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'I Like Being a Lab Rat': Student Experiences of Research Participation

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'I Like Being a Lab Rat': Student Experiences of Research Participation

Undergraduate students are often expected to be participants in academic research. However, decisions relating to student participation in research are typically based on speculation or educator assumptions rather than a solid research base. We conducted three studies to investigate student experiences of research participation. These included online surveys (Study 1), semi-structured interviews (Study 2), and analysis of reflective essays (Study 3). A range of pedagogic and ethical issues were considered including motivation to participate, distress, and the educational value of participation. Findings suggest that the experience provides students with important opportunities to learn about research methodology and ethical issues which inform their own research practice. Further, students cite additional non-academic benefits of research participation such as self-discovery and networking opportunities. Negative experiences typically consisted of nervousness prior to the first laboratory study or boredom, though for some students (e.g. those uncomfortable in social situations) engagement in research may lead to anxiety. We conclude that participation in research has pedagogic value to students, and educators should promote those elements of the research experience (e.g. critiquing studies, networking with researchers) that are most beneficial. However, researchers and educators should also actively work to reduce apprehension and minimise potential distress.

Introduction

Students entering universities are exposed not only to teaching but also to the research activities of their lecturers. As a result, students benefit from a wide range of research informed teaching activities including learning about research methodology or specific studies and designing or conducting experiments. Healey and Jenkins (2009) identify

four primary ways in which undergraduates engage with research and inquiry. These include activities where student are participants (both research tutored and research based), for example students engaging in research discussions or actively undertaking research. Students can also engage with research and inquiry by taking part in activities where they are an audience (both research led and research oriented). These include activities such as learning about current research in the discipline and developing research and inquiry skills and techniques. It is argued that each of these four ways of engaging with research and inquiry should be incorporated within the curriculum and can confer a range of benefits for the student (Seymour, Hunter, Laursen, and DeAntoni, 2004). For example, engagement in undergraduate research promotes skill development (Bauer and Bennett, 2003), deep approaches to learning (Kuh, 2007), and aspirations (Eagan, et al. 2013; Pascarella and Terenzini, 2005).

One way in which students can become involved in research is to volunteer to work as research assistants helping with data collection. Clear links have been shown between students who help with data collection and academic outcomes. For example, student researchers have been shown to be more likely to pursue postgraduate study (Hathaway, Nagda, and Gregerman, 2002). Other research-informed teaching methods include the completion of an undergraduate research dissertation. Previous research indicates that despite differences between student and supervisor perceptions of the dissertation and student-supervisor relationship (Brewer, Dewhurst, and Doran, 2012) this practice confers a range of benefits (e.g. Kuh, 2007; Lopatto, 2004). However, less is known about the educational benefits for students taking part in research as a participant. Therefore, the current studies investigate student experiences of research participation and the pedagogic and ethical issues which arise from this practice.

Undergraduate students are often expected to participate in academic research, with opportunities existing from very early in their academic careers. This practice is so widespread within academia that students have been described as human 'fruit flies' (Keith-Spiegel and Koocher, 1985). Student engagement in research is particularly prevalent within disciplines such as psychology and students are frequently required to participate in order to receive course credit (Sieber and Saks, 1989). Indeed, undergraduate research participation is so embedded within Psychology that the discipline has been described as 'the science of the behavior of sophomores' (McNemar, 1946). Educators have little direct knowledge of the student participant experience however and criticisms of the approach typically focus on the quality of subsequent research findings rather than the pedagogic value of the practice (e.g. Peterson and Merunka, 2014). Further, where research has considered the participant experience, studies often focus on barriers to participation in a community setting (Russell, Maraj, Wilson, Shedd-Steele, and Champion, 2008) or appropriateness of the methodology used for a specific, non-student population (for example, people's experiences of palliative care; Gysels, Shipman, and Higginson, 2008). As the majority of studies on research participation are not applicable to the student population, educators often make decisions about the educational value of research participation in the absence of a reliable evidence base.

Those requiring students to participate in academic research have typically argued that participation is of important educational value. Some studies support this claim, with students who participate in research doing better academically than their peers (Padilla-Walker, Thompson, Zamboanga, and Schmersal, 2005; Roberts and Allen, 2013). In particular, taking part in research may provide students with a greater understanding of research methodology or ethical issues (Burgess, 1990; Dalziel, 1996).

If research participation does have pedagogic value and can enhance the student experience, it is important to understand which aspects are of the greatest benefit in order to develop and expand these components. For example, it has been suggested that increasing the amount of quality information about the study provided to student participants may enhance the learning experience (Brody, Gluck, and Aragon, 2000). If, however, the benefits of research participation are not greater than those achieved by traditional teaching methods, such as lectures or seminars (Eliott, Rice, Trafimow, Madson, and Hipshur, 2010), should academics reconsider the educational value placed on this activity?

It is important for those investigating student experiences of research to consider both the potential benefits and harm that may result from participation (Iphoften, 2005). Mandatory participation has been shown to lead to students having a more negative attitude towards learning (Nimmer and Handelsman, 1992) and the recruitment of students as research participants raises a number of specific ethical issues. Although students offered rewards, such as academic credit, tend to start participation earlier in the academic year and take part in studies more frequently (Ferrari and McGowan, 2002) there is a risk that students will be coerced into research participation. It has therefore been suggested that there should be specific international standards governing student participation, consistent with guidelines for other vulnerable groups such as patients (Leentjens and Levenson, 2013). However, in contrast, others have commented that if the practice has important educational value additional barriers, such as restrictive ethical procedures, should not be put in place as they may discourage participation (Lawrence, 2007). It is clear that there is the need for a fine balancing act here between adoption of mandatory (and potentially unethical) research participation policies and encouraging participation for academic learning. At present, decisions

relating to student participation in academic led research appear to be based on speculation and educator assumptions rather than a solid research base.

The current studies seek to investigate student experiences of research participation in order to inform future practice. The research addresses a range of pedagogic and ethical issues including barriers to participation, distress, and the educational value of participation. In Study 1, students completed online surveys focusing on prior experience of research participation. In Study 2, undergraduate students engaged in semi-structured interviews. In Study 3, first year undergraduate students prepared a reflective account of their participation experience.

Study 1: Method

Students ($N = 64$) were recruited via a British University participation pool and online research websites. Participants were aged $18 - 38$ years ($M = 20.33$, $SD = 3.90$) and typically ($N = 62$) in their first year of undergraduate study. Students from all academic disciplines were eligible to take part. Participants responded to a series of bespoke questions relating to the selection of research, research outputs, and ethical issues. Participants were asked to identify the extent to which a range of issues, such as the subject area or study design, were important (1 = not important at all to 7 = very important) when deciding which study to take part in. Example items include 'The study area (e.g. health psychology, social psychology, forensic psychology)' and 'The availability of other incentives (e.g. vouchers, prize draws)'. Participants were then asked to respond to statements relating to the impact of research participation. Example items included Participation in Research… 'Is beneficial to the scientific community' and 'Encourages me to reflect on my own experiences or behaviour'. Items were answered on a 7-point scale (1 = strongly disagree to 7 = strongly agree). Finally,

participants rated the importance of ethical issues on a 7-point scale (1 = not important at all to 7 = very important). Example items included 'Being able to change my mind and leave the study before it is finished' and 'Being reassured that my individual responses will be held confidentially'. The research received ethical approval from the host institution.

Study 1: Results

Students deciding whether to participate in a study placed the greatest emphasis on factors such as the identity of the researcher, whether the research is student or academic led, and the study design, followed by whether the study is online or offline, and the number of participation points available. The subject area and availability of other incentives such as vouchers or prize draws were also considered important. With regards to the impact of research, students held a strong belief that participation would influence the way in which they conduct research, benefit the scientific community, and forms an important part of the learning process. Students also reported that participation is interesting, encourages reflection, enhanced understanding of research methodology and the subject area. Students also endorsed the suggestion that research benefits society. With regard to ethical issues, students reported that confidentiality was the most important consideration followed by being provided with practical information (e.g. length of time) before agreement to participate, and being able to change their mind and withdraw from the study. Being valued as a participant, being provided with background information (e.g. subject area) before agreeing to participate, researcher honesty, time to decide whether to participate, and the opportunity to provide additional information were also important. These data are shown in Table 1.

[Table 1 here]

Study 2: Method

Nine undergraduate psychology students were recruited via a British University participation pool. No demographic information was collected. Semi structured interviews (each lasting approximately 30 minutes) were conducted either in person or via telephone. Example questions included 'When deciding whether to take part in a study, what factors do you consider' and 'What ethical issues do you think are important when taking part in studies?' All interviews were recorded on a portable hand held device, transcribed verbatim, and subject to Interpretative Phenomenological Analysis. The researcher then read each transcript in detail and transcripts were coded for emergent themes. Principles proposed by Braun and Clarke (2013), Smith, Flowers, and Larkin (2009) and Sullivan, Gibson, and Riley (2012) were adhered to throughout the data collection and analytic process to provide rigour and cohesion. For ethical reasons (i.e., to allow participants to comment on research conducted by the authors anonymously), interviews were conducted, transcribed, and anonymised by Research Assistants. The research received ethical approval from the host institution.

Study 2: Results

Four themes were identified, Practical Issues, Information, Learning Experience, and Distress.

Practical Issues

Participants commented on the importance of time and specifically the extent to which the amount of time required by a study influenced the decision to participate. For example, 'Time. Basically the first experiment I took part in, before I knew you had to get SONA [participation point scheme] points, I took part in a study which took aaages.

Seriously like erm one and a half hour ish or something ridiculous. And because of this it just put me off experiments for a while… So yeah the length of the experiment has to be taken into consideration' (P8) and 'I like doing questionnaires just cos they're quick and easy and I can just do it in my room' (P9). The utility of the participant point system was also important though participants reported a variety of experiences. For example, 'The whole system is really good I really like it. It's pretty simple not a hard thing to do' (P1) and 'I just find it confusing but I have asked my tutor for help with it' (P2).

Information

Each participant commented on the level of information provided by researchers. Overall, students reported that the level of information was sufficient, though in some instances the amount of information provided led to students not fully reading information sheets etc. For example, 'Sometimes it's too much, I ain't gonna lie but like I don't even read through it all like just the top bit just to understand what's going on and that's it…I pretty much skim through it and see if there is anything I'm uncomfortable with. But all the studies I have looked at, even the one's I didn't partake in were sufficient' (P1) and 'I sometimes skip over the brief because there are so many similar ones' (P7). Consequently, some students appreciated concise information sheets and suggested that these could be condensed. For example, 'The briefs and introductions can sometimes be quite long winded so it's nice to have it clear and concise' (P4) and 'I think you should really summarise that in like small parts or more compact. I think that really puts off the students as to how much they have to read...I just think the information should be a bit smaller' (P5).

Learning Experience

Each student commented that research participation was beneficial, particularly with regards to learning about the subject area or research methodology and access to research equipment which could enhance academic success e.g. 'You got to use and see the genuine equipment so it was definitely a good experience' (P5). Participants often highlighted the relationship between experience as a research participant and conducting research for the third year dissertation. For example, 'It is a really good experience because it allows us to question the different studies and make us think about our own, the ones we will conduct' (P4) and 'You can learn a lot and have that experience which is really good cos like in third year we'll have to do our own projects and by taking part in experiments you learn a lot which you take to third year' (P9). Adopting the perspective of a participant was believed to be especially important e.g. 'It was a really good opportunity, if they were studying something I don't mind doing in my third year to see how they did it and to get it from a participant's point of view so I have got a better understanding for when I do it in my third year' (P3).

The learning was extended to non-academic issues and participants obtained valued information about themselves. It was reported that 'It sort of teaches you more about yourself as a person' (P4) and 'It tells you a bit about yourself' (P6). Overall, the experience was viewed as beneficial. As summarised by one student 'I like being a lab rat' (P5). The learning experience was heightened when participants engaged in offline studies which provided the opportunity to network with researchers 'That connection you get with the third years, you can ask them questions about the course, advice if you're unsure about something and what to look out for, definitely a good networking thing if nothing else' (P4) and 'Networking has a massive impact' (P5).

Distress

Students commented on experiences of distress or discomfort. For example, 'Not uncomfortable but as I said there I was rather tense' (P3) and highlighted the importance of clearly identifying the scope of the study 'I have always been well prepared beforehand and if it is an uncomfortable one I've gone into it knowing because I have been pre-warned so it's not hit me and made me feel that I want out' (P6). One student reported that she was not comfortable participating in face to face studies, reflecting unease in social situations 'Erm, basically I'm not good at making friends or comfortable with that all… or going along with anything… I feel I don't have the right words to communicate with people… I feel that participating in experiments and face-to-face studies, I have trouble with and I am not erm comfortable…I find it difficult to be in groups, I'm the person who is separated from everyone else… I just don't feel comfortable with participating in experiments etc' (P2). Hence, it is important to ensure that a range of study types (e.g. online studies and laboratory experiences) are available.

Study 3: Method

To successfully pass a first year module, undergraduate psychology students were required to either (a) engage in a range of research studies (acquiring the equivalent of 20 points) and prepare a 500 word reflection on their experiences or (b) complete a 2,000 word essay discussing research ethics. The vast majority of those enrolled on the module participated in research studies and submitted the reflective assignment ($N = 107$), with a minority of students completing the lengthier essay ($N = 16$) or failing to complete either ($N = 17$). Those completing the reflective assignment were asked permission for these to be analysed. Of those contacted 52 provided consent for the researchers to analyse the work. No additional demographic information was requested

and all reflective essays were anonymised prior to analysis. The research received ethical approval from the host institution.

Qualitative content analysis was employed, consistent with previous research investigating student reflective assignments (Chamoso and Caceres, 2009). The approach is defined as 'a research method for subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns' (Hsieh and Shannon, 2005, p1278). Codes were formed through both inductive and deductive methods. Existing research questions contributed to the development of deductive codes whilst themes repeatedly emerging from the data were introduced as inductive codes as analysis of the data progressed. Saturation was evident when no new codes developed. This approach is consistent with prior qualitative content analytic research (e.g. Lopez, Detz, Ratanawongsa, and Sarkar, 2012).

Study 3: Results

Six themes and eighteen subthemes were identified. The frequencies of each theme and subtheme are reported in Table 2. Two researchers independently coded 15 (28.85%) reflective essays. Kappa statistics were performed and showed a high degree of agreement (K = 0.80). Hence, the remaining entries were coded by the lead investigator only.

[Table 2 here]

Context

Participants frequently described the context in which the research occurred. In particular, students specified the type of studies completed (e.g. experiment, observation) and the research area (e.g. sibling aggression, distraction). Typical

comments included 'I took part in a combination of online surveys and face-to-face laboratory studies in a variety of tasks including cognitive assessments and self-report style questionnaires'. Participants also discussed course requirements as motivation for engaging with research e.g. 'I participated in several different studies in order to accomplish the target to achieve 20 SONA [participation point scheme] points'. Though students are not required to participate in further studies, they frequently reported their intentions to do so, suggesting that participation was a rewarding or enjoyable process. For example, 'I hope to continue taking part in research throughout my course in order to gain as much experience as possible'.

Learning

Research participation allowed students to learn about particular research areas and more frequently about research methodology, ethics, or equipment. As stated by one student 'Research participation allowed me to get a deeper understanding of different areas in psychology. Furthermore, my participation gave me more awareness about research design limitations, and the needs of my participants'. Participants frequently commented that their experiences would influence their own research, particularly their final year dissertation. For example, 'I had the chance to see how real researchers work in the lab environment, which gave me useful hints about how to run my own studies'. Understanding the participant experience appeared to be particularly important. As stated by one participant 'When I come to create my own psychological project, I will understand what it is like to be a participant and therefore, be able to be a better experimenter'. Consequently, students often commented that 'Taking part in studies has now prepared me for my third year project'.

Participants often critiqued the studies demonstrating an important understanding of research issues which may contribute to future evaluation or study design. Furthermore, students often commented that they would address specific limitations when conducting their own research. As stated by one participant 'I personally found that when studies went on for too long, my attention, effort, and concentration declined, so my data may not be reliable...I will be able to put this into practice in my own studies by ensuring that any trials are kept as brief and concise as possible'. Learning was not limited to academic work however and some participants commented that they had learnt about themselves during the studies. Typical comments included 'It really got me thinking about the sort of person I am' and 'They asked questions I would not usually ask myself therefore allowing me to learn more about myself in the process'.

Practical Considerations

Participants discussed the utility of the course credit system. For example, 'I found gathering the points difficult at first as I had trouble with the SONA [participation point scheme] system and my log in, which I sought IT advice for' and 'The SONA [participation point scheme] system itself was easy to navigate and studies were updated regularly and easy to sign up for'. Convenience was also important, particularly for the selection of research studies. For example, participants commented 'I chose to participate in mainly online studies as they were more convenient for me to do at home as I commute to university' and 'This was partly due to not having much time to do lab studies with having two under 5 year olds to get home to everyday'.

Social Considerations

A small number of participants commented on the networking opportunities provided by research participation. For example, 'I was able to interact with real researchers in person, which was useful for any questions and inquiries I may have had' and 'I also got the chance to question the students, in regards to their experience and the three years spent at the university. These studies broke-down the obstacles between the students and this allowed us to socialise and interact with them more'. As previously stated, students often participated in research in order to fulfil course requirements. However, others participated in order to support their fellow students (frequently completing an undergraduate dissertation). Typical comments included 'I was really excited to know that I can help fellow psychology students complete their final year projects' and 'Another reason I was willing to take part was purely because I like to help others as it gives me personal satisfaction'.

Positive Responses

A minority of participants reported gaining confidence from research participation. For example, 'I gained the confidence to go on to take part in a lot of different studies at the university' and 'I have also gained more confidence as a result of taking part as I have met new people and socialised more often than I would of normally'. Participants reported a range of positive responses and comments included 'This made the study more fun', 'The studies I took part in face to face were a lot more interesting for me', and 'It was both enjoyable and informative'.

Negative Responses

Participants identified a number of negative issues associated with research participation. These often concerned the amount of time required or boredom. As stated by one participant 'Questionnaires were used most with the online studies and were often very long. When I was taking part in questionnaires I often felt bored'. However, some students commented that their initial perceptions about research participation were not correct or that they had not experienced distress. For example, 'Initially I felt I would not enjoy participation and all experiments would be time consuming / boring, however I was wrong' or 'So far I have not felt upset whilst taking part in a study'. Other negative emotions were also reported such as 'This frustrated me'. Many participants commented on experiences of distress, anxiety, or discomfort. For example, 'I remember how excited and anxious I felt when I participated in my first real life online study'. Though some participants reported feeling these negative emotions, this often preceded the study and they reported that they were reassured by the researcher. As reported by one student, 'I was very nervous about participation. What to expect, whether I would be adequate, even if the experimenter would be friendly? This was however instantly put to rest as it was a laid back atmosphere and I was made to feel very comfortable'.

Discussion

The present findings suggest that engagement as a participant in research provides students with an important opportunity to learn about specific subject areas, research methodology, and ethical issues. Students clearly recognised the value of this learning and reported that participation would inform their own research (e.g. the research dissertation). Further, students noted some wider educational benefits of participating in

research such as gaining confidence, learning about themselves, and networking with other students who were more advanced on the course and academic staff. These issues are expected to impact on students from all subject discplines.

Our findings are consistent with previous studies, suggesting that research participation is a valuable learning experience (Bradbury-Jones, Stewart, Irvine, and Sambrook, 2011; Moyer and Franklin, 2011) and personal research experiences enhance taught sessions (Burgess, 1990). Hence, greater integration between the taught components of the course and individual research participation may be beneficial. However, it is important to strike a careful balance between a system which actively pressurises students and a completely voluntary system which fails to engage students. Padilla-Walker et al. (2005) suggest that the students who would not normally volunteer may benefit the most from research participation. However, a mandatory system is likely to lead to student disengagement (Nimmer and Handelsman, 1992). Therefore, whilst the results of the current study suggest that taking part in research is valuable to the student learning experience and should be actively encouraged by educators, it may be advisable to form a partnership between students and educators in order to develop the most beneficial opportunities for participation (Healey, Flint, and Harrington, 2014). This may involve the promotion of additional activities, such as research conferences (Garde-Hansen and Calvert, 2007), writing journal articles (Charlesworth and Foster, 1996), taking part in journal clubs (Roberts, 2009), and undertaking peer review (Nicholson, 2011) in order to fully embed research within the curriculum.

A number of students commented on the networking opportunities provided by research participation. Interactions between academics and students have been shown to be important for academic growth, and can for example, influence student's education aspirations. Unfortunately, students in their first year of academic study may be unlikely

to have had the opportunity to meet teaching staff on a one to one basis at their institution. Hathaway et al. (2002) suggest that working as a researcher is one way to gain access to academic staff. However, students early in their academic careers are unlikely to have the skills to take on research assistant posts. Therefore, taking part in research early in a student's academic journey may provide networking opportunities which are educationally beneficial.

As well as the opportunities to network with staff, students in the current study also noted that the enhanced interaction with other students further advanced in their studies was useful. Previous research suggests the development of social networks can help the transition to University (Glaser, Hall, and Halperin, 2006) and so networking via research participation could be useful as it helps social networks to develop. Whilst academia often supports social relationships between students at the same stage of their course (e.g. induction programmes) there are typically few opportunities for students to network with those from other areas of the programme. As students clearly value these interactions educators should encourage additional interactions with fellow students. For example, final year students may present their research to first or second year students, providing presentation experience for those discussing their work and opportunities for those beginning their academic career to ask questions and obtain advice. In summary, it is clear that direct contact with both academic staff and students via offline studies has many important benefits for students. It may be advantageous to put into place measures to reduce the barriers that can stop participation, such as offering childcare or having experimental sessions during formal teaching time.

Another barrier noted by some of the students was the apprehension and anxiety that they felt before they took part in research. However, this worry was also reported to be unfounded once students had started to participate and the majority reported that

their experience of participation had been positive. Helping students to overcome their nervousness regarding participation may be useful. Previous studies have found that giving out course credit for research participation is a good motivational tool (Ferrari & McGowan, 2002) and could be used as a way to help students to overcome their nervousness. In the current study, the majority of the students were taking part in research to fulfil a course requirement. Some students noted that they had been apprehensive about taking part but had enjoyed the experience so much that they would continue to participate in studies after they had completed the research participation required by their course. These findings suggest that although research participation may initially be anxiety-inducing for some and driven by rewards for others, after a while participation can be perceived as useful for learning and enjoyable.

The social aspect of research participation was highlighted by those students commenting that they participated in research in order to help others. This is consistent with previous research investigating motivations for contributing to healthcare research (Gysels, Shipman, and Higginson, 2008). Of course, though social interaction may be rewarding for some students, for others this may be uncomfortable. It was this issue which typically led to distress or discomfort rather than unease with the subject material. It is therefore important for educators encouraging students to engage in research to provide a range of experiences. For example, online studies may allow students that would be uncomfortable participating in a laboratory environment to become familiar with the research process. In addition, interventions designed to reduce anxiety regarding participation, for example for students with social anxiety, may be appropriate.

It has been argued that the information provided to students participating in research is inadequate and increasing the amount of information provided may enhance

the learning experience (Brody, Gluck, and Aragon, 2000). In the present studies, participants reported that information was sufficient or excessive. Therefore, some students did not fully read the information sheets provided. This issue has been raised previously (e.g. Lavelle-Jones, Byrne, Rice, and Cuschieri, 1993). Though researchers conducting laboratory studies can address this issue by verbally briefing participants, this is not appropriate for online studies. Hence, it is important to present information to participants in a clear and concise manner. Educators may also familiarise students with research codes of conduct (e.g. British Psychological Society Code of Conduct, Declaration of Helsinki) to ensure that participants are familiar with their rights and important issues such as the right to withdraw from research studies.

The findings of the current study were, of course, limited by reliance on student perceptions of change. Although students believe that participation has pedagogic value, independent validation of positive academic outcomes would be useful. In particular, future research could explore whether engagement in research influences the objective ability to design or conduct research, academic achievement, or progression to postgraduate study. This is particularly important as students often experience difficulties identifying research questions, designing or conducting studies, and reporting results. Future research should investigate how the educational value of research participation can be enhanced. Previous research suggests that techniques such as closer integration between research methods teaching and the studies available for participation, an enhanced debrief or feedback later on the study outcomes, or class assignments relating to the participant experience (Roberts and Allen, 2013) may be useful. In addition, some students said that they had discovered more about themselves as a result of participation in research studies. Future research could investigate how

research participation aids self-discovery and how personal growth from taking part in research studies can be supported.

Studies two and three recruited psychology students only from a single British university. Important differences may occur across disciplines, institutions, or cultures. For example, Daniels et al. (2016) report that Hispanic students obtained greatest benefit from their undergraduate research experiences. Similarly, we have focused on the undergraduate experience and it is possible that postgraduate students participating in research may provide a different perspective. Previous research indicates that a range of demographic and academic factors such as gender, academic ability, and discipline influence undergraduate research experiences (Taraban & Logue, 2012; Zimbardi and Myatt, 2014) and subsequent studies should explore these themes with a more diverse student cohort. Furthermore, faculty member engagement in undergraduate research (Webber, Nelson Laird, and BrckaLorenz, 2013) and the emphasis placed by institutions on undergraduate research (Baker, Greer, Lunsford, Pifer, and Ihas, 2016) vary; and the manner in which this variation impacts on the quality of the student experience should be considered.

To conclude, students report that participating in research provides important learning opportunities. In particular, those engaging in research learn about the subject area, research methodology, and ethical issues. This experience enhances the ability to evaluate research and informs the manner in which they intend to design and conduct their own research. Educators wishing to promote research participation should ensure that a range of studies are available to minimise the likelihood of distress and support students (e.g. those with caring responsibilities) for whom attendance at traditional laboratory studies may be problematic.

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Table 1: Survey Response Descriptive Statistics

Question	Mean	SD
How important are the following when deciding which study to participate in?		
The study design (e.g. questionnaire, experiment, observation etc)	5.48	1.26
Whether the study is online or offline	5.41	1.35
The subject area (e.g. health psychology, social psychology, forensic psychology)	4.88	1.79
The number of participation points available	5.41	1.55
The availability of other incentives (e.g. vouchers, prize draws)	4.77	2.05
Whether it is a student project or a staff project	5.63	1.96
Who the researcher is	5.73	2.01
Please indicate how strongly you disagree or agree with the following statements		
Participation in research strengthens my understanding of research methodology	5.44	1.21
Participation in research enhances my understanding of psychology	5.36	1.36
Participation in research is an important part of the student learning process	5.90	1.36
Participation in research is beneficial to the scientific community	5.97	1.19
Participation in research benefits society	5.34	1.50
Participation in research will inform the way in which I conduct research (e.g. the third year project)	6.05	1.05
Participation in research is interesting	5.59	1.21
Participation in research encourages me to reflect on my own experiences or behaviour	5.56	1.37
Please indicate how important the following ethical issues are to you		
Being provided with practical information before agreeing to take part (e.g. how long the study will take)	6.14	1.01
Being provided with background information before agreeing to take part (e.g. what the study is investigating)	5.70	1.22
Being valued as a participant	5.94	1.27
Being able to provide information I regard as important (that the researcher does not directly ask about)	5.08	1.36
Being provided with honest information at all times	5.53	1.25
Being able to change my mind and leave the study before it is finished	6.03	1.26
Being able to spend time thinking about whether I want to take part before starting the study	5.53	1.31
Being reassured that my individual responses will be held confidentially	6.28	.98

Table 2: Categorisation of Reflective Themes

Theme	Subtheme	Total Number of Students*	% of Students	Example Comment
Context	Description of Study Type	47	90.38	'I participated in an equal amount of both online questionnaires and face to face experiments'
	Description of Study Area	35	67.31	'The online studies I chose to participate in were based around personality and romantic revenge, university students and sexual coercion, sibling aggression, victimization, ethical issues, and eating psychopathology'
	Course Credit as Motivation for Research Participation	35	67.31	'You had to complete numerous studies in order to reach a total of 20 points'
Learning	Subject Specific Learning	8	15.09	'From these experiences I have learnt about many different topics that otherwise I would have thought I didn't have an interest in'
	Methodology, Ethics or Equipment Learning	37	71.15	'I have developed a broader understanding of the different procedures that can be devised by the experimenters'
	Learning About the Self	6	11.54	'I felt I knew a little more about myself after this study'
	Informing Own Research	45	86.54	'The online questionnaires also gave interesting insights into what questions I could possible ask my own participants in my third year project'
	Critique of Study	32	61.54	'Some of the questions were hard to understand'
Practical Considerations	Ease of Course Credit System	4	7.69	'The SONA system itself was easy to navigate and studies were updated regularly and easy to sign up for'
	Convenience	10	19.23	'I found them to be a lot easier and more convenient to access as well as complete during my own time'
Social Considerations	Networking	6	11.54	'Throughout these studies I was able to freely talk to the other students and exchange experience and career plans, which I found to be very refreshing and interesting'
	Motivation to Help	7	13.46	'I was especially eager to help the final year students with their studies'
Positive Responses	Confidence	7	13.46	'I have also gained more confidence as a result of taking part'
	Other Positive Emotion (e.g.	29	55.77	'I enjoyed this study'

	Interest, Excitement)			
Negative Responses	Fatigue	25	48.08	'It was long and tiring'
	Boredom	17	32.69	'I began to find them quite boring to fill out'
	Distress, Anxiety, or Discomfort	28	53.85	'I was considerably anxious before taking part in the first laboratory research however I soon discovered that it was unnecessary to feel this way'
	Other Negative Emotions (e.g. Frustration)	12	23.08	'I found this frustrating'