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'Thanks For All The Support' - An Evaluation Of Gender Bias In PhD Supervision

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Abstract

Despite high profile gender equality initiatives such as the Athena Swan Charter Mark and publication of gender pay gap data there continues to be an under representation of women in senior levels in higher education. This paper explores sources of gender inequality and bias in higher education and in particular the area of student evaluation of teaching. Student acknowledgements in PhD theses in Educational Research at a pre-1992 university in the North West of England are analysed as a proxy for student satisfaction as students nearly always include comments about their supervisors. The findings support previous work on acknowledgements in terms of the types of individuals and organisations acknowledged. There did not appear to be a significant gender bias in the acknowledgements. However, there was some tendency for male supervisors to be 'thanked' for their humour and intellectual characteristics whereas no female supervisors were acknowledged for these traits. Female candidates were also more likely to comment on issues relating to domestic responsibilities, unlike men. This finding supports previous research that traditional social roles endure. The conclusion is that PhD thesis acknowledgements are a valuable source of data but due to their public nature, students may not express their true opinions of their supervisors and further research would be required in this area to ascertain the impact of gender bias on student evaluation of PhD supervision.

Introduction

Gender bias is a current and highly topical issue that permeates through all areas of higher education. The recent debate about the under representation of women on BBC2's University Challenge which came 'under fire for its gender imbalance' (Turner, 2018 p.117) and the lack of gender neutral questions on the programme has once again shone the spotlight on the gender inequalities in higher education. The recent publication of company data on the gender pay gap, has revealed continuing gender inequality in HE as evidenced by the disparity in earnings between men and women (Government Equalities Office, 2016). Much research has focused on the lack of representation of women in senior positions in UK higher education and more recently has highlighted the differences in student attitudes towards male and female tutors teaching undergraduate students. In particular, that gender bias exists in evaluation of teaching with female tutors consistently being evaluated lower than their male colleagues (Young et al., 2009, Boring, 2017, MacNell et al., 2015). However, there has been little research investigating the attitudes of post-graduate students towards their tutors and in particular if there are any differences in expectations of academic staff relating to their gender. This exploratory piece of research investigates the relationship between PhD students in educational research with their supervisors to identify any gender bias. Unlike many undergraduate and taught post-graduate courses there is often no formal evaluation of the supervisory process. Therefore, the acknowledgements made by students in their theses are used as a proxy for evaluation of the supervisory experience. The overall aim of this paper is to evaluate the acknowledgements made in PhD theses in Educational Research at a pre-1992 university in order to investigate evidence of

gender bias. In order to achieve the overall aim of the study the following research questions are identified:-

- RQ1: Can PhD thesis acknowledgements be used as a means of evaluating teaching, and if so, is there any evidence of gender bias?
- RQ2: What are the sources of support for PhD students and is there any evidence of gender bias?
- RQ3: What impact, if any, does the gender of the supervisor and/or student have on the nature of the supervisor/ student and other relationships?

Literature Review

The literature review commences with a discussion of gender inequality and bias in HE in order to provide a context for the study. Unconscious bias and the use of gendered language are explored to identify gender differences in the use of language. Existing research exploring gender bias in evaluations of teaching is reviewed and the nature of the PhD supervisory role is explored. The use of acknowledgements as a data source is investigated in order to justify the use of acknowledgments as an appropriate scholarly genre.

Gender Inequality and Bias

Despite recent improvements in employment law and other initiatives to address imbalance in the workplace between men and women, there continues to be inequality in higher education based on gender. Gender bias, which is defined as 'positive or negative unconscious belief about a particular category of people' (Poppenhaeger, 2017 p.1), can have a major impact on the actions and attitudes of both men and women. Biases and discrimination are not the same things. However, if biases are not challenged and people consciously decide to act upon them this can result in discrimination.

There continues to be much evidence of inequality in higher education based on gender. Many universities are seeking the Athena Swan charter mark to demonstrate a commitment to gender equality (Gibney, 2013). Despite these high profile equality programmes there continues to be an under representation of women professors in UK Higher Education. The Higher Education Statistics agency revealed that in 2015-16 only 24% of UK professors were women (cited in Cohen and Duberley, 2017). Approximately 1/10th (9.9%) of academic staff are professors but there is a significant difference between men and women with 13.8% of male academic staff working as professors but only 5.1% of women (HESA, 2017). There is a lower proportion of women, than men, studying in higher education in STEM subjects, despite an increase in recent years. Posselt et al (2018) found that the number and proportion of women in Chemistry and Civil Engineering in higher education, between 2000 and 2011 had increased but there is still a gender imbalance. This bias was greater for Civil Engineering than Chemistry and the bias was greater for PhD degrees than undergraduate.

Cislak et al (2018) argued that there are 3 types of gender bias in scientific academia: firstly bias that results in the underrepresentation of women in academia, particularly at the higher levels, secondly that some findings apply only to male participants, which produces biased knowledge and thirdly that there is a bias against research on a gender basis. Roberts and Verhoef (2016) found that women's conference papers were more likely to be accepted if their gender was not revealed. This prompted the move to a double-blind reviewing process at the Evolution of Languages conference in 2016 to remove this gender bias. Witteman et al (2017) cited in Pells (2018) explored possible gender bias in peer review of research funding applications. The study found that women were less likely to be successful when applications were evaluated on the background of the principal investigator rather than the quality of the science. This supports previous research that there is a gender bias in peer review and also that their research is less likely to receive funding (Ley and Hamilton 2008 cited in Cislak et al., 2018).

Research conducted over 40 years ago investigating the reasons for the lack of progression of women in the workplace was based on the premise that women 'assumed responsibility for child care and housework' (Parsons 1953, p. 117) 'and that most women preferred such a situation' (Galenson 1973, p. 112). The result being that women were socialised in to accepting that they were inferior to men in the world of work and this led to women possibly being prejudiced against other women (Ferber and Huber, 1975). It may be assumed that we have made progress and that this stereotypical view of women is in the past. However, there is still evidence to suggest that we link men with high-authority positions and women with low-authority (Rudman and Kilianski, 2000). Even a diversity consultant revealed that her image of a competent airline pilot was 'a tall, white, male, preferably with silver grey hair and looks like he is ex-military' (Turnbull, 2013). A Gallup Poll found that the majority of respondents favoured male over female bosses and women expressed this opinion more than men (Gallup,1996) cited in Rudman and Kilianski (2000). Women now account for half of all workers and yet perceptions that social roles for women and men are different and that women are associated with domestic roles and men with careers still exists. This association between men and authority may explain why female authority figures are often disliked (Rudman and Kilianski, 2000) and help to explain gender bias.

Unconscious Gender Bias

Unconscious gender bias is often regarded as a barrier to the advancement of women in the workplace. 'Unconscious gender bias (also referred to as implicit or second-generation gender bias) occurs when a person consciously rejects gender stereotypes but still unconsciously makes evaluations based on stereotypes' (American Association of University Women, 2016 p.24) and can then inadvertently favour men and disadvantage women.

Poppenhaeger (2017 p.1) argued that unconscious gender bias can have 'a significant effect on how students and their proficiency are evaluated by academic staff'. Moss-Racusin et al (2012) found that during a blind assessment of C.V's that male students C.V.'s were more likely to be rated highly in terms of competency by professors and offered the position and a higher salary, on average. Interestingly, there was no difference between male and female

professors. Project Implicit (Greenwald et al., 2018) is a long running test that uses the speed by which people categorise words to test for unconscious bias. The data shows that even trained women in physical science often associate males with science and females with liberal arts.

Gendered Language

There are particular words or phrases that are regarded as 'gendered'. Research has found that men and women are assessed very differently at work in terms of the language used in feedback (Silverman, 2015). There is more focus on men's individual performance and technical skills in contrast to more emphasis on the collaborative efforts and communication skills of women. A large scale study analysed 4,000 U.S. military personnel's evaluations of performance (Smith et al., 2018). The study found no differences between men and women in terms of the objective measures such as fitness and the number of positive attributes assigned. However, women were assigned significantly more negative attributes and there were significant differences in the language used in the evaluations of men when compared with women (see figure 1).

Managers Use More Positive Words To Describe Men in Performance Reviews and More Negative Ones to Describe Women				
Words used to describe men		IN DESCENDING ORDER OF RELATIVE FREQUENCY	Words used to describe women	
Positive	Negative		Positive	Negative
Analytical			Compassionate	
Competent				Inept
Athletic			Enthusiastic	Selfish
Dependable	Arrogant		Energetic	Frivolous
Confident				Passive
Versatile			Organized	Scattered
Articulate				Opportunistic
Level- headed				Gossip
	Irresponsible			Excitable
Logical				Vain
Practical				Panicky
				Temperamental
				Indecisive

Figure 1: Words Used To Describe Men's and Women's Performance. Reproduced in full from Smith et al (2018 p.1).

Positive attributes assigned to men were more likely to describe them as analytical and women as compassionate. The most frequent negative attribute describing men was arrogant, for women this was inept. The study found 'statistically significant gender differences in how often these terms (and others) were used (relative to the other positive or negative terms available for selection) when describing men and women — even though men's and women's performances were the same by more objective measures' (Smith et al., 2018 p.2). The attributes more likely to be assigned to men are regarded as of more

value in organisations, particularly in leadership and therefore impacts on career progression.

Gender Bias in Student Evaluations of Teaching

Unconscious gender bias can also impact on how male and female academics are evaluated by their students (Poppenhaeger, 2017). Student evaluations of teachers (SET) assess students' views about the quality of teaching. These are increasingly used to assess teaching ability and can affect promotion and career progression (Terkik et al., 2016). Research has shown that gender bias contributes to students' assessment of teaching (Young et al., 2009). Boring et al (2016) revealed a large and statistically significant bias against female teachers in a study in both France and the U.S. MacNell et al (2015) found that students rated teachers lower on all aspects of teaching when they believed them to be female. This is supported by the work of Boring (2017) who analysed 22,665 evaluations of 4,423 first year undergraduates at a French University. Boring concluded that 'students appear to rate professors according to gender stereotypes' where 'male students give much higher scores to male teachers in terms of overall satisfaction' despite no evidence that there are differences in terms of 'actual teaching effectiveness' (Boring, 2017 p.31).

An analysis of 'Rate My Professor', a review website that allows students to assign scores to their university teachers, by Storage et al (2016) also found gender bias in the comments. Students were 2-3 times more likely to use the words 'brilliant' or 'genius' to describe male professors as female professors. This study was based on a large sample of 14 million reviews in the U.S. and there were no reasons, other than cultural stereotypes, as to why these terms were more likely among white male professors (Storage et al., 2016).

Terkik et al (2016) analysed students' written comments of SETs covering eight years and 5 STEM subjects in the U.S. This study, unlike previous studies such as MacNell et al (2015) that used numerical scales, did not find differences by teacher gender. However, the findings found 'gender-based differences in the language students use when providing written comments about their instructors' (Terkik et al., 2016 p.875). This gender difference was manifested in two ways. Firstly, there were differences in the way male and female instructors were addressed or referred to with male teachers more likely referred to with their professional title such as Prof. or Dr. Female instructors were more likely to be referred to by their first names or the teacher/ instructor. Table 1 illustrates the gender differences in words used to describe men compared with women. Females received many positive comments but these were more likely to be generic terms (amazing, loved, wonderful). Also, women were described more often for their impact on student's learning experience (organized, willing, helpful). In contrast, men were acknowledged for their personal qualities (funny, knowledgeable, interesting and understanding) that do not necessarily reflect their ability to teach.

Word	F	M	Diff
Amazing	**32**	18	128%
love(d)	**59**	32	84%
wonderful	**28**	12	57%
organized	**243**	178	37%
willing	**114**	88	30%
helpful	**454**	402	13%
tangent(s)	3	**16**	400%
funny	4	**14**	250%
knowledgeable	21	**33**	57%
Interesting	68	**92**	35%
Understanding	110	**126**	15%

Table 1: Gender Differences in words used to describe men and women (Terkik et al., 2016 p.874)

Basow (1995) analysed student evaluations in a private liberal arts college in the northeastern United States over a four year period and investigated the impact of student gender. Overall, the evaluations of the male professors did not appear to be affected by the gender of the student. However, female professors received higher evaluations from women and lowest scores from male students. This finding was supported by Centra and Gaubatz (2000) in their study of 741 classes at 21 institutions in the U.S. in which they found that evaluations for male professors were similar for both male and female students. However, female professors were rated higher overall on questions relating to communication by female students. Basow and Montgomery (2005 p.92) suggest that these findings could be explained by 'gender stereotypic expectations and gender-specific teaching styles'. Hancock et al (1993) revealed that teachers were rated higher across most aspects of effectiveness by female students than male. However, other research has demonstrated that students rated teachers of the same gender higher (Centra and Gaubatz, 2000). Despite the mixed findings about the impact that gender has on student evaluation of teaching there is agreement that gender plays a complex role (Basow, 2000 cited in Young et al (2009) and that there is a need for more research in this area (Young et al., 2009).

These 'student evaluations of teaching' (SET) are often used when making decisions about academic promotion and therefore can have a detrimental effect on womens' career progression. Gender stereotypes lead to different expectations of men and women (Biernat, 2003), particularly in relation to those in positions of authority (Rudman and Kilianski, 2000) and this may impact on the relationship between a supervisor, regarded as a figure of authority, and their student.

Relationships and Roles in PhD Supervision

Research conducted by Litalien and Guay (2015) revealed that a large proportion of PhD students failed to complete, 40-50% in the US. The findings of this research identified that 1 of 3 key factors in successful completion of a PhD was the quality of the student and

supervisor relationship. 'Students who completed their PhD were more likely to perceive previous interactions with their advisors as supportive' (Litalien and Guay, 2015 p.229). There appears to be little difference between men and women in terms of PhD completion rates, which is in contrast to statistics for 'school and first degree performance where males tend to lag behind' (MacLeod, 2005 p.1).

As universities evolve, supervising PhD students is becoming more complex (Bøgelund, 2015). Supervisors are having to adapt to the changing landscape of the 'marketisation' of higher education, the increased focus on 'knowledge production from a market perspective' at the expense of 'the sole pursuit of academic and professional aims' (Bøgelund, 2015 p.50) and the continuing tensions between teaching and research. A key role of a PhD supervisor, could be regarded as that of a mentor. A supervisor could take on the role of a mentor but it is important to acknowledge that a supervisor is not necessarily always a mentor. A respondent in Lee et al's (2007) study stated 'there is a difference between a supervisor and a mentor. With the latter you find that you are not simply a student with a research project, but a student with a career in front that the mentor helps to start' (Lee et al., 2007 p.791). Nevertheless, many PhD supervisors do take on the role of mentor and it is perhaps helpful to review what constitutes good mentoring. Lee et al (2007 p.792) reflect on good mentoring and suggest that there are characteristics of good mentors which include 'enthusiasm, sensitivity, appreciating individual differences, respect, unselfishness and support for others than one's own'. As highlighted earlier there is evidence to suggest that men continue to be associated with high authority, such as PhD supervisors, and therefore students may have different expectations of supervisors depending on their gender. There appears to be little research investigating the impact of gender on the nature of the supervisor's role. Therefore, this paper investigates the relationship between 'supervisor' and 'student' by exploring the content of PhD acknowledgements.

Acknowledgements as a Scholarly Genre

The submission of a PhD thesis is the culmination of many years of hard work, late nights, sacrifices and often self-doubt and stress. Therefore, PhD dissertations are often regarded as a "'high stakes' genre; at the top of the 'academic genre ladder'" (Swales and Feak 2000) cited in Hyland (2004 p.306). It is also often a time for reflection and many students take the opportunity to recognise others that have played a part in their journey and show their gratitude to, among others, supervisors, family, colleagues and friends in the form of an acknowledgement. Hyland (2004 p.307) revealed that students regarded acknowledgements as 'an important way of publicly recognising the role of mentors and the sacrifices of loved ones' and recognised that they are 'sophisticated and complex textual constructs which bridge the personal and the public, the social and the professional and the academic and the moral'. Unlike other academic genres they give an insight into the writer's personal situation and allow readers a 'glimpse of a writer enmeshed in a network of personal and academic relationships' (Hyland, 2004 p.323). For this reason acknowledgements have been referred to as a 'Cinderella' genre that is neither entirely personal nor entirely academic (Hyland, 2003 p.243).

The study of acknowledgements is a relatively recent phenomenon led by Blaise Cronin in the 1990's (Cronin, 1991, Cronin et al., 1992, Cronin et al., 1993, Cronin and Overfelt, 1994). Cronin's work inspired others to study acknowledgements (Desrochers et al., 2017) and as Hubbard (2018) suggested they have been used to investigate a number of issues including 'research funding', 'intellectual and social networks' and also the importance of library services (Hubbard et al., 2018 p.405). The majority of research focused on the use of acknowledgements in journal literature with less attention given to dissertations and theses. Cronin (1992) identified seven categories of acknowledgement which he then reduced down to six: moral support; financial support; access to facilities; clerical support; technical support and peer interactive communication (Cronin et al., 1993). Peer interactive communication is a 'record of, presumably significant, intellectual input and influence received from one's peers' (Cronin et al., 1992 p.117). Research has shown that acknowledgements feature in the majority of theses and dissertations. Hyland (2003) found that 80% of theses and 97.5% of dissertations contained acknowledgements and Scrivener (2009) found that 93.6% of history dissertations featured acknowledgements. Previous studies have shown supervisors are the most frequently acknowledged category (Hyland, 2003). Hyland and Tse (2004) found 98% of PhD dissertations and 80% of Masters' theses had an acknowledgement and supervisors featured in all of them. Scrivener (2009) found that 98.1% of dissertations acknowledged the supervisor. Al-Ali (2010) in his analysis of Arabic PhD theses found that thanking ones supervisor and other academics was the only component found in all the texts and could therefore be regarded as an 'obligatory constituent'.

Much of the research has focused on the contribution of acknowledgements as a form of academic recognition (Cronin, 1991, Cronin et al., 1992, Cronin et al., 1993, Cronin and Overfelt, 1994, Cronin, 1995). However, Cronin and Overfelt (1994 p.165) regard acknowledgements as one of the 'vocabularies of public life' that are under-explored and a potentially valuable 'source of insight into the rule of engagement' in academic communities. They suggest that 'textual exegsis' can be used to investigate these 'social relationships and power structures within specific communities' using techniques such as discourse and content analysis and semiotic techniques. Therefore, analysis of acknowledgements could explore the social relationships and networks of PhD students. They could be used to investigate the relationship between supervisor and student and in particular the extent to which implicit gender bias exists in this relationship. Evidence already exists to suggest that acknowledgements are a function of gender. Cronin and Overfelt (1994) found that 91.1% of males claimed to have been acknowledged compared with 67.4% of females. Females also claimed that they were acknowledged rather than awarded co-author status. Al-Ali (2010) states that acknowledgements provide insights into social systems. For example, his research found that male students thanked their wives for their support and 'daily nurturing of their family' whilst they were preoccupied with their thesis. Moore (1984) investigated the effect of author(s)' gender on acknowledgments in psychology texts and found that men were more likely to acknowledge other males for professional help and women were more likely to acknowledge males and females. This may partly be accounted for by the fact there are fewer appropriate female academics than male. However, there was a tendency for authors to acknowledge same-gender colleagues. This research revealed an inequity in relation to the thanks given to spouses, 'female

authors of books turn to their husbands for criticism and advice, while male authors thank their wives for typing their manuscripts' (Moore, 1984 p.1030). The author acknowledged that this may not be a true reflection of the situation but highlighted the inequity if women were actually providing advice and not been credited for it.

Al-Ali (2010 p.2) believes that the aim of acknowledgements is to 'textualise gift giving for all kinds of contributions received from others to accomplish a piece of academic writing'. Therefore, acknowledgements are written in the context of 'cultural values' which affect 'how members behave and interact'. It would therefore be fair to conclude that in a society where women in higher education continue to be under represented and subject to gender bias that dissertation acknowledgements would be an appropriate genre to investigate the extent to which gender bias exists. Hyland (2003) also suggests that further research would be necessary in the area of students' gender.

The nature, role and practice of PhD supervisors has been extensively investigated and differences between disciplines explored. However, the impact of gender on the PhD supervisor and student relationship and experience has largely been ignored. This research will be an exploratory investigation into the impact that gender has on the PhD supervisor and student relationship using the acknowledgements in PhD theses as a proxy for 'evaluation of teaching'.

Methodology

This exploratory study is based on a corpus of acknowledgements included in 113 PhD dissertations. The dissertations were written by successful students studying for the PhD in Educational Research at a pre-1992 university in the North West of England since the start of the programme in 1999 until the end of 2017.

The methodology draws on the approach of previous authors studying acknowledgements where the text corpus also consisted of the acknowledgements section of dissertations (Hyland, 2004, Hyland and Tse, 2004, Cheng, 2012, Al-Ali, 2010, Hyland, 2003). In all these studies the acknowledgements were analysed for their length, thanking strategies, sources of support and in particular their move structure.

The acknowledgements were written by the PhD authors as personal tributes to those that had helped them during their PhD journey, not as a data source. However, they are a useful source of data to investigate gender differences.

Hypothesis

A key objective is to explore the gender differences in the PhD supervisory process and therefore the following hypothesis is proposed:

- Female and male students rely on different types of support during the PhD supervisory experience and in particular that supervisors are acknowledged for

different skills/ types of support based on student expectations of the gender of the supervisor.

Research Approach

The thesis title, year of submission, gender of the student, gender of the supervisor, length of the acknowledgement and the text contained in the acknowledgement were recorded in an excel spreadsheet. A mixed methods approach was adopted. A qualitative approach was generally employed because the data available was largely non-numeric i.e. text based and a detailed understanding was required (Bazeley and Jackson, 2013). However, quantitative analysis was also undertaken to analyse the number of words in the acknowledgments. This corpus of documentary evidence, i.e. the acknowledgement in its entirety, was analysed using content analysis, defined by Krippendorff (2013) as 'a research technique for making replicable and valid inferences from texts (or other meaningful matter) to their contexts of their use" (Krippendorff, 2013 p.24). The theses were not written specifically to answer any research questions, or intended to be analysed, which is the case of most of the data used in content analysis according to Krippendorff (2013) who also believes that content analysis is a useful technique to explore differences, which is a key objective of this study. It also 'offers a means of synthesising study reports by allowing a systematic way of categorising and counting themes' (Desrochers et al., 2017 p.2824).

Data Analysis

The excel spreadsheet containing the 113 cases was uploaded into NVivo for analysis. The initial analysis involved coding the data "a way of 'tagging' texts with codes, of indexing it, in order to facilitate their later retrieval" (Bazeley and Jackson, 2013 p.70). The naming of concepts or ideas helps in analytical thinking (Corbin and Strauss, 2008 cited in Bazeley and Jackson, 2013) and helps 'move from document analysis to theorising' (Bazeley and Jackson, 2013 p.71). NVivo automatically precoded the column data into nodes. Nodes in NVivo store the codes and each node relates to a particular theme or topic (Bazeley and Jackson, 2013). The acknowledgements were reviewed and line-by-line-coding was employed to allow relevant themes and patterns to emerge. These themes were then allocated to relevant nodes.

Word Frequency

The methodology adopted a similar approach to Terkik et al. (2016) who used word frequency to investigate gendered language. NVivo was used to run frequency word counts on the total corpora and then separately for male students, female students, male supervisors and female supervisors to compare the word frequency of each, and investigate whether there were any differences in the language used in relation to the gender of the supervisor and or, the student. The aim was to examine the corpus as Ding (2007 p.372) also did in his analysis of medical personal statements, 'from different perspectives, and to reach a richer understanding of the genre at both the functional and rehetorical level'.

Categorisation

The acknowledgements were analysed and categorised according to the individual or organisation being thanked and also according to Cronin et al' s (1993) six categories identified as sources of support: moral support; financial support; access to facilities; clerical support; technical support and peer interactive communication. The aim was to explore to what extent gender differences existed in the types of support and the individuals and organisations that PhD students acknowledged during their PhD journey.

Length of Acknowledgement

The excel spreadsheet was also imported into SPSS to undertake an analysis of the length of the acknowledgements in order to identify any differences in the mean scores between different genders of students or supervisors.

Ethical Considerations

The theses are publicly available and the author sought permission of the programme administrator to collate the data. All data was anonymised, de-identified and names were not referred to in the research. Any files containing data were stored securely, treated confidentially and anonymously and password protected to ensure the data were protected. Institutional ethics approval was granted by the university.

Findings and Discussion

The total number of words in the corpus was 18,262 with acknowledgements ranging from an abrupt 15 words to a two-page composition of 752 words. The average length of the acknowledgements was 169 words. These findings mirror the findings of Hyland (2004) who analysed acknowledgements from a range of disciplines and found they ranged from 38 to 1085 words with an average of 160. This was also similar to the findings of Al-Ali (2010) who analysed 100 Arabic acknowledgements where the length ranged from 74 to 784 with an average of 216 words. Of the 113 theses, 96% included an acknowledgement which supports previous research that showed that the majority of PhD theses contain an acknowledgment (Hyland, 2003 98%), (Hyland, 2004 90%), (Scrivener, 2009 94%).

Gender Differences in Relation to the Length of Acknowledgements

The length of each acknowledgement was recorded. Table 2 compares the length of the acknowledgements between male and female students and male and female supervisors.

Number of Words	Minimum	Maximum	Average
Total	15	752	169
Male Students	21	498	172
Female Students	15	752	168
Male Supervisors	15	752	173
Female Supervisors	18	419	152

Table 2: Length Of Acknowledgements According to Gender

In order to investigate whether there were significant differences in mean scores between the length of the acknowledgement for men and women the excel spreadsheet was exported in to SPSS and an Independent samples t-test was conducted.

Student Gender

The mean length of words in the acknowledgement of male students (m= 171.47, sd=101.889) was not statistically different (t=.170, df=106, two-tailed p=.865) from that of female students (m=167.80, sd=13.151). As the variances for the two groups were not significant (f=.015, p=.903), i.e. p is greater than 0.05, equal variances were assumed.

Supervisor Gender

The mean length of words in the acknowledgement for male supervisors (m= 173.11, sd=111.647) was not statistically different (t=.796, df=106, two-tailed p=.428) to that of female supervisors (m=152.43, sd=83.826). As the variances for the two groups were not significant (f=.824, p=.366), i.e. p is greater than 0.05, equal variances were assumed.

It is concluded there is no significant difference between the length of male and female students' or male and female supervisors' acknowledgements.

Gender of Successful PhD Students' And Their Supervisors.

Over two thirds (67.3%) of the successful PhD candidates were female and yet over 4/5 (82.3%) of supervisors were male as illustrated in table 3. This is interesting in that this is obviously a discipline in which many women are working at pre PhD level and yet at a senior level i.e. Professor level, there are few women. Approximately 1/10th (9.9%) of academic staff are professors but there is a significant difference between men and women with 13.8% of male academic staff working as professors but only 5.1% of women (HESA, 2017). Therefore, this sample is representative of the wider population. This also supports previous research that found that there is a lack of women at senior levels in higher education (Danell and Hjerm, 2013) and supports the view that gender inequality exists.

n=113		Female Supervisor		Male Supervisor		Total	
		N	% down	N	% down	N	% down
Female Student	n	15	75%	61	65.6%	76	67.3%
	% across	19.7%	-	80.3%	-	100%	-
Male Student	n	5	25%	32	34.4%	37	32.7%
	% across	13.5%	-	86.5%	-	100%	-
Total	n	20	100%	93	100%	113	100%
	% across	17.7%	-	82.3%	-	100%	-

Table 3: Successful PhD Candidates in Educational Research at a pre-1992 university 1999-2017

Are There Any Gender Differences When Addressing Supervisors?

The title, or lack of it, such as Doctor or Professor, used to refer to the student's PhD supervisor in the acknowledgment was recorded and the results are showed in table 4.

Referred to as	Male Supervisor		Female Supervisor	
	Count	%	Count	%
Supervisor	4	4.4%	0	0%
No title (just name)	30	33.0%	8	40%
Professor	47	51.7%	6	30%
Doctor	10	11.0%	6	30%
Total	91	100%	20	100%

Table 4: Titles Used To Address Supervisors According to Gender. * The total number of supervisors is not the same as the total number of PhD students as not all students included an acknowledgement or acknowledged their supervisor. In one case 1 student mentioned both supervisors.

For both male and female supervisors many students did not refer to their supervisor with an appropriate professional title (e.g. Dr. or Prof.). However, this was more prevalent for female supervisors with 40% of students referring to them by name and no title, compared with 33% for male supervisors, which did not reflect their status as university professors or doctors. This is a very small sample but it does support the findings of Terkik et al (2016) who found that in student evaluations students were more likely to refer to male teachers by their professional title. A thesis acknowledgement serves a different purpose to a student evaluation but the findings suggest a bias toward the more frequent use of prestigious titles for male supervisors when compared with female supervisors, regardless of their academic status.   It is not possible to comment specifically on the differences between males and females for the use of the title 'Professor' as there was only 1 female professor out of 8 supervisors and they accounted for all 6 mentions. In contrast, there were 9 male professors of which 4 of them were professors. Therefore, it is most appropriate to amalgamate the categories of Professor and Doctor for analysis.

Use Of Gendered Language in PhD Acknowledgements?

The investigation of the extent to which PhD candidates used gendered language in their acknowledgements was explored by analysing word frequencies. Word frequencies were run to identify the 25 most frequently mentioned words in a) the acknowledgement and b) the description of the specific comments relating to the supervisor.

Acknowledgement Text

	All Supervisors	Count	%	Male Supervisors	Count	%	Female Supervisors	Count	%	Male Students	Count	%	Female Students	Count	%
	Word			Word			Word			Word			Word		
1	Thank	344	3.63	thank	273	3.49	thank	71	4.28	thank	106	3.06	thank	238	3.95
2	Support	239	2.52	support	188	2.40	support	51	3.08	support	93	2.68	support	146	2.43
3	Like	149	1.57	like	118	1.51	research	35	2.11	research	52	1.5	like	106	1.76
4	Research	134	1.41	research	99	1.26	like	31	1.87	also	45	1.3	research	82	1.36
5	Also	111	1.17	also	90	1.15	also	21	1.27	help	44	1.27	encouragement	72	1.2
6	encouraging	103	1.09	encouraging	88	1.12	journey	19	1.15	like	43	1.24	also	66	1.1
7	Helping	96	1.01	help	79	1.01	supervisor	19	1.15	thesis	36	1.04	supervisor	57	0.95
8	supervisor	85	0.9	professor	67	0.86	provided	18	1.09	university	35	1.01	professor	54	0.9
9	Professor	84	0.89	times	66	0.84	thesis	18	1.09	encouraging	31	0.89	study	54	0.9
10	Thesis	81	0.85	supervisor	66	0.84	doctoral	17	1.03	providing	30	0.87	times	53	0.88
11	Study	77	0.81	study	64	0.82	help	17	1.03	educational	30	0.87	help	52	0.86
12	Times	77	0.81	thesis	63	0.80	professor	17	1.03	professor	30	0.87	doctoral	48	0.8
13	Doctoral	73	0.77	university	61	0.78	encouragement	15	0.91	supervisor	28	0.81	thesis	45	0.75
14	University	72	0.76	particular	58	0.74	finally	14	0.84	colleagues	26	0.75	throughout	44	0.73
15	Providing	67	0.71	doctoral	56	0.72	program	14	0.84	doctoral	25	0.72	particular	41	0.68
16	Particular	66	0.7	without	53	0.68	staff	13	0.78	particularly	25	0.72	without	40	0.66
17	Without	62	0.65	colleagues	52	0.66	study	13	0.78	staff	24	0.69	family	38	0.63
18	Work	59	0.62	work	51	0.65	throughout	13	0.78	times	24	0.69	participated	37	0.61
19	Staff	59	0.62	providing	49	0.63	family	12	0.72	work	24	0.69	provided	37	0.61
20	colleagues	58	0.61	staff	46	0.59	phd	11	0.66	study	23	0.66	university	37	0.61
21	throughout	57	0.6	educational	44	0.56	share	11	0.66	finally	22	0.63	journey	36	0.6
22	Finally	57	0.6	many	44	0.56	time	11	0.66	lancaster	22	0.63	finally	35	0.58
23	educational	54	0.57	throughout	44	0.56	university	11	0.66	many	22	0.63	staff	35	0.58
24	Family	53	0.56	finally	43	0.55	acknowledge	10	0.6	without	22	0.63	work	35	0.58
25	Lancaster	50	0.53	lancaster	43	0.55	educational	10	0.6	programme	20	0.58	students	33	0.55

Table 5: Top 25 Most Frequent Words In The Acknowledgements

Tables 5 and 6 illustrate that there does not appear to be a great deal of difference in the word frequencies for male/female students or male/female supervisors in the acknowledgements with 'thank', 'support', 'encouraging' and 'helping' all high on the list across. There were a few words that appeared to be ranked differently according to gender.

Family – ranked 24th overall but for female students it appeared 17th, 19th for female supervisors and yet did not feature in the male student or supervisor's top 25 words. 'Family' was not in the top 25 for all male students whether they had a male or female supervisor but featured 17th for female students with a female supervisor and 20th for female students with male supervisors.

Colleagues – ranked 20th overall but for male students it appeared 14th, 17th for male supervisors and yet did not feature in the female student or supervisors top 25 words. Colleagues did not feature in the top 25 words for female students with female supervisors and was 25th for female students with male supervisors but featured 14th for male students with male supervisors and 19th for male students with female supervisors.

Journey – did not appear in the top 25 words but for female students it appeared 21st, 6th for female supervisors and did not feature in the top 25 for either male students or supervisors. Interestingly, the word journey was listed 5th for female students with female supervisors but did not appear in the top 25 for female students with male supervisors or male students with either a male or female supervisor.

These findings suggest that family is of greater importance to female students than men when writing their acknowledgement. In contrast, males acknowledged the contribution of their colleagues to a greater extent than females. Many students likened their PhD to a journey but this was more prevalent among females and in particular with females with female supervisors.

	All Supervisors			Male Supervisor & Male Student			Male Supervisor & Female Student			Female Supervisor & Male Student			Female Supervisor & Female Student		
	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%
1	thank	344	3.63	thank	92	2.94	thank	181	3.85	thank	14	4.09	thank	57	4.33
2	support	239	2.52	support	81	2.59	support	107	2.28	support	12	3.51	support	39	2.97
3	like	149	1.57	research	42	1.34	like	82	1.74	research	10	2.92	research	25	1.9
4	research	134	1.41	also	41	1.31	encouraging	60	1.28	like	7	2.05	like	24	1.83
5	also	111	1.17	help	39	1.25	research	57	1.21	thesis	7	2.05	journey	19	1.44
6	encouraging	103	1.09	like	36	1.15	also	49	1.04	supervisor	6	1.75	also	17	1.29
7	helping	96	1.01	university	32	1.02	study	44	0.94	finally	5	1.46	provided	16	1.22
8	supervisor	85	0.9	thesis	29	0.93	supervisor	44	0.94	help	5	1.46	doctoral	15	1.14
9	professor	84	0.89	providing	28	0.90	times	43	0.91	also	4	1.17	professor	14	1.06
10	thesis	81	0.85	encouraging	28	0.90	help	40	0.85	need	4	1.17	program	13	0.99
11	study	77	0.81	educational	27	0.86	professor	40	0.85	patience	4	1.17	supervisor	13	0.99
12	times	77	0.81	professor	27	0.86	particular	36	0.77	teachers	4	1.17	throughout	13	0.99
13	doctoral	73	0.77	work	24	0.77	without	35	0.74	without	4	1.17	encouragement	12	0.91
14	university	72	0.76	colleagues	24	0.77	thesis	34	0.72	educational	3	0.88	help	12	0.91
15	providing	67	0.71	time	23	0.74	doctoral	33	0.70	encouragement	3	0.88	staff	11	0.84
16	particular	66	0.7	doctoral	23	0.74	throughout	31	0.66	especially	3	0.88	thesis	11	0.84
17	without	62	0.65	staff	22	0.70	participated	31	0.66	particular	3	0.88	family	10	0.76
18	work	59	0.62	particularly	22	0.70	university	29	0.62	professor	3	0.88	learning	10	0.76
19	staff	59	0.62	supervisor	22	0.70	colleagues	28	0.60	study	3	0.88	phd	10	0.76
20	colleagues	58	0.61	many	21	0.67	family	28	0.60	university	3	0.88	study	10	0.76
21	throughout	57	0.6	lancaster	20	0.64	work	27	0.57	wife	3	0.88	time	10	0.76
22	finally	57	0.6	study	20	0.64	complete	26	0.55	write	3	0.88	finally	9	0.68
23	educational	54	0.57	project	20	0.64	finally	26	0.55	acknowledge	2	0.58	share	9	0.68
24	family	53	0.56	programme	19	0.61	friends	26	0.55	ann	2	0.58	acknowledge	8	0.61
25	lancaster	50	0.53	without	18	0.58	students	26	0.55	colleagues	2	0.58	experiences	8	0.61

Table 6: Top 25 Most Frequent Words In The Acknowledgements Analysed By Gender of Supervisor and Student

Descriptions of Supervisors

	All Supervisors			Male Supervisors			Female Supervisors			Male Students			Female Students		
	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%
1	support	45	12.43	support	34	11.30	support	11	18.03	support	15	12.71	support	30	12.3
2	encouragement	31	8.56	encouragement	26	8.64	guidance	7	11.48	encouragement	8	6.78	encouragement	23	9.43
3	guidance	29	8.01	guidance	22	7.31	encouragement	5	8.2	guidance	8	6.78	guidance	21	8.61
4	advice	19	5.25	advice	15	4.98	advice	4	6.56	patience	8	6.78	advice	13	5.33
5	patience	19	5.25	patience	15	4.98	patience	4	6.56	advice	6	5.08	patience	11	4.51
6	feedback	12	3.31	feedback	10	3.32	feedback	2	3.28	enthusiasm	4	3.39	feedback	9	3.69
7	insight	9	2.49	insight	9	2.99	invaluable	2	3.28	feedback	3	2.54	insight	8	3.28
8	enthusiasm	8	2.21	enthusiasm	7	2.33	knowledge	2	3.28	help	3	2.54	intellectual	6	2.46
9	invaluable	7	1.93	intellectual	6	1.99	meticulous	2	3.28	humour	3	2.54	enthusiasm	4	1.64
10	help	6	1.66	help	5	1.66	academic	1	1.64	invaluable	3	2.54	invaluable	4	1.64
11	intellectual	6	1.66	humour	5	1.66	calm	1	1.64	knowledge	3	2.54	time	4	1.64
12	knowledge	6	1.66	invaluable	5	1.66	constant	1	1.64	supervision	3	2.54	constructive	3	1.23
13	humour	5	1.38	constructive	4	1.33	emotional	1	1.64	excellence	2	1.69	help	3	1.23
14	supervision	5	1.38	knowledge	4	1.33	enthusiasm	1	1.64	work	2	1.69	knowledge	3	1.23
15	time	5	1.38	professional	4	1.33	excellent	1	1.64	academic	1	0.85	professional	3	1.23
16	constructive	4	1.1	supervision	4	1.33	expertise	1	1.64	approach	1	0.85	wisdom	3	1.23
17	excellent	4	1.1	time	4	1.33	guiding	1	1.64	astute	1	0.85	academic	2	0.82
18	professional	4	1.1	excellent	3	1.00	help	1	1.64	clarity	1	0.85	challenge	2	0.82
19	wisdom	4	1.1	prompt	3	1.00	perseverance	1	1.64	comprehensive	1	0.85	compass	2	0.82
20	academic	3	0.83	valuable	3	1.00	persistence	1	1.64	constructive	1	0.85	constant	2	0.82
21	guided	3	0.83	wisdom	3	1.00	person	1	1.64	continuous	1	0.85	excellent	2	0.82
22	meticulous	3	0.83	academic	2	0.66	questioning	1	1.64	dedication	1	0.85	expertise	2	0.82
23	prompt	3	0.83	challenge	2	0.66	reassuring	1	1.64	diligence	1	0.85	guided	2	0.82
24	valuable	3	0.83	clarity	2	0.66	sensitivity	1	1.64	direction	1	0.85	humour	2	0.82
25	challenge	2	0.55	compass	2	0.66	skillful	1	1.64	endurance	1	0.85	inspiration	2	0.82

Table 7: Top 25 Most Frequent Words Used to Describe Supervisor

Tables 7 and 8 illustrate that there does not appear to be any difference in the words used by male or female students to describe either male or female supervisors. Support, encouragement, guidance, advice and patience were the top 5 words for both male and female students and also in their descriptions of male and female supervisors. Due to the limited data it is difficult to draw further conclusions. However, there were two words that appeared to be ranked differently according to gender.

Humour – ranked 13th overall with 5 mentions of supervisor's humour. These were all used to describe male supervisors and humour was ranked 8th for male students and 18th for female students when describing male supervisors. No male or female students described female supervisors as humorous. This supports the research of Terkik (2016) who found that men were acknowledged for their personal qualities such as being funny.

Intellectual – ranked 11th overall with 6 mentions. Intellectual was ranked 9th by male students and 8th by female students. No female supervisors were described as intellectual.

	All Supervisors			Male Supervisors & Male Student			Male Supervisors & Female Student			Female Supervisor & Male Student			Female Supervisor & Female Student		
	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%	Word	Count	%
1	support	45	12.43	support	13	12.50	support	21	10.66	patience	2	14.29	support	9	19.15
2	encouragement	31	8.56	encouragement	7	6.73	encouragement	19	9.64	support	2	14.29	guidance	6	12.77
3	guidance	29	8.01	guidance	7	6.73	guidance	15	7.61	advice	1	7.14	encouragement	4	8.51
4	advice	19	5.25	patience	6	5.77	advice	10	5.08	encouragement	1	7.14	advice	3	6.38
5	patience	19	5.25	advice	5	4.81	patience	9	4.57	guidance	1	7.14	feedback	2	4.26
6	feedback	12	3.31	enthusiasm	4	3.85	insight	8	4.06	help	1	7.14	knowledge	2	4.26
7	insight	9	2.49	feedback	3	2.88	feedback	7	3.55	invaluable	1	7.14	meticulous	2	4.26
8	enthusiasm	8	2.21	humour	3	2.88	intellectual	6	3.05	perseverance	1	7.14	patience	2	4.26
9	invaluable	7	1.93	knowledge	3	2.88	constructive	3	1.52	persistence	1	7.14	academic	1	2.13
10	help	6	1.66	supervision	3	2.88	enthusiasm	3	1.52	questioning	1	7.14	calm	1	2.13
11	intellectual	6	1.66	excellence	2	1.92	help	3	1.52	skillful	1	7.14	constant	1	2.13
12	knowledge	6	1.66	help	2	1.92	invaluable	3	1.52	wisdom	1	7.14	emotional	1	2.13
13	humour	5	1.38	invaluable	2	1.92	professional	3	1.52				enthusiasm	1	2.13
14	supervision	5	1.38	work	2	1.92	time	3	1.52				excellent	1	2.13
15	time	5	1.38	academic	1	0.96	wisdom	3	1.52				expertise	1	2.13
16	constructive	4	1.1	approach	1	0.96	challenge	2	1.02				guiding	1	2.13
17	excellent	4	1.1	astute	1	0.96	compass	2	1.02				invaluable	1	2.13
18	professional	4	1.1	clarity	1	0.96	humour	2	1.02				person	1	2.13
19	wisdom	4	1.1	comprehensive	1	0.96	inspiration	2	1.02				reassuring	1	2.13
20	academic	3	0.83	constructive	1	0.96	prompt	2	1.02				sensitivity	1	2.13
21	guided	3	0.83	continuous	1	0.96	rigour	2	1.02				sound	1	2.13
22	meticulous	3	0.83	dedication	1	0.96	valuable	2	1.02				stimulated	1	2.13
23	prompt	3	0.83	diligence	1	0.96	academic	1	0.51				supervision	1	2.13
24	valuable	3	0.83	direction	1	0.96	belief	1	0.51				time	1	2.13
25	challenge	2	0.55	endurance	1	0.96	clarity	1	0.51				wonderful	1	2.13

Table 8: Top 25 Most Frequent Words Used to Describe Supervisors Analysed By Gender of Supervisor and Student

It is difficult to conclude that PhD candidates use 'gendered language' when describing their supervisors in the same way that Smith (2018) discovered when assessing performance. However, there was some indication that male and female supervisors are described differently. Further research would be required to investigate this further.

Evidence Of Gender Bias In Sources of support

The sources of support referred to in the acknowledgement were categorised and coded and the findings are presented in rank order in table 9. Analysis of the acknowledgements revealed that PhD students rely on a wide variety of sources for support during their studies. The most frequently cited source being their supervisor 90% (102 mentions). This is consistent with previous research that also showed that supervisors were the most frequently cited source (Scrivener, 2009) and endorses Hyland's (2004) view that students view the acknowledgement as 'an important way of publicly recognising the role of mentors' (Hyland, 2004 p.307). However, the support networks were extensive and included friends, family, colleagues, departmental academic and support staff and even pets! One particular member of the support staff in the department was specifically mentioned, 63 times.

Source of support	Cronin's key	Count	%	Male count	%	Female count	%
Supervisor	6.	102	14.4	35	14.5	67	14.3
Respondents	3.	69	9.7	22	9.1	47	10.0
Academic Staff in the Department	6.	63	8.9	22	9.1	41	8.8
Fellow Students	1.	59	8.3	17	7.1	42	9.0
Family	1.	59	8.3	18	7.5	41	8.8
Administrative Staff	4.	45	6.3	21	8.7	24	5.1
Parents	1.	41	5.8	11	4.6	30	6.4
Work Colleagues	1.	40	5.6	12	5.0	28	6.0
Children	1.	37	5.2	13	5.4	24	5.1
Husband/male partner	1.	34	4.8	2	0.8	32	6.8
Friends	1.	27	3.8	7	2.9	20	4.3
Employer		26	3.7	9	3.7	17	3.6
Wife/ female partner	1.	23	3.2	23	9.5	0	0
Technical Support	5.	21	3.0	7	2.9	14	3.0
Financial Support	2.	8	1.1	3	1.2	5	1.1
Spiritual/ religious		3	0.4	3	1.2	0	0
Grandparents	1.	2	0.3	0	0	2	0.4
Pets		2	0.3	0	0	2	0.4
Students		2	0.3	1	0.4	1	0.2
Teacher from secondary school		1	0.1	1	0.4	0	0
Other person (unspecified)	1.	39	5.5	11	4.6	28	6.0
Other organisation		6	0.8	3	1.2	3	0.6
Total Mentions		709	100	241	100	468	100

Table 9 Sources of Support in PhD Supervision Analysed by Student Gender

Cronin's (1993) six-part categorisation of sources of support was mapped on to the sources identified and colour coded.

Cronin's key	Description
1.	Moral Support
2.	Financial Support
3.	Access (to facilities, data, sample etc
4.	Clerical Support
5.	Technical Support
6.	Peer Interactive Communication (PIC)

Despite the categorisation being developed over 20 years ago, it appears to still be an appropriate framework to review sources of support. There were several sources that did not fit neatly into any of the categories such as pets, students, previous teachers and named but unspecified persons but these were probably related to moral support. Clerical support may becoming less important with the rise in computer and voice assisted packages to aid the production of the thesis. Sources of moral support were amalgamated and accounted for 50.8% of all mentions. Al-Ali (2010) found that moral support accounted for 61% of all thanking strategies. However, the categorisation used in the current study perhaps did not allow for recognition of the moral support offered by supervisors and therefore under represented this category.

A comparison of the differences between males and females in terms of their sources showed few differences. Possible differences may be evident in the areas of administrative staff, male/female partner and friends. Administrative staff accounted for 6.3% of all mentions but with 8.7% for males and 5.1% for females there could be a tendency for males to rely more heavily on administrative staff than females.   This would need further exploration to validate this finding. Partners/wives/husbands in total accounted for 8% of all mentions but it could be suggested that males (9.5%) thanked their partners on more occasions than females (6.8%). If the 2 mentions by males that thanked their male partners were also included in the analysis then 10.4% of mentions for men related to thanking their partners compared with 6.8% for women.

A review of the acknowledgements relating to thanking partners revealed that both male and females' thanks was for mainly for support, encouragement, patience and understanding. However, it appeared there was some evidence to suggest there was a gender bias in terms of expectations relating to household activities. Unlike men, 5 women specifically mentioned thanking in relation to household tasks:

> *I would like to thank Paul ….for being prepared to sacrifice holidays, a social life and a clean house (Female Candidate).*

> *Special thanks go to my husband Ian ….support and help with our two boys (Female candidate).*

> *Simon who never complained when this over took our lives, and who did all the things that I should have done (Female candidate).*

In contrast, one male candidate thanked his wife for:-

> *I am grateful to my wife for… her loving ability to create a friendly and warm at family atmosphere that help so much in scientific research" (Male candidate).*

It is impossible from this data to conclude that females continue to be regarded as responsible for the majority of household tasks such as cooking, home making and childcare, but the acknowledgements suggest that females tended to be more conscious of household duties and possibly even had a sense of guilt surrounding their preoccupation with their studies at the expense of their family. This supports previous research that women continue to be associated with domestic duties (Rudman and Kilianski, 2000).

Future research could further investigate the differences in support relating to the gender of the student. Perhaps women are more likely to acknowledge the role of others in their successes than men? The recurring theme throughout the acknowledgements is that the students felt that completing the PhD would have been very difficult without a supportive network and sacrifices have been made by all parties, as demonstrated by the following comment:-

> *Last, but by no means least, I would like to express my gratitude to my long-suffering friends and family, especially my husband, Simon, who has been nothing but a tower of strength throughout the long, long process (Female candidate).*

Conclusions and Implications

This study concludes that acknowledgements are a valuable data source and supports the findings of previous research on the use of acknowledgements in terms of the frequency with which PhD dissertations feature acknowledgements. However, there was little evidence that the acknowledgements may be used as a means of evaluating teaching. The sources acknowledged in this study were consistent with previous research and revealed a complex network offering support to PhD students, in particular with supervisors being the most frequently acknowledged sources but there was little evidence to suggest that there was any significant gender bias in the findings. However, there was some evidence to suggest that female students were more likely to refer to domestic activities in their acknowledgements than men and that male supervisors were thanked for their humour. However, further research would be necessary to validate these gender differences. It is difficult to prove or refute the hypothesis that female and male students rely on different types of support during the PhD supervisory experience and in particular that supervisors are acknowledged for different skills/ types of support based on student expectations of the gender of the supervisor. Further research would be necessary and could involve extending the sample to other PhD dissertations both within the Department of Educational Research but also in other subject areas. Further in-depth research could also be conducted into PhD students' perceptions of their supervisors. The acknowledgements are obviously public

displays of gratitude that students realise will be read by others, including their supervisors. It would be interesting to explore the more 'private' views of PhD students. Perhaps the published acknowledgements are not a true representation of the experiences of the students and therefore an inappropriate mechanism to use to evaluate teaching.

Having reviewed the data the overriding impression is the role that the acknowledgements play in providing an insight into the private lives of PhD students.   It was apparent that studying for a PhD is often a painful and arduous journey, sometimes confronting death, divorce, childbirth and yet these people successfully submitted their theses. This supports the view that a key to successfully achieving a PhD is resilience (Topalidou, 2018). This was not an intended objective of this study but it has been a privilege to see into the lives of these students as they embarked on their personal journey to successful completion of their PhD.

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