Social outcome expectations and women's intentions to return to IT employment

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Abstract

Women leaving IT employment for childcare or other reasons, and never returning, is a phenomenon that contributes to the underrepresentation of women in IT. However, potential women returners, women who have recently left IT employment and may or may not return, remain an under-researched group. We studied the effects of social outcome expectations on the intention to return to IT employment for 182 potential women returners from New Zealand, Australia, and the United States. The data were obtained via a survey questionnaire. Expectations of friendly co-workers, work-life balance, and family proximity were included; and the expectations of friendly co-workers had a statistically significant effect on the intentions of potential women returners to return to IT employment. The results highlight the difficulty of creating an environment that encourages potential women returners to return to IT because, unlike work-life balance or family proximity, friendly co-workers is a factor that is difficult to control via managerial interventions. For practice, the results suggest that organisations should promote an environment friendly to women, which in part may be achievable by implementing agile approaches to organizing IT work.

Keywords: IT, Women, Social outcome expectations.

1   Introduction

The problem of underrepresentation of women in the IT industry has been a subject of renewed attention in recent literature (Alok et al., 2021; Happe & Buhnova, 2022; Happe et al., 2021; Molnar et al., 2021; Serenko & Turel, 2021; Singh & Vanka, 2021; Tokbaeva & Achtenhagen, 2023; Trauth & Connolly, 2021). Indeed, the underrepresentation remains, even though it has been highlighted since the end of the 20th century (Baroudi & Igbaria, 1994; Panteli et al., 1999; Truman & Baroudi, 1994). For example, in 2020 only 29% of employees in ICT occupations in Australia were women (https://www.statista.com).

Even though to a considerable extent the underrepresentation of women in the IT industry can be attributed to women and girls staying away from IT careers, women leaving the IT industry is also an important factor (Armstrong et al., 2018; Castaño Collado & Webster, 2011; Herman, 2015b; Panteli, 2006, 2012; Panteli & Pen, 2009; Singh & Vanka, 2021). For example, in a survey of IT companies in India (Raghuram et al., 2017), 40% of the companies reported that more than 20% of their women employees going on a maternity leave did not return, with 16% of the companies reporting that more than half for their women employees did not return. Nonetheless, there is a paucity of studies of potential women returners, women who have left

the IT industry and might or might not return (Singh & Vanka, 2021). In particular, factors affecting the decision to return are not well understood. The present study aims to investigate the role of perceived social outcomes of re-joining the IT industry, which have been argued to be particularly relevant to women (Ahuja, 2002; Armstrong et al., 2018; Holth et al., 2017; Tokbaeva & Achtenhagen, 2023). The study pursues the following research question:

How do the perceptions of social outcomes of re-joining the IT industry by women who have left it affect their intentions to re-join?

To address the research question, a research panel-based survey of potential women returners was conducted, measuring a range of perceived social and family outcomes and the intention to return to IT employment. The data were analysed using PLS SEM.

The rest of the paper is organised as follows. First, the relevant prior research is synthesized to reveal the research gaps and to justify the focus of the present study. Then, the hypotheses are developed, followed by method, results, discussion, and conclusions sections.

2   Background

An influential study by Ahuja (2002) offered a process model for women's careers in IT, highlighting career choice, persistence, and career advancement stages. In the persistence stage women face a considerable work-family conflict as they need to devote attentional resources to raising children, which often results in women leaving and possibly never re-joining the IT workforce. Ahuja uses the metaphor of a leaky pipeline to describe this situation.

The kaleidoscope model of women's career experiences by Mainiero and Sullivan (2005) suggests a process model that is not entirely dissimilar to Ahuja's model. In the kaleidoscope model, challenge (pursuing greater responsibility and pay) is followed by balance (emphasis on accommodating both work and family responsibilities), which is followed by search for authenticity - for a better subjective career experience after the children grow up. Even if the end points in the two models are, arguably, inverted, the middle stage is largely identical, highlighting the importance of understanding how women combine career pursuit or career maintenance with family commitments. Additionally, the two models come from very different ideological premises. The kaleidoscope model celebrates flexibility in women's careers, rather than implicitly asserting the value of linear progression upward, as in Ahuja's model.

A common strategy (or pattern, as it is not necessarily planned or deliberate) for potential women returners is to leave work for a period of time to re-join (or not re-join) when children are older, and the family situation is less time intensive (Herman, 2015a). The individual difference perspective on women employed in the IT industry asserts that the experiences of women belonging to different cultures and backgrounds may differ in important ways (Trauth, 2002). Women also leave the IT workforce for a variety of reasons other than raising children, for example, to travel for an overseas experience (Wilson et al., 2009), or to relocate to follow a partner pursuing a business or career opportunity (Van der Velde et al., 2017). From the perspective of reducing gender imbalance in the IT industry, the important question is whether women who leave the industry for whatever reason will eventually return to IT, or will they find employment in a different industry or end up out of the workforce altogether, thus realising the "leaky pipeline" metaphor (Herman, 2015a; Singh & Vanka, 2021; Tomlinson

et al., 2009). The issue of women returning to IT careers has also been highlighted in the practitioner literature (Barratt, 2018).

Nonetheless, there are very few empirical studies of women returners (those who have already returned) or potential returners (those who have left and might, or might not, return) to the IT industry. A recent interview-based study by Tokbaeva and Achtenhagen (2023) of women working in the IT industry in Sweden included some women returners and adopted a strong individual responsibility perspective, taking a view that women stayed in the pipeline by developing career resilience as an individual trait. In contrast, a study in India (Singh & Vanka, 2021) emphasised resources and deliberate external support, highlighting upskilling, corporate career restart programmes, digital community platforms, and the availability of day care centres. In a UK study, Kirton and Robertson (2018) adopted a feminist perspective that highlighted "inequality regimes" - systems of practices deliberately or unconsciously designed to "combine and interact to produce and maintain gender inequality in the IT workplace" (p. 157). Kirton and Robertson (2018) highlighted the existence of an insufficient flexibility discourse in which it is assumed that women returners, because of the need to care for their family, cannot be flexible enough to cope with core responsibilities, resulting in them being assigned to an informal "mommy track" of lesser responsibility and fewer career prospects.

In an interview-based study of women returners and non-returners to science, engineering, and IT careers in the UK, Herman (2015a) suggested a trichotomy of rebooting (returning to the initial career/industry), re-rooting (returning to work in a different industry), and retreating (staying out of the workforce altogether). The study highlighted the persistence of initial career identities even in those who "re-rooted" or "retreated", suggesting that under the right circumstance these women would return.

A longitudinal study by the same author interviewed mature female students in the UK attempting to return to work in STEM (science, technology, engineering, and mathematics) careers and found that locality was an important factor – women were constrained by the location of their partner's job or by the availability of extended family members for childcare support, and they would only consider local opportunities, thus drastically reducing their chances of success (Herman, 2015b).

A quantitative, cross-sectional survey-based study of women returners to the IT industry in India by Ravindran and Baral (2014) found that job satisfaction and career commitment were positively affected by implementation of family friendly policies and an organisational culture that values integration of family and work, fairness, and diversity.

Rajesh et al. (2013) conducted a descriptive study of attitudes of managers at different levels towards women returners in the IT industry in India, revealing that the attitudes are not always positive (e.g., middle and junior managers were much more likely to feel apprehensive about the performance of women returners than to be willing to help them when required).

Finally, Panteli (2012) reported the results of an evaluation of a programme in the UK intended to help potential women returners to find IT employment. Panteli (2012) highlighted the positive feedback by the programme participants about network-building activities. Both network building among potential women returners and with currently active IT professionals were seen as valuable confidence building exercises, rather than as being instrumental for getting interviews and job offers. This study by Panteli (2012) was the only empirical study that focused on potential women returners to the IT industry, rather than on returners or on

women working in IT in general, but it focused more on evaluating an intervention programme, not on potential returners in a broad sense. However, from the perspective of addressing the underrepresentation of women in the IT industry, understanding potential returners is more important than understanding those who have already returned, because the decision to re-join the industry is made by potential returners, and not all of them make the decision to return. The present study contributes to addressing this research gap by empirically studying the intention to return by potential women returners to the IT industry from the perspective of outcome expectations.

Outcome expectations is an important class of factors that influence behaviour, and they are included in a number of theories that explain behaviour, such as Ajzen's theory of planned behaviour (Ajzen, 1991) and, in the MIS field, the unified theory of acceptance and use of technology (Venkatesh et al., 2003) (as performance expectancy). Thus, women's behaviour with respect to re-joining the IT industry after a break is likely to be influenced by their expectations of the outcomes of such a move. The present study follows Venkatesh et al. (2017) in considering outcome expectations with respect to IT employment from the total rewards perspective (Fulmer & Li, 2022; Lawler, 2011). Rather than considering the outcomes of employment in the IT industry solely in terms of pay and promotion opportunities, we consider a broader range of benefits of being employed.

Venkatesh et al. (2017) identified three categories of outcomes of being employed in the IT industry: (a) extrinsic or instrumental outcomes (direct external consequences, such as pay, promotion, and job security), (b) social outcomes (outcomes pertinent to social relationships and family), and (c) intrinsic outcomes (individual outcomes that arise from engaging in work activity, such as skills development). Research on women's choice of, and advancement in, IT careers has consistently highlighted the importance for women of social and family factors, which are often seen as a differentiator between genders in their IT career-related behaviours (Ahuja, 2002; Armstrong et al., 2018; Holth et al., 2017; Tokbaeva & Achtenhagen, 2023). In these studies, both social relationships outside of work (such as caring for older relatives) and in IT work (where women's social abilities can make them particularly valuable employees) have been found to be particularly relevant to women. Therefore, rather than considering the broadest possible range of outcomes of women being employed in the IT industry, the present study focuses on social outcomes. In the spirit of the theory of planned behaviour and related theories, it is anticipated that women's expectations of the social outcomes of re-joining the IT industry influence their intentions (and, ultimately their behaviour) with respect to finding an IT job after a break. Hence, the research question of the present study formulated in the Introduction: How do the perceptions of social outcomes of re-joining the IT industry by women who have left it affect their intentions to re-join?

Studying the actual behaviour remains outside of the scope of the present study because the relevant data were not feasible to obtain. However, it has been demonstrated in prior studies that intent is strongly associated with actual behaviour (Ajzen, 2002; Westaby, 2005).

3   Hypotheses development

We follow Venkatesh et al. (2017) in conceptualising social outcomes of working in IT in terms of three constructs: friendly co-workers, work-life balance, and family proximity. In this section we consider these constructs in the context of women considering a return to IT employment and formulate the hypotheses of the present study.

3.1 Friendly co-workers

Male IT workers may engage in gendered behaviours that result in a work environment uncomfortable to women or excluding women from access to tacit knowledge or decision making (Crump & Logan, 2000; Gupta, 2015; Li, 2021). Wu (2020) summarised such behaviours by describing three archetypes of male IT workers: brogrammers, who engage in hypermasculine competitive behaviours, tech hobbyists (or geeks), who derive life satisfaction from technology and thus lack work/non-work boundary, and coding peasants, who are mainly immigrants pursuing breadwinner roles. For women, engaging in hypercompetitive behaviours is difficult because they tend to pursue harmony, rather than conflict, in social interactions (Niederle & Vesterlund, 2008). Further, women tend to attribute more importance than men to family relationships, so that devoting themselves fully to technology (by, for example, working extremely long hours) is not a viable option. Finally, the worldview suggesting that men are supposed to be breadwinners is in contradiction with women pursuing IT careers. Thus, the presence of these archetypes in the workplace is bound to make it difficult for women to fit in, particularly when they are in a minority. Moreover, as a minority group not fitting the workplace culture defined by the dominant brogrammer, geek, and male breadwinner archetypes, women may become targets of microaggressions, discursive steps undermining their confidence and professional identities (Kim & Meister, 2022; Wilkins-Yel et al., 2019). Kim and Meister (2022) categorized microaggressions deployed (intentionally or unintentionally) against women working in STEM occupations, with the most important categories being devaluation of technical competence (assuming that women are not technically competent) and devaluation of physical presence (failing to engage women in decision making situations). One may expect that women will perceive co-workers in such an environment to be not friendly, both in a personal sense (as individuals) and in a professional sense (as colleagues).

Friendly co-workers are a desirable outcome from two distinctive, but complementary, perspectives. Friendly co-workers will help the returning woman employee to become more productive more quickly. Information technology changes very fast, as do the formal and informal organisational structures that support these changes (Armstrong et al., 2007; Carayon et al., 2006). To become productive in an IT-related role, the returning employee needs to acquire substantial technological, organisational, and customer knowledge, whether the return is to the workplace she left or to a new one. A lot of this new knowledge is tacit because often, in a rapidly changing environment, the benefits of codifying knowledge do not justify the effort. Thus, this knowledge can only be obtained from other employees, so that a friendly attitude of other employees making knowledge transfer effortless (or, even possible) is essential (Milligan et al., 2013). Furthermore, women often rely on their social skills to shape their jobs to offer value to their employer, and they do so to a greater extent than men (Woodfield, 2002). These skills are particularly relevant in the current IT workplace because organisations rely more and more on agile approaches and practices that emphasise direct informal communication over formal documentation and planning (Denning, 2018; Hoda et al., 2018). Significantly, social skills are easier to employ in a friendly environment.

Moreover, it has been reported that women, more than men, derive life satisfaction from social exchanges (Yang & Girgus, 2019). Therefore, a friendly environment is particularly valuable to a woman, quite independently from being productive on the job. At the same time, social exchanges with co-workers that are not immediately job related serve to improve

communication and to build trust, ultimately contributing to on-the-job performance (Xie & Li, 2021; Yeow et al., 2019).

Thus, potential women returners who – based on their prior experience in the IT workplace, as well as on other inputs, such as from family, friends, and media – expect the IT workplace to feature friendly co-workers are more likely to intend to return:

H1: Higher expectations of friendly co-workers are associated with greater intent by women to return to work in the IT industry.

3.2 Work-life balance

Work-life balance refers to the ability of an employee to maintain important non-work social activities, such as caring for their children or older relatives, socialising with friends or neighbours, or pursuing community work (Beauregard & Henry, 2009). Work-life balance may be difficult to maintain for an IT worker because the constantly changing technology requires constant upskilling and because much of IT work involves client-oriented work on projects combining high technology and business uncertainty with strict deadlines, or running global services that require 24/7 uptime, with strict penalties for downtime (Alok et al., 2021; Panteli, 2006). Because IT work is knowledge intensive, it takes time to become productive working on an IT project and asking employees to work overtime to mitigate emergencies is easier than adding new workers to manage workload spikes (Legault & Chasserio, 2012). However, the agile movement has been associated with a trend to move away from excessive reliance on overtime work on the grounds that work conducted at an expected pace results in more predictable, manageable outcomes and in superior quality (Hoda et al., 2018).

Excessive workload (even when compensated) and unpredictable workload, with an implicit assumption that work should always take priority over non-work activities, is detrimental to work-life balance, and is difficult to reconcile with taking care of young children or other non-work activities requiring commitment. Indeed, work-life balance has been highlighted very strongly as a critical factor to achieve gender balance in the IT workforce (Ahuja, 2002; Sardeshmukh & Srinivasan, 2014; Trauth & Connolly, 2021), particularly in connection with the retention of women IT workers.

Thus, potential women returners who expect to be able to maintain important non-work social activities after returning to the IT workforce are more likely to intend to return:

H2: Higher expectations of work-life balance are associated with greater intent by women to return to work in the IT industry.

3.3 Family proximity

Family proximity refers to the extent to which a job enables an employee to be physically located close to family members, thus enabling in-person interactions with the family. High quality IT work is often concentrated in large or important cities (such as Auckland or Wellington in New Zealand) or in geographically concentrated entrepreneurial systems, such as Silicon Valley in the United States (Bresnahan & Gambardella, 2004; Coletti, 2010). Thus, getting a quality IT job often involves relocation, which may be incompatible with a woman's family situation (e.g., her spouse may already have a job at the location where she currently resides, or her aging parents she is caring for may be unwilling/unable to relocate). Moreover, client-based IT work may require the employee to frequently travel to work on clients' premises, even if her base of operations is located close to the family residence (Morganson et

al., 2010; Panteli, 2006). Training needed to keep up with the constantly changing technology may also require travel. Finally, long commutes may also greatly reduce the time a woman can be in physical proximity with her family (D'Mello, 2006; Morris & Zhou, 2018).

Interestingly, it has been reported that societal expectations make it more difficult for a male partner to interrupt his career to follow a woman who wishes to pursue a career opportunity than the other way round. Moreover, because of expectations that women are the primary care givers for older relatives, family proximity is a greater issue for women than it is for men (Shah & Barker, 2020; Srinivasan et al., 2013).

Thus, potential women returners who expect to be able to remain in physical proximity to their family after returning to the IT workforce (e.g., they may already reside in a large city with work-related travel likely be within the city) are more likely to intend to return:

H3: Higher expectations of family proximity are associated with greater intent by women to return to work in the IT industry.

The research model utilised in this study is shown in Figure 1. It consists of the three social outcome expectations discussed above and a set of control variables, which are used to assess the behavioural intention of potential women returners.
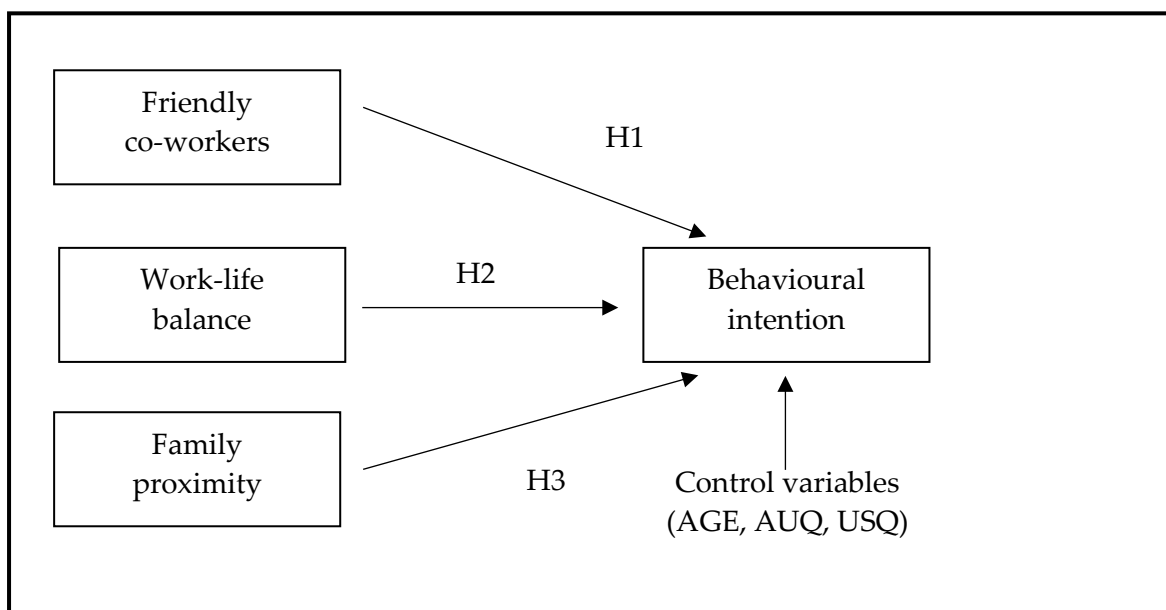

Figure 1. Research model (AGE = age, AUQ Australia, USQ = US)

4 Method

To test the hypotheses of the present study, we conducted a panel-based cross-sectional survey of potential women returners. This design enabled us to reach enough respondents to conduct statistical tests.

4.1 Sample and procedure

The sample included women who had left an IT-related role within two years prior to when the survey was conducted. The participants were from New Zealand, Australia, and the United States. The study targeted participants aged between 18 and 45 years old, and thus considerably below the retirement age, which is 65 years old in New Zealand and 66 years old

in Australia and in the United States. By including participants from more than one country, the study achieved greater generalisability (with country available as a control variable). While acknowledging that the experiences of older female workers are important and deserve attention, as highlighted by Myers et al. (2021), we focused on younger workers. This is consistent with the view that the perceptions and behaviour of younger workers have greater impact on the IT workforce composition because they can have longer careers within the industry.

The data (182 responses) were obtained from a Qualtrics research panel: Qualtrics served our questionnaire deployed using Qualtrics online survey software to the members of their research panel who fulfilled the criteria described in the previous paragraph. Thus, the respondents were not selected at random from the full population of potential women returners to the IT industry. This was an essential aspect of the research design because a database listing potential women returners does not exist. There was no missing data, and all responses were included in the analysis. Massey University ethics procedures were followed, resulting in low-risk notification number 4000025367 recorded.

The three countries were almost equally represented in the sample, with 61 responses from New Zealand, 60 from Australia, and 61 from the United States. The best represented age range was 30 to 33 years old (39 responses), and the least represented was the 42 to 45 age range (17 responses). The rest of the responses were distributed as follows: 18 to 21 years old (25 responses), 22 to 25 years old (23 responses), 26 to 29 years old (24 responses), 34 to 37 years old (33 responses), and 38 to 41 years old (21 responses).

Overwhelmingly, the respondents were highly educated: 153 of them (84% of the sample) had a college or university education and almost half of these (68, or 37% of the sample) had completed a graduate or postgraduate degree. This is not surprising, because a university education is often a prerequisite for finding an IT job.

As to the IT jobs left by the respondents, the most frequently reported specialisations were ICT trainer (15 participants), ICT account manager (13), ICT project manager (13), web designer (11), and software engineer (10). Some other roles were chief information officer (7 participants), ICT sales assistant (4), and telecommunications cable jointer (1). This represents a very broad range of specialisations, covering software, hardware, design, business/sales, and management. About two-thirds (114, or 63%) of the participants had left their IT jobs less than a year before the survey was conducted.

4.2 Measurement

Items used to operationalise the constructs of the research model are listed in Table 1. Three social outcome expectations – friendly co-workers (FCOV), work-life balance (WLB), and family proximity (FAMP) – were measured using the operationalisations developed by Venkatesh et al. (2017). Items for measuring behavioural intention (BI) were based on Davis (1989), following the common practice in MIS research (see, for example, (Venkatesh et al., 2012)). The survey questions were paraphrased to fit the context of women returning to IT employment. All measures have been initially developed as reflective and were used as such in the present study. Items were measured on five-point Likert scales, from "not at all" to "great deal" for FCOV, WLB, and FAMP, and from "strongly agree" to "strongly disagree" for BI.

Operationalisation of Constructs	
Friendly co-workers	
Please rate how much you expect each of the following friendly co-workers related characteristics to be present in your job if you were employed in an information technology (IT) related role.	
FCOV1	Friendly co-workers.
FCOV2	Collegial co-workers.
FCOV3	Co-workers who are supportive.
Work-life balance	
Please rate how much you expect each of the following work-life balance related characteristics to be present in your job if you were employed in an information technology (IT) related role.	
WLB1	Being able to balance my family life with my work life.
WLB2	Having time for my personal life.
WLB3	A work environment that supports work-family balance.
Family proximity	
Please rate how much you expect each of the following family proximity related characteristics to be present in your job if you were employed in an information technology (IT) related role.	
FAMP1	Being in the same geographic location as my immediate family (i.e., spouse/life partner, children, parents, siblings).
FAMP2	Living in the same area as my immediate family.
FAMP3	Being in very close geographical proximity of my immediate family.
Behavioural Intention	
BI1	To find an information technology (IT) related job, I plan to access information about openings for IT related jobs during the next four weeks.
BI2	To find an information technology (IT) related job, I intend to access information about openings for IT related jobs during the next four weeks.
BI3	To find an information technology (IT) related job, I will expend effort accessing information about openings for IT related jobs during the next four weeks.

Table 1. Operationalisation of Constructs

Age (AGE) and country were included as control variables, with country operationalised as two dummy variables (AUQ and USQ) taking the value of 1 if the respondent was, respectively, from Australia or US, or taking the value of 0 otherwise. New Zealand, thus, served as the base.

5   Results

The research model was validated by using PLS modelling using R package SEMinR (version 2.3.0), with VIF analysis conducted using R package car (version 3.0-12). PLS fitted the purpose of the present study because it allows validation of both measurement and structural models, it can be used with small data sets, and it is suitable for exploratory research (Hair et al., 2019). Bootstrap analysis with 1000 subsamples was used to test the statistical significance of the path coefficients.

5.1   Measurement model

To assess the measurement model, item reliability, internal consistency reliability, convergent validity, and discriminant validity were assessed. Item loadings are given in Table 2. All item loadings on their own constructs were higher than the threshold of 0.7, suggesting item reliability (Hair et al., 2019). Furthermore, for all constructs, Cronbach alpha and composite reliability values were above 0.7, suggesting internal consistency reliability (Hair et al., 2019), and AVE values exceeded 0.5, suggesting convergent validity (Hair et al., 2019) (see Table 3).

All items loaded on their own constructs higher than on other constructs in the model (see Table 2) and for all constructs, inter-construct correlations involving a construct were lower than the construct's square root of AVE (see Table 4), suggesting discriminant validity (Fornell & Larcker, 1981). Finally, HTMT ratios of correlations for all pairs of constructs were below the threshold of 0.90 (see Table 5), thus meeting the recently introduced criterion of convergent validity by Henseler et al. (2015).

	FCOV	WLB	FAMP	BI
FCOV1	**0.865**	0.635	0.468	0.199
FCOV2	**0.851**	0.507	0.359	0.233
FCOV3	**0.858**	0.698	0.486	0.186
WLB1	0.693	**0.883**	0.617	0.129
WLB2	0.593	**0.883**	0.558	0.135
WLB3	0.585	**0.884**	0.590	0.123
FAMP1	0.420	0.591	**0.881**	0.111
FAMP2	0.438	0.592	**0.914**	0.114
FAMP3	0.463	0.555	**0.816**	0.100
BI1	0.236	0.135	0.106	**0.895**
BI2	0.186	0.068	0.094	**0.886**
BI3	0.214	0.182	0.132	**0.863**

Table 2. Item Loadings and Cross-loadings

Construct	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
FCOV	0.822	0.893	0.736
WLB	0.859	0.914	0.780
FAMP	0.840	0.904	0.759
BI	0.858	0.912	0.777

Table 3. Internal Consistency Reliability and Convergent Validity

	FCOV	WLB	FAMP	BI
FCOV	**0.858**			
WLB	0.706	**0.883**		
FAMP	0.504	0.665	**0.871**	
BI	0.242	0.146	0.125	**0.881**

Note. Square roots of AVE are given on the diagonal, in bold.

Table 4. Discriminant Validity: Inter-construct Correlations and Square Roots of AVE

	FCOV	WLB	FAMP	BI
FCOV				
WLB	0.850			
FAMP	0.615	0.784		
BI	0.283	0.169	0.147	

Table 5. Discriminant Validity: HTMT Ratios of Correlations

5.2 Structural model

The results of structural model testing are summarised in Table 6. For all independent variables variance inflation factor (VIF) values were below the threshold of 5, suggesting that there were no collinearity issues (Hair et al., 2014; Hair et al., 2019).

Of the three hypotheses, only H1 was confirmed, suggesting that friendly co-workers is an important outcome expectation women consider when returning to the IT industry after a break. Additionally, one of the control variables, AUQ, had a statistically significant effect, suggesting that in Australia women who have left the IT industry were more likely to consider returning to work in comparison to New Zealand and the US. The R square value for the only dependent variable in the model (behavioural intention to return to IT employment) was estimated as 0.098, which is relatively low (Hair et al., 2014; Hair et al., 2019). This suggests that to fully explain variation in the intention of women to re-join the IT workforce further factors, in addition to social outcomes, need to be included.

Path	Hypothesis	Path coefficient	*t* statistic	2.5% CI	97.5% CI	*p* value	VIF
FCOV→BI*	H1	0.267	2.500	0.051	0.456	0.013	2.158
WLB→BI	H2	-0.060	-0.508	-0.289	0.179	1.389	2.778
FAMP→BI	H3	0.035	0.329	-0.168	0.267	0.742	1.840
AGE→BI		0.082	1.096	-0.082	0.215	0.274	1.088
AUQ→BI*		0.178	2.063	0.012	0.351	0.039	1.402
USQ→BI		0.039	0.487	-0.115	0.192	0.627	1.383

Table 6. The Results of Structural Model Testing

5.3 Robustness check

As is common in panel-based research (Schonlau & Toepoel, 2015), the data set contained responses with possible straightlining (i.e., respondents using the same response category for all questions in a survey section). Following the recommendation by Zhang and Conrad (2014) and Schonlau and Toepoel (2015), we conducted the analysis with responses involving straightlining excluded. For this analysis, we classified responses using the same category to answer all items measuring the independent variables, FCOV, WLB, and FAMP as responses involving straightlining. There were 29 responses meeting this criterion.

The results of the analysis of the remaining 153 responses were, in essence, identical to the analysis of the full data set: all reliability and validity criteria were met, there were no collinearity issues, and the statistically significant effects were the ones by FCOL and AUQ. With straightlining reduced, there was stronger discrimination between constructs (the highest HTMT ratio, the one between WLB and FCOV, was reduced from 0.850 to 0.788). Furthermore, in the analysis with straightliners removed the path coefficients for statistically significant relationships had higher values (e.g., 0.292 for FCOV→BI and 0.246 for AUQ -> BI) and p values were smaller (both were below 0.01, thus meeting a stronger criterion for statistical significance). The implications for the hypotheses of the present study remained the same, suggesting that the overall approach was robust.

6   Discussion

6.1   Theoretical contributions

The present study is, to the best of our knowledge, the first quantitative study of potential women returners to the IT industry (women who have left IT employment and are considering returning). The study contributes to the literature by testing the effects of women's perceived social outcome expectations of returning to IT employment on their intentions to return. Of the three factors considered, friendly co-workers, work-life balance, and family proximity, only the expectation of friendly co-workers had a statistically significant effect on the intention to return to IT employment. Thus, the results of the present study suggest that the expectation to encounter friendly co-workers, who could both make it easier for women returners to re-integrate into the work environment and allow them to derive life satisfaction from social exchanges, is particularly important in shaping their intention to return.

A recent study of women returners to the IT industry (those who already returned) by Ravindran and Baral (2014) found that an organisational climate that accepts diversity – a construct that, in relation to women workers, is similar in content to the friendly co-workers construct of the present study – had a statistically significant effect on job satisfaction, career satisfaction, and career commitment – constructs that are congruent in content to the intention to work in IT. Thus, the results of the present study are consistent with the results by Ravindran and Baral (2014).

On the other hand, the effects of work-life balance have been demonstrated to be significant in related contexts (e.g., organisational commitment by accountants (Berk & Gundogmus, 2018), trust in the organisation by software workers (Scholarios & Marks, 2004)). A possible explanation of no statistically significant effect of expectations of work-life balance found in the present study is that the expectations did not vary enough across the participants to make a difference. Thus, one should not interpret the results as suggesting that work-life balance does not matter. Similarly, family proximity has been found to have an effect on workforce participation by women with children (Compton & Pollak, 2014), and one should be cautious about interpreting the results of the present study as suggesting that family proximity does not matter. Nonetheless, the results are consistent with a view that, when assessing the intention of potential women returners to re-join the IT industry, the expectation of friendly co-workers is more of a differentiator than expectations of work-life balance or family proximity.

The content of the friendly co-worker concept, as introduced by Venkatesh et al. (2017), is rather broad and covers both friendliness in a personal sense (as individuals) and friendliness in a professional sense (being collegial). Both in the study by Venkatesh et al. (2017) and in our study, statistical analysis has confirmed the discriminant and the convergent validity of the construct, suggesting that in the context of the IT industry the perceptions of friendliness in a personal sense go hand in hand with the perceptions of friendliness in a professional sense. This may be attributed to the creative and professional character of IT work, and thus may not automatically apply to all work contexts.

A fundamental distinction between friendly co-workers and work-life balance and family proximity is the extent to which these variables can be controlled by legislative or management interventions. Organisations can improve work-life balance for returning female IT employees by taking unambiguous direct actions, such as offering flexible work arrangements

(Eurofound, 2017) or, to some extent, by following agile project management practices, which is a strong trend at present (Meso & Jain, 2006). Furthermore, regulatory bodies can establish regulations compelling organisations to implement policies that encourage work-life balance. To a considerable extent, this also applies to family proximity: employers can rely more on remote work (Topp et al., 2022) or work from home (Ozkaya, 2021). Indeed, unlike in other industries, such as manufacturing or hospitality, most of the jobs in IT can be done remotely (Ozkaya, 2021). Indeed, the shift to remote work associated with the COVID-19 pandemic resulted in considerable organisational learning in organising and managing remote work, and in greater acceptance of such work (Dubey & Tripathi, 2020).

In contrast, the concept of friendly co-workers is akin to organisational culture (Heras et al., 2021). Management cannot order people to be friendly, and regulatory bodies cannot legislate friendliness. While managers can take actions, such as modelling friendly behaviour, it is far from certain that such actions will have the desired effect (Aitken, 2007). Indeed, attempts to legislate friendliness may have the opposite effect, making the fact of women returning to work more salient. Some co-workers may be uneasy about women returning to the workforce because of the perception that they could be unreliable in project work. Specifically, workers may believe women returners will prioritise families over work responsibilities (Rajesh et al., 2013). These feelings may be reinforced by patriarchal beliefs that women with children should stay at home, which may be relevant in some national cultures (Wijayawardena et al., 2017). These feelings can be based on a viewpoint that women returners took an opportunity to have a career and a family life that other workers did not (Beauregard, 2014), or for other reasons. If women's return to work is more salient, these co-workers are more likely to take actions, or inactions, that are not friendly (Harris & Ogbonna, 1998).

Similarly, managerial or regulatory actions designed to improve work-life balance or to improve family proximity may have a negative effect on friendliness if co-workers form a perception that women returners get special treatment that results in shifting workloads or risks (Rajesh et al., 2013). A cultural change resulting in women returners being welcome by friendly co-workers requires a change in the organic, tacit work ecosystem (Subramony et al., 2018), rather than a deliberate managerial or regulatory design.

Thus, the finding of the present study that friendly co-workers is an important factor in determining women's intentions to return to IT work highlights the challenge of achieving a greater gender balance in the IT workforce. The main implication for theory is that research on achieving greater gender balance in the IT industry should focus more on peer-to-peer relational dynamics, on organisational (and industry) culture, and on the IT work ecosystem.

6.2 Practical implications

The present study contributes to practice by highlighting the need for managers to promote a work environment that women would perceive as friendly, which is an aspect that is not always emphasized in the current practitioner literature. For example, Hewlett (2008) lists a number of recommendations, such as creating reduced-hour jobs and nurturing ambition, but stops short of recommending measures intended to create a friendly environment. Even though behaviours associated with the brogrammer and the geek archetypes may be based on deeply held beliefs and thus may be difficult to change, managers may reduce their impact in the workplace by not promoting competition and not encouraging work overtime. Indeed, agile approaches to IT project management, widely believed to represent the best practice in organising IT work, emphasize collaboration in a team, rather than competition between

individuals, and suggest timeboxing work with no overtime. Thus, even though a deep cultural change (as, for example, suggested by Coe et al. (2019)) may be difficult, to an extent, a workplace more friendly to women employees could be created by implementing agile approaches to organizing IT work, for as long as agile implementations are true to the agile principles of relying on "self-organizing teams" (rather than on competing individuals) and on maintaining a "a constant pace indefinitely" (rather on binge-working to meet deadlines) (https://agilemanifesto.org/principles.html).

At the micro level, managers could also discourage microaggressions by modelling discourse friendly to women and by challenging aggressors. This could involve openly acknowledging the expertise of women (both technical and soft skills), ensuring that women have an opportunity and feel comfortable to contribute their perspectives in formal and informal decision-making situations, and addressing other types of microaggressions described in the literature (Kim & Meister, 2022).

The results of the present study suggest that creating an environment in which colleagues are friendly and collegial to women is important to encourage women to return to IT work after career breaks. However, friendly colleagues are not the only factor, and measures such as creating reduced hour jobs and providing flexibility to make it easier to combine work with childcare, removing the stigma of having a career interruption, and nurturing ambition (Hewlett, 2008) are also important. However, the importance of expectations of friendly co-workers in forming the intention of potential women returners to re-join the IT industry suggests that in implementing measures intended to correct the gender imbalance managers and regulatory bodies should avoid creating perceptions that the interests of women returners conflict with other employees, male or female. Any changes brought in to attract women returners should be seen as an improvement for everyone: tensions between equity and equality (Bierhoff & Rohmann, 2011) should be managed to ensure that the organisation is perceived as just (Fuchs & Edwards, 2012).

Furthermore, even though potential women returners are well informed in forming their expectations around the outcomes of re-joining the IT industry – because they have worked in IT in the past – messages that they receive from the media make some of the memories and perceptions more salient than others (Kligler-Vilenchik et al., 2014). Thus, media messages depicting unfair or unfriendly treatment of women employed in IT, even though possibly intended to prompt managerial or regulatory actions to improve women's conditions at work, may also make their return less likely. From the perspective of improving the gender balance in the industry and assuring greater diversity, for as long as such messages reflect reality, depictions of the IT workplace as friendly to women are more desirable.

6.3 Limitations and further research

As a study with a relatively small sample and a specific focus (women's perceptions of social outcomes of returning to the IT workforce), the present study is far from comprehensive. To achieve a better explanation/prediction of women's intentions (and ultimately, actual behaviour) with respect to returning to the IT workforce additional research is required. Specifically, larger quantitative studies covering a broader range of factors are desirable, possibly covering aspects such as organisational policy and organisational justice (Ravindran & Baral, 2014), or opportunities for professional development (Annabi & Lebovitz, 2018). Longitudinal quantitative studies measuring actual behaviour (whether women who intended to return to IT employment actually returned) are also desirable. Further, the mechanisms

behind the effects discovered in the present study could be understood in greater depth by conducting qualitative research.

Actual social relationships (women's participation in various social networks, such as social networks involving people currently employed in IT) may influence social outcome expectations of returning to IT employment and may influence women's intention to return to IT employment by establishing subjective norms (Manning, 2009) favourable or unfavourable towards returning to IT employment. The role of social relationships could be clarified in further research.

The incidental finding of the present study that potential women returners to the IT industry in Australia may be more likely to form a behavioural intention to re-join the industry than women in New Zealand or in the US suggests the IT work ecosystems in different countries may differ in their attractiveness for potential women returners. Australia may be offering a superior environment for women returners, which other countries may wish to replicate. Purposeful and comprehensive country comparisons are needed to provide sufficient evidence for practical steps in this respect.

The present study was funded to focus on New Zealand, Australia, and US. Future studies could provide more insightful cross-country comparisons by including countries with different cultures and countries that are particularly successful in promoting women participation in the IT industry, such as India (Raghuram et al., 2017; Ring, 2018 ; Sondhi et al., 2018).

7 Conclusions

We conducted a survey to study the effects of social outcome expectations with respect to intention to return to IT employment for potential women returners from New Zealand, Australia, and the United States. Expectations of friendly co-workers, work-life balance, and family proximity were included. The expectation of friendly co-workers had a statistically significant effect on the intentions of potential women returners to return to IT employment. The results highlight the difficulty of creating an environment that encourages potential women returners to return to IT because, unlike work-life balance or family proximity, friendly co-workers is a factor that is difficult to control via managerial interventions. For practice, the results suggest that organisations and industry bodies should promote an environment friendly to women, which in part may be achievable by implementing agile approaches to organizing IT work.

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