

A quarter century of gender and information systems research: the role of theory in investigating the gender imbalance

Nita Mennega, Carina de Villiers

Department of Informatics, University of Pretoria, Pretoria, South Africa

Email: Nita.Mennega@up.ac.za Tel: +27 (0)12 420 4189, Fax: +27 (0)12 362 5287

This study analyses the role of theory in gender and information systems (IS) research by providing a descriptive review of 25 years' IS journal publications on the topic of gender and IS. Trauth (2013) performed a critical literature analysis on research papers that appeared in information systems journals between 1992 and 2013. This paper extends the analysis by Trauth (2013) adding a literature analysis for research papers from 2012 to 2020. Decades of research on the underrepresentation of women in information systems (IS) has revealed a chequered landscape of studies ranging from completely atheoretical to theoretically well-informed work. Contained in this considerable body of knowledge lie a collection of explicitly theorised gender and IS studies. These are the only types of study that allow researchers to build upon each other's work, and allow the field to progress from purely descriptive studies to studies that are more analytical in nature, with the goal of suggesting interventions aimed at broadening participation in the IT workforce. This study examines only explicitly theorised research and finds that IS research has indeed progressed from gender essentialist studies toward gender intersectional studies. The intersectional approach encourages explanatory studies which investigate relevant issues in today's diverse global IT workforce and allows the identification of suitable interventions.

Keywords: diversity; gender; gender and information systems theory; gender imbalance; gender theory; intersectionality; Individual Differences Theory of Gender and Information Technology.

Note: Although the common nomenclature in the Information Technology (IT) field varies, the term IT seems to be more frequently used when associated with the science domain while the term information systems (IS) is more frequently used within the business domain (McLachlan et al., 2016). In this paper we will

refer to the entire continuum of workers who build and manage IT application systems, as "information systems (IS) personnel". As per Niederman, Ferratt and Trauth (2016: 29), "we use this terminology in reference to IS workers, IT professionals, and other phrases referring to those working with information systems".

1. Introduction

In an increasingly technological world, countries are becoming more reliant on their science, technology, engineering and mathematics (STEM) workforce in order to compete in the global economy (Hüsing et al., 2015). Consequently, job opportunities in the STEM field abound. In addition to availability, these jobs are among those that offer the highest remuneration (Kulturel-Konak & Trauth, 2012). The information and communication technologies (ICT) sector in the STEM field offers employment opportunities worldwide, which implies economic empowerment to suitably qualified workers (Oreglia & Srinivasan, 2016).

However, in order to qualify for these jobs, incumbents require post-secondary education. Research shows that the number of qualified graduates is paradoxically decreasing (Kori, Altin, Pedaste, Palts & Tõnisson, 2014). Various reasons, which include beliefs about job scarcity due to the dotcom bust, perceptions regarding the difficulty of the subjects and perceptions regarding the image of the professionals as nerds or geeks, are proposed for the decline in the number of ICT graduates (Ridley & Young, 2012; Mui, Tee & Sien, 2013; Ashcraft, Eger & Friend, 2012). The secondary school system is also a contributing factor to the persistently low number of students in post-secondary ICT education. Inadequate computer science education at secondary school level leads to a decrease in the number of students who enrol for ICT studies (Wilson, Sudol, Stephenson, Stehlik, Acn & Csta, 2011).

Hayes and Bigler (2014) identify two emerging trends from worldwide efforts to produce a sufficiently large technology workforce. The first is that students are internationally mobile and able to gain their qualifications at perceived high-ranking institutions outside their country of birth. Globalisation also demands that graduates are prepared and able to work in different countries with culturally diverse development teams, as well as culturally diverse users (Patil, 2005). The second trend concerns the lingering under-representation of women in STEM studies. A significant number and variety of interventions are in place to introduce girls to information technology (IT) (Fisher, Lang, Craig & Forgasz, 2015; Von Hellens, Trauth & Fisher, 2012; Trauth, 2012; Christensen, Knezek & Tyler-Wood, 2014; Clayton, 2007). However, the number of females who commence and continue pursuing ICT studies and occupations remains low. While women earn the lion's share in tertiary qualifications, only 25% of engineering and IT degrees go to women (DiPrete & Buchman, 2013) and only around 16% are employed as IT specialists (Gorbacheva et al., 2019). In the United States, the under-representation of women and minorities is recognised as one of the main problems of the professional computing fraternity (Ross, 2007).

Trauth, Quesenberry and Huang (2008) approach female ICT under-representation from the following theoretical point of view:

“The under-representation of women in the IT workforce, coupled with increased cultural diversity emanating from the globalization of the IT sector, highlights a problem both for the practice and the research domains of the IT field. The problem for practice is to develop interventions to increase the under-representation of women. The problem for research is to theorize the issue and compile data in such a way that actionable interventions can result.” (Trauth et al., 2008:2)

Trauth et al. (2008) call for researchers to focus on explicitly theorising their work which makes it possible to share findings, and to aim at identifying practical interventions to address the problem of female under-representation.

However, in a descriptive summary of papers on gender and IS from a selection of IS journals and conferences since 1990, Gallivan (2013) found that only a minority of papers explicitly employ a gender theory. Gallivan reviewed 190 papers which he divided into four topic areas and classified the authors' research methods, epistemological stance and the type of gender theory they used. He found that most authors assume that males are the norm in the IS field, an assumption which he says should be challenged, and concludes by highlighting the need for authors to explicitly articulate the gender theory they use in their studies – to describe what factors cause the reported differences in the behaviours of men and women in the IT industry. The strength of this study lie in the findings that researchers do not recognise the implicit bias in the IT workforce and that they do not realise the need for providing theoretical clarity in their research.

Another study which was published in the same year, performed a critical literature analysis on the topic of gender and information systems theorising. Trauth (2013) identified 132 journal articles on the topic of gender and information systems theorising which appeared in leading IS journals in the 20-year period from 1992 to 2012. She analysed the approach to theorising by conceptualising the term “theory” to include both established and emergent theory, as well as theoretical frameworks and conceptual models. Three types of theorising were considered: firstly where no gender theory was used, secondly where an implicit gender theory was observed, and lastly where an explicit gender theory was employed in the study. She concluded that there existed a sufficient body of descriptive gender and IS research and called for more theoretically-informed research to be performed that is more analytical in nature. She also called for greater

diversity of methodology and epistemology, and that gender and IS research should become fully inclusive.

Recent years have seen an increase in research efforts aimed at understanding female disinterest in IT education, moving away from gender essentialism to a wider understanding of socio-cultural issues affecting participation (Nix & Perez-Felkner, 2019). Ashcraft, Eger and Friend (2012, p. 30) call for future research that takes a more in-depth look at intersections of race, gender, class, ability, and sexuality, saying that "...variation within sex is often greater than variation between the sexes".

In a Management Information Systems Quarterly special issue on "ICT and Social Challenges", Oreglia and Srinivasan (2016) drew attention to the necessity for more theoretically sophisticated research on gender and IS. They agreed with Adam, Howcroft and Richardson (2004) who criticised the existing gender and technology scholarship for focusing too narrowly on gender as a binary variable in determining differences in behaviour, while ignoring variables such as age, class and ethnicity. They mention Corneliussen (2005), Pozzebon, Mackrell and Nielsen (2014), Tapia (2006) and Trauth (2013a) as producing theoretically sophisticated research on gender and IS, Adam *et al.* (2006), Howcroft and Trauth (2008) and Trauth and Howcroft (2006), as integrating critical theory in IS research, and D'Mello and Eriksen (2010), Kvasny (2006) and Ravishankar, Pan and Meyers (2012) for investigating race in IS. However, they emphasise that these studies constitute the exception rather than the rule.

In an attempt at providing a bird's-eye view of theorising in the field of gender and IS since its inception 25 years ago, the objective of this study is threefold: to identify research papers on the topic of gender and IS that succeeded in explicitly articulating their theoretical underpinning, to investigate the degree to which they are diverse in terms of

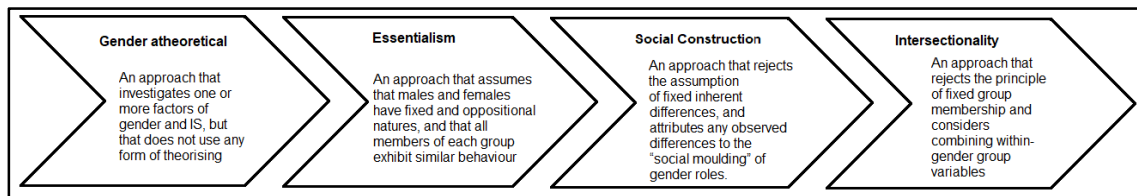
methodology and epistemology, and to investigate whether these papers achieve fully inclusive gender and IS research.

Background

Theories in the field of gender and IS research, mostly originate from the social sciences. Researchers in this field have employed various theoretical frameworks in attempting to understand the situation of women in the IS environment, and to record the knowledge gained from their research. Despite a large body of research, criticisms are still being levelled at the perceived insufficient theorising of gender in information systems research (Trauth, 2013).

Theorising in the field of gender and IS research can be imagined to lie along a continuum (See Figure 1).

Figure 1: Theorising in gender and IS research



At the leftmost side of the continuum are studies that investigate one or more factors of gender and IS, but that do not use any form of theorising. These are termed gender atheoretical studies. Then there are studies that assume that men and women have fixed and oppositional natures, and that all members of each group exhibit similar behaviour. This is termed the Essentialist approach. The next type of theorising is called Social Construction, and is an approach that rejects the assumption of fixed inherent differences, and attribute any observed differences to the "social moulding" of gender roles. Both the Essentialist and the Social Construction approach essentialise women as a single group and men as a single group. The rightmost side of the continuum can be

seen as occupied by an approach called “Individual Differences”, which acknowledges a variety of factors influencing gender relations. This type of theorising is also called “Intersectionality” and is found in gender intersectionality and minority gender theories (Trauth, 2013). It rejects the principle of fixed group membership and proposes the variability found in considering a combination of within-gender group variables such as gender identity, race or ethnicity. Gender intersectional research considers the differences between people and therefore looks deeper than the essentialist and social construction approaches which do not distinguish between “gender research” and “gender differences research”.

2 Methods

Trauth (2013) performed a critical literature analysis on research papers that appeared in information systems journals between 1992 and 2013. The papers were sourced from the “core” IS outlets – the Association for Information System's Senior Scholars’ “Basket of 8” journals, and a number of other highly ranked journals that publish information systems research (See Table 1). Non-IS journals were excluded. The study was titled “The role of theory in gender and information systems research”. By identifying and discussing the role of theory in the chosen studies, Trauth (2013) had created a list of publications purporting to be about gender and IS, and had analysed each according to the type of theorising employed. By focusing on IS journals alone, many relevant studies were excluded. Finding these studies can be pursued in future. The advantage of focusing on the highly regarded information systems journals is that the subsequent findings are highly relevant to our study.

The departure point for this study is Trauth’s list of publications on gender and IS theorising. This study updated Trauth’s list to include publications that have appeared

since (i.e. over the time period 2012 to 2020). To update the list, the authors followed the same method as Trauth. The following journals were perused:

“European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of the Association for Information Systems, Journal of Information Technology, Journal of MIS, Journal of Strategic Information Systems and MIS Quarterly) or other journals that publish information systems research (The Database for Advances in Information Systems, Information & Management, Information & Organization, Information Resources Management Journal, Information Technology & People, International Journal of Technology & Human Interaction, and Journal of Information, Communication and Ethics in Society)” (Trauth, 2013:279).

Criteria for inclusion were the word “gender” or an equivalent such as “girl”, “woman” or “female” in the title, abstract or keywords. The search yielded 43 papers (excluding the original study by Trauth), and can be seen in Table 1.

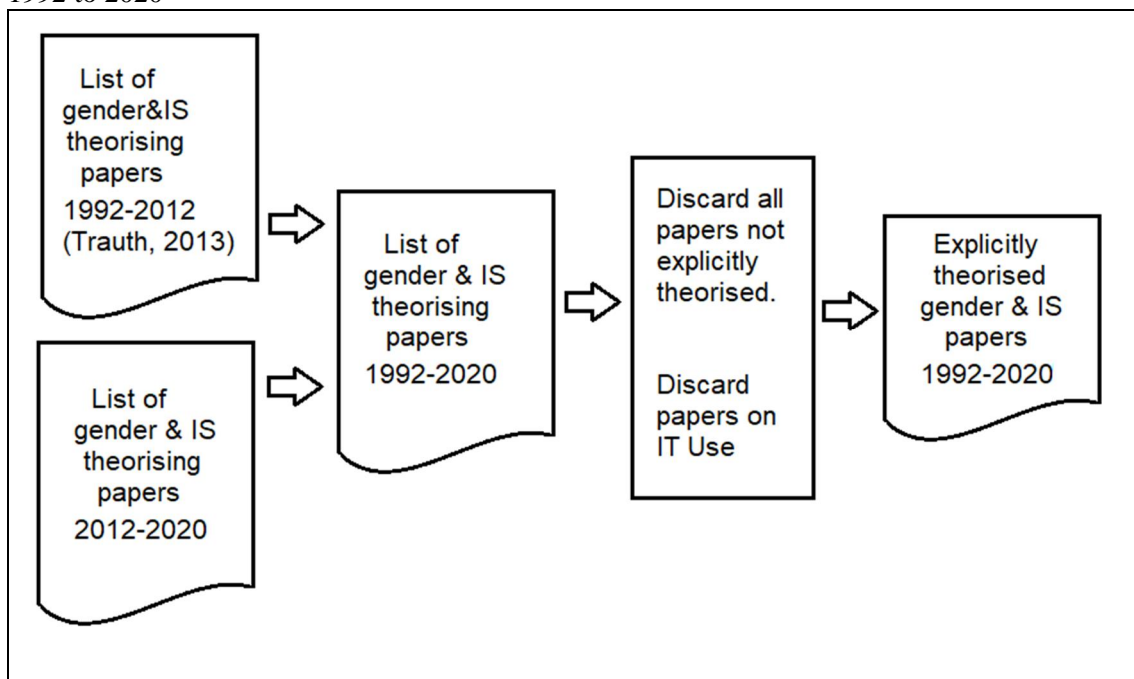
Table 1: Journal papers (by journal name) on gender and IS that were published between 2012 and 2020.

Journal	Authors
<i>The Database for Advances in Information Systems</i>	Brooks, Hardgrave, O’Leary-Kelly, McKinney & Wilson, 2015 Ge, Kankanhalli & Huang, 2015 LeRouge, Wiley & Maertz, 2013 Trauth, Cain, Joshi & Kvasny, 2016
<i>European Journal of Information Systems</i>	Chen & Sharma, 2015 Foth, 2016 Gorbacheva <i>et al.</i> , 2019
<i>Information and Management</i>	Lin, Featherman & Sarker, 2017 Zhang, Zhao, Lu & Yang, 2016
<i>Information and Organization</i>	Trauth, 2013
<i>International Journal of Technology and Human Interaction</i>	Chiu, 2012 Park, Lee & Shin, 2015 Khedhaouria & Beldi, 2014 Nisha, Iqbal, Rifat & Idrish, 2017 Reid & Thomas, 2017 Smith, Mendez & White, 2014
<i>Information Resources Management Journal</i>	-
<i>Information Systems Journal</i>	Annabi and Lebovitz, 2018 Armstrong, Riemenschneider and Giddens, 2018 Craig, 2016 Newman, Browne-Yung, Raghavendra, Wood & Grace, 2017 Pozzebon, Mackrell & Nielsen, 2014 Venkatesh, Sykes & Venkatraman, 2014 Windeler & Riemenschneider, 2015 Xu, Xu & Li, 2015
<i>Information Systems Research</i>	-
<i>Information Technology and People</i>	Alam & Imran, 2015 Dhar-bhattacharjee and Richardson, 2018 Huang, Shi, Chen & Chow, 2016 Mishra, Ostrovska & Hacaloglu, 2017 Molnar & Hava Muntean, 2015 Newbery, Lean & Moizer, 2016 Wijayawardena, Wijewardena & Samaratunge, 2016
<i>Journal of the Association for Information Systems</i>	Fehrenbacher, 2017 Gallivan & Ahuja, 2015 Hansen & Walden, 2013
<i>Journal of Information Communication and Ethics in Society</i>	Baglione, Harcar & Spillan, 2017 Flick, 2015 Fothergill <i>et al.</i> , 2019 Khalil & Seleim, 2012 Yeganehfar <i>et al.</i> , 2018
<i>Journal of Information Technology</i>	Laumer, Maier, Eckhardt & Weitzel, 2016
<i>Journal of MIS</i>	-
<i>Journal of Strategic Information Systems</i>	Krasnova, Veltri, Eling & Buxmann, 2017
<i>MIS Quarterly</i>	Oreglia & Srinivasan, 2016 Godinho de Matos, Ferreira & Krackhardt, 2014 Venkatesh, Windeler, Bartol & Williamson, 2017

All the papers in Table 1 were then analysed in the same way as Trauth did in her original list, and added to the papers from Trauth’s study. Together, these studies represent the last 25 years’ peer-reviewed IS journal papers on gender and IS theorising. (These tables are available on request from the author).

Since this paper focuses on explicit theorising in the field of gender and IS research, we were only interested in those studies that explicitly harnessed a gender theory. Therefore all gender atheoretical and gender essentialist studies were discarded, as well as those with a focus on IT Use, to allow a focus on studies of various aspects of the information workforce (See Figure 2).

Figure 2. Steps followed to create list of explicitly theorised gender and IS research papers: 1992 to 2020



The list of explicitly theorised Gender and IS research papers can be seen in Table 3. The authors of the paper are listed in the first column. Then the relationship to gender theory is specified, followed by the name of the theory and the role the theory played in the study. The original author’s labels were used. The “relationship to gender theory” label indicates that the paper employs either a gender theory (an imported theory) or a

gender and IS theory (a theory developed in the IS field). The “Name of the gender theory” is the name the author of the paper gave to the theory they employed. The “Role of the gender theory” indicates the overarching role that the gender theory plays in the paper. The term “Guiding” indicates that the gender theory was used to guide the research that was reported in the paper while the term “Resulting” indicates that the gender theory was created from the research reported on in that paper.

Table 2. Journal papers on the IS workforce, employing explicit gender and IS theorising, that were published between 1992 and 2020.

Author	Relationship to gender theory	Name of gender theory	Role of gender theory
Igbaria & Baroudi, 1995	Gender theory	Gender bias in job performance assessment	Guiding
Igbaria & Chidambaram, 1997	Gender theory	Gender in human capital theory	Guiding
Panteli et al., 1999	Gender and IS theory	Gender occupational segregation in IT the industry	Resulting
Ahuja, 2002	Gender and IS theory	Model of barriers to women in IT	Resulting
Gallivan, 2004	Gender and IS theory	Model of barriers to women in IT	Guiding
Joshi & Schmidt, 2006	Gender theory	Gender role theory	Guiding
Riemenschneider, Armstrong, Allen & Reid, 2006	Gender and IS theory	Model of women’s voluntary IT turnover and workplace barriers	Resulting
Armstrong, Riemenschneider, Allen & Reid, 2007	Gender and IS theory	Model of women’s thoughts about work-family conflict	Resulting
Timms, Lankshear & Anderson, 2008	Gender theory	Model of factors influencing female participation in ICT*	Guiding
Guzman & Stanton, 2009	Gender and IS theory	Occupational culture including gender	Resulting
Panteli, 2012	Gender theory	Community of women returning to IS work	Resulting
Armstrong, Riemenschneider and Giddens, 2018	Gender and IS theory	Model of barriers to women in IT - extended	Guiding
Fothergill et al., 2019	Gender and IS theory	Gender intersectionality	Guiding
Björkman, 2005	Gender theory	Feminism	Guiding
Kvasny, Greenhill & Trauth, 2005	Gender theory	Feminist standpoint theory	Guiding
Adam, Griffiths, Keogh, Moore, Richardson & Tattersall, 2006	Gender theory	Critical feminism	Guiding

Author	Relationship to gender theory	Name of gender theory	Role of gender theory
Reid, Allen, Armstrong & Riemenschneider, 2010	Gender theory	Critical feminist theory	Guiding
Harvey, 1997	Gender and IS theory	Social construction of gendered technology	Guiding
Woodfield, 2002	Gender theory	Social shaping of gender	Guiding
Harris & Wilkinson, 2004	Gender and IS theory	Social shaping of gender and technology	Guiding
Corneliussen, 2005	Gender theory	Social shaping of gender	Guiding
Tapia, 2006	Gender theory	Social construction of gender	Guiding
Joshi & Kuhn, 2007	Gender theory	Social construction of gender roles	Guiding
Kuhn & Joshi, 2009	Gender theory	Social construction of gender roles	Guiding
Lang, 2012	Gender and IS theory	Socio-cultural construction of gender norms	Guiding
Windeler & Riemenschneider, 2015	Gender (minority) theory	Affective events theory and social exchange theory	Guiding
Adya & Kaiser, 2005	Gender and IS theory	IT career choice model	Resulting
Croasdell, McLeod & Simkin, 2011	Gender and IS theory	TRA applied to gender	Resulting
Clayton, Beekhuizen & Nielsen, 2012	Gender and IS theory	IT career choice model	Guiding
Trauth, 2002	Gender and IS theory	IDT	Resulting
Quesenberry, Trauth & Morgan, 2006	Gender and IS theory	IDT	Guiding
Trauth & Howcroft, 2006	Gender and IS theory	IDT	Guiding
Howcroft & Trauth, 2008	Gender and IS theory	IDT	Guiding
Trauth, Quesenberry, Huang & McKnight, 2008	Gender and IS theory	IDT	Guiding
Trauth, Quesenberry & Huang, 2009	Gender and IS theory	IDT	Guiding
Kvasny, Trauth & Morgan, 2009	Gender and IS theory	IDT	Guiding
Quesenberry & Trauth, 2012	Gender and IS theory	IDT	Guiding
Ridley & Young, 2012	Gender theory Gender and IS theory	IDT, gender essentialism, social shaping of gender	Guiding
Trauth, Cain, Joshi & Kvasny, 2016	Gender and IS theory	IDT	Guiding
Annabi and Lebovitz, 2018	Gender and IS theory	IDT	Guiding

* ICT – Information and Communications Technology

Figure 3 represents the same papers, represented graphically on a timeline.

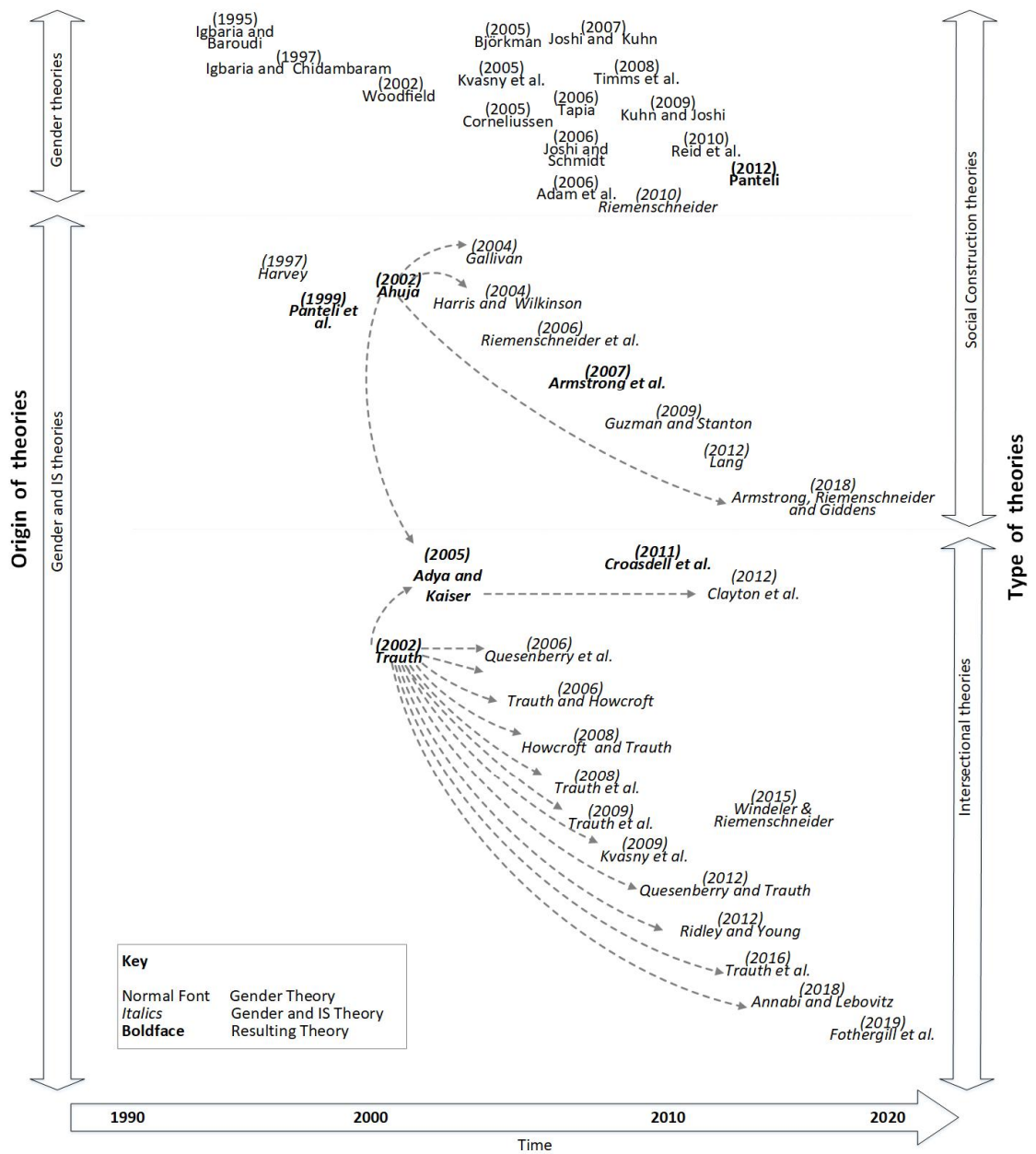


Figure 3: Chronology of gender and IS studies published in the IS journals: 1990–2020

Each paper is identified as using either a gender theory or a gender and IS theory (written in italics). The papers in boldface indicate work that resulted in a theory. Arrows originate from studies that created a theory, and indicate studies that subsequently use the theory. An example is Ahuja's paper (Ahuja, 2002) that built upon the published literature

on gender research to create a model of barriers faced by women in the IS field. Gallivan (2004) subsequently employed Ahuja's (2002) model to investigate IS professionals' adaptation to technological change. Another example is Trauth (2002) who created a gender theory that identifies various influences on women who enter and remain in the IS field. The figure effectively illustrates how many subsequent studies employed this theory.

Adya and Kaiser (2005) built upon the theoretical foundation of two studies, those by Ahuja (2002) and Trauth (2002), to develop a model of IS career choice by young women.

5. Discussion

The gender and IS studies illustrated in Figure 3 are those listed in Table 2. They are plotted along a timeline ranging from 1990 to 2020, with two vertical axes indicating the origin of the theories and the type of theories used in the papers. The origin of the theories indicate that two types of theories are used in the selected studies: those theories inherited from the Social Sciences (gender theories) and those theories native to the IS field (gender and IS theories). The studies plotted in this figure use theories that belong to one of two broad types of theories: social construction theories and intersectional theories.

Social construction theories are situated in sociology and social psychology, and are based on the “social shaping” of gender and sex roles which are internalised by the individuals in that society. They are another form of gender essentialism, that essentialize men as a single group and women as a single group. Intersectional theories on the other hand, are not based on a gender binary. They acknowledge within-gender group

variability by considering the interaction of biological sex and other identity characteristics such as gender identity and ethnicity.

It is interesting to see that in 25 years of gender and IS research, almost an equal number of studies were based on either social construction theories or intersectional theories.

The individual studies depicted in the diagram are listed in more detail in Table 3, where their methodology and findings are summarised.

Table 3 : IS journal papers employing explicit gender and IS theorising 1992-2020:

methodology and findings.

Authors	Methodology	Respondents	Findings
Igbaria & Baroudi, 1995 [G, Guiding]	Survey	IS development staff - utility company (US)	No significant gender differences in job performance ratings, but men perceived to have more favourable chances for promotion than women.
Igbaria & Chidambaram, 1997 [G, Guiding]	Survey	IS managers and professionals (US, Canada)	Significant gender differences observed in tenure, human capital and seniority.
Woodfield, 2002 [G, Guiding]	Qualitative – Interview analysis	Developers	Male workers and their competencies are privileged. The nature of IS work will not automatically shift when more women undertake it.
(Panteli et al., 1999) [G&IS, Resulting]	Survey- Analysis of secondary data	IT workers (UK) (n=2236 and n=35 000)	The gendering of occupations in the IT industry. The low proportion of women and their underrepresentation at the higher ranks of both the technical and management career paths.
Ahuja, 2002 [G&IS, Resulting] Creates theory “model of barriers to women in IT”	Literature review	Women in IT (US)	Three career stages (entry, persistence and advancement) that limit women’s career progress.
Gallivan, 2004 [G&IS, Guiding] [uses theory from Ahuja, 2002]	Interviews, surveys	IS employees (US)	Women showed weaker technical skills than the men, but stronger communication skills.
Joshi & Schmidt, 2006 [G, Guiding]	Survey	College students, IS professionals (US)	Stereotypes disappear when students are educated in the unique nature of IS. The perception of an IS professional favours masculine traits and abilities.

Authors	Methodology	Respondents	Findings
Riemenschneider, Armstrong, Allen & Reid, 2006 [G&IS, Guiding]	Interviews	Women working in IT at a Fortune 500 company, United States	No link between promotion opportunities and voluntary turnover. Relationships identified between managing family responsibility, work schedule flexibility, job qualities and stress.
Armstrong, Riemenschneider, Allen & Reid, 2007 [G&IS, Resulting]	Causal mapping	Women IT workers (US)	Family responsibilities, work stress, work schedule flexibility and job qualities influence women's work-family conflict.
Timms, Lankshear & Anderson, 2008 [G, Guiding]	Survey	ICT professionals (Australia)	Females should not be seen as a homogenous group. Female discomfort in the ICT industry is not industry-wide but originates in particular workplace relationships.
Guzman & Stanton, 2009 [G&IS, Guiding]	Mixed methods research	IT college students (US)	Women and ethnic minorities experience greater difficulty fitting into the IT culture.
Panteli, 2012 [G, Resulting]	Qualitative study on 3 years' primary and secondary data	Women who return to IT industry (UK)	Women have less human capital (training and education) due to their interrupted pattern of employment
Windeler & Riemenschneider, 2015 [G, Guiding]	Field study	IT workers (US)	Organisations should emphasise psychosocial mentoring and interventions for their ethnic minority IT workers.
Björkman, 2005 [G, Guiding]	Discussion paper	N.A.	Feminist research in technology and computing broadens the concepts and understandings of technology.
Kvasny, Greenhill & Trauth, 2005 [G, Guiding]	A critical, feminist perspective on gender	N.A.	Explores both methodological and epistemological aspects of conducting IS research from a feminist perspective.
Adam, Griffiths, Keogh, Moore, Richardson & Tattersall, 2006 [G, Guiding]	Interviews and web-based survey	Women in IT industry	The organisational and socio-cultural contexts of experiences of women in IT.
Reid, Allen, Armstrong & Riemenschneider, 2010 [G, Guiding]	Survey	IS managers of both genders (US)	Male participants' understanding of challenges is superficial and that men and women have little cognitive overlap with regard to the challenges that women face.
Harvey, 1997 [G, Guiding]	Literature review	N.A.	The IT culture, which is socially constructed, is a masculine culture that denies the feminine voice.
Harris & Wilkinson, 2004 [G, Guiding] [uses theory from Ahuja, 2002]	Survey	Students (Canada)	Different types of IS work are discussed in terms of interactions of gender, computing and skill required.

Authors	Methodology	Respondents	Findings
Corneliusson, 2005 [G, Guiding]	Survey	Students (Norway)	Computing is not “incompatible to being a girl”
Tapia, 2006 [G, Guiding]	Case studies	Three small IT businesses from the dotcom era	Despite an acute shortage of employees, the businesses sustained a hostile work environment against female employees.
Joshi & Kuhn, 2007 [G, Guiding]	Interviews	IT Employees (US)	A “top performer” was considered masculine.
Kuhn & Joshi, 2009 [G, Guiding]	Survey	Recent IT graduates	Aspiring IT professionals agree on the same work values and job attributes, yet with subtle gender differences in factors (social construction)
Lang, 2012 [G, Guiding]	Interviews	School students (Australia)	Neither gender understood the IT profession. The IT discipline holds a lower status than most other professional careers.
Armstrong, Riemenschneider and Giddens, 2018 (gender & IS theory)	Interviews (Focus groups)	Women in IT companies	We need to cultivate an occupational culture of inclusion so that women and minorities have true opportunities to flourish.
Adya & Kaiser, 2005 [G&IS, Resulting]	Literature Review	Literature Review (US)	Factors that influence girls’ career choice social, structural and individual differences.
Croasdell, McLeod, & Simkin, 2011 [G&IS, Resulting]	Survey	Students (US)	Personal interest and family influence mostly account for females’ IT study choice.
Clayton, Beekhuyzen & Nielsen, 2012 [G, Guiding]	Survey	Schoolgirls (Australia)	Sets a broad agenda for IT-related career choices.
Trauth, 2002 [G&IS, Resulting]	Qualitative study	Female IT professionals	Results in a framework of individual differences that characterise personal, family and environmental influences on an individual’s IT career.
Quesenberry, Trauth & Morgan, 2006 [G&IS, Guiding]	Interviews	Women employed in the IT workforce in the United States	Each woman interprets the complex societal messages differently, which contributes differently to that individual’s decisions about their professional and personal lives.
Trauth & Howcroft, 2006 [G&IS, Guiding]	Qualitative study - critical	IT females (US)	Power dynamics in the IT workforce
Howcroft & Trauth, 2008 [G&IS, Guiding]	Literature review - critical	N.A.	Critical studies benefit gender and IS research due to the possibilities of generating new insights into the subject.
Trauth, Quesenberry & Yeo, 2008 [G&IS, Guiding]	Survey	Female IT professionals (US)	Socio-cultural factors both bar and facilitate women’s entry into and progress in the IT industry.
Trauth, Quesenberry & Huang, 2009 [G&IS, Guiding]	Interviews	Women in IT (US)	Three factors (work-life balance, organisational climate and mentoring) affect each woman’s

Authors	Methodology	Respondents	Findings
			career development in different ways.
Kvasny, Trauth & Morgan, 2009 [G&IS, Guiding]	Survey data analysis	Women in IT (US)	Highlights intersections between characteristics such as race and class.
Quesenberry & Trauth, 2012 [G&IS, Guiding]	Survey data analysis	Women in IT (US)	Organisational interventions should become flexible enough to cater for the diversity of women in IT.
Ridley & Young, 2012 [G&IS, Guiding]	Content analysis	Newspaper articles (Australia)	The essentialist theory is dominant. Media interventions are proposed to increase awareness.
Trauth, Cain, Joshi & Kvasny, 2016 [G&IS, Guiding]	Survey	University students of different ethnic origins (US)	Gender stereotypes exist, but are not uniform across all members of a gender group.
Annabi and Lebovitz, 2018 [G&IS, guiding]	Case study	IT professionals (US)	A framework of organizational interventions.
Fothergill <i>et al.</i> , 2019 [G&IS]	Literature review	N.A.	Suggestions for developing related policy in large ICT projects.

When analysing the studies listed in Table 3, it can be seen that there are approximately equal numbers of papers following qualitative approaches and quantitative approaches. There are a small number of mixed methods studies. Critical studies are increasingly being used to highlight new interactions. Approximately half of the studies follow essentialist approaches while the other half, notably the studies by Trauth, follow intersectional approaches. Intersectional approaches encourage researchers to explore more options than a gender binary, and illuminate the interactions of attributes such as race, ethnicity, minority status or disability status. It is encouraging to see that none of the gender and IS theories follow the essentialist approach.

6. Conclusion

In an answer to calls for researchers to explicitly articulate the gender theory used in their studies (Gallivan, 2013; Oreglia and Srinivasan, 2016; Trauth, 2013), this study investigates gender and IS research published in leading IS journals. It attempts to

provide an overview of the last 25 years' research on gender studies and their theoretical underpinning.

The objective was to identify explicitly theorised research papers on the topic of gender and IS, to investigate their methodological diversity and to determine whether these papers achieve fully inclusive gender and IS research. The picture that emerged was one of societies that struggle to see past stereotypes, but of researchers who persevere in uncovering more complex truths.

Various stereotypes are being neutralised by presenting alternative images (Master et al., 2016) and thereby reducing feelings of incompatibility. Simultaneously, the male-female gender dichotomy is being challenged socially. Such diversity can be studied using intersectionality approaches, recognising that not only are females underrepresented but also other minorities such as people of different cultures and ethnicities.

The true relevance of using intersectionality models to study gender and IS, and further diversity, lies in the fact that the findings can be shared (Trauth, 2013). A body of research such as the collection of studies discussed in this paper, strengthens the hand of a researcher who aims to analyse, explain or address a perceived problem in gender and IS research. Trauth's individual differences framework (IDTGIT) has proved itself an effective tool to research and address issues in the diverse modern workforce, not only in enabling theoretically informed research but also in theoretically informed interventions.

Conflicts of interest: none

References

- Adam, A., Griffiths, M., Keogh, C., Moore, K., Richardson, H., & Tattersall, A. (2006). Being an 'it' in IT: gendered identities in IT work. *European Journal of Information Systems*, 15(4), 368–378.
<https://doi.org/10.1057/palgrave.ejis.3000631>
- Adam, A., Howcroft, D., & Richardson, H. (2004). A decade of neglect: Reflecting on gender and IS. *New Technology, Work and Employment*, 19(3), 222–240.
<https://doi.org/10.1111/j.1468-005X.2004.00139.x>
- Adya, M., & Kaiser, K. M. (2005). Early determinants of women in the IT workforce: a model of girls' career choices. *Information Technology and People*, 18(3), 230–259. <https://doi.org/10.1108/09593840510615860>
- Ahuja, M. K. (2002). Women in the information technology profession: a literature review, synthesis and research agenda. *European Journal of Information Systems*, 11(1), 20–34. <https://doi.org/10.1057/palgrave/ejis/3000417>
- Alam, K., & Imran, S. (2014). The digital divide and social inclusion among refugee migrants. *Information Technology and People*, 28(2), 344–365.
<https://doi.org/10.1108/ITP-04-2014-0083>
- Annabi, H., & Lebovitz, S. (2018). Improving the retention of women in the IT workforce: An investigation of gender diversity interventions in the USA. *Information Systems Journal*, 28(6), 1049–1081. <https://doi.org/10.1111/isj.12182>
- Armstrong, D. J., Riemenschneider, C. K., Allen, M. W., & Reid, M. F. (2007). Advancement, voluntary turnover and women in IT: A cognitive study of work-family conflict. *Information and Management*, 44(2), 142–153.

<https://doi.org/10.1016/j.im.2006.11.005>

Armstrong, D. J., Riemenschneider, C. K., & Giddens, L. G. (2018). The advancement and persistence of women in the information technology profession: An extension of Ahuja's gendered theory of IT career stages. *Information Systems Journal*, 28(6), 1082–1124. <https://doi.org/10.1111/isj.12185>

Ashcraft, C., Eger, E., & Friend, M. (2012). Girls in IT : the facts. *SIGCSE '13 Proceeding of the 44th ACM Technical Symposium on Computer Science Education*, 79.

Baglione, S. L., Harcar, T., & Spillan, J. (2017). Turkish students' perceived relevance of Facebook as a marketing tool. *Journal of Information, Communication and Ethics in Society*, 15(2), 125–144. <https://doi.org/10.1108/JICES-08-2016-0027>

Björkman, C. (2005). Feminist research and computer science : starting a dialogue. *Information, Communications and Ethics in Society*, 4, 179–188.

Brooks, N. G., Hardgrave, B. C., O'Leary-Kelly, A. M., McKinney, V., & Wilson, D. D. (2015). Identifying with the Information Technology Profession: Implications for Turnaway of IT Professionals. *ACM SIGMIS Database*, 46(1), 8–23. <https://doi.org/10.1145/2747544.2747546>

Chen, R., & Sharma, S. K. (2015). Learning and self-disclosure behavior on social networking sites: The case of Facebook users. *European Journal of Information Systems*, 24(1), 93–106. <https://doi.org/10.1057/ejis.2013.31>

Chiu, M.-S. (2012). Gaps Between Valuing and Purchasing Green-Technology Products - Product and Gender Differences. *International Journal of Technology and Human Interaction*, 8(3), 54.

- Christensen, R., Knezek, G., & Tyler-Wood, T. (2014). Student perceptions of Science, Technology, Engineering and Mathematics (STEM) content and careers. *Computers in Human Behavior*, 34, 173–186. <https://doi.org/10.1016/j.chb.2014.01.046>
- Clayton, K., Beekhuyzen, J., & Nielsen, S. (2012). Now i know what ict can do for me! *Information Systems Journal*, 22(5), 375–390. <https://doi.org/10.1111/j.1365-2575.2012.00414.x>
- Clayton, K. L. (2007). *The influence of metropolitan Brisbane middle-school ICT experiences on girls ' ICT study and career choices (Unpublished doctoral dissertation) Griffith University, Australia.*
- Corneliussen, H. (2005). ‘ I fell in love with the machine ’ Women’s pleasure in computing. *Journal of Information, Communication and Ethics in Society*, 3(4), 233–241.
- Craig, A. (2016). Theorising about gender and computing interventions through an evaluation framework. *Information Systems Journal*, 26(6), 585–611. <https://doi.org/10.1111/isj.12072>
- Croasdell, D., McLeod, A., & Simkin, M. G. (2011). Why don’t more women major in information systems? *Information Technology & People*, 24(2), 158–183. <https://doi.org/10.1108/09593841111137340>
- D’Mello, M., & Eriksen, T. H. (2010). Software, sports day and sheera: Culture and identity processes within a global software organization in India. *Information and Organization*, 20(2), 81–110. <https://doi.org/10.1016/j.infoandorg.2010.03.001>
- Dhar-Bhattacharjee, S., & Richardson, H. (2018). A tour of India in one workplace :

- investigating complex and gendered relations in IT. *Information Technology & People*, 31(2), 578–594. <https://doi.org/10.1108/ITP-08-2015-0198>
- DiPrete, T., & Buchman, C. (2013). *THE RISE OF WOMEN: The Growing Gender Gap in Education and What It Means for American Schools*.
- Fehrenbacher, D. D. (2017). Affect infusion and detection through faces in computer-mediated knowledge-sharing decisions. *Journal of the Association for Information Systems*, 18(10), 703–726.
- Fisher, J., Lang, C., Craig, A., & Forgasz, H. (2015). If Girls Aren'T Interested in Computing Can We Change Their Minds? *Ecis*, 2015, 1–14.
- Flick, C. (2015). Mentorship in computer ethics. *Journal of Information, Communication and Ethics in Society*, 13(3/4), 326–345.
<https://doi.org/10.1108/JICES-10-2014-0052>
- Foth, M. (2016). Factors influencing the intention to comply with data protection regulations in hospitals: Based on gender differences in behaviour and deterrence. *European Journal of Information Systems*, 25(2), 91–109.
<https://doi.org/10.1057/ejis.2015.9>
- Fothergill, B. T., Knight, W., Stahl, B. C., & Ulicane, I. (2019). Intersectional observations of the Human Brain Project's approach to sex and gender. *Journal of Information, Communication and Ethics in Society*, 17(2), 128–144.
<https://doi.org/10.1108/jices-11-2018-0091>
- Gallivan, M. J. (2004). Examining IT Professionals' adaptation to technological change: The influence of gender and personal attributes. *The Database for Advances in Information Systems*, 35(3), 28–49. <https://doi.org/10.1145/1017114.1017119>

- Gallivan, Michael, & Ahuja, M. (2015). Co-authorship, homophily, and scholarly influence in information systems research. *Journal of the Association of Information Systems*, 16(12), 980–1015.
<http://www.scopus.com/inward/record.url?eid=2-s2.0-84952786857&partnerID=tZOtx3y1>
- Gallivan, Mike. (2013). A structured review of IS research on gender and IT. *Proceedings of the 2013 Annual Conference on Computers and People Research - SIGMIS-CPR '13*, 45. <https://doi.org/10.1145/2487294.2487304>
- Ge, C., Kankanhalli, A., & Huang, K.-W. (2015). Investigating the Determinants of Starting Salary of IT Graduates. *ACM SIGMIS Database*, 46(4), 9–25.
<https://doi.org/10.1145/2843824.2843826>
- Godinho de Matos, M., Ferreira, P., & Krackhardt, D. (2014). Peer Influence in the Diffusion of the iPhone 3G over a Large Social Network. *MIS Quarterly*, 38(4), 1103–1133. <https://doi.org/Article>
- Gorbacheva, E., Beekhuyzen, J., vom Brocke, J., & Becker, J. (2019). Directions for research on gender imbalance in the IT profession. *European Journal of Information Systems*, 28(1), 43–67.
<https://doi.org/10.1080/0960085X.2018.1495893>
- Guzman, I. R., & Stanton, J. M. (2009). IT occupational culture: The cultural fit and commitment of new information technologists. *Information Technology & People*, 22(November), 157–187. <https://doi.org/10.1108/09593840910962212>
- Hansen, J., & Walden, E. (2013). The Role of Restrictiveness of Use in Determining Ethical and Legal Awareness of Unauthorized File Sharing The Role of

Restrictiveness of Use in Determining Ethical and Legal Awareness of Unauthorized File. *Journal of the Association for Information*, 14(9), 521–549.

Harris, R., & Wilkinson, M. A. (2004). Situating gender : students ' perceptions of information work. *Information Technology & People*, 17(1), 71–86.
<https://doi.org/10.1108/09593840410522189>

Harvey, L. (1997). *A genealogical exploration of gendered genres in IT cultures*. 7(2), pp.153-172.

Hayes, A. R., & Bigler, R. S. (2014). Postbaccalaureate STEM Students ' Perceptions of their Training : Exploring the Intersection of Gender and Nativity. *International Journal of Gender, Science and Technology*, July.

Howcroft, D., & Trauth, E. M. (2008). The implications of a critical agenda in gender and IS research. *Information Systems Journal*, 18(2), 185–202.
<https://doi.org/10.1111/j.1365-2575.2008.00294.x>

Huang, J., Shi, S., Chen, Y., & Chow, W. S. (2016). How do students trust Wikipedia? An examination across genders. *Information Technology & People*, 29(4), 750–773. <https://doi.org/10.1108/ITP-12-2014-0267>

Hüsing, T., Korte, W. B., & Dasjha, E. (2015). *e-Skills in Europe: trends and forecast for the European ICT Professional and Digital Leadership labour markets (2015-2020)*. November, 1–42.

Igbaria, M., & Baroudi, J. (1995). The Impact of Job Performance Evaluations on Career Advancement Prospects: An Examination of Gender Differences in the IS Workplace. *MIS Quarterly*, 19(1), 107. <https://doi.org/10.2307/249713>

- Igbaria, M., & Chidambaram, L. (1997). The impact of gender on career success of information systems professionals: A human-capital perspective. *Information Technology & People*, 10(1), 63–86.
- Joshi, K. D., & Kuhn, K. M. (2007). What it takes to succeed in information technology consulting. *Information Technology & People*, 20(4), 400–424.
<https://doi.org/10.1108/09593840710839815>
- Joshi, K. D., & Schmidt, N. L. (2006). Is the Information Systems Profession Gendered? Characterization of IS Professionals and IS Career. *ACM SIGMIS Database*, 37(4), 26–41. <https://doi.org/10.1145/1185335.1185343>
- Khalil, O. E. M., & Seleim, A. A. S. (2012). Attitudes towards information ethics: a view from Egypt. *Journal of Information, Communication and Ethics in Society*, 10(4), 240–261. <https://doi.org/10.1108/14779961211285872>
- Khedhaouria, Anis; Beldi, A. (2014). Perceived Enjoyment and the Effect of Gender on Continuance Intention for Mobile Internet Services. In *International Journal of Technology and Human Interaction*. International Journal of Technology and Human Interaction (IJTHI) 10(2).
- Kori, K., Altin, H., Pedaste, M., Palts, T., & Tõnisson, E. (2014). What Influences Students To Study Information And Communication Technology ? *Proceedings of INTED2014 Conference, 10-12 March*, 1477–1486.
- Krasnova, H., Veltri, N. F., Eling, N., & Buxmann, P. (2017). Why men and women continue to use social networking sites: The role of gender differences. *The Journal of Strategic Information Systems*, 26(4), 261–284.
<https://doi.org/10.1016/j.jsis.2017.01.004>

- Kuhn, K. M., & Joshi, K. D. (2009). The Reported and Revealed Importance of Job Attributes to Aspiring Information Technology Professionals : A Policy-Capturing Study of Gender Differences. *The DATA BASE for Advances in Information Systems*, 40(3), 40–60.
- Kulturel-Konak, S., & Trauth, E. (2012). Information Systems and Technology Education: Perspectives from USA Community Colleges. *AMCIS 2012 Proceedings*. <http://aisel.aisnet.org/amcis2012/proceedings/ISEducation/6>
- Kvasny, L., Trauth, E.M. and Morgan, A.J., 2009. (2009). Power relations in IT education and work: the intersectionality of gender, race, and class. *Journal of Information, Communication and Ethics in Society*, 7(2/3), 96–118.
- Kvasny, L., Greenhill, A., & Trauth, E. M. (2005). Giving voice to feminist projects in management information systems research. *International Journal of Technology and Human Interaction*, 1(1), 1–18.
- Kvasny, Lynette. (2006). Let the sisters speak: Understanding information technology from the standpoint of the “other.” *ACM SIGMIS Database*, 37(4), 13.
<https://doi.org/10.1145/1185335.1185342>
- Lang, C. (2012). Sequential attrition of secondary school student interest in IT courses and careers. *Information Technology & People*, 25(3), 281–299.
<https://doi.org/10.1108/09593841211254330>
- Laumer, S., Maier, C., Eckhardt, A., & Weitzel, T. (2016). User personality and resistance to mandatory information systems in organizations: A theoretical model and empirical test of dispositional resistance to change. *Journal of Information Technology*, 31(1), 67–82. <https://doi.org/10.1057/jit.2015.17>

- LeRouge, C. M., Wiley, J. W., & Maertz, C. P. (2013). A comparison of job satisfaction between IT and non-IT women incumbents in clerical, professional, and managerial positions. *ACM SIGMIS Database*, 44(2), 39.
<https://doi.org/10.1145/2488968.2488972>
- Lin, X., Featherman, M., & Sarker, S. (2017). Understanding factors affecting users' social networking site continuance: A gender difference perspective. *Information & Management*, 54(3), 383–395. <https://doi.org/10.1016/j.im.2016.09.004>
- Master, A., Cheryan, S., & Meltzoff, A. N. (2016). Computing whether she belongs: Stereotypes undermine girls' interest and sense of belonging in computer science. *Journal of Educational Psychology*, 108(3), 424–437.
<https://doi.org/10.1037/edu0000061>
- McLachlan, C. A., Craig, A., & Coldwell-Neilson, J. (2016). Students' computing use and study: When more is less. *Australasian Journal of Information Systems*, 20, 1–17. <https://doi.org/10.3127/ajis.v20i0.990>
- Mishra, D., Ostrovska, S., & Hacaloglu, T. (2017). Exploring and expanding students' success in software testing. *Information Technology & People*, 00–00.
<https://doi.org/10.1108/ITP-06-2016-0129>
- Molnar, A., & Hava Muntean, C. (2015). What can people risk attitude tell us about people preference for multimedia quality? *Information Technology & People*, 28(2), 383–404. <https://doi.org/10.1108/ITP-11-2013-0199>
- Mui, G. Y., Tee, Y. J., & Sien, V. Y. (2013). Perceptions of Information Communications Technology Education: A Supply-Side Case of Malaysian Private Education. *PACIS* (p. 208).

- Newbery, R., Lean, J., & Moizer, J. (2016). Evaluating the impact of serious games: the effect of gaming on entrepreneurial intent. *Information Technology & People*, 29(4), 733–749. <https://doi.org/10.1108/ITP-05-2015-0111>
- Newman, L., Browne-Yung, K., Raghavendra, P., Wood, D., & Grace, E. (2017). Applying a critical approach to investigate barriers to digital inclusion and online social networking among young people with disabilities. *Information Systems Journal*, 27(5), 559–588. <https://doi.org/10.1111/isj.12106>
- Niederman, F. ., Ferratt, T. W. ., & Trauth, E. M. . (2016). On the co-evolution of information technology and information systems personnel. *Data Base for Advances in Information Systems*, 47(1), 29–50. <https://doi.org/10.1145/2894216.2894219>
- Nisha, N., Iqbal, M., Rifat, A., & Idrish, S. (2017). Mobile Health Technology Evaluation- Innovativeness and Efficacy vs. *International Journal of Technology and Human Interaction (IJTHI) V*, 13(4), 1–21.
- Nix, S., & Perez-Felkner, L. (2019). Difficulty Orientations, Gender, and Race/Ethnicity: An Intersectional Analysis of Pathways to STEM Degrees. *Social Sciences*, 8(2), 43. <https://doi.org/10.3390/socsci8020043>
- Oreglia, E., & Srinivasan, J. (2016). ICT, Intermediaries and the Transformation of gendered power structures. *Mis Quarterly*, 40(2), 501–510.
- Panteli, A., Stack, J., Atkinson, M., & Ramsay, H. (1999). The status of women in the UK IT industry : an empirical study. *European Journal of Information Systems*, 8, 170–182.
- Panteli, N. (2012). A community of practice view of intervention programmes: The case

of women returning to it. *Information Systems Journal*, 22(5), 391–405.

<https://doi.org/10.1111/j.1365-2575.2012.00415.x>

Park, E. K., Lee, K. M., & Shin, D. H. (2015). Social Responses to Conversational TV VUI - Apology and Voice. *International Journal of Technology and Human Interaction*, 11(1), 17–32.

Patil, A. (2005). Global Engineering Criteria for the development of the global engineering profession. *World Transactions on Engineering and Technology Education*, 4(1), 49–52.

Pozzebon, M., Mackrell, D., & Nielsen, S. (2014). Structuration bridging diffusion of innovations and gender relations theories: A case of paradigmatic pluralism in IS research. *Information Systems Journal*, 24(3), 229–248.

<https://doi.org/10.1111/isj.12007>

Quesenberry, J. L., & Trauth, E. M. (2012). The (dis)placement of women in the IT workforce: An investigation of individual career values and organisational interventions. *Information Systems Journal*, 22(6), 457–473.

<https://doi.org/10.1111/j.1365-2575.2012.00416.x>

Quesenberry, J. L., Trauth, E. M., & Morgan, A. J. (2006). Understanding the “Mommy Tracks”: A Framework for Analyzing Work-Family Balance in the IT Workforce. *Information Resources Management Journal*, 19(2), 37–53.

<http://search.proquest.com/docview/215885596?accountid=14484%5Cnhttp://www.tdnet.com/bgu/resolver/default.asp??genre=article&issn=10401628&volume=19&issue=2&title=Information+Resources+Management+Journal&spage=37&date=2006-04-01&atitle=Understanding+the+%22Mo>

- Ravishankar, M., Pan, J., & Meyers, M. (2013). Information technology offshoring in India: a postcolonial perspective. *European Journal of Information Systems*, 22, 387–482.
- Reid, Alan J; Thomas, C. N., Reid, A. J., & Thomas, C. N. (2017). A Case Study in Smartphone Usage and Gratification in the Age of Narcissism. *International Journal of Technology and Human Interaction*, 13(2), 40–56.
<https://doi.org/10.4018/IJTHI.2017040103>
- Reid, M. F., Allen, M. W., Armstrong, D. J., & Riemenschneider, C. K. (2010). Perspectives on Challenges Facing Women in IS: The Cognitive Gender Gap. *European Journal of Information Systems*, 19(5), 526–539.
<https://doi.org/10.1057/ejis.2010.30>
- Ridley, G., & Young, J. (2012). Theoretical approaches to gender and it: Examining some Australian evidence. *Information Systems Journal*, 22(5), 355–373.
<https://doi.org/10.1111/j.1365-2575.2012.00413.x>
- Riemenschneider, C. K., Armstrong, D. J., Allen, M. W., & Reid, M. F. (2006). Barriers facing women in the IT work force. *ACM SIGMIS Database*, 37(4), 58.
<https://doi.org/10.1145/1185335.1185345>
- Ross, J. (2007). Perhaps the Greatest Grand Challenge: Improving the Image of Computing. *Computing Research News*, 19(5), 1-9.
- Smith, K., Mendez, F., & White, G. (2014). Narcissism as a Predictor of Facebook Users Privacy Concern, Vigilance, and Exposure to Risk. *International Journal of Technology and Human Interaction*, 10(2), 18.
<https://doi.org/10.4018/ijthi.2014040105>

- Tapia, A. H. (2006). Hostile Work Environment.com: Increasing participation of underrepresented groups, Lessons learned from the Dot-Com Era. *Advances in Information Systems*, 37(4), 79–98.
<https://doi.org/http://doi.acm.org/10.1145/1185335.1185346>
- Timms, C., Lankshear, C., & Anderson, N. (2008). *Riding a hydra : Women ICT professionals ' perceptions of working in the Australian ICT industry*. 21(2), 155–177. <https://doi.org/10.1108/09593840810881060>
- Trauth, E. M. (2002). Odd girl out: an individual differences perspective on women in the IT profession. *Information Technology & People*, 15(2), 98–118.
<https://doi.org/10.1108/09593840210430552>
- Trauth, E. M. (2012). Are There Enough Seats for Women at the IT Table ? *ACM Inroads*, 3(4), 49–54. <https://doi.org/10.1145/2381083.2381099>
- Trauth, E. M. (2013). The role of theory in gender and information systems research. *Information and Organization*, 23(4), 277–293.
<https://doi.org/10.1016/j.infoandorg.2013.08.003>
- Trauth, E. M., Cain, C. C., Joshi, K. D., Kvasny, L., & Booth, K. M. (2016). The Influence of Gender-Ethnic Intersectionality on Gender Stereotypes about IT Skills and Knowledge. *Database for Advances in Information Systems*, 47(3), 1–46.
<https://doi.org/10.1145/2980783.2980785>
- Trauth, E. M., & Howcroft, D. (2006a). Critical empirical research in IS: an example of gender and the IT workforce. *Information Technology & People*, 19(3), 272–292.
<https://doi.org/10.1108/09593840610689859>
- Trauth, E. M., & Howcroft, D. (2006b). Critical research on gender and information

- systems. *Encyclopedia of Gender and Information Technology, Volume 1*, 141–146. http://pdf.aminer.org/000/589/397/hostile_work_environment_com.pdf
- Trauth, E. M., Quesenberry, J. L., & Huang, H. (2008). A Multicultural Analysis of Factors Influencing Career Choice for Women in the Information Technology Workforce. *Journal of Global Information Management, 16*(4), 1–23.
- Trauth, E. M., Quesenberry, J. L., & Yeo, B. (2008). Environmental influences on gender in the IT workforce. *ACM SIGMIS Database, 39*(1), 8. <https://doi.org/10.1145/1341971.1341975>
- Venkatesh, V., Sykes, T. A., & Venkatraman, S. (2014). Understanding e-Government portal use in rural India: Role of demographic and personality characteristics. *Information Systems Journal, 24*(3), 249–269. <https://doi.org/10.1111/isj.12008>
- Venkatesh, V., Windeler, J. B., Bartol, K. M., & Williamson, I. O. (2017). Person-Organization and Person-Job Fit Perceptions of New It Employees: Work Outcomes and Gender Differences. *MIS Quarterly, 41*(2), 525–558. http://www.vvenkatesh.com/wp-content/uploads/dlm_uploads/2015/11/MISQ-RA-12709-FINAL1.pdf
- von Hellens, L., Trauth, E., & Fisher, J. (2012). Editorial. *Information Systems Journal, 22*(5), 343–353. <https://doi.org/10.1111/j.1365-2575.2012.00412.x>
- Wijayawardena, K., Wijewardena, N., & Samaratunge, R. (2017). Compromising gender identities: Stay strategies of women in gender-atypical information technology firms in Sri Lanka. *Information Technology and People, 30*(2), 246–264. <https://doi.org/10.1108/ITP-01-2016-0012>
- Wilson, C., Sudol, L. A., Stephenson, C., & Stehlik, M. (2011). Running on empty: The

Failure to Teach K-12 Computer Science in the Digital Age. *Inquiry : A Journal of Medical Care Organization, Provision and Financing*, 48(3), 177–182.

<https://doi.org/10.1002/bies.201100050>

Windeler, J. B., & Riemenschneider, C. K. (2015). The influence of ethnicity on organizational commitment and merit pay of IT workers: The role of leader support. *Information Systems Journal*, 157–190. <https://doi.org/10.1111/isj.12058>

Woodfield, R. (2002). Woman and information systems development : not just a pretty (inter)face ? *Information Technology and People*, 15(2), 119–138.

<https://doi.org/10.1108/09593840210430561>

Xu, B., Xu, Z., & Li, D. (2015). Internet aggression in online communities: A contemporary deterrence perspective. *Information Systems Journal*.

<https://doi.org/10.1111/isj.12077>

Yeganehfar, M., Zarei, A., Isfandyari-Mogghadam, A. R., & Famil-Rouhani, A. A.

(2018). Justice in technology policy: A systematic review of gender divide literature and the marginal contribution of women on ICT. *Journal of Information, Communication and Ethics in Society*, 16(2), 123–137.

<https://doi.org/10.1108/JICES-06-2017-0038>

Zhang, S., Zhao, L., Lu, Y., & Yang, J. (2016). Do you get tired of socializing? An empirical explanation of discontinuous usage behaviour in social network services. *Information and Management*, 53(7), 904–914.

<https://doi.org/10.1016/j.im.2016.03.006>