthermore, those who met everyday or who lived together suggested that they did not directly interact via Facebook (e.g. P5, P6).

The current theme has shown two strands of offline communication. Interviewees meet offline first and move the relationship onto Facebook, and interviewees require their offline relationships to be developed in order to use Facebook more frequently, or use more features of Facebook. However, if the interaction pair are not co-located, i.e. offline meetings are unavailable, Facebook is used to keep up with them, pausing the relationship. When offline interaction becomes available again and the relationship develops, Facebook interaction seems to again increase. Therefore, while offline is still weighted as more important than Facebook interaction, when interaction partners are geographically distant, more weight is placed on Facebook communication until the preferable alternative offline meeting becomes available.

5.4.2.2.2. Facebook Feature use and Relationship Stage.

This theme identifies examples where interviewees show differences in their use of Facebook features based on the type of relationship they hold with an interaction partner (see Table 5.5). This includes using different features with a new and old friend, and utilising Facebook features to lead to offline events, differing depending on the relationship type.

Interviewees expressed using Facebook more frequently with more established friends. With newer friends they would restrict their use of Facebook in terms of

frequency and feature set. In more established friendships, interviewees would discuss more personal and intimate topics via more closed channels of Facebook, i.e. direct messaging and the Facebook chat feature. Interviewees also expressed the relationship needing to be more established to use Facebook more interactively, i.e. to go beyond passive information seeking. It was also suggested that individuals will communicate more intimately with more established friends, either through ambiguous messages amongst one another on Facebook walls, or via direct 'private' channels. However, interviewees expressed using all features of Facebook more often with one another in more established relationships, but showed a tendency to need the relationship to be more established for closed channel, private or intimate conversations. Therefore, it is considered that the number of different features used in Facebook increases cumulatively as relationships progress, starting with passive strategies and browsing, towards comments and group interaction and finally adding communication via private channels. There is a delicate balance of utilising the private and public communication channels and adapting depending on the information shared. Interview extracts (Table 5.5) also suggests that communication with a group of friends is preferential in the public spheres so it can be seen by others. The conclusion drawn is that non-public information occurs in the private channels, and with more established friends public information is willingly shared in the public sphere for other friends to see. In addition, a larger set of features is used with older friends than new friends including greater use of 'private' Facebook channels for more intimate conversation topics. The use of commenting with older friends suggests a higher frequency of communicating, as comments do not take as long to construct as personal, non-public direct messages. Instances of deep disclosure level are very limited when discussing a new Facebook friend, but there are more examples of shallow information disclosure.

In addition, some interviewees (e.g. P18) suggest that the use of different Facebook features can depend in part on the type of relationship as well as its stage of development. Not only considering the personal closeness of a Facebook friend but also a distinction between friend communication and that conducted with a work or university colleague. P3, P5, P9 and P11 showed instances of using Facebook to coordinate events and tasks which differed depending on whether the relationship was social or work-based. In instances of coordination, the direct message feature was used, typically indicative of intimacy, but with a group of recipients. Therefore, if the communication is regarding coordination direct messaging maybe utility based, whereas in personal communication it represents a symbol for intimacy.

5.4.2.2.3. Mode Switching: symbolism for intimacy.

With reference to the research aims and questions, this theme emerged unexpectedly. Although mode switching is an established practice, the original aim of the research was to outline how relationships develop and decline in SNS. However as part of the process of relationship development and decline, it is evident that for some relationship aims and needs communication must occur outside of Facebook. That is, Facebook is a useful social tool but cannot necessarily accomplish all relationship goals. Within this theme are two distinct strands, the modes used at early stages and the modes used at later stages of relationships.

The status of the relationship an interaction pair holds can be identified as causal to different levels of Facebook use. At early stages offline is important when meeting a new friend for the first time, or in groups, before the online relationship can progress (as indicated in the theme 'offline dominates'). At later stages, when conversation may move to more intimate and private discussion (i.e. greater depth of disclosure), a mode

switch occurs away from Facebook to either face-to-face communication or using alternative electronic methods. For example, P13 suggests infrequent use of the Facebook chat feature early on in his relationship with his old friend but describes his use of text and phone calls now the relationship is more established (Table 5.5). P11 suggests that video chat via Skype is preferable for more personal conversation compared with instant messenger or Facebook chat.

However, within mode switching it is also evident that a utility and convenience judgement is made. For example, friends that move apart from each other may use Facebook rather than long distance phone calls or SMS, as it is cheaper (free) and more convenient. Therefore, mode switching back to Facebook is indicative of the geographic dispersion between relationship pairs, rather than solely as a symbol for intimacy. Whereas, with co-located friends a move to other methods, such as phone calls, may act as a symbol for increased intimacy, both in the communication content and the mere effect of switching to a more personal medium.

Further support for the intimacy of different communication platforms is found when interviewees discuss the relationship development process in reverse, i.e. when a relationship comes apart. P1 identifies her relationship with her older friend as potentially dissolving, and explains how her communication method and pattern will change. P1 suggests emails as being involved with more intimate, and frequent interaction, then moving back down to general Facebook commenting as the relationship begins to break down, before ending up as just another connection on Facebook, potentially laying down a placeholder for them for if/when the relationship re-develops.

In other examples, e.g. P15, mode switching occurred in reverse. Where interviewees met their friends online first, they would mode switch for verification of

identity and to establish more intimate connections. In P15's example, she passively seeks information about a potential housemate via Facebook, then moves to offline interaction to get a better opinion of them in order to determine if the relationship should progress to quite an intimate position, i.e. as housemates.

Overall, mode switching was expressed in relation to an old friend. This suggests that mode switching from Facebook is only utilised once relationships develop to a particular level, or to discuss more intimate subjects. As offline is dominant in establishing the relationship in earlier and mid-term relationship stages, it is suggested that the use of mode switching only with old friends is indicative of more intimate discussions and the need for more personal, and non-public channels.

Table 5.5: Locus of Relationship sub-themes and quotes to support theme descriptions

Sub-Theme	Quotes
Offline Dominates	<p>P1: “realistically, I can probably be, we continue to email then eventually like time between the emails gets bigger then it’ll probably just peter out, and then it’ll be someone you occasionally, like, you go on your news feed and it’s like you see something and it’s ‘oh, what are they up to?’”.</p> <p>P2 [on the need for offline interaction]: “I think it will definitely peter out, just because unless I go back and work there again, I won’t, once you’ve left a place if you don’t continue, if you don’t have shared interests and know the people at work then you’re not really gonna talk [online or offline]”.</p> <p>P3: “a group of friends... run a wine night in Bath on Thursday night every week, and they, everyone invites friends along so I met her there on Thursday night [before adding her to Facebook]”... “I didn’t really [look around the profile], I think just from conversation on the night I knew, most of what probably would’ve been on an information page, I knew she was single, or the fact she’s got a boyfriend, I know she goes to this university, I know what job she did”.</p> <p>P4: “we started sailing together this year, and neither of us had done it before so we went on a course and it was through that... we met there”... “erm, the relationship is gonna be purely around when we go sailing, and Facebook’s gonna be involved in documenting any nights out we have, and also arranging who’s going, cos’ I drive and she doesn’t drive, so they kind of need me to go, to be able to go”.</p> <p>P5: “I see her every day, so I didn’t really feel the need to talk to her on Facebook”.</p> <p>P6: “I think that’s probably learning like learning all that [about her] was probably through conversation than through Facebook”.</p> <p>P7: “[we met] through a sports club... [with communication being] like sports related. So looking back to like the mutual interest”... [Regarding writing on her wall, uploading photos or using the chat feature with her] “not as the relationship is at the moment I think I would do that if sort of the offline relationship developed first before I do it on Facebook”.</p> <p>P9: “I’m in my third year at Bath, I’d seen him around before but I never actually chatted to him, before maybe, like a month or so ago, cos’ he was DJ-ing at a friend’s party, so I chatted to him then cos’ I knew he was on my course and then we sat together in a lecture and he’s been put in one of my groups... he’s really cool, he’s just like a cool guy, he has long blonde hair... we’d already chatted</p>

before... I was pleased he was put in my group [for coursework]"....
"I don't think I'll see him much, we're going on placement in February, I don't think we'll be in contact via Facebook when we've gone off on our own, to do our next jobs, but then I might next year when we come back to uni."

P11: "I don't think the relationship will develop on Facebook, more by talking to her or by directly interacting with her, between now and Christmas there will be more interaction than after Christmas".

P12: "probably cos' I don't see her enough [offline] to become close friends".

P13: "since we started talking properly, since she started the course, basically. We started talking a bit more as soon as I came back [from university placement], I just happened to see her... and we just chatted from there".

P14: "[in] six months I might be on placement in London, so if she's not on a placement in London then [the relationship] will be no further, if she is in London near me then I suppose we might go to a party together, something like that".

P18: "Facebook is more for just keeping that communication so that you don't forget each other, kind of, keeping the link, whereas meeting up is the crucial bit, the more personal bit".

**Facebook
feature use and
relationship
stage**

P1: "he's commented on my status before, so that's the sort of thing that probably I, might comment on his"... "I mean I'm very unlikely to say, send an inbox message or something like that, but maybe a random comment every now and again"... "I'd say commenting on peoples' statuses and writing on their walls, and then there's a couple of people who I use it to email but they tend to be people I don't really see but people from back home or people who I've met, like, when I've been away, to just sort of generally keep in touch, but usually it's just commenting on peoples' statuses probably with people I see very often actually".

P2: "it really depends, cos' I would say close friends I might look at more often, cos' I might be writing on their wall or something, then there's certain people that I never look at their profile, or like, I do occasionally if it comes up on the news feed".

P3: "I think, [I've] viewed photos from that night, and erm just commented on statuses, but no direct conversation and no mail, nothing like that"... "I tend to only use the direct chat with people that I'm very good friends with that I often converse with both online and offline, whereas somebody I've just met once I probably won't be touching base with them too much, I wouldn't have thought I would be chatting, erm, same with direct mail, I wouldn't

one on one mail"... "[my perceptions of him] it could've [changed], maybe slightly, but I'd say it was probably, by the time I'd moved in with him I hadn't really remembered much about the Facebook page, I don't always pay that much attention to what people are like on Facebook, if I'm gonna be spending a lot of time with them I'll form my own opinions, and they just happened to be quite similar to the ones I'd got when looking at his Facebook page".

P5: "I often use it when there's quite a few of us cos' it's easier to send out one message and we've all got it on our phones so it comes through quickly, and it saves texting loads of people and... it's just more convenient... to arrange, like, social events".

P9: "we're in the same marketing group for a piece of coursework, erm, and we've set up a marketing group online, and he added me, so that, I don't know why he added me, just cos' we're in the same group so we [the group] can communicate on Facebook".

P11: "they were doing a party in her accommodation, and I'm not from there so she just wanted to inform me that I'm invited".

P14: "what she's been up to, what the plans are... it's normally organising an event or organising meeting up, or something like that".

P18: "I think that's it really [only used a few features]. But I think it's different depending who it is".

Mode switching

P1: "Sometimes speak on Skype, and occasionally text [SMS]... obviously Face to Face"... "some of the stuff we talk about is a bit more personal... but I guess anything really personal I would... probably Skype, or actually talk to them rather than just writing it down [in a Facebook message/chat]".

P1 [old focal target]: her friend's move to Australia affected their use of Facebook together, "now I use it more for like, using the inbox messaging than previously, because I don't, say, text him, or call that much... before that it was definitely texting, not really Facebooking"... "realistically, I can probably be, we continue to email then eventually like time between the emails gets bigger then it'll probably just peter out, and then it'll be someone you occasionally, like, you go on your news feed and it's like you see something and it's 'oh, what are they up to?'".

P3: "personally in my life I don't really use it anymore to chat to people much, I tend to do that by phone or by face to face, I use it more to check up on whether anybody's said anything to me, what events I've been invited to, what's going on, birthdays things like that, almost like a social calendar really, rather than a chat, and messaging network"... "I think it's a great way of, erm, sort of

keeping in touch with people that you're probably not hugely best friends with, I use it mainly to touch base with people that maybe they might have changed their numbers and I'm not one of their closest friends so you don't text, you Facebook".

P11: "mostly for now [we talk] on Skype, because he's in Germany and I'm in Bath, at home in Montreal we are talking to each other, so personal interaction [face-to-face], and maybe a few times the, err... Instant messenger [Facebook chat]"... "for Skype, for example, I like to see the person I like to interact with him, and I think you have a lot of information about how he feels, or how he is, by seeing him, or her, and by Skype I'm able, he's able to see me and I'm able to see him, or by just direct talking also, we're able, it's faster and we can see each other, so I think we have more information than just words".

P13: "chat, this chat feature at the bottom, I've used like once. She said 'hello', and I just quickly talking about what we were trying to do. Erm, because now we've swapped numbers, texting's just as common, if not more common now and calling if necessary, but usually it's just text".

P14: "It's [Facebook] just a great way to share photos, I think it's the biggest aspect for me, I quite like phone calls, so, cos' then I get an immediate response, and it's a lot of to-ing and fro-ing if you actually want to communicate, but if you're trying to arrange and meet up then Facebook is great, or an event or for multiple people, but for a one-on-one finding out how they are I find it's a bit impersonal"... "I will use direct if it's a kind of private thing, but then obviously [for] group [messaging], cos' I actually went on holiday with her at the end of year 1, so me, [name], [name], and her had some group messages".

P15: "we were looking for housemates, cos' me and one other girl had a house and then we needed to find two other people to live with for this year, and er, so I put a message out on the Bath noticeboard, about accommodation, and she replied to that, she emailed me, and then, erm, then I was obviously interested in her, she sounded like a normal person, you know, a nice person to live with, so I added her to Facebook to check what she looked like on Facebook and did a bit of stalking. And then I met her in person... about a month after that, to actually meet her and discuss if she wanted to live with us, like, see if she liked us and wanted to live with us, see if we liked her and would like to live with her".

P16: "we kind of normally use Facebook as, when we haven't had a chance to talk to each other for a while, for whatever reason, we just kind of send this quick message to say, 'hi, how are you doing? hope everything's going well, are you free for a chat?' really, so it's more of a, Facebook is more of a way just to say, in a way to then

start up a different form of communication I suppose, so you'd say like 'are you free this Sunday for a quick phone call?' But, I'm generally quite a private person I don't go talking about everything that I've been doing [on the wall], cos' I just, like we were saying earlier, you don't know, cos' their profile is open to other people, and they can then see what you've said on their wall".

P18: "church maybe, more like personal things I think, things that you don't want everyone to see".

5.4.2.3. *Impact on Relationships*

The following two themes construct the consideration of Facebook's influence on relationships with interview excerpts given in Table 5.6. The theme *Facebook Features/Signalling* shows the use of Facebook that may impact upon a relationship, however, causality is difficult to infer from this data set unless explicitly stated. The second category relates to the awareness interviewees have about their relationships and how Facebook may have influenced them, as well as expressions about a social contract that is expected before or throughout Facebook interaction. In this second category, *Social Awareness & Social Contract*, a violation of the expected social contract due to Facebook use results in negative relationship outcomes. In addition it marks the transition to the discussion of the results, identifying a key contribution: There is a necessary but fine balance to be made where a need for privacy opposes the need for others to see information on one's profile in order to progress certainty, and thus liking. Instances that break the social contract are received negatively.

5.4.2.3.1. *Facebook Features/Signalling.*

This theme demonstrates two strands of impact of Facebook use on relationships. In some cases, after adding a new friend to Facebook interviewees reported very little or no change in their impression or consideration of the new friend

compared with their prior offline judgement, e.g. P11, P12, and P10. The second strand demonstrates an impact of Facebook use on a relationship, either positively or negatively affecting the interviewee's impression, e.g. P13, P18. However, it was still generally found that while Facebook was useful for information searching and generating an image of their new friend, interviewees would rely on offline interaction to reinforce the opinions of their Facebook searching, e.g. P6 and P11. In particular, P11 noted that in Facebook interaction compared with offline discussion, it is difficult to make judgements of trust about a friend, attributed within the present research to certainty about others. A causal relationship is also identified between offline relationship stage and Facebook use, as suggested by P4, and reinforces the earlier category "Facebook feature use and relationship stage".

Within the earlier theme "What are you like?" examples were given where judgements were made about others based on a lack of visible activity, or too much detail and over-sharing through photographs as well as posts showing an inflated sense of self-importance and ego. These excerpts are not re-quoted here but are considered important to this category. The conclusion from this theme and the quotes throughout this study is that Facebook can influence a relationship positively and negatively but the difference between each of these outcomes is subtle and relies on an established social contract.

5.4.2.3.2. Social Awareness and social contract.

This short theme identifies the existence of a social contract and generally extends the previous themes and quotes throughout. It was observed that social norms of Facebook use are developed and users enter into an expected social contract with one another. Violations of this contract are met with negative evaluations of the violator, i.e.

over-sharing and under-sharing can result in negative relational outcomes. The balance between sharing resulting in a positive or negative relationship outcome is intricate. Examples given in Table 5.6 show the expectations of social contracts and Facebook norms, with particular respect to the information sharing practices of others.

The examples given demonstrate users labelling their friends as ‘weird’ if there are no photographs and general wall activity demonstrating the friend is socially capable, e.g. P1. In other instances interviewees are looking to make sure their friends are ‘normal’, e.g. P14. Of particular interest, photographs and comments/wall activity are utilised to make judgements regarding a friend’s adherence to the social contract, with interviewees not expecting others being too into themselves or having ‘soft porn’ in their profile pictures. Interestingly, P1 notes that their friend needs to be seen in photographs with others, yet P14 suggests too many photos of his friend at parties with others may impact his evaluations negatively, thus reinforcing the delicacy of achieving an appropriate balance of information disclosure at early relationship stages.

P2 and P3 suggest their relationship with their friend is degraded due to violations of expected Facebook behaviour. Although P2 stated she was joking, the impression of the interviewer suggested she was serious and took offence to their friend’s behaviour (see Table 5.6). P3 had built up an initial impression outside of Facebook, which was more reserved, but that as he came to know more about him from living with him, his impressions were similar to those garnered from Facebook. P3 expresses a small violation in the expected behaviours he had built up from the initial interaction but suggests that he understands it was because he was using a form of impression management.

Table 5.6: Impact on Relationships sub-themes and quotes to support theme descriptions

Sub-theme	Quotes
Facebook Features/Signalling	<p>P4: “with her it just felt about time [to add them on Facebook], you know, I think if you’re friends with them for a while and you don’t add them on Facebook, it’s a bit, it’s not really the done thing. But also, I wanted to talk to her about, kind of, my brother”.</p> <p>P6: “I think that’s probably learning like learning all that was probably through conversation than through Facebook... it wasn’t really because I looked on her wall or whatever, it was more conversation [outside Facebook]”.</p> <p>P10: “That’s pretty much what she’s like, I dunno, that picture sums her up pretty much”, while pointing to a profile picture of hers.</p> <p>P11: “She looked pretty much, simple, like I said... yeah she’s a simple girl, about my age, she’s from France, I’m talking in French at home so that’s a common aspect. Yeah I think she’s mostly, like the girl that I knew in the trip”... “what’s difficult by talking on Facebook or chatting, it’s the trust relation, when you see someone it’s easier to trust him than just words on a chat message”.</p> <p>P12: “[my impression of her between Facebook and offline] didn’t really change much, I thought she was an alright person, quite genuine, I thought she was a nice person, nothing particularly over the top, just a normal profile really”.</p> <p>P13: “there were a couple of photos with some banter on it, you know an exchange between her and someone else I know, which sort of just showed that she’s more humorous than I thought she was before, but other than that it was just one of those things I saw and thought, oh that’s quite funny, but other than that [it didn’t change]”. [level of certainty changed to 8 from 2 once he got talking to his new friend], “Oh, God. 2... yeah, cos’ I wouldn’t, cos’ you know, I know she swims and I know she likes to keep fit, so like I’d know her a little bit but other than that... not a clue”.</p> <p>P18: “[my impression of him] was different, I think, yeah, it was more positive because I got to know him a bit more, sometimes when you get to know someone you kind of know that you wouldn’t want them as a long term friend... whereas the opposite happens sometimes where you think, ‘oh yeah, this person’s similar to other friends who I’ve been friends with for a long time’, so you can see you being friends longer”.</p>

**Social Awareness
& Social Contract**

P1: “he looks like he’s a very active Facebook user, I’d say, there’s a lot of like wall posts and stuff... there’s a photo of him with all his friends, on his profile picture, on a night out, so suggests he’s not too weird, he’s got some other friends”.

P2: “I was a little bit angry with him, I was like, ‘excuse me?’ ... in a jokey way, I was just like ‘you need to add me straight away’ ... then [looked at] who else he’d added... because obviously he’d added some people from work as well and I wanted to know who he added, who he picked over me. I should’ve been the first add”.

P3: “maybe it was a case that because we met when he knew he was gonna be living with us he put on a slightly more reserved front, whereas on Facebook you’re sort of talking to people you’ve maybe known for years, you’re just more yourself... he’s probably more consistent with the Facebook opinion, I see him going out every night bringing girls back to our house, and yeah from conversations with him he’s a bit more of a typical bloke”.

P14: “they [his impression of her] might have changed if I’d seen her doing some kind of sensual photos or something like that... if there had been, not soft porn, but you know that kind of thing, really skimpy bikinis and guys kissing them and whatever... then I might have thought, ‘oh right, she’s a party girl’ or I don’t know, that might have changed my impression of her, or if she had no kind of friends feed, then I might have thought she’d’ve been a bit of a loner type thing”.

5.5. General Discussion & Implications for this Thesis

5.5.1. Overall impressions of communication patterns and relationship consequences

The themes identified from the interviews suggest people progress through stages of their relationship and adapt their communication type, depth and method throughout the process. It was found that Facebook use can develop, maintain and dissolve relationships, but the valence of Facebook utility for such outcomes depended on the stage of relationship between interaction partners. There were exceptions to this general finding, where a few cases started their relationships online rather than offline, or suggested Facebook was not influential. There also tended to be a discrepancy over Facebook use depending on the geographic dispersion of interaction pairs.

At the onset of a relationship most interviewees met their friend offline, with only 3 of 34 cases meeting online first. At this stage it seems that offline knowledge of the person is necessary before adding them to Facebook unless a task or function of Facebook is required. During the process of accepting a friend request on Facebook, a tendency was displayed to look for cues to identity about the person if they had little idea who they were. Once the interviewee was certain of the name and profile picture, typically recalling where they had met, the friend request was accepted. This marks the first step to reduce uncertainty at the early stages. Congruent to URT, high levels of uncertainty led to increased information searching behaviour. During the process of adding a new friend to Facebook this came in the form of first finding out who the person was. Once added, uncertainty was reduced through more thorough information searching. At this stage the interviewees aimed to find out what the other person is like and to determine how they fit into their social world. Typically this involved scouring the profile for general activity on the wall, looking for mutual friends, using photographs to form an impression of the other person and reading status updates and comments on the photographs.

These first instances of information searching to reduce uncertainty about another involve *passive* information searching. The interviewees look around the profile, observing interactions, potential known network connections and forming opinions of the person based on what they identify. At these early stages evaluations of a new friend can be positive or negative depending on the information displayed and how it fits into the information receiver's schema, or by how much it adheres to an expected social contract. Different information types and Facebook features can result in different judgements based on their content and use. Generally, profile pictures were considered to offer valuable insight to a new friend's personality and social make-up. At

initial relationship stages, if profile pictures depicted the individual as overly “into themselves” or too “sensual” it created a poor impression. Similarly, profile photographs were expected to contain an image of the person so that they could be identified. A reasonable level of activity with friends shown on the wall of a new friend was also expected, and a general lack of activity resulted in them being labelled “weird”, or socially recluse. Axiom six of URT suggests that similarity between interactants helps reduce uncertainty, and individuals expressed this phenomenon when searching for confirmation of what the other person is like. Still within early relationship stages, recipients of information desired knowledge of friends in common to see how they fit into their social network.

Around the latter stages of *passive* information searching, interviewees expressed interacting with their new friends using particular features of Facebook. This marks a move into more *interactive* strategies of uncertainty reduction but also a desire to conform to a social contract of communication intimacy ensuring the method of communication reflects an appropriate level. Interviewees expressed that at the early stages of a relationship they may comment on their new friend’s wall, comment on their photos or join in some group “banter”. Furthermore, it was often reported that they would not use specific features with a new friend, indicative of the associated intimacy of that feature. For example, interviewees would not be inclined to use the direct chat or direct message feature (now a combined feature set in Facebook), noting that they may do as the relationship progresses. Similarly, when discussing a degrading relationship it was expressed that communication may move back from direct messaging and direct discourse through other mediums to general commenting and viewing of profile elements before reducing to very little or no direct communication via Facebook.

During the initial period of uncertainty reduction and information seeking, it is necessary for information to be visible on a new friend's profile. This has implications for both disclosure and privacy. Within a personal privacy boundary, a user may wish to conceal information from new friends to stop information spread to those whom they are uncertain about. However, by doing so it does not allow a new friend to browse all aspects of the profile and form positive impressions. By not sharing enough information it seems to have the opposite effect, forming negative opinions in the minds of new friends who need information to reduce uncertainty. Contradictorily, too much information available to a new friend may lead them to draw false negative conclusions about the poster's appropriateness. Photographs where too much of the body is revealed, or where inappropriate behaviour is occurring compared to the new friend's current expectations may lead them to be more uncertain that the discloser is somebody they wish to be friends with.

Overall it is concluded that at early stages it is useful to show information and display some activity, in particular, wall activity, status updates, activity from friends and 'normal' profile photographs. As the relationship progresses and more information is required to reduce uncertainty, more thorough information searching occurs. There is a shift towards *interactive* information searching.

Once interaction partners had added one another to Facebook and initiated the uncertainty reduction process, interviewees expressed the need to meet the other person offline to develop the relationship on Facebook, or expressed that the relationship may develop on Facebook because they would be seeing them offline. Interviewees said they could not use a particular Facebook feature, such as direct chat or direct messaging, unless they knew the other person better. Other interviewees said that they do not place much emphasis on what somebody is like via Facebook and only build up a true

representation when meeting offline. In addition, most interviewees expressed offline interaction as being important when discussing how they met, whom they would socialise with and the situation that allowed them to get to know their friend better. This is emphasised in the categories ‘mode switching’ and ‘you’re not important enough to stalk yet’. In the latter category, the relationship on Facebook is paused once the initial connection is made until it develops in other environments.

The importance of offline interaction with new friends differed between early stages of offline interaction and later stages, relative to intimacy. That is, when first meeting a new friend offline it tended to involve a group of friends or a group social activity, such as a party or wine evening. Once interaction partners developed their relationship offline, more features of Facebook were subsequently used and future offline interactions could move from group social activities to one-to-one, personal activities.

It should be noted that at any stage of certainty and relationship development, whether offline or on Facebook, as the relationship and communication pattern progressed the previous method(s) of communicating or socialising could still occur. That is, when friends became more intimate, or knowledgeable of one another, they would *add* to their array of communication channels, not *substitute* earlier methods for later methods.

With old friends interviewees showed a tendency to use mode switching. Interviewees described mode switching either for convenience or because the conversation was more personal or intimate. When discussing convenience, other modes of communication or direct messaging on Facebook were used when two friends became geographically distant. Examples of such communication included Skype or Facebook use rather than phone calls, text messages or emails because it was easier to

use Facebook, or free to use Skype or Facebook. When discussing mode switching for greater intimacy, interviewees expressed holding discussions face-to-face, again showing the dominance of offline channels. Alternatively they discussed using Facebook to arrange a phone call at another mutually convenient time. In addition it was expressed that Skype may be used because there were more cues to how the friend was feeling and because it felt more personal, in line with early findings of Internet communication where the Internet was considered to involve less cues and therefore be less personal, (e.g. Walther, 1992).

There were exceptions to the above general descriptions and identified phenomenon. Certainty seemed to be required before a relationship could progress and Facebook helped in the early stages to reduce uncertainty. Figure 5.2 outlines the categories across time as expressed by interviewees, suggesting that the themes are progressed towards offline interaction then onto more general, multiple mediums of communication and involve more personal details.

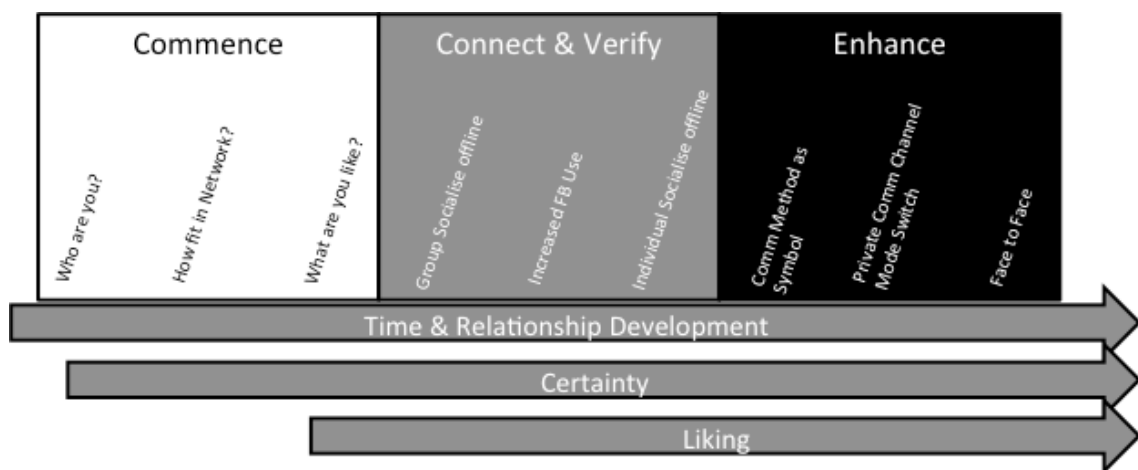


Figure 5.2: Themes and stages of communication with simultaneous relationship stage progression with certainty and liking development

Interviewees relied on an expected social contract when adding a new friend to Facebook and progressing through the relationship. At early relationship stages the social contract can be violated at a surface level, i.e. small violations of the contract regarding profile photographs or lack of wall activity. As relationships develop the expected social contract involves the methods of communication and the features of Facebook interaction partners find acceptable to use. Early on, interviewees expressed that it would be inappropriate to send direct messages or communicate directly with the friend, but preferred passive information searching. Later in the relationship, interviewees described using more features of Facebook, communicating directly with them as well as eventually having one-to-one offline interaction and using multiple mediums to communicate. This highlights a developed norm of Facebook interaction whereby features can only be used with particular types and strengths of network tie. It also suggests that at some point around the latter offline interaction stage, it becomes appropriate to commence interaction via phone calls, text messages or Skype calls. Unless a relationship starts online, it was generally expressed that offline connections must be made before using Skype, phone calls and text messages identifying these communication channels as indicative of deeper self-disclosure. However, it should be noted that on the few occasions where communication was task oriented, i.e. to achieve a work goal, communicating outside of Facebook appeared to be the norm, regardless of relationship stage. This can be observed similarly in Global Virtual Teams using internet technologies to communicate, such as video conferencing, conference phone calls and group emails (e.g. Anawati & Craig, 2006; Huysman, et al., 2003; Jarvenpaa, et al., 1998; Ridings, et al., 2002; Shachaf, 2008).

From the observed mode switching and change in level of communication to deeper disclosure, it is suggested that the process of switching mode itself may indicate

a move into more intimate communication and further relationship stages. For example, in a dating scenario moving from meeting in an offline environment to exchanging telephone numbers or email addresses may signal a desire by both parties to increase intimacy. However, for task-oriented goals it may be necessary to exchange email addresses, phone numbers or Skype handles to organise an event or goal. Signalling through the use of a medium is supported by established literature (e.g. Daft & Lengel, 1986; Trevino, Lengel, & Daft, 1987).

With reference to Altman & Taylor's (1973) social penetration model, the use of different communication mediums can be displayed visually. Within this study deeper disclosure, that relating to core constructs of the self, occurred in more established friendships, was related to increased communication frequency and an increase in the number of methods used to interact. Therefore it may be viewed in opposition to the slicing from peripheral to core constructs of the self originally proposed in the social penetration model. Altman & Taylor suggest that there are greater number of categories of the self as well as more frequent disclosure of these categories towards the peripheral layers of our self construct. Towards more core levels there are less categories of and deeper disclosure of information. Figure 5.3 shows the social penetration model with Altman & Taylor's representation of disclosure, overlaid with the frequency and communication types used by interviewees in this study. Further detail of the progression from fewer disclosure methods and lower frequency to a greater array of mediums and more frequent interaction is shown in the extrapolation of the additional element of the social penetration model produced by this work (Figure 5.4).

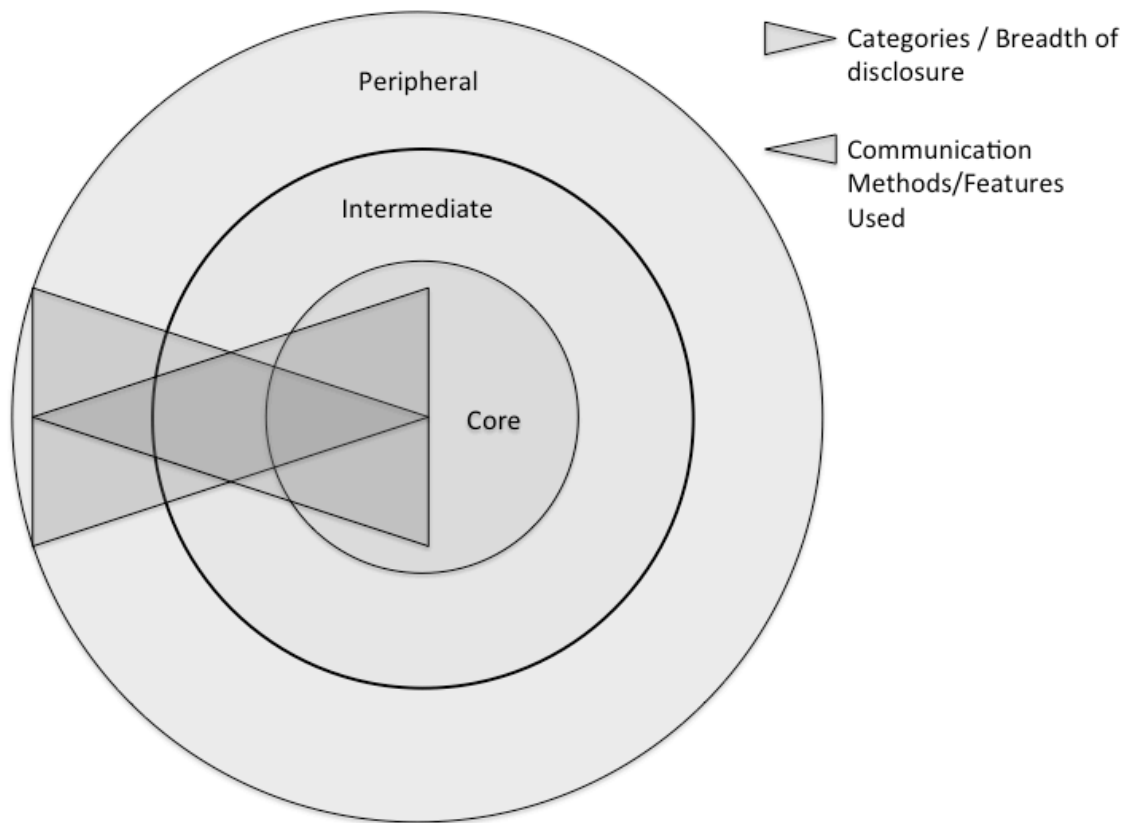


Figure 5.3: Development of Altman & Taylor's (1973) Social Penetration Model to include number of communication channels used.

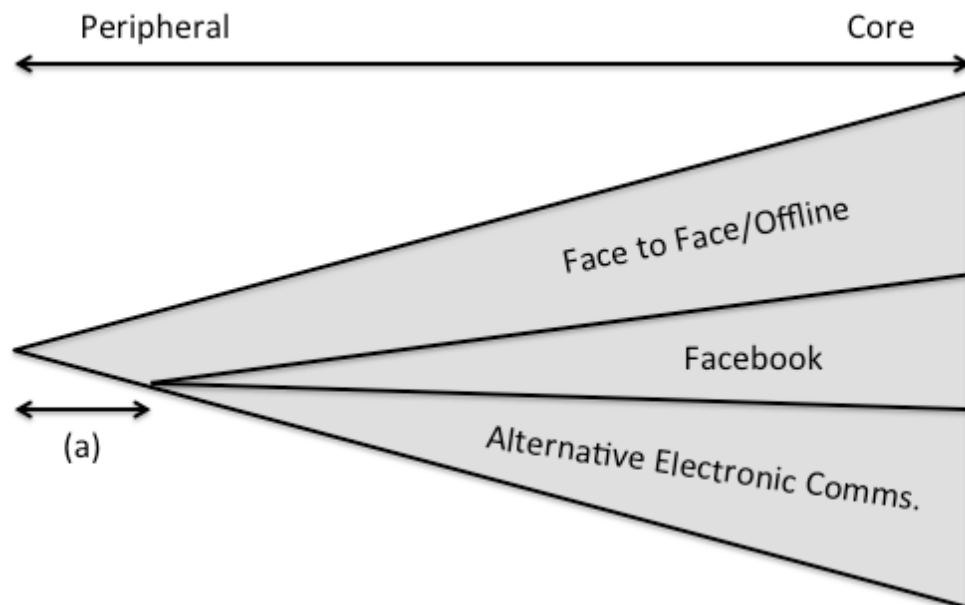


Figure 5.4: Communication methods and frequency with reference to level of self-construct disclosed

As shown in Figure 5.4 relationships observed in this chapter tended to start in the offline environment. After an initial period (a) the interaction partners may add each other to Facebook and exchange phone numbers or Skype handles. However, towards more core layers of disclosure and intimate discussions, the spectrum of communication broadens to include more Facebook features, more offline interaction and a greater number of alternative electronic communication mediums.

However this model presumes that the expected social contract at each level of the relationship is fulfilled and the relationship is successfully progressed. A critical finding of this study is that there is a fine balance between expected norms of disclosure, and being either too private – withholding valuable information that would allow a relationship to progress at early stages – and being too open – sharing too much or inappropriate information as perceived by the recipient resulting in a negative judgement of character.

As observed in Study 3 (Chapter 4) the balance between sharing too much information (for Study 3 this was in depictions of photograph content) and withholding information is different depending on the recipient. The current study found that the stage of a friendship can determine what is appropriate as well as individual differences in preference. Study 3 shows that the type of relationship held with the recipient can alter the perception of received photographs and consequently alter relationship quality. The current study also identified photographs as a critical component of Facebook information exchange. Interviewees looked for photographs at the early stages for identity verification and to judge character, but also to identify common events they had participated in once the offline relationship had developed.

The current study demonstrates that the use of SNS can support the development of relationships, particularly in the early stages. Furthermore, Facebook use and making

connections with friends helped to maintain a relationship. Critically, Facebook use can also deteriorate a relationship by leading information recipients to negative conclusions about new friends when conducting information searching. As a relationship progresses, SNS can support offline interaction through coordinating and documenting offline events and activities. The different features available in Facebook support the different needs of interaction partners at different relationship stages. However, it is broadly concluded that offline interaction still dominates the progression of a relationship and that SNS act as a support tool. When discussing more intimate topics with a friend, individuals may use a wider array of communication mediums that include SNS to support such discussions. Last, the use of different features within an SNS can indicate to a friend the intimacy intrinsic in a relationship.

With specific reference to research question 1a, this study shows that disclosure can lead to liking, but it is important to acknowledge that there is a fine balance between appropriate and inappropriate sharing that alters depending on the SNS feature and stage of relationship, as well as the level of certainty interaction partners have of one another.

This study addressed research question 1b suggesting that different features can signal different levels of intimacy and a feature used at an inappropriate stage of communication, or for an inappropriate purpose (when task related) may be detrimental to interpersonal relationships. Later stages of relationships are linked to greater use of Facebook features in both number and frequency. However, the quality of a relationship is more likely affected by offline incidents.

For research question 2a this study suggests that the stage of a relationship can be influenced by information sharing, and that different stages are characterised by different expectations of Facebook feature use. Similarly, for research question 2b, a

similar process is demonstrated. Earlier stages of friendship are characterised by low levels of certainty and the features of Facebook can impact on certainty levels, again requiring a fine balance between disclosure and non-disclosure on Facebook profiles. Uncertainty reduction is initially characterised by passive information searching practices, and moves to interactive strategies. However, support for active strategies of information disclosure was not identified. This may be in part due to the study design. Interviews asked users to talk about how they add, search and communicate directly with a new or old friend, and areas involving discussing this friend with others were not covered.

The final research question addressed in this chapter, 3a, is significant and perhaps produces the greatest contribution of this study. Balancing privacy and self-disclosure is important, and evidence throughout this study suggests that the balance is not always found. Interviewees expressed a negative evaluation of their new friend in some cases, which identified the process of over or under sharing within the Facebook environment. However the study has provided insight into how the balance can be used to manage relationships of different stages. It is preferential to utilise the privacy settings available and control access to different information in Facebook. With a new friend it is suggested that privacy settings are used to limit the visibility of some of the profile photographs to new friends, either by utilising a 'new friends' group setting and changing the individuals to an 'established friends' group, or not disclosing photographs that may be deemed inappropriate by any recipient. However, the latter solution will result in a broad collapsing of context, (e.g. Binder, et al., 2009; Marwick & Boyd, 2011), neutralising any photographs added and this may affect relationships that have already developed, as in Study 3. Furthermore, withholding too much information may prohibit new friends from reducing uncertainty, and reduce site stickiness, degrading the

overall experience of using Facebook, (e.g. Burke, et al., 2009). With more established friendships, such restrictions over photographs may not be necessary as the relationship pair may have a greater understanding of one another from their offline interactions and interactions through other mediums, thus will expect photographs more akin to their natural personality with less impression management. This identification of the need to control photograph sharing with targets at different relationship stages adds support to Study 3.

Control over the dissemination of information goes beyond restricting or allowing specific types of photographs. Other areas require balancing as expressed by interviewees. These include showing some activity with friends on the profile wall, allowing friends to be navigated to determine who the new interaction partners have as mutual friends, and ensuring that status updates and photograph comments are not egotistical or offensive. However, this is not a straightforward exercise. There are likely to be individual differences to what is found to be offensive and appropriate. Furthermore, the Facebook privacy settings are notoriously difficult to navigate and set up, and are often subject to change by the site owners and developers.

Overall it is concluded that Facebook is a useful tool that can aid in relationship development and maintenance. However, care is needed to ensure that appropriate information reaches others based on the appropriate relationship stage.

5.6. Limitations of Study 4

Although steps were taken to ensure validity and reliability, such as an interview plan and interview environment and question style considerations, there are several limitations to this study that may influence the overall results. First, interviewees participated for course credit. While this is unusual in management and business

schools, it is not dissimilar to the practice of offering financial rewards, and is commonplace in psychology departments throughout the UK and USA. Students needing a boost to their overall grade may be more likely to volunteer for participation than those who have consistently high grades throughout their course. The credit formed a very small percentage of a participant's overall module grade (ca. 1% maximum for 1 hour participation), therefore an even smaller percentage of their overall degree mark.

A second consideration is the potential overlap between themes. Although designed to determine instances of certainty, liking and general information sharing, the study themes are not as distinctive. Although the researcher made several passes of the data set and theme structure, it is possible that some utterances were not in a theme of best fit. While it was generally considered a robust process using previously proposed interview structures, processes and designs (e.g. Braun & Clarke, 2006; Bryman, 2008; Creswell, 2009; Johnson, 1997; Johnson & Onwuegbuzie, 2004), categories were not coded separately by other researchers. This is in part due to the need for this work to be entirely the author's.

A limitation of the study design is that the expressions of the interviewees were related to the adding, searching and communicating patterns of new and old interaction partners. Within the label of new and old friends it is possible for the relationship type to be one of many, i.e. it was not enforced that the targets were friends rather than relatives or partners. However, this was a necessary component of the study to ensure that the targets discussed were either the last added, removing any effects of missing an initial online interaction period. Simultaneously, it ensured that old friends were friends that the interviewee communicated with regularly using Facebook to determine the differences in feature use and information searching practices. This point is considered

neutralised through the triangulation strategy adopted across all five studies of this thesis.

Another consideration is that of the positivist approach taken to this research. Traditionally qualitative designs are considered as part of - or implicit in - an interpretative approach. However, this research used a more rigorous theory driven design. This may be criticised by those strictly advocating the use of TA and qualitative practices in general to allow theory to emerge from the data set. However, to do so would be directly opposing the overall research structure and the understanding of the researcher.

As described in section 3.9, excerpts were considered as contributing to a theme if the interviewee expressed a theme concept explicitly. However, throughout the analyses it became evident that there were areas where the interviewee did not discuss a particular construct explicitly. The need to reduce uncertainty was implicit in their behaviour and so represents a slight deviation from the pure semantic level of analysis desired. It is still considered that the approach fits within the positivist philosophy.

A final consideration is that not all areas of interpersonal communication will have been captured in the interviews. Participants may have other methods of communication or discuss more in-depth topics with their new friends but not expressed it in these interviews about Facebook. For example, an interviewee may have met a new friend several times before adding them to Facebook and so already formed an impression of them and discussed deeper level constructs.

6. Phase 3: Quantitative Analysis of Facebook Features, Certainty, Liking and Relationship Stage

6.1. Introduction

This chapter aims to validate the findings of chapters 4 and 5 and investigates the relationship between certainty, liking and sharing using quantitative analyses (see Figure 6.1). Studies 1-4 demonstrated how the use of Facebook could develop, maintain and weaken relationships and had implications for uncertainty reduction and best practices for information sharing in Facebook. Concepts identified in the interviews (Study 4) will be validated in this chapter and investigations will extend to identifying differences in liking and certainty at early and late stages of relationships, while controlling relationship type.

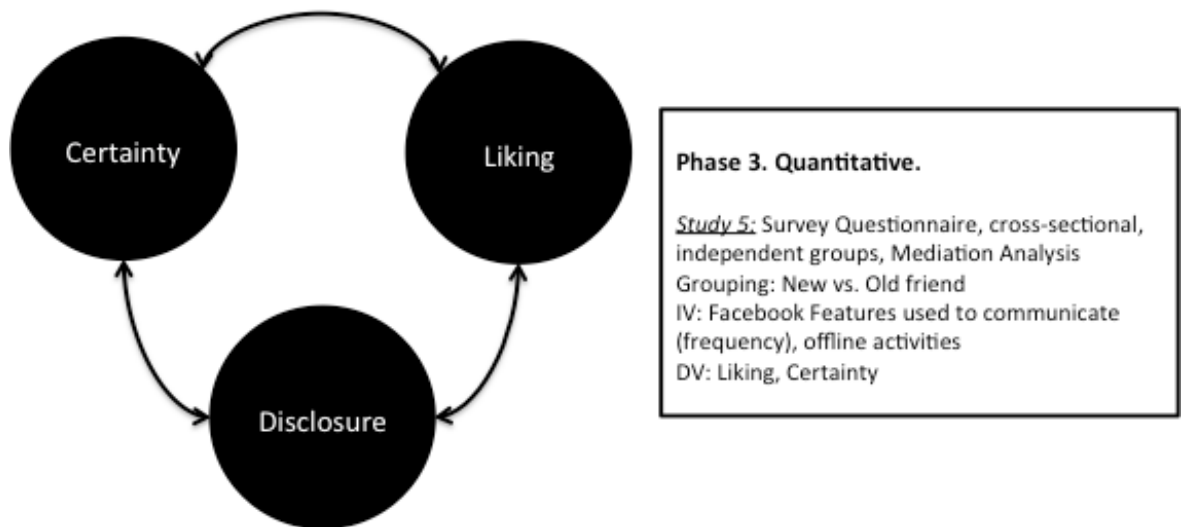


Figure 6.1: Sections of model investigated and Study 5 aim and design.

Studies 1-3 showed that different relationship qualities are held with different relationship targets, i.e. a relative, partner, friend or colleague. It was also demonstrated that viewing photographs shared by a particular relationship partner in Facebook could have positive and negative relational outcomes, and that depending on the depiction in

the photograph an optimum balance can be achieved by limiting sharing of some photograph types. These results led to the conclusion that information sharing frequency can a) directly influence relationship standing, b) interact with the type of photographs shared to influence relationship standing, and c) interact with both sender type and photograph type to influence relationship standing.

The interviews in Study 4 showed that other types of information shared in the Facebook environment could be used to influence relationship outcomes. Interviewees suggested an iterative process, meaning that information seeking can help build certainty and develop a relationship, yet certainty and relationships generally must be at a particular level or stage for information sharing to move to more channels of communication and deeper disclosure. There was also a tendency to shift toward greater offline interaction as the relationship progressed, unless geographically dispersed.

Therefore the following hypotheses are developed to test a sample of the variables highlighted in studies 1-4, and identify the process of developing certainty in Facebook and its relationship to liking: -

H5: Participants will communicate with Old friends more frequently than New friends across all mediums.

H6: Certainty will correlate positively with liking for all participants (sample validation).

H7: Sharing (information seeking and interaction) will lead to greater certainty.

H8: Sharing (information seeking and interaction) will lead to greater liking.

H9: The relationship between Sharing (information seeking and interaction) and liking will be mediated by certainty.

The hypotheses and subsequent analyses make the assumption that an expected social contract is not violated in this sample. The remainder of this chapter is structured as follows. First the study design will be discussed with reference to achieving the aims of this study. Second, the analysis and results will be presented. Third, an interpretation of the results and discussion are conducted.

6.2. Research Design & Methods

6.2.1. Design

A cross-sectional, independent groups design is adopted in this study (see Appendix 6 for the questionnaire, data and output files used throughout this study). Two surveys are constructed to test the manipulated variables: a survey measuring the variables with a new friend, and an established friend (old friend). The type of relationship in this study is restricted to a friend. The variables investigated include demographic variables (age in years, gender, relationship status, education level, ethnicity and nationality), gender of their chosen focal target (friend), how long they have known the focal target, where the focal target was met, how often participants see them, and the likelihood of interacting with them in a) the environment in which they met, and b) socially.

Following the demographic questions, participants are asked to think of either a new friend, or an old friend. For a new friend, participants are asked: -

“For the remainder of the survey we ask you to answer the questions with regard to a NEW person you have just met and ADDED on Facebook”.

For an old friend participants are asked: -

“For the remainder of the survey we ask you to answer the questions with regard to a friend you knew before coming to university that has not come to the same institution (or did not go to university) AND whom you have as a friend on Facebook”.

Both types of surveys then ask participants to write a reference for the focal target to help keep them in mind throughout, as per Study 3.

Variables relating to their general communication are measured. Participants are asked how often in the last two weeks they have communicated via: Face to Face, Telephone, SMS, Email, Instant Messenger/Chat, SNS, or Letter. Participants will answer these questions using a 7-point scale labelled ‘Never’ to ‘Almost Constantly’. Participants are asked to identify the activities they are involved in with their friend when they meet face to face. Answers are given in up to 5 open response boxes. However, the nature of the activities is not of interest. Rather it is the number of activities they engage in with their friends that matters. The data are therefore tallied to a maximum of 5 activities.

Participants are then asked about their Facebook use with this person. First, which features of Facebook they use to communicate with the focal target, including: commenting on their posts, writing on their wall, commenting on their photos/photos of them, sending them a direct message, and using the chat feature. Answers are given using a 5-point scale from ‘Never’ to ‘Nearly Always’, with a further option indicating that the feature cannot be seen or is not available on their profile. The participants are asked how often they use the following features of the focal target’s profile when interacting with them: upload photos of them, tag them in photos, ‘like’ their photos, ‘like’ their comments, ‘like’ others’ comments on their wall, view their photos and view their videos. The same 5-point scale as in the previous question is used. The first of

these two questions concerns direct communication with the focal target, and the second question involves information searching or an interaction that does not require ‘written’ expressions.

The final two questions determine the participant’s liking and certainty scores of their friend. The liking scale is adopted from Rubin’s (1970, 1973, 1974) Liking scale. Responses are given on a 5-point scale where 5 indicates the most positive end of the continuum. The continuum ranges from “Disagree Entirely” to “Agree Entirely”, with a middle value (3) of “Neither Agree nor Disagree”. However, Rubin’s original scale consists of a continuum that is converted into a 9-point scale using a ruler and the marks left by participants on the line between the two ends (Rubin, 1974). Therefore, for ease of responding and clarity from participants, a 5-point scale is adopted (e.g. Berg, 1984) with the same continuum pole labels as Rubin’s original scale. Six items of the 13 items available on the various Liking scales are selected based on the text of the scale item and its appropriateness to this research. Therefore, the six questions asked are, “When I am with____, we are always in the same mood”, “I think that____ and I are quite similar to each other”, “I would vote for____ in a class or group election”, “I feel that____ is an extremely intelligent person”, “____ is one of the most likeable people I know”, and “____ is the sort of person whom I myself would like to be”. After cleaning the data file, scale reliability was tested producing Cronbach’s $\alpha = .751$ for the 6 scale items (N=112, 1 excluded case).

To measure certainty Clatterbuck’s (1979) CL7 Attributional Confidence scale is used, which is derived from suggestions of topic area for certainty by Berger & Calabrese (1975). All seven items are included and the responses re measured using an 11-point scale, rated 0 “Not at all”, to 10 “Entirely”. An 11-point scale is used offer an available mid-point to participants, and because the original scale used a 0-100% scale.

The adopted scale thus offers a comparable, scaled down version of the original. However, it is also noted that a 4-point and 9-point scale have also been used (Clatterbuck, 1979), but an 11-point scale is more in keeping with the original. Scale reliability was tested producing Cronbach's $\alpha = .967$ for the 7 scale items (N=111, 2 excluded cases). Although $\alpha = .967$ is high, the original CL7 scales have previously been found to have a reliability ranging between $\alpha = .763$ to $\alpha = .975$ (Clatterbuck, 1979; Douglas, 1990), with lower values relating to scales using only 4 of the 7 scale items.

6.2.2. Participants

Participants were new students at the University of Bath, School of Management (i.e. year 1, semester 1, weeks 1-2 of their course). The researcher gained access to a first year undergraduate module where surveys were handed out. The students were split into 5 classes across a two-week period, therefore 150 students responses were gathered in five stages across the first two weeks of semester 1. A prize draw was run offering the participants the chance to win an Apple iPod Nano for their participation.

After cleaning the data file for incomplete surveys or fatigue/extreme responses, the sample consisted of N=113 (New Friend n=59, Old Friend n=54). The age of the participants across all groups was 18.68 ± 1.34 (mean \pm S.D.), ranging from 17 to 27 years, 18.73 ± 1.41 for the New focal target group, and 18.63 ± 1.26 for the Old focal target group. An independent samples t-test confirmed the ages were not statistically different between groups (Equal Variances Assumed: Levene's $F = .011$, $p = .917$; $t = 0.392$, $df = 111$, $p = .696$ (2-tailed), n.s.). Participants were 55 females and 58 males overall, with 27 females and 32 males in the New group condition, and 28 females and 26 males in the Old group condition. Five other students were approached outside of the undergraduate class, and were each in the first two weeks of their degree, at a new

university (i.e. were not previously studying at the university having established friends already). Overall, 107 participants were undergraduates, 4 postgraduate masters students, 1 PhD student and 1 ‘other/undefined’, all of which had just started at the University of Bath.

6.2.3. Materials & Procedure

The two survey types were printed on double-sided A4 sheets and stapled to consent forms and debrief forms. Separate sheets were handed out alongside the surveys for participants to sign up for the prize draw. Small chocolate snacks were also handed out at the time of survey completion. Surveys were handed out in alternating sequence to assign participants to the new and old conditions, such that in their rows in class, participants were not sitting next to anybody taking the same survey type. Participants were given 15 minutes in the middle of the class to complete the surveys. In addition five other students were approached who were in their first two weeks of a new degree at the university, and took the survey in similar, timed environments. Completed questionnaires were collected and data were entered into a spreadsheet to be transferred into SPSS for data analyses.

6.3. Analyses

Nine independent t-tests were conducted using friend type (New or Old) as a grouping variable (see Appendix 6 for raw data and output files). Tests were conducted to determine with which friend type participants communicated more frequently across eight platforms: Face-to-Face (FtF), Phone, SMS, Email, IM, SNS, Facebook Direct Message, and Facebook Chat. The ninth test was conducted to determine if the number of activities participated in with a friend was different depending on the friendship stage

(New or Old). A Pearson Product Moment Correlation was conducted to identify the relationship between certainty and liking in this sample. This test simultaneously acts as sample validation as previous research suggests increased levels of certainty are related to increased liking, e.g. (Berger & Bradac, 1982), as do the results of Study 4. To determine the effects of viewing photographs (information searching) and commenting on other's profiles (interaction) in Facebook on liking and certainty, mediation tests were conducted. Study 4 suggests that certainty develops before liking, and information searching is a process of uncertainty reduction at early stages of friendship. Commenting on others' profiles occurred more frequently at later stages of friendship and was associated with how well interviewees considered they knew their friend.

6.4. Results

6.4.1. Comparison of Means – New vs. Old friends

Nine t-tests were conducted to compare means between the interaction frequency of participants with New and Old friends in different mediums. Table 6.1 shows the group means for each of the DVs tested.

Table 6.1: Comparison of Means - Descriptives

Survey Type		N	Mean (2 d.p.)	S.D. (2 d.p.)
FtF Freq.	New Friend	59	5.14	1.86
	Old Friend	54	3.06	1.98
Phone Freq.	New Friend	58	2.10	1.36
	Old Friend	54	3.35	1.7
SMS Freq.	New Friend	58	2.93	1.96
	Old Friend	54	4.31	1.98
Email Freq.	New Friend	58	1.24	0.68
	Old Friend	54	1.72	1.5
IM Freq.	New Friend	58	1.69	1.26
	Old Friend	54	3.31	2.19
SNS Freq.	New Friend	58	2.84	1.65
	Old Friend	54	4.39	1.63
FB DM Freq.	New Friend	59	2.22	1.29
	Old Friend	54	2.98	1.27
FB Chat Freq.	New Friend	59	2.61	1.4
	Old Friend	54	3.50	1.34
No. Activities	New Friend	56	2.96	1.36
	Old Friend	49	3.47	1.19

For frequency of FtF communication there was a significant difference between New and Old friend conditions (Levene's=0.00, $p>.05$; $t=5.763$, $df=111$, $p<.001$ two-tailed). The mean scores show that FtF communication was higher with New friends than Old friends. There was a significant difference for communication frequency by Phone between New and Old friends (Levene's=1.596, $p>.05$; $t=-4.313$, $df=110$, $p<.001$ -two tailed). The mean scores show that frequency of phone calls is greater with Old friends compared to New friends. Scores for SMS frequency were significantly different (Levene's=0.122, $p>.05$; $t=-3.712$, $df=110$, $p<.001$ two-tailed), with mean scores higher for Old friends than New friends. Email frequency was significantly different (Levene's=15.781 $p<.001$; Equal variances not assumed, $t=-2.160$, $df=73.00$ (2 d.p.), $p=.034$ two-tailed), with mean scores for Old friends higher than for New friends. Instant Messenger communication was significantly different between groups (Levene's=37.177, $p<.001$; Equal variances not assumed, $t=-4.772$, $df=83.374$, $p<.001$

two-tailed). General communication via SNS was significantly different between groups (Levene's=0.007, $p>.05$; $t=-4.974$, $df=110$, $p<.001$ two-tailed). The frequency of communicating via the Direct Message feature of Facebook was significantly different between groups (Levene's=0.001, $p>.05$; $t=-3.164$, $df=111$, $p=.002$ two-tailed), with Old friends having higher mean values than New friends. Similarly, the frequency of communicating via the Chat feature of Facebook was significantly different between groups (Levene's=0.610, $p>.05$; $t=-3.439$, $df=111$, $p=.001$ two-tailed), with Old friends scoring significantly higher than New friends. The number of activities participants engaged in with New and Old friends was significantly different (Levene's=0.870, $p>.05$; $t=-2.009$, $df=103$, $p=.047$ two-tailed) with more activities conducted with Old friends than New friends.

6.4.2. Correlation – Certainty and Liking, New and Old friend

There was a significant positive correlation between Liking and Certainty across both group conditions ($N=112$, Pearson's $R=.576$, $R^2=.331$, $p<.001$ one-tailed). The correlation can be seen in Figure 6.2.

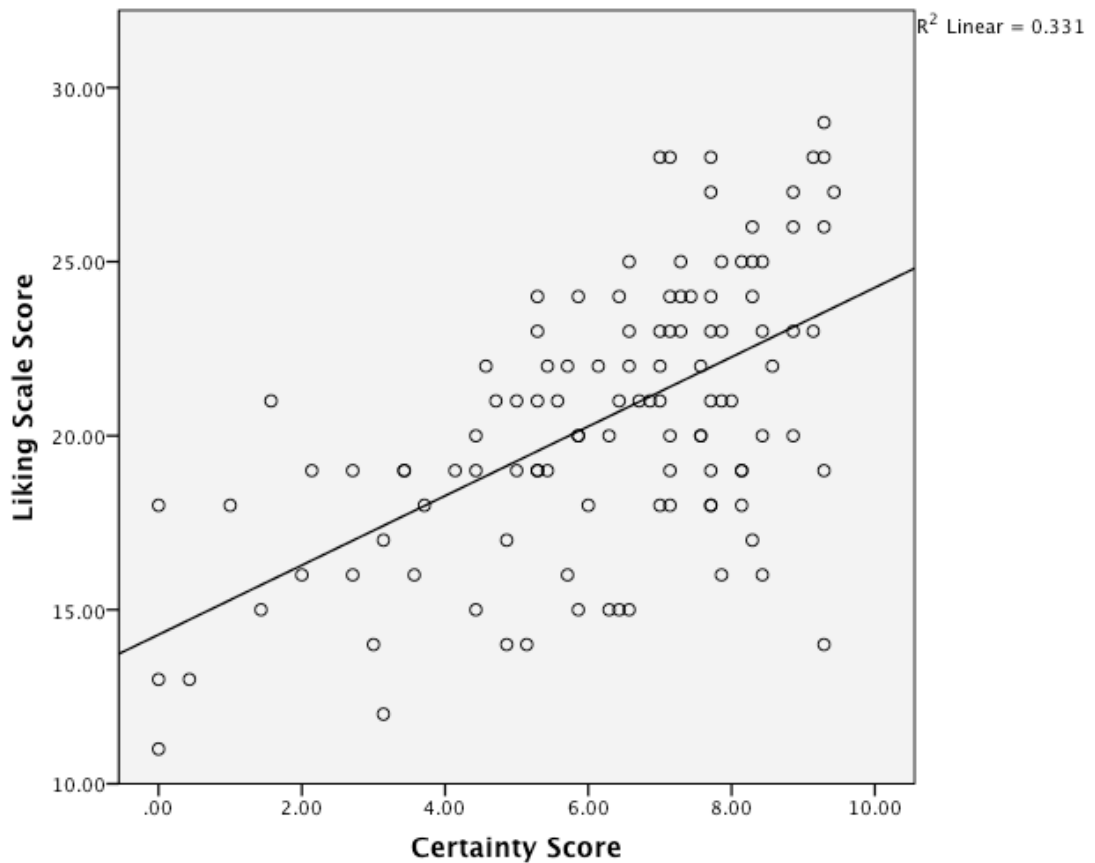


Figure 6.2: Certainty and Liking Correlation Across Both Conditions

6.4.3. Mediation Analyses – Photo Viewing and Commenting on Certainty & Liking

Mediation analyses were conducted using an SPSS add-in module developed by Dr. Andrew Hayes¹⁸, which conducts a bias correcting Bootstrap procedure and multiplicative mediation tests (i.e. $c = c' + ab$, cf. $c = a + b$) using inbuilt process commands of SPSS (for more details see Hayes, 2009). Bootstrap resampling was set to 10,000. Frequency of Viewing Photos was entered as X (IV), Liking as Y (DV) and Certainty as M (Mediator). An indirect mediation effect of Viewing Photographs and Liking was found, mediated by Certainty ($F=27.033$, $R^2=.332$, $df1=2$, $df2=109$, $p<.001$). There was no total effect of Photo Viewing Frequency on Liking ($F=2.573$, $R^2=.023$, $df1=1$, $df2=110$, $p=.112$). The effect of Viewing Photographs on Liking was

¹⁸ <http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html>

significantly reduced when Certainty was added as a mediator (Total effect of X on Y: $p_1=.112$, $B=.564$; Direct effect of X on Y: $p_2=.858$ $B=.054$), and the overall model was stronger ($\Delta R^2=.3316-.0229=.309$). The indirect effect values between the lower limit (.107) and upper limit (.983) of confidence intervals at 95% do not cross zero, i.e. have the same polarity meaning the indirect effect is not zero (Hayes, 2009). Figure 6.3 shows the indirect mediation (X-M-Y), total effect (X-Y), and direct effect (second X-Y)¹⁹.

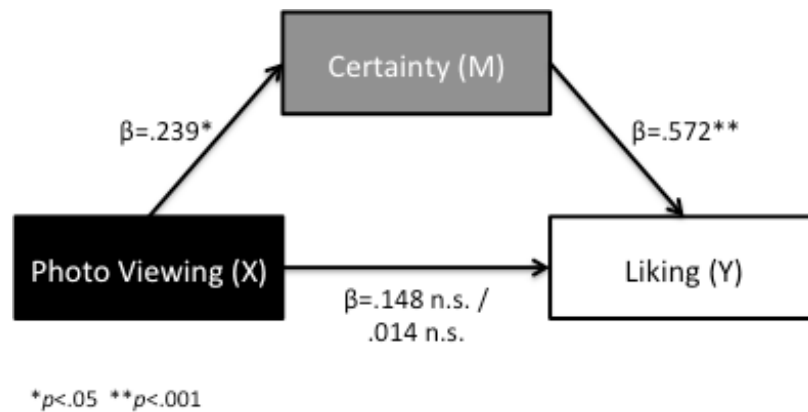


Figure 6.3: Coefficients for the Indirect Mediation Effect of Photo Viewing on Liking, by Certainty

Frequency of Commenting was entered as X (IV), Liking as Y (DV) and Certainty as M (Mediator). A total indirect effect of Commenting and Liking was found, mediated by Certainty ($F=28.885$, $R^2=.346$, $df1=2$, $df2=109$, $p<.001$). The total effect of Commenting on Liking was significant ($F=14.201$, $R^2=.114$, $df1=1$, $df2=110$, $p<.001$). The total effect of Commenting on Other's Profiles on Liking was

¹⁹ It should be noted that the Hayes mediation module does not produce standardised coefficients, therefore the models presented in Figures 6.3 and 6.4 use the Baron & Kenny (1986) method of mediation analysis ($c = a + b$) to present standardised coefficients. There are minor differences in the results, however the main effects of the models remain stable independent of analysis method. The in-text discussion and concluding analyses use the Hayes mediation module output.

extinguished when Certainty was added as a mediator, i.e. direct effect was non-significant (Total effect of X on Y: $p_1 < .001$, $B = 1.122$; Direct effect of X on Y: $p_2 = .116$, $B = .442$), and the overall model was stronger ($\Delta R^2 = .3464 - .1143 = .232$). The indirect effect values between the lower limit (.375) and upper limit (1.122) of confidence intervals at 95% do not cross zero, i.e. have the same polarity meaning the indirect effect is not zero (Hayes, 2009). Figure 6.4 shows the total indirect effect (X-M-Y), total effect (X-Y), and direct effect (second X-Y).

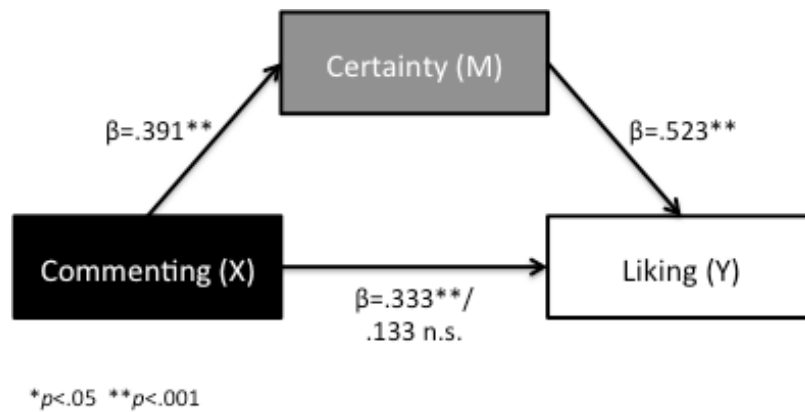


Figure 6.4: Coefficients of the Total Indirect Mediation Effect of Commenting on Liking, by Certainty

6.4.4. Unplanned Comparison of Means

The total effect of X on Y for Frequency of Viewing Photographs on Liking (i.e. the sharing to liking route for photographs) was not significant. To determine the cause further detail is required on the difference between the two group conditions for Frequency of Viewing Photographs. It was expected that photograph sharing would significantly predict Liking, but no effect was found. Therefore by conducting an independent t-test to compare scores between New and Old friends it is possible to establish any differences based on friendship stage.

If there is a significant difference then scores of Liking are independent to relationship stages in this data, i.e. viewing photographs is not significantly related to

Liking but is significantly related to relationship stage. If Liking is independent of relationship stage then it follows that there are more factors involved in perceived liking from viewing shared photographs than this relationship, and the indirect mediation finding (above) is critical to the overall research model.

A second t-test was conducted for Commenting to determine the differences in frequency of commenting on others' profiles. If there are differences in relationship stage it is concluded that commenting is directly related to liking, is different at late and early relationship stages, and is mediated by Certainty. This would support the results of Study 4 whereby commenting was deemed only appropriate at later stages of relationships when interviewees expressed knowing their friend well enough to comment.

The mean scores for New and Old friend for each t-test are shown in Table 6.2. There was a significant difference in Frequency of Viewing Photographs between Old and New friends, with participants viewing photographs more frequently on Old friends' profiles than New friends' profiles (Levene's=7.011, $p=.009$; Equal variance not assumed, $t=-2.416$, $df=107.291$, $p=.017$ two-tailed). A significant difference in frequency of Commenting on Others' profiles was found (Levene's=1.540, $p>.05$; $t=-6.199$, $p<.001$ two-tailed), with commenting occurring more frequently with old friends than new friends.

Table 6.2: Comparison of Means - Unplanned Contrasts

Survey Type		N	Mean (2 d.p.)	S.D. (2 d.p.)
Freq. View Photos	New Friend	59	3.29	1.18
	Old Friend	54	3.76	0.89
Freq. Commenting	New Friend	59	2.12	1.13
	Old Friend	54	3.33	0.93

6.5. Interpretation of Results & Discussion

6.5.1. Hypothesis Testing

The results from eight of the initial nine t-tests support H5: Participants will communicate with Old friends more frequently than New friends across all mediums. The findings of this study show that with an Old friend participants communicated more frequently via Phone, SMS, Email, IM, SNS, Facebook Direct Message, Facebook Chat, and participated in more activities than with a New friend. The first t-test showed that participants communicated more frequently FtF with New friends than Old friends, and this result does not support H5.

The results largely support the findings of Study 4, that at later stages of relationships participants communicate more frequently with their friends using a wide array of communication platforms compared to earlier stages. However, FtF interaction showed the opposite pattern, with participants communicating more frequently with New friends. This partly suggests that offline interaction is vital at early stages, before other methods of communication commence (as shown in the orange triangle of the updated social penetration model in Chapter 5, where FtF interaction is initiated before other methods of communication begin). However, it is likely that with this sample, the group condition for New friends specified that they were somebody the participant had just met in the first week or two of their degree programme, and Old friends were somebody that the participant knew before coming to university that did not come to the same institution. Therefore it is practically less possible for them to have communicated with their old friend FtF in the sampling time frame (two weeks prior to survey), whereas they are more likely to have contact with a New friend that they have met on their course or in halls of residence.

The correlation analysis showed support for the sample validation check, and thus for H6: certainty will correlate positively with liking for all participants. The significant Pearson Product Moment Coefficient suggests that certainty is positively related to liking, as measured by the CL7 and shortened Rubin liking scales (Clatterbuck, 1979; Rubin, 1970).

The mediation analyses support H7: Sharing will lead to greater certainty, for both information searching and interaction. Viewing photographs more frequently was related to increased levels of certainty (X-M route, Figure 6.3). Commenting on others' profiles more frequently was related to increased scores of certainty (X-M route, Figure 6.4).

The mediation analyses only partly support H8: Sharing will lead to greater liking. Viewing photographs more frequently was not significantly related to increased scores of liking (i.e. increased information searching did not relate to increased liking scores; X-Y route, Figure 6.3). However, commenting on others' profile pages was significantly related to increased liking scores (i.e. increased interaction related to increased liking; X-Y, Figure 6.4).

The results for H7 and H8 suggest a complex relationship between information searching, certainty and liking, and a simple relationship between interaction, certainty and liking. A possible reason for information searching not leading directly to liking is that photograph viewing occurs with similar frequency in Facebook with others of different levels of liking. That is, with a less liked friend photographs are viewed as often as with a more liked friend. Alternatively, viewing photographs with less liked friends may act as a form of uncertainty reduction process that later evolves into greater levels of Liking. As suggested by the analyses in Study 4, interviewees look around others' profiles at early relationship stages to find out who they are, how they fit into

their social network and determine what they are like, i.e. they use information searching to reduce uncertainty about others before making attributions of liking. This relationship was evident in the mediation analyses for the indirect effect of photograph viewing frequency on liking. Whereas commenting on a friend's profile is directly related to both liking and certainty. Analyses from Study 4 would suggest that interviewees would only comment on another's profile if they knew them well enough. This would imply that they had reached a particular level of certainty and liking to enable them to comment, as shown in the results of this study.

Information searching was not directly related to liking and was significantly positively related to certainty. To test if information searching leads to certainty and is required before liking can occur, as suggested by the timeline in Chapter 5.5.1 (Figure 5.2), a significant indirect effect must be found. H9 is supported fully by the mediation analyses conducted. There was a significant indirect mediation effect for frequency of viewing photographs and commenting on others' profiles (route X-M-Y, Figures 6.3 and 6.4). For photograph viewing, there was no significant total or direct effect, which means that liking is only increased by certainty which is increased by information searching. For interaction with others, liking is directly related to commenting on profiles, and is mediated by certainty, i.e. the direct effect is non-significant when commenting and liking is mediated by certainty.

6.5.2. Discussion of Findings and Implications

Overall the results support those found in studies 3 and 4. Sharing information allows others to view it and is useful to enable information searching and interaction to reduce uncertainty and increase liking. The results of this study add to the argument of a progressive use of many different features of communication and the requirement of

certainty to develop liking in some instances. However, it was also found that interaction is directly related to both certainty and liking, and suggests that although each are related, that some aspects of disclosure can lead directly to liking without the necessity to increase certainty. It should be noted that when interaction was found to relate positively to liking it was also found to relate positively to certainty and a mediation of sharing and liking was found with certainty.

The comparison of means shows that later stages of relationships (old friends) are symbolised by the use of available features of communication more frequently than at earlier stages. An exception was FtF interaction. Participants interacted FtF more frequently with their new friends than with their old friends. However, it is likely that this is due to the sample used, and the group conditions requiring an old friend to be a geographically distant friend who was not at the same university. The comparison of means for number of activities helps determine the offline interaction patterns with new and old friends. When asked to provide what activities participants did with their friend they were asked about offline activities and to give information about activities when they saw them, i.e. not restricted to the current or previous two-week period. Participants reported doing significantly more activities with an old friend than a new friend. This suggests that, outside of their forced university circumstances, the relationships they hold with older friends involves more offline interaction. This supports H5 and Study 4. Furthermore, it suggests that the FtF frequency found in this Study is representative of the sample and the manipulation performed. Thus, with older friends, offline interaction is greater than with new friends. Alternatively, high rates of FtF interaction of participants with new friends could be indicative of the necessity to communicate FtF to develop a relationship after making the initial connection. With the exception of FtF, overall the t-tests support the more frequent use of different channels

of communication at later relationship stages, with friendships that were already established.

The correlation of certainty and liking scores served to validate the sample. It was expected from previous literature and Study 4 that certainty and liking would be related. In Study 4 old friends had significantly higher scores of certainty than new friends, and interviewees expressed having greater certainty and stronger connections with old friends than with new friends. Furthermore, URT suggests that as liking increases, certainty increases (e.g. Berger & Bradac, 1982). The findings of the mediation analyses in this study suggest that certainty and liking are related to sharing in parallel, but certainty can also mediate the relationship between interaction and liking. There was no direct relationship between information searching and liking, which suggests that through photographs participants build certainty, which later allows them to establish liking with others. It is suggested that certainty builds through information searching in Facebook profiles, and that the relationships develop further to include liking through direct interaction, either through Facebook features such as commenting, or by meeting offline. However, the data for FtF interaction in this sample are restricted in that the group manipulations may be more important than the stage of relationship for this communication method.

To conclude it is considered that sharing information is vital to allow uncertainty reduction. Some instances of information sharing such as ensuring photographs are visible allow uncertainty reduction which leads to increased liking (presuming there are no social contract violations). Whereas other instances of disclosure such as direct interaction through the Facebook commenting feature, allow uncertainty reduction and increased liking directly, but critically the reduction of uncertainty encourages greater liking scores. It is suggested that direct interaction allows liking to develop, either via

Facebook communication features or in offline channels (Study 4). However, it should be noted that the process is likely to be iterative, that liking can lead to greater interaction and greater interaction in turn can improve liking. It is also suggested that information searching can act to decrease uncertainty, and subsequently increase liking, but the act of information searching alone does not directly relate to increased liking.

Therefore, it is necessary to show photographs to help reduce uncertainty, and it is a necessary component of liking to be interactive. However, as studies 3 and 4 suggest, there is also a fine line between sharing information to increase liking and sharing too much information to violate an expected social contract.

6.6. Limitations of Study 5

Study 5 successfully validated the relationship between disclosure, liking and certainty, and identified differences in Facebook use for new and old friends. However, several noteworthy limitations are identified, which could be addressed in future work. First, the data were collected using a cross-sectional survey design. Although this identifies differences in behaviour for the two types of friend investigated, a longitudinal approach would allow the capture of the development of Facebook use and dyads' relationships, i.e. the processes between the two cross-sectional studies could be identified. However, given the resource and time limitations of the present work it was not practically possible to utilise a longitudinal design.

A second consideration is the timing of the data collection. All data were collected across the first two weeks of a university course. While the patterns of Facebook use and relationship quality with an old friend may be stable across this period, in a new university environment with rapidly occurring interaction offline and online it is possible that between week 1 and week 2, i.e. between some data points, a

difference may exist in the quality of the relationships measured. However, in the broader scale of relationship development, one week is not considered a delayed time to collect data identifying differences in relationship development and Facebook use. A third related limitation is within the environment that the research was conducted. All participants were university students in the very early stages of their degree programmes, as designed to capture relationships with completely friends. However, such a huge change in life circumstances for each of the participants in this period, with potential contact with several new friends simultaneously, could impact on the frequency that the participants would communicate with their new friends.

Finally, future work may wish to consider other participant samples to test the findings of Study 5, i.e. outside of university environments. Such environments may be naturally encouraging of high frequency friendship development with new friends and reduced Face-to-Face and Facebook contact with old friends. However, contradictorily, old friends may be communicated with more frequently via remote channels in this period of adjustment to provide emotional support to the participants.

7. General Discussion and Implications of this Thesis

This chapter will discuss the key findings of studies 1-5, the specific contributions for individuals communicating within Facebook, and the contributions of the present work to the broader knowledge of Internet communication platforms and self-disclosure, uncertainty reduction, privacy and relationships more generally. The overall aim of this research was to use a single self-disclosure, URT and privacy lens (see Figure 7.1) to determine how intentional sharing of day-to-day information within SNS could impact on the relationships we hold with different network connections.

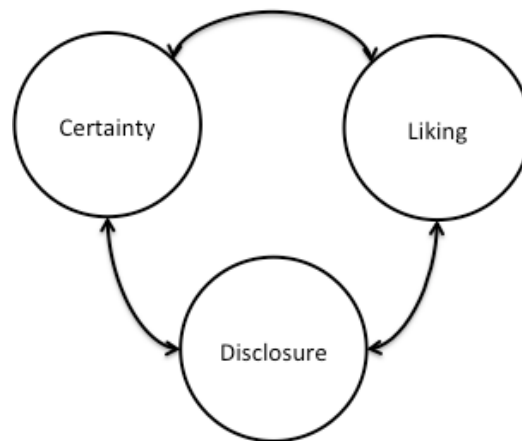


Figure 7.1: Cyclical model of disclosure, liking and certainty

Through a procedure of data triangulation utilising a mixed methods research strategy, the studies in the present work have four key contributions: -

1. Sharing typical day-to-day information in SNS can impact upon the qualities of *different* established relationships with both positive and negative consequences depending on the *details of the shared content*;

2. Increased *information searching* and *interaction* can lead to *increased liking* of others, but the disclosure to liking relationship is also *mediated by a decrease in uncertainty*;
3. It is necessary for information to *be available to-* and *shared with-* individuals to help the development and maintenance of relationships, but the *type of information available* and *the method of communication* differ depending on the *development stage of the relationship*. Concealing particular information may be detrimental depending on the relationship stage or target type; and
4. Although relationships can be developed via Facebook alone and Facebook is useful for relationship maintenance, *offline interaction* and personal conversation mediums form a large and *vital part of relationship development*, with individuals utilising a *wider array* of traditional and technological communication channels *as relationships progress*.

The four contributions presented here address the overarching research question of the current work: *How does the use of SNS affect our relationships?* First, a discussion of the potential contributions and results of the current work with reference to the research questions developed in Chapter 2 is presented. Second, a model of sharing, liking and uncertainty in interpersonal relationships using SNS is proposed. Third, the key findings will be discussed with reference to the reviewed literature.

The developed research questions were: -

1. SNS use and relationships:
 - a. How does information sharing in SNS environments strengthen or weaken our relationships?

- b. How do the features of SNS affect the qualities of our relationships?
 - c. How does the sharing of information in SNS affect our relationships with different types of recipient?
2. Relationship progression and uncertainty:
- a. Is there a relationship between stage of relationship and sharing information in SNS?
 - b. Is there a relationship between certainty and SNS use with others?
3. Balancing disclosure and privacy for successful outcomes:
- a. How are privacy and self-disclosure balanced in SNS to manage relationships?

7.1. Key findings and implications for the research aims and questions

7.1.1. The details of shared content and different relationship types

The first key contribution draws on studies 1-3, and partially on Study 4, to provide evidence for research questions 1a, 1b and 1c (highlighted in Figure 7.2).

Typical day-to-day information sharing can impact on the relationship qualities held with others. The extent of the impact is determined by the frequency and content of the information shared.



Figure 7.2: Research questions addressed in contribution 1

Study 1 found that relationships held with different target types have distinct relationship qualities. It was identified that photographs were the most used feature of Facebook, supporting previous research (e.g. Joinson, 2008; Jones & O'Neill, 2011), and therefore photographs were selected as the information category to investigate in Study 3. The results of Study 3 found that while photographs as a category of information sharing may be considered broadly similar, the exact content related to different levels of relationship qualities depending on the frequency at which they were shared by others. Across all relationship types sharing more photographs of *family* relates to lower scores of companionship, sharing more photographs of *friends* relates to higher scores of support and companionship, and sharing more photographs of one's *self* is related to lower scores for support, intimacy and affection.

Study 3 also found that photograph sharing in Facebook has different effects depending on the relationship a recipient has with the discloser, the content of photographs and the frequency with which they are shared. A general Facebook friend was compared with four target conditions: a relative, partner, close friend and a colleague. When a colleagues post photographs of family more frequently, it is related to increased scores of companionship, whereas colleagues sharing more photographs

depicting objects is related to a decrease in conflict. When partners share more photographs of events, it is related to increased scores of intimacy and support. In addition, partners sharing more photographs of family is positively related to increased scores of support, affection and companionship. However, more frequent posting of photographs depicting friends by partners is related to decreased scores of support, intimacy and companionship. The last interaction of photograph type with partners as the target is that more frequent sharing of photographs of objects is related to a decrease in affection and companionship. When relatives share more photographs of family and their self it is related to increased scores of support and affection, and increased sharing of photographs depicting family was also related to increased scores of companionship. More frequent sharing of photographs of friends by a close friend was related to decreased scores of support, intimacy and companionship, whereas close friends sharing more photographs of their self was related to higher scores of support, intimacy and companionship.

In Study 4 it was found that the precise details of shared content could make the difference between a new friend being perceived positively or being evaluated negatively. Interviewees reported that, with a new friend, if photographs contained depictions of extreme or abnormal behaviour they would be evaluated negatively. Interviewees also stated that within the self-description section of a Facebook profile, they would be looking to make sure that a new friend is similar to their expectations, and does not make profound statements about themselves or that there was information available in general. These expectations were stated with reference to a new friend, and so differences in the type of relationship cannot be determined, however these inferences of a friend by the information they post are indicative of a general

expectation of new Facebook connections, which may differ depending on the type of target connected with.

These findings suggest implications for research questions 1a, 1b and 1c. Information sharing in SNS can strengthen and weaken our relationships through the appropriate, or inappropriate, combination of information content, frequency and with different targets. Photograph sharing can improve or deflate a relationship by impacting upon the relationship qualities of that relationship. There is an interaction with the photograph type and frequency of posting photographs with the type of relationship held, such that: -

Information Content X Frequency = Impact on Relationship

And: -

*Information Content X Frequency X Relationship Type = Impact on
Relationship*

7.1.2. Sharing, liking and certainty

This section discusses the second key contribution of this work and addresses research questions 1a, 1b, and 2b. A discussion follows on the links between disclosure, liking and certainty within and outside of Facebook. The crux of this contribution is derived from the findings of studies 4 and 5, alongside implications from Study 3 (highlighted section of Figure 7.3).

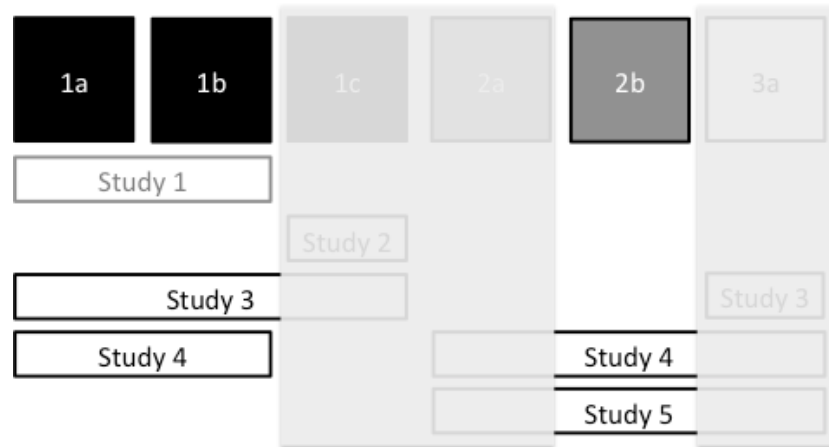


Figure 7.3: Research questions addressed in contribution 1

In Study 4 interviewees were asked to indicate on a scale between 0 and 10 their level of certainty about their new and old friends. T-tests on the data obtained found that interviewees were significantly more certain about their old friends compared with their new friends. Throughout the interviews it was generally considered that high levels of uncertainty existed with new friends, and interviewees would use information seeking strategies to discover information about their friends to reduce uncertainty. In the early stages of a relationship such information seeking was indicated through passive information searching to identify similarities between their self and their new friend in attitudes, activities and social networks. Similarities in attitude have been associated with liking and holding similar beliefs has also been linked to reduced uncertainty about others (e.g. Berger & Bradac, 1982; Berger & Calabrese, 1975; Byrne, 1961; Rubin, 1974). Similarities in activities can be argued to represent similar behaviours as well as interests. Seeking information about each of these activities acts to reduce cognitive and behavioural uncertainty about a new friend. As relationships progressed, interviewees indicated using more personal methods to communicate, both inside and outside of Facebook, and moving conversation toward more intimate topics of conversation. Study

5 supports this finding suggesting that participants would use SNS and direct communication methods more frequently with old friends than with new friends.

The stage of a relationship may also be indicative of liking. More developed relationships can be considered to have progressed because the dyad are motivated to connect with each other. Arguably, individuals who are disliked by others will not have progressed to later stages. The indication from Study 4 is that interaction pairs in later stages also have less uncertainty about one another, supporting a link between certainty and liking. Combined with the use of more Facebook features and more frequent communication between individuals at later stages, it is considered that sharing is linked to both certainty and liking. A simple correlation in Study 5 between certainty and liking showed a significant positive relationship. Participants that were more certain of their friends also scored them higher on the Rubin liking scale.

However, Study 4 also indicated that initial levels of uncertainty must be reduced for a new friend to be engaged with actively and interactively to develop liking, supporting early research in offline environments (e.g. VanLear & Trujillo, 1986). Relationship connections are made initially, uncertainty is then reduced before liking can occur, before uncertainty and liking are reduced simultaneously as relationships progress. This finding in Study 4 impacted the hypothesis development in Study 5.

Study 5 showed a significant positive relationship between viewing photographs of a friend's Facebook profile and certainty about them. Viewing photographs is indicative of passive information searching and was expressed by interviewees in Study 4 to occur from very early relationship development stages, in some cases before interviewees had added their new friend to Facebook. However, frequency of viewing photographs was not directly related to liking. Mediation analysis with bootstrapping showed a significant indirect effect of photograph viewing on liking, when mediated by

certainty. Although the direct effect of photograph viewing and liking was not significant even under mediation conditions, the direct effect was weaker than the total effect. Overall it is concluded that there is no difference in passive information seeking via photograph viewing with respect to liking, but certainty plays a significant role in the development of liking from passive information seeking, see Figure 7.4²⁰.

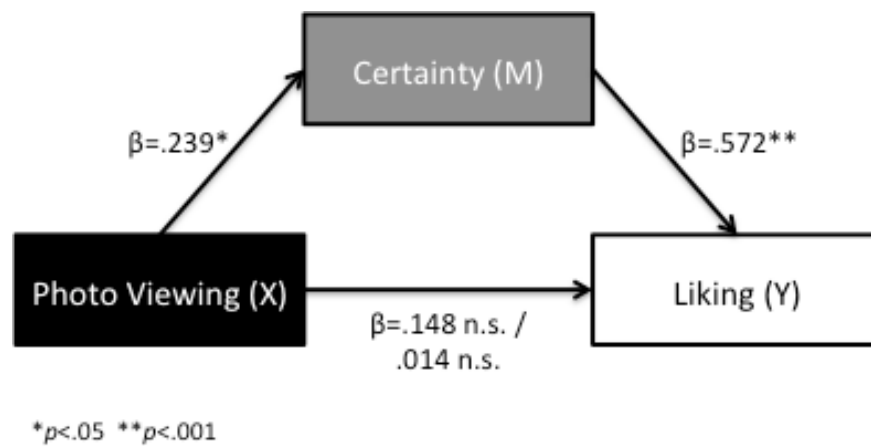


Figure 7.4: Coefficients for the Indirect Mediation Effect of Photo Viewing on Liking, by Certainty

The second implication of Study 4 investigated further in Study 5 was that more frequent interactive communication is related to higher liking and certainty scores. There was a significant positive relationship between commenting on the profile of a friend and certainty, i.e. more commenting related to higher certainty. Unlike passive information searching, there was a significant positive relationship between commenting and liking, i.e. more commenting related to higher levels of liking. There was also a significant total indirect effect of certainty between commenting and liking. That is, more commenting relates to increased scores of certainty that in turn relate to higher scores of liking, see Figure 7.5²¹.

²⁰ Figures are presented using the Baron & Kenny (1986) mediation analysis method.

²¹ Figures are presented using the Baron & Kenny (1986) mediation analysis method.

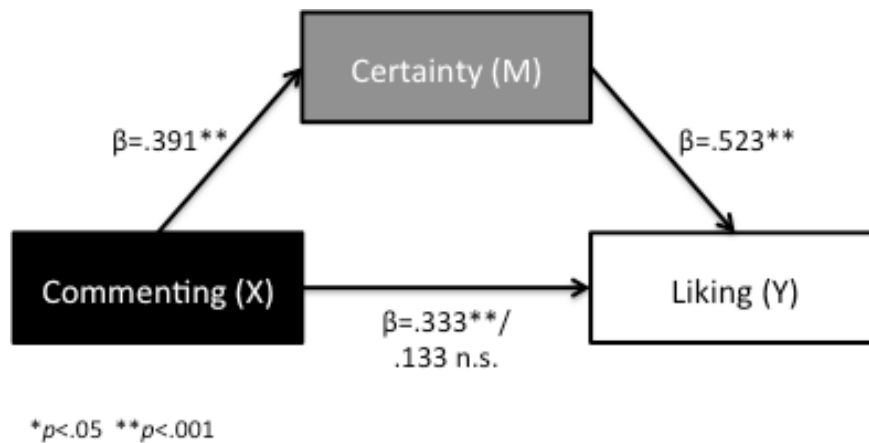


Figure 7.5: Coefficients for the Total Indirect Mediation Effect of Commenting on Liking, by Certainty

Using triangulation of the results from studies 4 and 5 it is concluded that uncertainty is reduced through passive information seeking in Facebook, specifically through viewing photographs more frequently. Then, reduced uncertainty leads to higher scores of liking. However, passive information seeking does not relate *directly* to liking of others but is mediated by certainty. As observed in Study 4, early stages of relationship development via Facebook utilised passive information searching. However Study 5 suggests that, as liking increases there is no difference in the frequency of viewing a friend’s photographs. Using the results from Study 4, the assumption is made that more established friendships are indicative of increased liking scores. Therefore it is argued that although other methods of communication develop throughout a relationship, early methods of uncertainty reduction are utilised simultaneously and are not replaced, i.e. photographs are viewed with similar frequencies regardless of levels of liking. However as Study 4 suggests, more interactive methods of communicating will only be conducted according to the social contract, i.e. interviewees were reluctant to communicate with new friends via commenting or direct personal messages until the relationship had progressed beyond its initial stage. Therefore, it is concluded that

commenting is indicative of behaviour in later stages, and thus indicative of liking and certainty. Study 5 supports this argument as commenting was directly related to liking *and* directly related to uncertainty reduction. The “like” feature of Facebook (developed since data collection) could serve the purpose to border passive and interactive communication to help develop liking at early relationship stages and maintain connections at later stages.

Commenting is an interactive strategy of uncertainty reduction and photograph viewing is passive. It is concluded that interactive strategies are more beneficial to liking directly, whereas passive strategies seek to reduce uncertainty. If passive information strategies are utilised at early stages before liking is improved then it is expected that certainty will improve before liking occurs. The developed timeline of relationship progression (Figure 7.8) is supported by the indirect mediation of photograph viewing on liking. The total, direct and indirect mediation effects found between commenting and liking suggest that commenting can help develop liking of others directly, and indirectly through uncertainty reduction. This supports the proposed timeline where *simultaneous* progression of liking and certainty occurs from mid to late stages of relationships.

The connection between disclosure and certainty is considered to occur at all stages of a relationship. Certainty development is continual and dynamic. As with the relationship between disclosure and liking, disclosure can relate to certainty positively and negatively. Several factors can impact upon the valence and polarity of this relationship including disclosure content in combination with stage of relationship (Study 4), appropriateness of information disclosure in accordance with an expected social contract (Study 4), and the frequency of passive and interactive information searching and general interaction (Study 4, 5). At early stages of a relationship passive

information seeking via Facebook was typical. Interaction partners looked for information about each other that they could browse without alerting the other person that they were doing so. At this instance certainty can be increased by the display of the information sought by the profile holder. Information seekers desired visible activity between the new contact and their wider network and to be able to identify the person, their friends and activities in available photographs. If such information was absent, a negative evaluation could result and interviewees in Study 4 suggested it left them unsure about a new contact, that they may be “a weirdo”. At later stages of a relationship interaction partners reduced uncertainty through interactive strategies, i.e. meeting offline, commenting on photographs and wall posts, and joining in the social conversations. Instances where interviewees felt uncertain at this stage (while limited in number) were if the friend violated the social contract, for example saying something racially provocative or inappropriate for a given conversation.

The connection between certainty and liking was indicated in the literature reviewed. The axioms of URT suggest that as certainty increases liking increases between interaction pairs (Berger & Calabrese, 1975). This relationship is supported by the present research findings. In Study 4 interviewees were significantly more certain of old friends than new friends and showed throughout the interviews a greater liking and knowledge of their old friends. The use of different information seeking strategies and the indications of general relationship progression between friends suggested that certainty increased initially before liking but the two then increased simultaneously, i.e. there is a delayed onset phase for liking but not certainty. Study 5 supported the general positive correlation between certainty and liking. The mediation of certainty between viewing photographs and liking and between commenting and liking suggests a later onset for liking, but later simultaneous development with certainty. Interactive

information seeking strategies were used more with old friends than new friends. Therefore, the non-significant link between viewing photographs and liking, but the significant indirect effect of certainty mediation in this relationship, suggests that *passive* information seeking strategies typically associated with early stage relationships do not lead directly to liking but relate positively to certainty. *Interactive* communication, typically associated with later stage relationships, had a significant positive link to liking *and* certainty, as well as a significant total indirect mediation effect of certainty. Figure 7.6 shows the onset relative to the information seeking strategies used. The mediation analysis performed in Study 5, and the direction of relationship development expressed in Study 4 determined the direction between certainty and liking, i.e. certainty is a construct of liking and is derived from information about others.

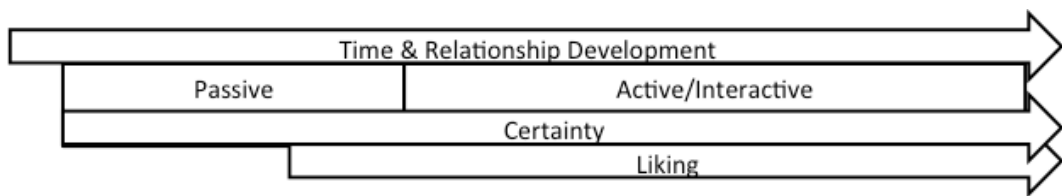


Figure 7.6: Onset of strategies of uncertainty reduction and liking

A final consideration of the mediation effects between Facebook use and liking is the tendency of interviewees to use a placeholder for new connections that are not developed immediately. Support is found for the proposed careful balance of restrictive access and disclosure of information at early relationship stages. Passive information seeking cannot lead directly to liking but requires uncertainty reduction. If information typically associated with passive strategies and early relationships is not available, i.e. photographs cannot be viewed, then certainty cannot be developed. Without certainty or progression to interactive strategies of communication, liking cannot occur.

Interviewees in Study 4 suggested that they use passive strategies to develop relationships up to a point, and then switch to offline meetings or more personal communication mediums to continue the relationship. Although information seeking does not occur entirely through Facebook at early stages, without photographs to view it is more difficult to develop liking of others or reduce uncertainty to allow the movement to offline interaction and develop liking.

7.1.3. Disclosure and privacy, and their connection to relationship stages

The third contribution of the current research further addresses research questions 1a and 1b, and addresses research questions 2a and 3a, drawing on the results of studies 3, 4 and 5 (see highlighted section of Figure 7.7).

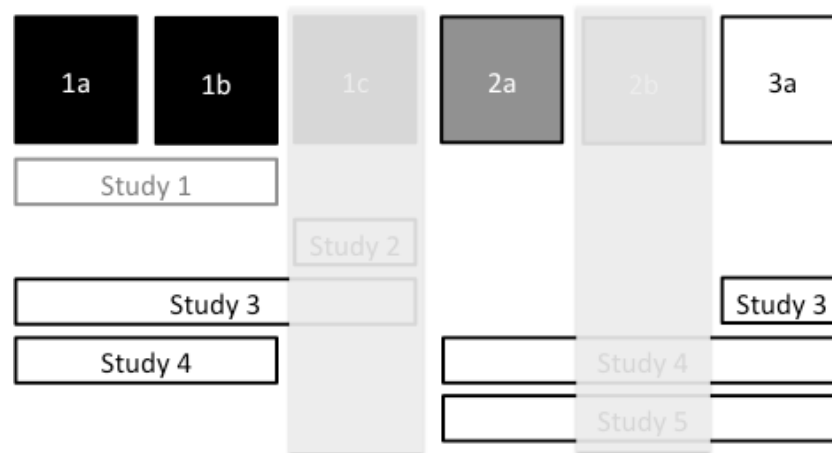


Figure 7.7: Research questions addressed in contribution 3

Relationship stages were not investigated in studies 1-3 but conclusions of the need to disclose and conceal information for beneficial outcomes can be made. Sharing particular photographs more frequently can be beneficial, but conversely, *reducing* the sharing of other photographs is beneficial. It is suggested that the privacy settings within SNS can be utilised to restrict access to only those relationship types where the

photographic content may be beneficial to the relationship, e.g. prohibit partners from viewing photo albums that contain images of friends as it may result in decreased intimacy. However, in reality the privacy control settings of Facebook are cumbersome when deciding which individual photographs to share with other users, but settings can be altered for access to each photo album.

The results from Study 4 suggest the need to be selective with information sharing and how it can differ depending on the stage of a relationship and interpersonal closeness. Interviewees reported using the descriptive information their new friends had posted to Facebook to begin their initial search and develop impressions about them. At this early stage of the relationship information seeking is passive. Users look around the profile of a new friend searching for information that will give them an indication of who they are. Information typically sought includes the 'about me' section that contains information about their age, current town of residence, their university or school network and current job. Users look for the number of friends a new connection had, and look to place them into a position within their own broader social network using mutual friends and general activity on their profile by others as indicators. Similarly with wall posts and status updates, users would look for comments made by mutual friends and their wider social network. Without exception, users would identify at least the profile photograph. Furthermore, after verifying and adding a new friend participants would often look in more depth at the photographs to see what activities they are interested in.

At more established stages of relationship development, communication via Facebook involved commenting, posting links and photographs to the walls of friends, making text based wall posts and joining in conversations with mutual friends via wall posts and comments more generally. Interviewees also reported a critical point where

their relationship would be at a developed enough stage to communicate via the direct message or chat features. However, interviewees indicated exceptions to this finding. A direct message, group message or chat session may be held at early stages of a relationship if their relationship was formal, e.g. as university peers, or the goal of their communication was to fulfil a task, e.g. coursework or university society administration. Generally, communication via Facebook at later stages was more personal, relating to their common activities or interests, or to their wider social group. Interaction at these late stages involved more interactive information seeking, e.g. speaking directly to their friends to ascertain information about them.

Study 5 showed the differences in the frequency of communication for different communication platforms of a participant with new and old friends. Participants communicated with older friends significantly more often via Facebook's direct message and chat features and within SNS more generally than with friends they had just made. These differences in communication patterns support the findings of Study 4 to suggest that with more established connections individuals use the direct message and chat features of Facebook more frequently than with friends they have just met and added to Facebook. Furthermore, the general use of SNS is lower with new friends, which may indicate the tendency to use Facebook passively, awaiting the progression of the relationship to enable them to be able to use Facebook interactively. As participants in Study 4 suggested, some new friend connections in Facebook are made but their communication does not develop, the relationship is put on pause until it is plausible to progress. It is argued that users enter a state of inter-dependence and so the benefits of communicating must be sufficient for both parties, supporting previous work on the economics of disclosure (e.g. Derlega & Grzelak, 1979; Kelley & Thibaut, 1978).

Throughout the development of relationships, interviewees in Study 4 described a form of social contract expected when connecting with others via Facebook. With new friends they discussed expecting to see low-level information on their profile, photographs and a moderate level of activity on their profile. New friends who violated this social contract were evaluated more negatively than those who did not. For example, interviewees suggested that there being little information available at early stages left them uncertain about a new friend. Participants wanted to see that the new connection was not socially abnormal by seeing activity from friends, demonstrating their ability to maintain relationships. However, there was also an expectancy of a new friend not to share too much information, or to represent their self as overly extraverted. When discussing old friends the expectation of shared information was not explicit. However, indications from interviewees were that with older friends they would develop communication to more personal levels and that conversation was based on shared activities and environments. At later stages a relationship is more developed and more personal information is discussed through the direct channels of Facebook interaction. However the channels used early on, for information browsing, photograph sharing and viewing wall activity, are still utilised in the later stages. That is, as relationships progress more channels and direct communication, with interactive information seeking strategies, are *added* to the collective of communication possibilities, and do not *replace* channels used early on. The *function* of the communication is then considered when disclosing.

Study 4 shows that the general progression of information sharing, the reduction of uncertainty and increases in liking all occur over time and with gradual changes in communication. The sequence of sharing, certainty and liking were verified in Study 5. It should be noted that the progression of relationships is considered to involve

Facebook as a tool within the wider process and is not based solely on Facebook interaction and information seeking within it, which supports previous work suggesting that online and offline worlds are not dissimilar but part of a broader social affiliation (Ellison, et al., 2007; Joinson, 2008; Quercia, Bodaghi, & Crowcroft, 2012). The use of multiple platforms and the dominance of offline interaction are discussed in section 7.1.4.

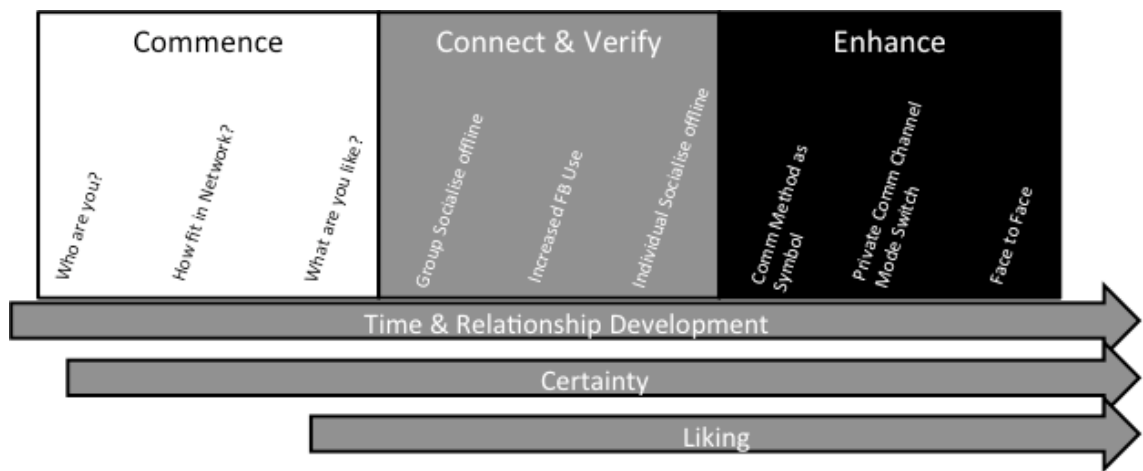


Figure 7.8: Proposed timeline of relationship development

The stages and timeline of relationship progression (Figure 7.8) resonate with the first three stages of Knapp & Vangelisti's (2005) relationship development model. Knapp & Vangelisti suggest that relationships develop through five stages of development and dissolve through another five stages, which they call 'coming apart'. The fourth and fifth stage of development go beyond the boundaries of this research and identify how relationships progress to strong, intimate relationships between romantic partners. The first three stages of their relational development model are *initiation*, *experimentation* and *intensifying*. The stages of relationship progression identified in the current research consist of similar sub-stages and behaviours but are applied specifically to an environment involving SNS interaction, and ICT use more generally.

Initiation involves the first impressions individuals make about another after first encountering them, such as their physical appearance (Knapp & Vangelisti, 2005). This stage involves very surface disclosure in conversations and an assessment is made as to whether the progression of the relationship is a desired possibility. In the current work, the *commence* stage encapsulates the searching behaviours individuals conduct to examine more surface level characteristics, identify who the person is and what they are like. If a relationship is not currently desired, the connection will be maintained via Facebook but placed on hold.

The second stage of development is experimentation (Knapp & Vangelisti, 2005). Here, people attempt to find common interests and experiences and begin to actively search for information. It is suggested that many relationships end here once further information searching has been conducted. In the current work, similar experimentation is conducted, the *connect and verify* stage begins the transition to active and interactive information searching and users identify common ground to begin socialising. If one desires not to progress a relationship, it may be placed on hold after the initial connection in the *commence* stage, or could be aborted after socialising in a group, before progressing towards one-to-one offline interaction or using other communication media.

The third stage of development, *intensifying*, begins to identify the limits of the relationship with different depths of self-disclosure to test the response of the recipient (Knapp & Vangelisti, 2005). Disclosure becomes deeper at this stage. The third stage proposed by the current work is the *enhance* stage. At this point users begin to mode switch to signal the desire to move to more personal communication topics, and use alternative communication media to Facebook to hold these personal discussions, as well as meeting FtF. Similar to Knapp & Vangelisti's model, this stage identifies deeper

levels of disclosure. Overall, this stage proposes integration of signal with the depth of disclosure, the development of certainty and liking and, the development of different methods of communicating.

Although Knapp & Vangelisti's full model involves further relational development and coming apart, the current work cannot establish the development of a romantic or thoroughly connected interaction pair. However, interviewee responses in Study 4 suggest that when relationships dissolve, the stages are essentially reversed. A lack of communication frequency at later stage relationships resulted in fewer one-to-one discussions and socialising, fewer group meetings involving that person, and eventually ended with little passive Facebook information searching. Therefore, the proposed model of relationship development in SNS is bi-directional, which is addressed in the conceptual model development in section 7.2.

As discussed earlier, concealing different types of information may impact upon a relationship depending on its stage of development. If basic information is not available to a new friend via Facebook it may act to hinder relationship development as the browser of a profile cannot ascertain congruency to normality from photographs, identify common interests, networks and personal friends. Although relationship development could be argued to continue outside of Facebook regardless of the failure to disclose vital information, interviewees reported using Facebook to find things in common and start a conversation with a new friend that they otherwise would not have been able to start. Therefore, a complicated decision is placed upon interaction partners when adding new friends to Facebook. At one end of the continuum is the desire to conceal information. The new friend is not known well, trust and certainty levels may not be high enough for individuals to consider sharing information, and the often discussed privacy harms of SNS may be salient (e.g. identity fraud - Acquisti & Gross,

2009). At the opposing end of the continuum is the need to share surface level information and photographs, and allow visible activity on the profile wall for new friends to browse and begin uncertainty reduction.

At later stages this need to balance privacy and disclosure may not be as critical. Friends that can be considered to know a lot about one another may not need to have restricted access to a profile. However as Study 3 suggested, even with long known others, such as relatives, close friends and partners, some information disclosure may be detrimental and so a need to balance disclosure and concealment does not arise just from the need to prevent privacy harms such as ID fraud, but also from the need to prevent the degradation of relationship qualities.

It is not concluded that all new friend connections develop to their strongest state, via Facebook or other platforms. Some connections are placed on pause whereby the connection is present but not active until the relationship becomes plausible or necessary. Even with relationships that aren't placed on hold immediately, it may be preferred to prevent certain acquaintances from discovering some information and signalling to them to remain acquaintances can be performed through restricted access, as with strangers offline (e.g. Derlega & Grzelak, 1979). Therefore, another facet in the decision to disclose is identified. Individuals must choose who they want to have access to their personal information and how close they desire to be. The use of signalling, and thus the placeholder, is considered to be a form of boundary regulation as proposed by Altman (1975), Derlega & Chaikin (1977) and later communication privacy management (CPM - Petronio, 2002).

7.1.4. Relationship progression and the use of increasing channels of communication

The fourth key contribution of this work is the identification of the progression to a broader array of communication channels throughout the development of interpersonal relationships. Although Facebook is popular and its use can impact upon relationships, offline interaction still dominates the relational development process. This section will discuss the empirical results of studies 4 and 5 to address research question 2a (see Figure 7.9).

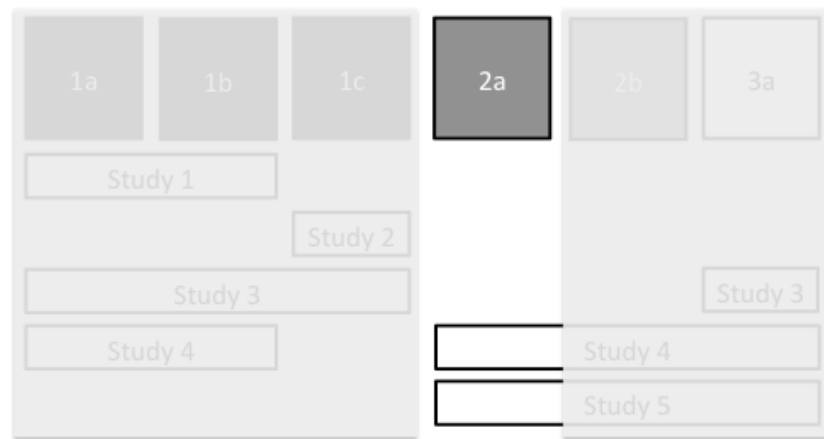


Figure 7.9: Research questions addressed in contribution 4

The multiple linear regression models used to analyse the data in Study 3 at step 5 accounted for between 10.5% and 32.4% of the variance observed ($R^2=.105$ to $.324$). It was concluded in Chapter 4 that although these are usually considered weak models, as there are many variables that could influence liking that could not realistically be controlled for a significant finding within these parameters is accepted. Amongst the potential confounding variables is information disclosure within Facebook other than via photographs, e.g. wall posts, status updates and direct messages; or interaction and other factors outside of Facebook, e.g. offline interaction, mutual activities and friend

networks, as well as any relationship history, anticipated future interaction or hidden agendas.

The present research suggests that such extraneous variables act successfully upon perceived liking of others. Study 4 found that communication outside of Facebook plays a critical part in the development and maintenance of relationships. However, a somewhat unexpected finding was the reliance on other communication methods given the diversity of Facebook's features that could potentially help relationship development. As relationships progressed, interviewees expressed that they would mode-switch to another platform outside of Facebook. It was also concluded that offline interaction was critical to help new acquaintances develop their relationship or to maintain older relationships. Although Facebook was used to maintain relationships when friends became geographically dispersed, predominantly phone calls, SMS, Skype interaction, Facebook direct messages and FtF interaction were suggested to be more useful methods of communication for personal topics. Furthermore, it was suggested that throughout relationship development, methods of communication between interaction pairs are cumulative and not *replaced*. Study 5 supports these findings. Participants reported communicating more frequently via telephone, SMS, email, IM, SNS, Facebook direct message and Facebook chat with old friends than with new friends. This suggests that each of these methods was used with newer friends but they were used more frequently as the relationship progressed. Although it cannot be concluded from Study 5 that they were added incrementally, the practical applications of beginning each of these communication methods at once rule it unfeasible that they were not added sequentially.

SPT suggests that at early stages of development, less intimate information is disclosed to others, but there are more instances (category and frequency) of disclosure

of peripheral information (Altman & Taylor, 1973). Using the results from studies 4 and 5, the increase in the number of communication methods is argued to increase as the depth of disclosure increases. Interviewees in Study 4 suggested that the features of Facebook were indicative of an expected social contract, i.e. indicative of a degree of intimacy between interaction partners. Figure 7.10 shows how the array of communication platforms is increased with the depth of communication, transposed over the pattern of topics and self-constructs progressed towards the core.

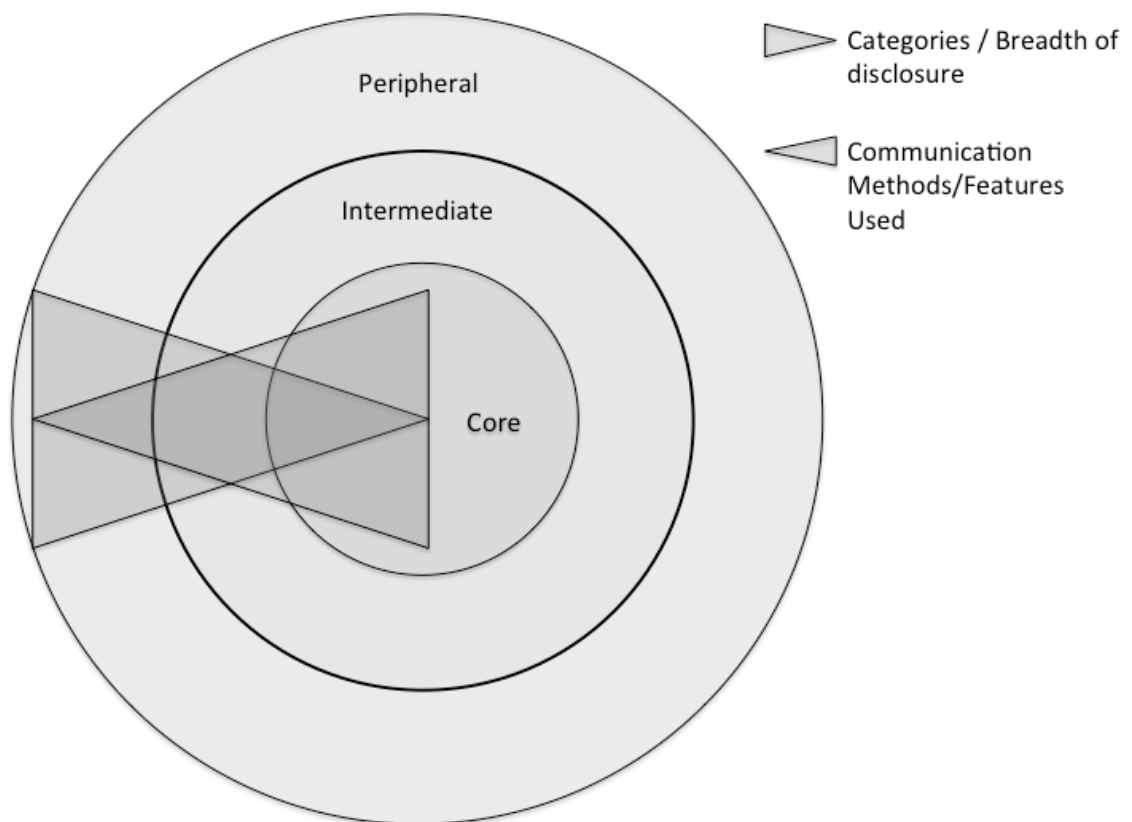


Figure 7.10: Adapted Social Penetration Model with Mode-Switching

Offline interaction was also expressed in Study 4 to be pivotal to relationship development. Most of the interviewees expressed the need to meet up, or that their friendship would improve with new friends once they had met up socially. Initially this would involve a group of mutual friends, and as the pair's relationship progressed

within this mutual group they would begin to meet one-on-one. Support for the increase in the number of activities conducted FtF with friends as relationships progress is found in Study 5. Participants reported doing more activities FtF with an old friend compared with a new friend. It should be noted that 31 of the 34 relationships discussed by interviewees in Study 4 began offline initially. This leads to the general conclusion that FtF interaction starts a relationship and Facebook can be used to help progress the initial stages *quicker* than without using Facebook. Later, Facebook becomes a useful tool for maintaining the connection and keeping up with friends. The use of Facebook is therefore considered to be *one tool of many* to help develop relationships, yet it needs to be used carefully so as to not weaken a relationship, e.g. careful consideration of which type of photographs to share with each audience at different relationship stages (studies 3, 4 & 5). These findings support previous research on the use of Facebook to connect with already known others (e.g. Ellison, et al., 2007; Joinson, 2008), although it is acknowledged that Facebook can be used to initiate a relationship online and progress to offline environments. Figure 7.11 magnifies the triangular segment representing communication methods and feature use in Figure 7.10 to detail the use of different communication platforms in the progression of relationships towards greater intimacy and depth of disclosure. The area (a) in Figure 7.11 identifies the short period of FtF interaction before a new acquaintance is added as a network connection in Facebook.

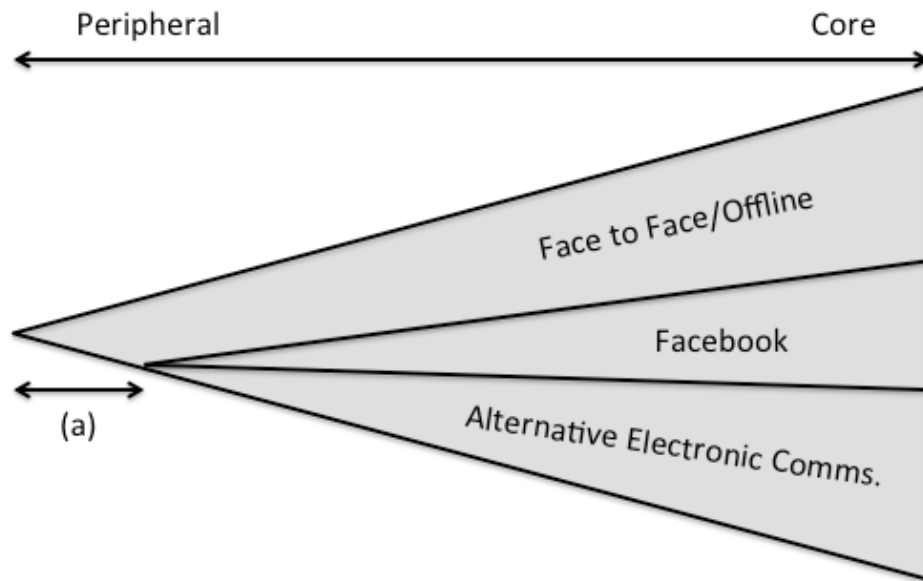


Figure 7.11: Progression towards intimacy and the use of different communication platforms

7.2. Theoretical Model Contribution

A fifth, major contribution of the current work is to compound the four key contributions and present a conceptual model of the effects of sharing day-to-day information in SNS and beyond. Critically, the model highlights the underlying components of SNS use: the latent motivations for sharing information and connecting with others to progress relationships. Figure 7.12 shows the combination of the timeline of relationship development in SNS (Figure 7.8) and the proposed social penetration segment of mode-switching associated with increasing penetration of the core constructs of the self (Figure 7.11). An overlay to the two models shows the connection of the stages of development to the progression of technology use towards deeper disclosure of the self (Figure 7.12). The crux of this contribution is shown below these combined models (within Figure 7.12): the driving force of interactions in SNS.

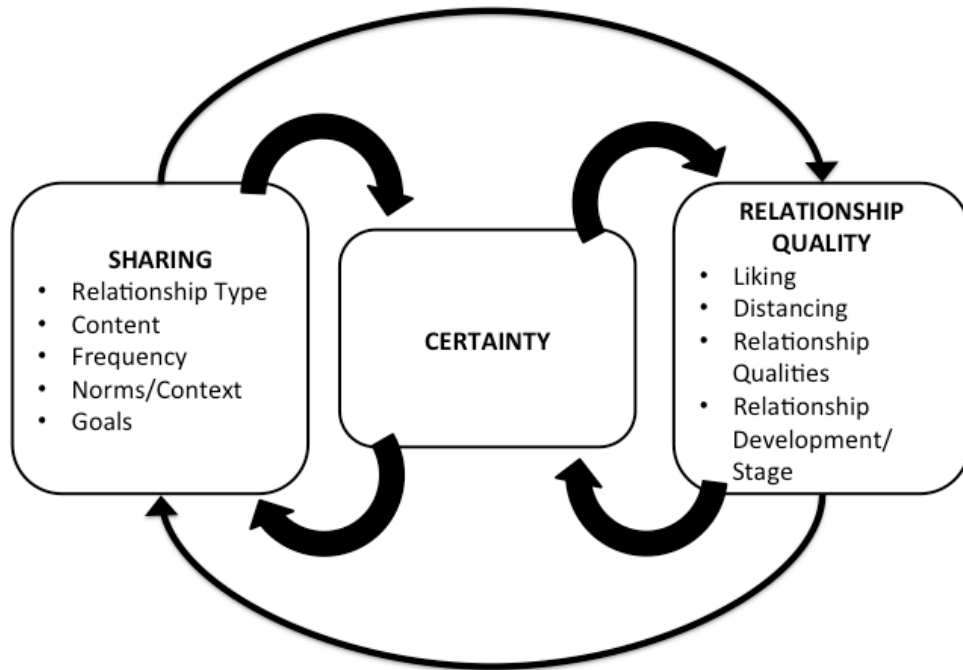
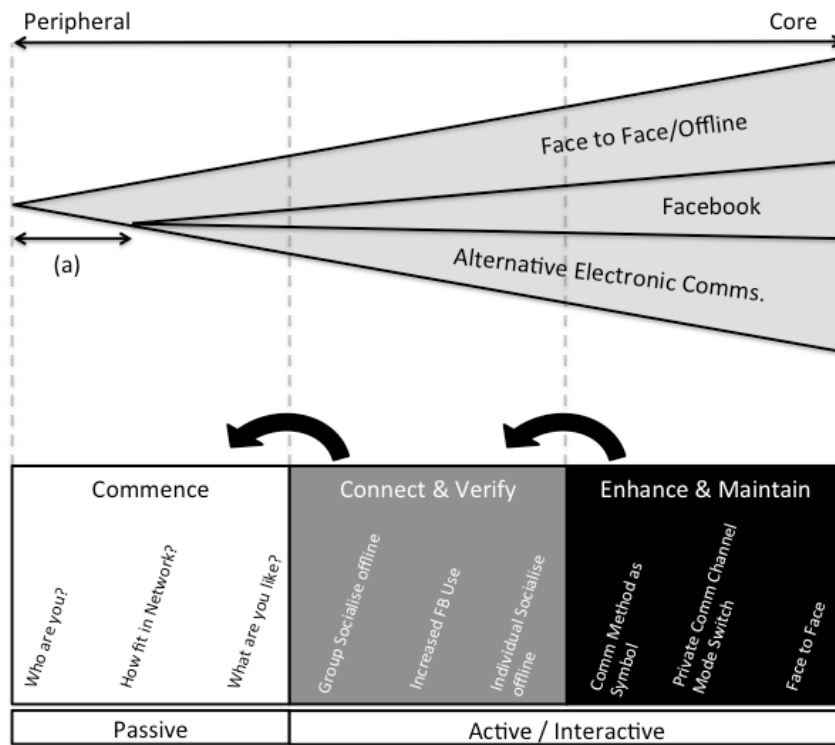


Figure 7.12: Conceptual model of the motivations for SNS use throughout the development of different relationships

7.2.1. *Explanation of theoretical model*

The overlay on the combination of the two identified models of communication patterns within SNS highlights the links between each of the development stages and the reported features used typically at these stages. In the *commence* stage, a relationship has just been initiated. Section (a) of the diagram shows the typical onset period where individuals meet one another offline. This begins to answer the question, *who are you?* As well as providing some information about how the new person fits in their wider social network and what they are like. Further communication is then commenced via Facebook and in some cases, already begins via other electronic communication, i.e. email. Via the information available on the new connection's Facebook profile, individuals then begin searching for more information about who the person is, how they fit into their wider network and what the person is like. This information searching is typically conducted passively using photographs, visible status updates and wall posts, and observing interaction with the new connection and their other friends. Uncertainty reduction begins at this point – an underlying motive that requires satisfaction. In addition, should a relationship not be plausible or preferential at this point, the connection remains, but little more than passive information searching is conducted until the relationship can continue.

At the *connect and verify* stage, individuals begin to increase both the frequency of communication and the number of channels used to communicate. A slow transition begins from passive information searching to communicating via private channels. Socialising in a group and meeting one-on-one requires FtF interaction to continue, and Facebook use increases overall. Types of Facebook interaction move towards commenting on one another's photos, walls and status updates, marking a shift from passive to interactive information searching. At this stage liking as well as certainty are

increasing about one another (in *successful* relationship development). A visible addition to the combined model compared to the previous separated models are the arrows that show how a relationship can roll back a stage. This can occur when more information is needed, or certainty is not high enough for the individuals to be able to connect to one another. Furthermore, if the behaviour of one of the interaction pair is outside the expected norms of communication for this level of development, or for the type of relationship, then more information may be required about the person and their goals of communicating. Within this stage, relationship qualities can be impacted by the information received. Subtle differences in the disclosure of information (as shown by photograph types in Study 3) can result in increases and decreases in the quality of the relationship between the interaction pair. Furthermore, subtle differences in information disclosure interact with the type of target disclosing to alter relationship quality positively or negatively (Study 3).

In the final stage, *enhance and maintain*, the relationship is developed through signalling higher communication intimacy through the use of different communication platforms. At this stage more features of Facebook are used, dyads typically have one another's phone numbers, and perhaps connect using VoIP services as well as email. An increase in FtF communication is observed (if the pair are geographically co-located). The transition towards more private channels of communication is complete for topics of a deeper nature, yet interactants continue to use public channels of Facebook and meet socially in groups, but shallower information is shared via these channels. Certainty of one another is high at this point and the relationship is strong, with strong liking. However, at this stage, if one of the pair behaves outside of expectations of their attitudes, beliefs and behaviours, or a new scenario arises and they act outside of examples of their previous behaviour, more information may be required by the other to

develop certainty and maintain the relationship at its current level, or quality. That is, unexpected outcomes may result in the relationship moving backwards through the stages, motivated by uncertainty reduction and a need for more information about them. To maintain a relationship it is necessary for reciprocal sharing to continue, with shared problems and experiences to ensure that the relationship does not regress through stagnation.

7.2.2. Motivations for- and properties of- sharing for relationship development within and outside of SNS

As shown in Figure 7.12 the motivations for sharing and the driver of relationship development is a combination of disclosure, certainty, and the quality of a relationship. The term *relationship quality* is used in place of liking as relationship qualities can be positive and negative, whereas liking implies that the outcome is generally positive. Liking is considered a component of the overall relationship quality. Essentially, the driving force of relationship development is an extension of the original conceptual model (Figure 7.1), with an emphasis on the ability to progress and regress an individual through a relationship, identifying the key aspects of sharing and relationship qualities that form the first four key contributions of the current work.

The construct of sharing includes the type of connection the information is shared to, the content of the message disclosed, the frequency of disclosure, the norms and context of the disclosure and the goals of the discloser. The components of sharing are drawn directly from studies 3-5. Emphasis is placed on the relationship found in Study 3 between content, frequency and relationship type, with relationship qualities. There is a direct link between sharing and relationship quality. This link was identified more generally in previous literature (e.g. as disclosure-liking Collins & Miller, 1994)

and throughout these studies sharing has been found to relate directly to different relationship qualities (Study 3) and to liking more generally (studies 4 and 5).

The content component of sharing is relevant at all stages of relationship development and implicates the use of different features of communication in the different communication media used as a relationship progresses. However, in studies 4 and 5 at early stages it was found necessary for content to be at a surface level of intimacy, involving information that other users could browse passively without alerting their new Facebook friend. At later stages of a relationship the content of a disclosure became more personal and was communicated via direct, private channels of Facebook and other media. Ultimately, the norms and context of information disclosure have a significant impact on relationships directly, or on certainty, which can mediate the connection between sharing and relationship quality. Study 3 found that specific details of similar content types are significantly related to changes in different relationship qualities. This finding suggests that careful consideration must be given when choosing what to share via Facebook. Study 3 further identified the need to consider the contents of shared information when sharing to different audience members deliberately.

7.2.3. Goals and norms of sharing in SNS on relationship quality and certainty

Combining the findings of the current work with that of previously identified literature; the goals of a disclosure can impact upon certainty levels about others and the relationship qualities between an interaction pair. Derlega & Grzelak (1979) suggested that limiting the depth of a disclosure can signal to a recipient that a low-level of intimacy is desired. Furthermore, they suggested that the perception of a discloser's goals (or the intended function of a disclosure) could impact upon how the recipient perceives them, affecting the certainty the individual has of the discloser. In the present

work, Study 4 found that interviewees reported being unsure of a Facebook connection when they didn't know their goals of connecting. In addition, when the outcomes of an interaction were expected, interviewees reported communicating with them for that specific purpose, i.e. interviewees would connect with others to arrange events, organise meeting up, or to begin a friendship if this was their expected outcome of the communication. With old friends interviewees were more certain of expected methods and outcomes of communicating. Such certainty is suggested to be a manifestation of the underlying force of disclosure and sharing based on goals and interpersonal expectancies, shown in the model by the connection between sharing and certainty. This is a bidirectional relationship; therefore certainty can motivate the goals of sharing information.

A further consideration for sharing within the contexts and norms of disclosure is the use of interpersonal boundaries of privacy, or CPM (e.g. Altman, 1975; Derlega & Chaikin, 1977; Petronio, 1991, 2002; Westin, 1967). Norms of disclosure and privacy may act to encourage or restrict information disclosure throughout each of the stages of a relationship, or via any particular medium. For example, at early stages it was found that deeper information and disclosure of overly sensual photographs via Facebook can be detrimental to a relationship. At later stages, it may be more appropriate to share deeper information but the method of communicating falls into a norm or context based judgement. For example, to disclose personal information to a close friend may be appropriate, but to do so via a Facebook wall can have an impact on the relationship quality between the interaction pair, and between either of the pair and their wider social network. A careful consideration of what to share, with whom, when and how is needed. Study 3 adds support to the need to balance privacy and disclosure, finding that users may share the same photographs across audiences on Facebook, but depending on

the relationship type held with the recipient, relationships are altered differently. This introduces considerations of context, what the photograph depicts, who it is being shared to and for what purpose.

Certainty has a considerable role in the relationship between disclosure and relationship quality. A strong mediation effect was found in Study 5 for both passive and interactive information sharing and searching strategies. Although certainty was not tested in Study 3, such a strong mediation suggests that within the relationship between content, sharing frequency, relationship type and relationship qualities, certainty is likely to have an impact on how information is received. In Study 4, certainty was reduced by passive and interactive strategies, and was significantly higher in more developed relationships. The direction of certainty is suggested to mediate *from* disclosure *to* relationship quality. However, holding a strong relationship with another is significantly correlated to high levels of certainty (Study 5), which supports the axioms of URT (e.g. Berger & Calabrese, 1975). It is therefore suggested that a cyclical relationship exists between relationship quality and certainty.

7.2.4. Reciprocal motivation of liking and certainty in maintaining relationships

Constant maintenance of a relationship, or observing an interaction partner in a new scenario, may feed back to the levels of certainty held about that person as suggested in Study 4. This new level of certainty may either feed back to the relationship quality - improving, holding or weakening it - or feed back to the need for more information to subsequently make a new judgement or decision about the relationship quality with altered certainty. Such feedback in relationship maintenance and new scenarios implicates an iterative cycle between sharing, certainty and liking, one which motivates the different uses of Facebook, offline interaction and general

behaviours associated with the development of relationships through commence, connect and verify, and enhance stages. An iterative model of motivations draws attention to the bidirectional nature of relationships. A relationship can regress to an earlier stage if communication is not upheld, or is upheld inappropriately through the misaligned expectations and observations of communication. For example, if communication with a new friend is expected to be through more public channels and a message is received via a private channel it may hinder progress or cause the recipient to be wary of the sender.

As a relationship rolls back through the stages the latent driving forces act to encourage further information searching, either passive or interactive, or to increase certainty about a decision over the desire to continue the relationship. It may be preferred by an interaction partner to put the relationship back on pause if the information received about another negatively impacts the relationship qualities between them, holding the relationship until such times where information is received to encourage relationship progression.

Further support for the underlying drive of certainty and liking as a reciprocal motivator are found in studies 4 and 5. At later stages of a relationship, interviewees reported using a wider array of communication platforms and meeting one-on-one as well as in group situations. To be able to communicate using a wider array of platforms some interviewees suggested they were quite certain about how to contact their friend, describing the use of Facebook as a tool to help them arrange offline meetings or more personal conversation via other platforms. Interviewees that described meeting up with more established friends showed greater certainty towards them and by the nature of the study design, old friends were those that participants communicated with most often and had a strong relationship with. Therefore, certainty and the strength of the

relationship are considered reciprocal as well as acting to motivate the manifested behaviours of SNS use.

Identifying the components of relationship qualities suggests that liking is linked directly to sharing, as well as indirectly through certainty. Participants of Study 4 reported the need for communication to remain constant to secure a relationship. When a friend moved away, it was reported that Facebook was used to connect with the other person because they could not meet FtF. When interaction between these dyads decreased, or was predicted to decrease, interviewees suggested that the relationship would begin to come apart. This highlights the need to continue to share information to maintain the relationship, implicating a feedback from relationship quality to disclosure, either directly or through a process of uncertainty reduction (or uncertainty maintenance at later stages of relationship development). Further identification of direct links between sharing and liking are found in Study 3. When photographs were received by the participant relationship qualities were directly impacted. Study 5 identifies a direct link between interaction and liking, and found that participants communicated significantly more frequently with old friends than new friends across communication media.

It is considered within this work and the literature more generally that the connection between sharing and relationship qualities is bi-directional (e.g. Chelune, 1976a; Collins & Miller, 1994; Cozby, 1972, 1973; Derlega, et al., 1973; Douglas, 1990; Kleinke, 1979; Rubin, 1974; Taylor, 1979). As discussed earlier, the information shared may directly or indirectly impact upon the relationship quality. However, the quality of a relationship and the stage of its development also prescribe the norms of information sharing and certainty expectations of interaction pairs. This connection

between the relationship quality, certainty and sharing is illustrated in the third section of Figure 7.12, the driving forces of SNS interaction.

The conceptual model of interaction motivations in SNS does not hold up in two conditions: when connecting with others to perform a task oriented goal, such as coordinate group coursework or work related tasks; and if an individual is completely open, with a Facebook profile to reflect this. However, this model is not intended to understand these behaviours, but the interpersonal (not work/task related) communication within the framework of the norms of day-to-day information sharing. It is argued that those with completely open Facebook profiles do not represent the norms of interaction. Within Study 4, all participants had high and similar scores for their profile privacy. No participants had open profiles.

7.3. Implications for wider research fields

The findings of the current research, and the proposed conceptual model of SNS interaction, support the general disclosure to liking relationship previously identified (e.g. Altman & Taylor, 1973; Collins & Miller, 1994; Cozby, 1972; Derlega, et al., 1973; Douglas, 1990). The relationship previously identified is not considered to be a direct positive correlation between disclosure and liking and is influenced by other factors (Altman, 1975; Altman & Taylor, 1973; Chelune, 1979b; Petronio, 2002). Studies 3 and 4 support alternative links between disclosure and relationship quality by demonstrating the implications of the type of relationship held with a discloser, the frequency of communication and the content of disclosed information. This finding supports previous work that identifies the influence of the target type on the amount and level of information disclosed (e.g. Chelune, 1979a; Jourard, 1959; Jourard & Lasakow, 1958), and identifies how relationships can be impacted by particular targets disclosing

photographs via Facebook. Furthermore, the present research found that the content of a message is moderated by the target type, which can have both positive and negative effects on the relationship. Previous work had only identified what information was *generally* disclosed to different types of target for the use of self-reflection (e.g. first era self-disclosure work – Jourard & Lasakow, 1958), or the level of conversation topics and appropriate disclosure levels overall (Altman & Taylor, 1973; Berger & Bradac, 1982; Derlega & Grzelak, 1979).

7.3.1. Effects of breadth, depth and content of disclosure throughout relationship stages

The current research found that the frequency of communication is related to both positive and negative impacts on liking. High frequency disclosure of some photographs resulted in positive outcomes, suggesting that sharing these photographs more often would be beneficial, whereas sharing other types of photographs more frequently resulted in negative outcomes. As the depth of information disclosure via photographs was considered to be consistent across photograph types, it is concluded that the frequency of information alone can result in different liking outcomes. This both supports and refutes the findings of Shklovski et al. (2008). They identified a decrease in frequency of email to be related to a decrease in closeness between interaction partners, but an increase in frequency did not show an increase in closeness. However, a problem with the work of Shklovski and colleagues is that a general disclosure measure may miss the details of the content of shared information. Further support is found from the proposed concept of Digital Crowding, where over crowding of others can occur from disclosing too frequently (Joinson, et al., 2011). The conceptual model identifies content and type of disclosure as manifestations of an individual's latent motivations to connect with different others to improve certainty and

relationship quality overall. These motivations to connect with others resonate with the human need to connect (e.g. Alderfer, 1969; Maslow, 1954).

Disclosure effects differ depending on the message content (studies 3 & 4) and photograph depictions (Study 3), which supports previous research outside of Facebook environments. SET, URT and SPT each suggest that as a relationship progresses the content of a disclosure becomes more intimate (Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Homans, 1958; Worthy, et al., 1969). Within Study 3, the key outcome was the finding that different content amongst seemingly generic photograph sharing can impact relationship quality based on the connection a recipient holds with the sender. Study 4 showed how some content could be appropriate for task-oriented goals but the same behaviour was also considered inappropriate for interpersonal relationship development at early relationship stages. The proposed model (Figure 7.12) identifies the need to limit the depth of disclosure at early stages as well as use fewer communication channels. In support of URT and SPT, certainty could be reduced through disclosure of inappropriate content within the context of Facebook.

However, users may not want (or be ready) to progress every relationship from early stages and low intimacy disclosure. For example, responding to an over-disclosing stranger with lower level disclosures can indicate the desire to remain mere acquaintances (Derlega, et al., 1973). In the context of this work, the content of photographs and the selective use of Facebook features associated with earlier relationships may be useful indicators to new acquaintances that relationship progression is not desired. Furthermore, by using privacy settings to restrict information typically associated with the initial progression of a relationship, it is argued that relationship progression can be halted. The proposed model allows for individual

differences in relationship progression and for incongruences of certainty and disclosure to drive relationship *regression* as well as progression.

Communication at early-mid stages is counter to that expected by the audience size on Facebook. Previous self-disclosure theory suggests a greater willingness to disclose to smaller audiences (Kleinke, 1979; Solano & Dunnam, 1985). However, the initial interactive disclosure as relationships begin to progress via Facebook (*connect and verify* stage) is often conducted via wall posting, status updates and commenting. Commenting is a *public* channel of Facebook (although not available to everybody, the comment can be seen by friends of the poster, friends of the recipient and in some cases further) making the audience numbers unknown and potentially great. In more developed relationships communication tends to continue occurring via public channels but other features and platforms are also used, including FtF. The audience size could act only to restrict disclosure when the content is more personal in nature, hence the need for private channels and mode-switching. As identified in the quantitative section of Study 4, there was no significant relationship between number of friends and privacy levels, which may be indicative of information that is shared via public channels being considered appropriate for all connections and more personal topics are disclosed elsewhere rendering considerations of network size moot.

The current work suggests that SNS environments are contained within the broader context of interpersonal communication. Study 4 suggested relationship development required FtF interaction, common activities and social networks, and conversation via phone, SMS or Skype. Facebook use alone was insufficient to develop a relationship fully but useful for relationship maintenance. The underlying process is argued to be iterative between disclosure, certainty and relationship quality needs. At the visible level, disclosure must therefore be balanced with the need to conceal

information and, at later stages, the levels of privacy should gradually be reduced to allow disclosure of greater depth. Thus, disclosure leads to liking, but releasing of information or communicating using an inappropriate method at different relationship stages with different targets can result in disliking. The influences on the impact of a disclosure include timing, appropriateness, and fulfilment of social norms for the purpose of interpersonal development, supporting previous research (e.g. Altman & Haythorn, 1965; Altman & Taylor, 1973; Berger & Bradac, 1982; Derlega & Chaikin, 1976; Derlega & Grzelak, 1979; Homans, 1958; Jones & Archer, 1976; Jones & Gordon, 1972; Taylor, 1979; Worthy, et al., 1969) and contributing by identifying the specific components of Facebook that can alter the latent relationship quality.

7.3.2. Uncertainty reduction and disclosure within and beyond SNS

The process of uncertainty reduction was observed to differ across relationship stages. Study 5 found that certainty mediates liking for both passive and interactive strategies of information seeking. Furthermore, the direct relationship between liking and disclosure for passive information seeking strategies was not significant. Therefore it is concluded that uncertainty reduction is critical at early stages where passive information seeking was typical, and at later stages helps to develop liking through mediation. However at later stages where interaction was typical, a direct relationship was found between interaction and liking. Therefore, interactive strategies may be more efficient in developing liking, and the need to reduce uncertainty is of lesser importance. The mediation of uncertainty reduction between Facebook use and liking suggests that certainty is a *necessary component* of developing liking at early stages, and is *required* to progress to later stages where disclosure is related directly to liking as well as being mediated by certainty. Previous research suggests that certainty is increased and liking

develops simultaneously (e.g. Berger, 1979, 1993; Berger & Bradac, 1982; Berger & Calabrese, 1975, 2005). The results of Study 5 support this but mediation analysis implicates uncertainty reduction as a component of liking in its relationship with Facebook interaction and information seeking and suggests that initially certainty and liking are not concomitant.

For URT it is concluded that uncertainty reduction plays a vital role in Facebook communication and the development or prohibition of relationships. The present work finds support for the application of several axioms of uncertainty reduction (proposed by Berger & Calabrese, 1975) in the environment of SNSs. Axiom 1 states that at the onset phase of a relationship, uncertainty decreases with increased communication. This is supported through the use of passive strategies in studies 4 & 5. However, the onset of relationships in this research was typically offline before connecting via Facebook. Early Facebook communication did not involve direct communication, but at the onset of direct communication uncertainty was shown to reduce with an increase in the frequency of commenting. Axiom 3 states that higher levels of uncertainty cause an increase in information seeking. The results of studies 4 & 5 make it difficult to determine uncertainty as a cause of information seeking but suggest that increased uncertainty relates to earlier stages of information seeking and that as relationships move towards interaction (*connect & verify* stage), direct links between disclosure and liking become significant, reducing the impact of certainty. That is, with higher levels of liking lower levels of uncertainty are present and disclosure does not need to reduce uncertainty to increase liking. Axiom 4 was supported by this work. High uncertainty was related to shallower communication.

Axiom 5 suggests that reciprocity increases as a result of increases in uncertainty. This phenomenon is supported previously by SPT, SET and the “dyadic

effect” as suggested by Jourard (Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Chelune, 1979a; Cozby, 1972; Derlega, et al., 1973; Jourard, 1959, 1971; Jourard & Lasakow, 1958; Taylor, 1979; Worthy, et al., 1969). In Study 4 reciprocity was observed when interviewees discussed the progression and degradation of relationships. In moving from the *commence* stage towards the *enhance* stage information exchange occurred. For example, interviewees showed a gradual increase towards commenting on a new friend’s profile. For interaction pairs to meet offline they needed to determine that they have the same interests and desire to meet up: information was exchanged. Within the proposed motivational model (Figure 7.12) this is emphasised by the need to reduce uncertainty to strengthen a relationship enough to begin meeting offline and one-on-one.

Axiom 6 of URT states that similarity between interactants reduces uncertainty. Study 4 supports this axiom within Facebook communication. While searching for information at the *commence* stage of a relationship interviewees looked for similar activities, mutual friends and interests on the information page, or depicted in photographs. Interviewees also discussed having similar activities as the reason for meeting and adding one another to Facebook where the information searching begins, i.e. identified in section (a) of the onset of FtF communication (Figures 7.11 and 7.12).

Axiom 7 suggests that increases in uncertainty result in disliking. This is supported with a significant positive correlation between certainty and liking, in Study 5. However, the cause and effect cannot be established. Study 4 suggests causality from the nature of interviewee responses. When information was deemed to be inappropriate or unexpected, particularly at early relationship stages, interviewees expressed evaluating their new friend less favourably. Previous research has also identified that increases in certainty can result in unstable relationships (e.g. VanLear & Trujillo,

1986). This instance of relational closeness could be considered what Rubin (1974) terms *affiliation*: a proximal closeness for support but without necessarily meaning a friendship or liking is developed. However within the interviewee responses and proposed conceptual model, an increase in uncertainty or a relationship that began to come apart signalled an increase in information searching to restore certainty and the relationship quality.

Evidence from Study 4 strongly suggests that after initially connecting with a new friend via Facebook and searching for information interviewees identified mutual friends, similar others and looked at which networks the individual belonged to (University/Institution level networks). In a similar vain some interviewees expressed the importance of a sports club or university society for meeting up with their friends or for getting to know them better. This supports the axioms of URT overall, suggesting that similarity between interaction partners and their friend connections helps reduce uncertainty.

Factors of friendship were identified as including similarities in attitudes, beliefs and interests (e.g. Byrne, 1961; Kandel, 1978; Precker, 1952; Scissors, Gill, Geraghty, & Gergle, 2009; Secord & Backman, 1964; Taylor, 1979), and friendships on Facebook have been shown to be more likely to break down if the friend connection is not embedded within the same social circle (Quercia, et al., 2012). As shown above it was found that interviewees were looking for similarities between their self and a new friend and information seeking related to finding similarity in activities and interests. The observed information searching for similarities can be explained using Figure 7.12, the driving forces of communication in SNS. Individuals find and disclose information to push the development of certainty and strengthen a relationship, which in turn strive for further information.

Overall, the concepts and complexities of URT are found in the current work within general interaction and the progression of relationships as well as interaction within Facebook. An increase in uncertainty was indicative of poorer relationship quality and certainty formed a critical component of the development of liking, especially at earlier stages of relationships and in new environments and experiences. The findings of this work are largely supportive of those found of uncertainty reduction in CMC experiments and pre-SNS technologies.

7.3.3. Affordances of CMC channels – Cues filtered out, channels and modes

In support of Tanis & Postmes (2007) the present work demonstrates that users of Facebook will search for cues to identity, and photographs were a significant part of their Facebook use. However, regardless of the presence of an identifiable photograph participants would look around the profile for cues to identity in text-based information. For example, searching for comments and interactivity from other friends on a new friend's profile wall helps them to determine what the other person is like and who they connect with. When interviewees reported being unable to identify a person through their profile picture before adding them they would use other available information to fulfil the same purpose, or look for more cues to identity in other photographs, if available. Therefore the findings in this thesis support the need for identity indicators and agree that this information is available and actively sought outside of visual channels, if not available visually.

Tidwell & Walther (2002) found that despite a reduction in cues to identity and body language, interactants via CMC were able to achieve similar levels of certainty about one another compared to FtF interactants but that a longer time period may be necessary. In addition they found users of CMC to be more direct with their questioning

of others than FtF interaction partners, and that users of CMC may actually achieve higher levels of certainty than FtF interactants, a term Walther labelled *hyperpersonal* interaction (Tidwell & Walther, 2002; Walther, 1996). This research finds support for the development of certainty in SNS environments, however as uncertainty reduces and information is gained, participants began to move from the SNS environment to offline activities and interaction. Therefore it is concluded that uncertainty can be successfully reduced via SNS to a level strong enough to encourage offline meeting and further relationship development. However, evidence of hyperpersonal communication was not found.

Other effects found in pre-SNS era CMC work are applicable to SNS environments. Shklovski et al. (2008) discovered that email use was suitable for maintaining interpersonal relationships with distant friends, and the telephone was useful for maintaining and developing relationships. Similarities in the affordances of these mediums are found in the current work and the effects are similar. Throughout the *connect & verify* and *enhance & maintain* stages, interaction partners move from solely text-based interaction to platforms that include the telephone, VoIP and FtF interaction. These later stages of relationships show the most significant interpersonal developments compared with early stages using Facebook alone. Although Facebook was useful to develop a relationship initially, mid to late stage relationships involved more personal mediums. Like Shklovski et al. (2008) personal communication via non-text platforms was useful for advanced relationship development and for connecting with distant friends to *maintain* closeness. However, there are differences at the commence stage. Text-based communication was utilised to begin initial uncertainty reduction, develop relationships and mark the beginning of active and interactive stages of communication, which suggests SNS can also be utilised throughout relationship development, as well

as maintenance. Therefore, Facebook could be hyperpersonal when compared with email communication alone, however these specific effects were not investigated and so conclusions are limited.

Particular communication affordances of technology were suggested to be better suited to certain genders (Boneva, et al., 2001). Email was proposed to be more suited to males than females as it could support more instrumental than expressive communication. However, it was also argued that the unlimited space in email and its asynchronous abilities would suit expressive behaviour (Joinson, 2003). Boneva et al. (2001) also found that females spent more time communicating with friends and family via email compared with males. However in Study 4, gender differences were not apparent to the researcher, and the interviewees or subsequent analyses did not indicate interpersonal communication via Facebook to be gender specific, supporting the findings of Raacke & Raacke (2008) in their study of MySpace users. They found that engagement in SNS did not differ for gender generally, however some uses of MySpace were more gender-specific.

One of the significant yet unexpected findings of the current research was that Facebook is used as a supplementary tool to other platforms of communication towards later stages of relationship development. Within the SNS environment, increasingly personal features of Facebook were used to communicate. Simultaneously, progression of communication to other platforms, e.g. the use of phone calls and text messages, symbolised an increase in intimacy and general relationship progression. Two propositions are made. First, the affordances of the technologies encourage users to switch modes to communicate personal topics, i.e. to talk to them directly and glean more detail. This supports previous work on the use of different platforms to communicate based on the ability of the technology to allow symbol creation (i.e.

develop a common syntax for understanding one another, particularly when messages are ambiguous). This is argued to be useful to develop more meaningful relationships, or use pre-defined, commonly understood symbols that may be typical when only social norms govern communication expectancies (e.g. via email and written communication - Trevino, et al., 1987). Second, is the symbolic status of a particular channel or platform to *signal* a level of intimacy or relationship expectation. Akin to signalling to a stranger that a low level of intimacy is required by pulling away (e.g. Derlega & Grzelak, 1979), the non-reciprocity of mode switching may indicate a desire to stay at earlier, low intimacy stages of a relationship (e.g. *commence*), or moving to other platforms by giving out your phone number may be indicative of a desire to be more intimate, regardless of message content. This symbolism is then judged for its appropriateness with respect to the discloser goals, rewards, situation and stage of relationship (e.g. Altman & Taylor, 1973; Berger & Bradac, 1982; Berger & Calabrese, 1975; Collins & Miller, 1994; Derlega & Grzelak, 1979; Kleinke, 1979). The proposed model takes into account the use of communication platforms as a signal for more information, and, reciprocally, the need of information to alter the platform used. This is demonstrated through the iterative model section of the model at the bottom of Figure 7.12. That is, a communication platform may be considered if a relationship is ready to be progressed, *and* a relationship can be progressed if the platform is used to signal the desire to progress by either interaction partner.

7.3.4. Social and idiosyncratic norms and the implications for interpersonal closeness

Roberts & Dunbar (2010) found support for social activities as critically preventative of relationship decline with friends. They found that while interpersonal relationships can be developed and maintained through technological mediums, such as

phone calls and SMS, FtF interaction has a greater impact on closeness with friends. Support for this was found in studies 4 and 5. In Study 5, participants were involved in significantly more activities with old friends than new friends, suggestive of the need to be involved in activities to maintain closeness. Furthermore, in Study 4 the use of more personal, voice conversation mediums and the significant impact of FtF interaction on the closeness of interviewees with their friends further supports Roberts & Dunbar's (2010) finding. Roberts & Dunbar also found that frequency was critical for maintaining closeness with friends. In Study 4, relationships in decline were weakened by a gradual reduction in communication frequency with a friend after they had moved away. However, Study 3 also found that relationships with friends, partners and relatives can be weakened (at least temporarily) by frequent sharing of particular photographs. Therefore, frequency of sharing must be judged in context while simultaneously taking into account the message content within the SNS environment.

Interactive information seeking strategies in SNS are suggested to be the most efficient at reducing uncertainty (Antheunis, et al., 2010). Study 5 of the current work supports this finding. Photo viewing (a passive strategy) was significantly related to certainty within the mediation analysis (Figure 7.4). However, commenting (an interactive strategy) had a stronger significant positive relationship with certainty (Figure 7.5). Antheunis and colleagues also found that certainty mediated interactive information searching and perceived similarity of others. The current research found a mediation effect of certainty between interactive communication and liking, where liking is suggested to be partially influenced by perceived similarity to others (e.g. Byrne, 1961; Kandel, 1978; Rubin, 1973, 1974; Secord & Backman, 1964), as found in Study 4 at early relationship stages. Therefore, support for recent SNS work is found, with the addition of a proposed model of motivations to explain the relationship

between certainty, and the manifested communication behaviour in SNS and more generally.

EVT (e.g. Burgoon, 1978) was noted in the literature review of this document as having its origins in URT. The present research findings add support for the theory of EVT in interpersonal communication on Facebook. EVT suggests that communication norms are derived from social norms of interaction and known idiosyncrasies of an individual communicator (Burgoon, 1993). Norms of Facebook interaction and for network groups are developed over time through increased interaction (McLaughlin & Vitak, 2011; Postmes, Spears, & Lea, 2000). Communication expectancies are formed from consistent patterns of communication and are used to anticipate future behaviour of a communicator (Bevan, 2003; Burgoon, 1993). When a communicator violates these norms a discrepancy arises in the perceiver and creates alertness, which in turn causes the recipient to evaluate the communication intent and the communicator (Burgoon & Hale, 1988; Burgoon, et al., 1989; Burgoon, et al., 1995). Within the proposed model, such deviations create alertness in the need to seek more information about the communicator to re-develop or strengthen certainty via Facebook channels depending on the stage of the relationship.

In studies 3 and 4 it is argued that social norms and individual communicator norms are apparent in the violation of expectancies. In Study 4 interviewees that were performing passive information searching found that lack of information availability or profile pictures that were too revealing resulted in negative evaluations as the interviewee suggested they either violated a social norm of Facebook behaviour or expected idiosyncratic norms. However, when discussing later stage relationships there was little evidence of having experienced a violation of Facebook norms or individual expectancies. Collins and Miller (1994) suggest that single 'off' encounters are likely to

be dismissed as a relationship progresses as the recipient is able to determine that it is not the norm for that discloser. Therefore, it is argued that at earlier stages of relationships 'off' encounters and violations of these expectancies of Facebook norms result in stronger evaluations than at later stages. Furthermore, it is suggested that as relationships progress more information is known about an interaction partner and so idiosyncratic expectancies are developed, whereas at early stages recipients only have social norms, or in this case Facebook norms, and so make cognitive shortcuts of behaviour to determine if a disclosure is a violation (e.g. Burgoon & Hale, 1988). Study 3 supports the proposition that communicator variables will moderate expectancy and outcome evaluations (e.g. Collins & Miller, 1994), as relationship qualities were altered by the interaction between information type and relationship type.

However, expectancy violations are also based on situation and relationship factors (Burgoon & Hale, 1988). Studies 3 and 4 add support for relationship factors by identifying the appropriateness of communication for individuals at different relationship stages, or with different relationship types. Appropriateness of a disclosure can also be judged based on norms and functions (i.e. goals) of disclosure, and the timing can effect how recipients evaluate disclosure content (e.g. Derlega, et al., 1973; Jones & Gordon, 1972; Kleinke, 1979). Study 4 identified a social contract of communication between new and old friends and the interviewees. Violating the social contract by sharing too much information too soon, using features representative of high intimacy and personalised message content, or not supplying sufficient visible information saw profile subjects labelled as 'weird' or relationships were paused. The social contract is considered to consist of expectancies and be based on social norms. Idiosyncrasies of the communicator were discussed with old friends, however violations and evaluations about old friends were hardly expressed, suggesting a greater tolerance

to violations at these late stages, in line with previous offline research (e.g. Burgoon & Hale, 1988; Collins & Miller, 1994).

These findings have implications for privacy theory, and the assumption made in early SNS work that privacy must be protected at all times to prevent unintended consequences such as ID fraud and data aggregation across multiple SNS services (e.g. Acquisti, 2009; Acquisti & Gross, 2009; Dwyer, et al., 2007). As later SNS work suggests, information is required for successful user experiences (Burke, et al., 2009; Ellison, et al., 2011). This work contributes further by suggesting that prohibiting certain photographs, or different areas of the profile and general interaction content, at different relationship stages not only degrades user experience and site stickiness, but can be detrimental to the successful development of relationships. The current findings also suggest that boundary negotiation is critical to SNS groups based not only on the type of friends connected within Facebook or the extremeness of disclosed data (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Marwick & Boyd, 2011), but for day-to-day information sharing and availability. Disclosure must be carefully managed to allow enough data for the goal of interpersonal relationship development, but not allow seemingly appropriate (normatively) yet inappropriate (as identified in the current research) content or communication methods to be used with new friends.

Although a social contract and expectancies may provide a useful framework for evaluating interactants with little knowledge of them, a strict adherence to norms can result in fewer rewards for disclosers. An example given in the literature review was that of the expectancies of male disclosers. In general, male disclosers are evaluated less favourably if they disclose too much compared with female disclosers (Derlega & Chaikin, 1976). However, males adhering to this social contract may not benefit from the rewards of open communication, such as making information visible on profiles for

new friends to search, or sharing personalised messages through private channels with others and generally allowing relationships to develop. Although gender effects were inconclusive throughout this work in direct relation to disclosure or certainty, as with privacy and disclosure more generally - specifically the decision to disclose or conceal certain pieces of information at different relationship stages with different targets - a fine balance is required between social contract adherence and pushing the envelope to watch it bend.

7.3.5. Personal space analogies and regulation of the 'self' boundary

Although specific instances of personal space were not investigated throughout the current research, some analogies can be made between the user's account space and their own, physical personal space. Similarly, implications for the use of personal boundaries of the self can be made based on the findings and observed behaviour of the participants throughout this thesis.

Participants expressed concerns over receiving too much information or not having enough information to make an assessment of others via Facebook. Over and under disclosure of particular photographs was also demonstrated to be detrimental to relationships in Study 3. Taking Altman's (1975) and Derlega & Chaikin's (1976) boundary metaphor for personal space, individuals who desire more seclusion can decrease the permeability of their self-boundary, whereas those who wish to be more sociable can increase the permeability of their self-boundary to allow more information through. However, this work identified a norm of expected information flow for the permeability of the self-boundary when initially interacting with new friends via Facebook, an expected social contract. New friends who perhaps deviated from expectations or posted too deep or frequent information on Facebook, led participants to

feel their boundary needed to be less permeable, that the user was invading their personal space, evident in their negative judgements. In addition, the recipients of information made judgements about the expected permeability of other's boundaries for information posted on Facebook, i.e. how much others should be sharing about themselves. As indicated above in section 7.3.4, consideration should be given as to when the personal boundary should be opened and closed based on the temporal needs of interaction partners, on the content of the message, type of relationship, stage of relationship and any goals of communicating. Otherwise, boundary turbulence may occur, i.e. relationships may be harmed through inappropriate boundary negotiations.

A further indication of a need for personal space or to allow others into one's personal space are indicative from interview extracts identifying friends who had recently moved away from their previous geographic co-location. Instances where friends had moved away showed an increase in Facebook use, and aimed to maintain their friendship through Facebook communication when they could not meet offline. This shows that while being geographically dispersed, users assimilate Facebook communication via their personal profile as if to allow others more frequent access to their self, into their seclusion zone, to maintain intimacy levels. Akin to the increased intimacy building and self-disclosure found when interaction partners are proximally closer (Altman & Taylor, 1973; Argyle & Dean, 1965; Jourard & Friedman, 1970; Worthy, et al., 1969). Whereas, those others who are communicated with more frequently and are geographically co-located, can use offline interaction to allow one another into their personal space and to maintain and develop relationships, hence the desire to meet offline or mode switch to a more personal medium.

However, personal boundaries are mechanisms used to control privacy and information flow that are entwined with the culture in which individuals are based. As

outlined in the literature review, Altman (1975) and Westin (1967) both discuss how privacy, and thus disclosure, is culturally universal, yet the mechanisms used to apply privacy are culturally distinct. Within the present work the cultures were largely homogeneous and so within other cultures the effects of disclosure and the management of personal space and boundaries may differ. For example, the participants who expressed concern that their new Facebook friends were sharing too much information through photographs, or not enough information via Facebook walls, may be concerned *because* of the culture within which they operate. A sample from another culture, e.g. South America, may have completely different expectations of what is shared or not shared via Facebook for different relationship stages and types, and thus the levels of expected boundary regulation may differ. Future research should replicate these studies for a cross-cultural comparison to address any differences in perceived or expected personal space and the mechanisms that these cultures use to facilitate their boundary regulation and expected behaviour of others.

A final consideration of personal boundaries is that of crowding (e.g. Joinson, et al., 2011). Too much information may over-crowd users, enacting them to close their self-boundary using different mechanisms available to them. In offline environments this would be to move away from somebody physically, or isolate oneself from the environment where information flooding is occurring (e.g. Altman, 1975; Derlega & Grzelak, 1979; Westin, 1967). In a mediated environment including Facebook and a number of other technological platforms, users may restrict or open access to their personal information via the privacy settings, or for VoIP services may set their online status to 'offline' or 'private' (or any similar setting which prevents information reception or being alerted of new information). Examples of such behaviour using the telephone could be to unplug the phone from the network, or switch a mobile phone off

to prevent information flooding. However, to determine precisely what privacy settings and privacy mechanisms individuals in different cultures use to avoid digital crowding require future work.

7.4. Conclusion

This thesis aimed to identify the effects of day-to-day information sharing within Facebook and its impacts on the relationships we hold with Facebook ‘friends’. Using the assumption that Facebook users are aware of their audiences and the content they disclose, the research established that day-to-day information sharing and interaction within Facebook does impact upon our relationships. However, the relationship is not simplistic. The effects of information disclosure, sharing and interaction via Facebook differ depending on the method and content of a disclosure, the type of relationship, the stage of the relationship, the frequency of information disclosure and the goal of connecting with others. Each of the communication behaviours observed throughout this research are motivated by an interaction of sharing, certainty and relationship needs across stages of relationship development. These stages are fuzzy concepts as a degree of overlap is expected between them.

The current work established Facebook as just one platform in the toolbox of interpersonal communication mediums. Participants of this research showed a preference to communicate via personal mediums (including some direct features of Facebook) as relationships progress and disclosures become more intimate. Specifically, this work identifies an inverse relationship of communication method and the topics of disclosure as identified in SPT. Convenience was occasionally cited as a reason for choosing a particular medium, but overall the results support the work of Trevino et al. (1987) where the platform of communication is chosen based on its ability to clarify

ambiguity or where established norms already dictate preference. The use of a medium may indicate a desired level of intimacy, symbolically or via message content. Task oriented communication also dictated the type of Facebook feature used to achieve a common or team goal.

Overall support is found in the current research for the general relationship between disclosure, certainty and liking but within the context of interpersonal communication via Facebook. However unlike URT, this work identified a delayed onset of liking as certainty increased. Certainty showed a significant positive relationship with passive and interactive communication frequency, whereas liking was only significantly directly related to interactive communication frequency. Certainty was found to mediate passive and interactive communication and liking which suggests that the relationship between liking and certainty is not strictly bidirectional but disclosure interacts via feedback loops before liking or certainty is subsequently altered.

When the content of disclosure was altered it demonstrated a positive and negative relationship with the relationship qualities held with others. Small differences in disclosure content interacted with the stage of a relationship and the communication method. Thus the decision to disclose must be balanced with considerations of privacy, but not only one's own predispositions, potential outsider threats, or threats of over disclosure to particular audience members as previous work suggests (e.g. Acquisti, 2004; Acquisti & Gross, 2009; Binder, et al., 2009; Burke, et al., 2009; DiMicco & Millen, 2007; Ellison, et al., 2011; Skeels & Grudin, 2009). The need to conceal must also take into account the specific properties of day-to-day information such as message content, frequency of sharing, relationship stage and the need for new friends to browse peripheral information about the self. Previous research suggested that higher privacy concern led to lower disclosure levels in SNS (Krasnova, Spiekermann, Koroleva, &

Hildebrand, 2010; Stutzman, Capra, & Thompson, 2011), and that users adjust their profile visibility using site controls (Tufekci, 2008). However, such restrictive behaviour may prohibit relationship development at early stages. The aims of a particular task of communicating must also be considered, however expressions of these task related instances were limited and robust conclusions cannot be made.

EVT can act to identify how judgements about others are made in the Facebook environment, and beyond. Although not investigated throughout, the results from Study 4 strongly implicate EVT with reference to the development of social and idiosyncratic norms of communicators via Facebook. Interviewees expressed repercussions for others when norms were violated. At early relationship stages within Facebook, the expected social contract dictated the norms. As relationships developed users looked to idiosyncratic norms of disclosure for interactions of topic and platform/feature used to communicate. It is concluded that EVT as an extension of URT can aid the identification of appropriate behaviour for uncertainty reduction and strengthening relationships in SNS and beyond.

Overall, the concurrent triangulation method adopted in this work found that it is important to be aware of what is shared, to whom, at what stage of the relationship and how often within Facebook, as any poor choices in the combination of these may lead to negative relational outcomes. To discuss more intimate topics it is preferential to communicate FtF where possible or via conversational mediums in private channels. While technological developments support a greater range of features and possible mediums of disclosure within SNS platforms, FtF interaction is the most powerful to develop relationships, however Facebook can be used to speed up the process of uncertainty reduction. The development of a conceptual model for sharing behaviour in SNS environments is proposed. This contribution to the fields of disclosure,

communication science and ICTs is considered a first step and future research is necessary to validate the proposed model within and outside SNS platforms.

7.5. Future research directions

Two limitations of the current work include the limited age range used throughout the studies, and limited control for gender on the outcomes of the studies. The age range used in this research, young adults and university students may limit the generalisability of the results. However, older participants were not restricted from taking part in the studies, and a wider age range is evident in studies 1-3, although only a few participants were not students. Gender was controlled for in Study 3, and no effects were observed on relationship qualities. However, due to the number of variables and manipulations required to control for gender in the group conditions, it was not practical. Gender data was collected in Study 4 but the researcher did not observe any differences between participants for their communication behaviour. It is acknowledged that future research should control for age and gender conditions within the manipulations, with consideration of an experimental design.

The triangulation method used in this research allowed the broad areas of self-disclosure, uncertainty reduction, liking and SNS interaction with their multiple definitions, measurements and outcomes to be honed within the objectives of this research. The use of both quantitative and qualitative research phases allowed the depth and breadth of the relationship between disclosure, certainty and relationship qualities to be identified. However, the use of triangulation may reduce the ability to detect finer details for specific scenarios of disclosure and liking outcomes within Facebook that would be gradually identified within one set of definitions and measurements using sequential experiments.

Due to the nature of the cross-sectional work conducted the direction of causality cannot be explicitly determined. However the interviews and mediation analyses ensured that causality could be deduced without the need for longitudinal analyses.

Two assumptions were made throughout this work. (1) The participants and disclosers of information were aware of the multiple social circles within their Facebook audience and information disclosure was relatively flat across these audiences. (2) The relationships investigated in studies 3-5 were successful (i.e. participants added friends to Facebook who they liked and would not add those they dislike to Facebook), with unsuccessful relationships partially identified in Study 4. This manipulation allows the possible negative consequences to valued relationships to be identified with inferences made for the development of disliking.

Finally, consideration is given here to the development of Internet enabled platforms throughout the time-line of this thesis work. In 2008 when the work commenced, Facebook for mobile was in its early development stages. By completion and submission of the thesis use of Facebook via mobile platforms is widespread. In addition, the tablet market has also developed strongly, often using similar operating systems and means of connection to mobile smartphones, and used in similar circumstances. In parallel with the development of mobile and tablet platforms, the number of mobile Internet connections has increased. Although mobile subscription growth is declining globally, mobile subscription penetration is at 96% of the world population in 2013 (6.8 billion subscriptions with a population of 7.1 billion people)²². At the end of 2009 the number of mobile subscriptions was estimated to be 4.6 billion globally²³. These figures include all types of mobile subscription (including those not

²² <http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf>

connected to the Internet). However, in 2008 mobile broadband subscription numbers surpassed fixed broadband subscriptions²³, and in 2013 there are 422 million mobile broadband subscriptions, 68% penetration of the population²².

These overall trends indicate a user shift towards mobile broadband connectivity throughout the period this thesis was conducted. It is not only the platform of connection to the Internet that may impact the way users are behaving online, but the environments in which users are immersed when communicating online. For example, it could be that pre-mobile platform use of Facebook encouraged users to sit down at a desktop computer, consider their posts and share information carefully. The risk of digital crowding is reduced compared to mobile platforms where communication and Facebook updates can reach users effectively 24/7. With mobile Facebook platforms users may have less inhibitions about communicating with others online when they are in social environments, whereas previously users could not engage with others on Facebook whilst in offline social situations, instead waiting until an appropriate time to use their desktop PC to post information. Overall, mobile phone use for Facebook and the Internet may increase the immediacy of communication. Each of these considerations may impact on the findings of the current research. If users are prone to greater immediacy in studies 4 and 5, sharing may not be compared rigidly to studies 1-3. It is argued here that the increased immediacy can potentially increase communication frequency, which could impact on liking at different stages of relationships. Whilst such developments can affect findings, given the fast-pace at which mobile subscriptions and broadband connections have developed as well as the pace at which communication has changed over the course of this thesis, it was not practically possible to control each of these developments. Facebook features and

²³ <http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2009.pdf>

mobile vs. desktop use change regularly and it is acknowledged that the present work can only encompass a certain degree of stability throughout such a changing period.

Overall, the present research accepts the limitations outlined and considers the results to provide a key starting point for research combining the effects of sharing, liking and certainty on relationships amongst users of SNS and within the wider environment of interpersonal relationships.

Appendix 1

The original NRI as emailed by the authors can be found on the enclosed CD in the folder titled “NRI”.

Appendix 2

Study 1 questionnaire, and SPSS raw data and output files are found on the enclosed CD in the folder titled “Study 1”.

Appendix 3

Study 2 questionnaire and data file are available on the enclosed CD in the folder titled “Study 2”.

Appendix 4

Study 3 questionnaires, and SPSS raw data and output files are found on the enclosed CD in the folder titled “Study 3”.

Appendix 5

The interview plan, quantitative (SPSS) data and output files, and selected example transcripts can be found on the enclosed CD in the folder titled “Study 4”.

Appendix 6

The questionnaires, data files and output files used for Study 5 can be found on the enclosed CD in the folder titled “Study 5”.

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