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Empowering women micro-entrepreneurs in emerging economies: The role of information communications technology☆

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ABSTRACT

Drawing upon the Technology Acceptance Model (TAM), this research investigated the impact of information communications technology (ICT) on self-efficacy, social capital, and empowerment in the overlooked context of women micro-entrepreneurs. In addition to testing the original TAM constructs of usefulness and perceived ease of use, this research extended TAM to ICT use outcomes. Data were collected from 199 women micro-entrepreneurs in South Africa using an online survey and were analyzed via structural equation modeling. The results suggested that ICT usage decisions were influenced by women's perceptions of ICT ease of use and usefulness. Additionally, ICT usage influence on social capital bridging was moderated by self-efficacy, while ICT usage had a strong direct influence on self-efficacy and social capital bonding. Social capital bridging and bonding and self-efficacy had varying influence on women empowerment measured as goal internalization, perceived control, competence, and impact. These findings were robust even after controlling for potentially confounding variables identified in the literature. The theoretical and practical implications of these findings are discussed.

1. Introduction

One of the 17 Sustainable Development Goals launched on the United Nations 2030 Agenda for Sustainable Development is gender equality and the empowerment of women and girls (United Nations, 2018). Referring to Keller and Mbewe (1991), Rowlands (1995, p. 104) defines empowerment as: "A process whereby women become able to organise themselves to increase their own self-reliance, to assert their independent right to make choices and to control resources which will assist in challenging and eliminating their own subordination." Empowering women in emerging economies will not only improve household welfare but will also positively impact the social and fiscal health of nations through better education, poverty reduction, and decreased violence (De Vita, Mari, & Poggesi, 2014; Dolan & Scott, 2009; Scott, Dolan, Johnstone-Louis, Sugden, & Wu, 2012). One tool identified by scholars with the potential to facilitate women empowerment in emerging economies is that of information communications technology (Ajjan, Beninger, Mostafa, & Crittenden, 2014; Maier & Nair-Reichert, 2007; Wamala, 2012).

Information communications technology (ICT) is an umbrella term that includes all devices and applications, such as mobile phones, personal computers, and social media applications, which enable individuals to interact with each other in the digital world (Brown & Brown, 2008; Majchrzak, Markus, & Wareham, 2016). In their review of the literature, Cardona, Kretschmer, and Strobel (2013) suggested that ICT has facilitated economic competitiveness and sustained long-term economic growth. Using ICT, women in emerging economies can transform their social, political, and economic lives by changing and reshaping processes that lead to opportunities for growth and development, with the potential to bridge many gaps in human socio-economic development (Ajumobi & Kyobe, 2016). ICT has been credited with helping women in emerging markets identify new employment

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prospects, engage in self-employment opportunities, and further individual social development in terms of greater self-efficacy and increased social capital (Diaz Andrade & Doolin, 2016; Huyer & Mitter, 2003; Rahman, Taghizadeh, Ramayah, & Alam, 2017; Wamala, 2012).

We suggest, however, that the linkage between ICT use and women empowerment is indirect with mediators and moderators leading to different aspects of empowerment. In particular, social capital and self-efficacy have been identified in the literature as critical constructs to understand empowerment (Ansari, Munir, & Gregg, 2012; Ozer & Bandura, 1990). Thus, the research reported here utilizes the theoretical lens of the Technology Acceptance Model (TAM) to test the original TAM constructs (usefulness and perceived ease of use) and explore the relationships that lead to the outcome of women empowerment. With women empowerment in emerging economies linked to micro-enterprises and informal work (e.g., Beninger, Ajjan, Mostafa, & Crittenden, 2016; Crittenden & Bliton, 2019; Krishnan & Kamalanabhan, 2013), the current study focused on women micro-entrepreneurs in an emerging market and extended the TAM by linking the outcomes of ICT use with women's self-efficacy, creation and maintenance of social capital, and multidimensional aspects of empowerment.

In the next section, the four major constructs in the study (ICT, Social Capital, Self-Efficacy, and Empowerment) are described in detail and the research hypotheses presented. Following that, the methodology employed in the research is described. The results derived from the online survey and rigorous statistical analysis are then provided, followed by an in-depth discussion of these results along with theoretical and practical implications for scholars. Finally, study limitations and future research opportunities are offered.

2. ICT's role in empowering women micro-entrepreneurs

Microenterprises[1] offer considerable employment and income opportunities in emerging economies (Grimm & Paffhusen, 2015; Jamak, Ali, & Ghazali, 2014), with women disproportionately represented among these micro-entrepreneurs (Midgley, 2008). Bravo, Maldonado, and Weber (2013) noted that there is little knowledge about micro-entrepreneurs, which may be due in part to the informal nature of the microenterprises that are often run without employees (aside from the micro-entrepreneur) and little to no assets (Dana, 2012; Smith & Perks, 2006). Overall, however, a focus on women micro-entrepreneurs, or women entrepreneurs in general, in emerging economies has been limited in the literature (Krishnan & Kamalanabhan, 2013; Roomi & Parrott, 2008).

In a study conducted by Rahman et al. (2017), the impact of ICT on both personal and professional development of the micro-entrepreneur was clearly evident. Scholars have noted that ICT is both an important tool and a prerequisite for women empowerment (e.g., Huyer & Sikosa, 2003; Obayelu & Ogunlade, 2006). Thus, the TAM was the underpinning of the current study to help clarify how ICT can enhance the development of women micro-entrepreneurs.

Originally derived from the theory of reasoned action (Ajzen & Fishbein, 1980), TAM examines user adoption behavior as determined by two technology-related attitudinal measures: ease of use and perceived usefulness. Davis (1989) initially examined user perceptions of file editor and e-mail in the workplace, and the theory was later extended to measure new technology, including mobile technology (Hong, Thong, & Tam, 2006) and social media (Rauniar, Rawski, Johnson, & Yang, 2013). According to Davis (1989), perceived usefulness and perceived ease of use would influence technology use decisions. Since its development, the TAM has been used extensively as the theoretical foundation for exploring the acceptance of technology, but its use has been limited with respect to understanding technology usage outcomes (Venkatesh, Thong, & Xu, 2016).

While the literature is clear on the importance of ICT as a tool for women's empowerment (Huyer & Sikosa, 2003), the effort in this current research was to explore the intervening variables of social capital and self-efficacy in the relationship between ICT, as a tool, and women empowerment. Fig. 1 depicts the conceptual model with ICT, Social Capital, Self-Efficacy, and Empowerment as the major constructs explored in the current research. Each of these constructs is described below, along with the variables within each construct that are operationalized for testing in the hypotheses.

2.1. Information communications technology (ICT)

According to Maier and Nair-Reichert (2007, p. 43), ICTs are a key solution to "comprehensive development, poverty eradication and the empowerment of historically disadvantaged groups, such as women and minorities." ICT was described at the 2002 World Summit on the Information Society as a tool to empower women to improve their participation in the economy and their quality of life (Obayelu & Ogunlade, 2006). Several studies support the claim that ICTs are tools for women empowerment, both in terms of empowering individual women and organized groups of women, and the benefits of such empowerment are substantial (Huyer & Mitter, 2003). Capel, Vyas, and Brereton (2017) demonstrated how ICT could be designed to support and empower women in challenging circumstances (e.g., living conditions, social isolation, and stigma). Considering challenging situations, Obayelu and Ogunlade (2006) described how ICTs have played a critical role in helping Nigerian women address the chronic issues of widespread poverty. In addition to these pressing issues, Huyer and Mitter (2003) and Huyer and Sikosa (2003) go so far as to suggest that the empowerment benefits from ICT result in the creation of new and self-employment opportunities, more formal and non-formal education, and improved information and services related to health services and gender issues. ICTs such as mobile apps and social media provide individuals with opportunities to form new knowledge in ICT-mediated spaces, participate in social conversations, contribute to the development of new content, and build socially relevant connections and networks (Maidment & Macfarlane, 2009; Wilding, 2009).

Beninger et al. (2016) found that ICTs helped women small business owners in Egypt grow their businesses via greater access to customers. From a sales perspective, Agnihotri, Kothandaraman, Kashyap, and Singh (2012) suggested that ICT development serves as enablers for a salesperson to exploit both formal and informal networks to enhance a salesperson's perceived value. Bidwell et al. (2014) found that ICT access improved self-efficacy and, thus, the ICT user's ability to change her situation in rural South Africa.

The growing use of social and mobile technologies can be attributed to the ease of use and effectiveness in meeting an individual's need to connect with others to learn and share information (Rauniar et al., 2013). As suggested by the TAM, perceived ease of use and usefulness are direct determinants of peoples' intentions to use technology (Davis, Bagozzi, & Warshaw, 1989), and these three variables (ease of use, usefulness, and use) are operationalized for testing in the current research. Perceived ease of use can be defined as the degree to which a person believes that using a particular technology system is free of effort (Yen, Wu, Cheng, & Huang, 2010). Previous research has demonstrated that individuals are more likely to use a new ICT if they perceive their interaction with the technology to be clear and understandable. Moreover, Davis (1989) defined usefulness as the extent to which an individual perceives that using ICT enhances his or her job performance. Many scholars have found that user perception of ICT's usefulness has a great influence on adoption and use (Pontiggia & Virili, 2010; Yen et al., 2010; Zhou, Lu, & Wang, 2009). TAM suggests that perceived usefulness is influenced by ICT ease of use given that the

[1] According to Abor and Quartey (2010), a micro-enterprise is one where the turnover is less than the VAT registration limit annually and employs fewer than five people.

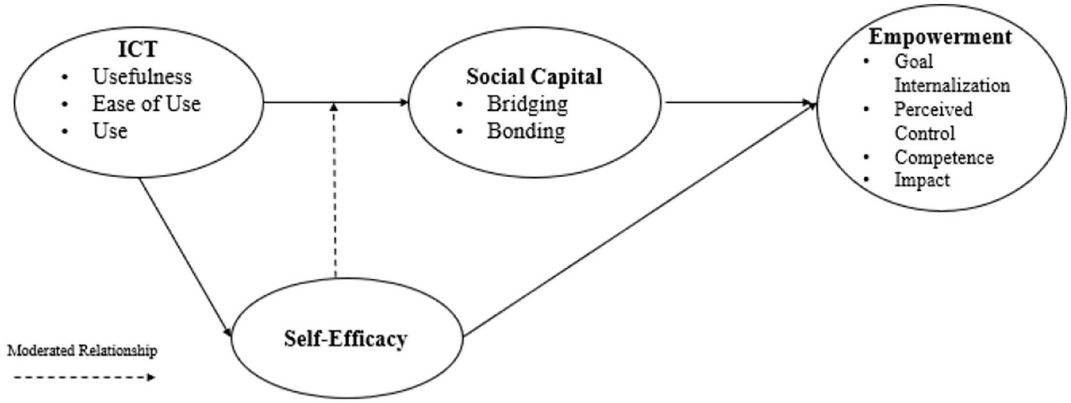

Fig. 1. Conceptual model.

easier it is to use the system, the more useful it can be (Venkatesh, 2000).

Thus, we hypothesize:

H1a. The perceived ease of use of ICT has a positive effect on women micro-entrepreneurs' perceptions of ICT usefulness.

H1b. The perceived usefulness of ICT has a positive effect on the degree of use of ICT by women micro-entrepreneurs.

H1c. The perceived ease of use of ICT has a positive effect on the degree of use of ICT by women micro-entrepreneurs.

2.2. Social capital and self-efficacy

2.2.1. Social capital

Mamun et al. (2015) suggested that social capital could have a strong influence on entrepreneurial competencies and enterprise performance, with Nahapiet and Ghoshal (1998) defining social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (p. 243). Participants in the relationship network gain access to intellectual, financial, and cultural resources (Bourdieu, 1986), with the level of access to resources differing based on the two relational social capital dimensions of weak and strong ties. According to Granovetter's (1973) strength of weak ties theory, strong ties are the relationships one has with close family and friends and weak ties refer to mere acquaintances. Building on the role people play in the weak ties, Burt (1992) referred to the notion of structural holes or gaps between individuals who have complementary sources of information. Extending one's network to these otherwise unconnected individuals would provide access to non-redundant, or complementary, sources of information (Batjargal, 2010). Entrepreneurs can thus access new knowledge through weak ties since acquaintances are proposed to be more diverse than close friends in a social network, and they can also activate the strong and homophilous ties for sources of information and influential referrals (Brown & Reingen, 1987).

Scholars have also stressed the benefits of strong ties in providing access to timely and needed resources (Batjargal, 2003). Based on Coleman's (1988) theory of network closure, a strong tie network is one in which an entrepreneur's contacts are connected with little or no structural holes (Stam, Arzlanian, & Elfring, 2014). Strong tie networks enable trust, allow the exchange of complex knowledge, and provide social support and norms of reciprocity that enable ease of cooperation among network members (Obstfeld, 2005).

In this regard, Putnam (2000) distinguished between bridging and bonding social capital. Bridging social capital is linked closely to weak ties. This bridging view suggests that entrepreneurs with large, diverse, and weakly connected social networks have access to novel ideas but may face difficulty in assembling resources to exploit the ideas. In contrast, bonding social capital is found among individuals with strong-knit connections (strong ties), such as family and close friends, and is typically associated with emotional or substantive support through continued reciprocity (Williams, 2006). From an entrepreneur's perspective, these bonding ties can be used more effectively to raise resources to support new projects but may lack access to new ideas (Stam et al., 2014). Both bridging and bonding social capital have been studied in the context of ICT (Choi, Kim, Sung, & Sohn, 2011; Ellison, Steinfield, & Lampe, 2007; Phua, Jin, & Kim, 2017; Su & Chan, 2017) and are used to operationalize social capital in the current study.

Smith, Smith, and Shaw (2017) integrated computer mediated communications with the social capital literature by suggesting that online affordances could impact the accrual of both bridging and bonding social capital for entrepreneurs. ICTs can lower the barriers to interactions within one's social community by encouraging social self-disclosure and the forging of new relationships that might not occur otherwise (Bargh, McKenna, & Fitzsimons, 2002; Tidwell & Walther, 2002). These new connections may result in an increase in social capital. For example, a 2009 Pew Internet survey reported that ICT users were more likely to have a larger, more diverse core discussion network than non-ICT users (Hampton, Goulet, Her, & Rainie, 2009). Constantinidis (2011) found that women entrepreneurs found social media, Facebook in particular, to be a useful tool for balancing work and family. Social networks comprised largely of women were perceived to create greater social capital than male or mixed networks, and the women entrepreneurs participating in the study reported the acquisition of both new customers and suppliers through their Facebook connections. Beninger et al. (2016) provided evidence that the social capital of women entrepreneurs in Egypt was enhanced by the increased reach and exposure enabled by the use of social media.

Past research has hypothesized that ICT could greatly increase the number of weak ties; individuals gain new resources (such as information or perspective) from loose connections with little effort and cost (Donath & Boyd, 2004). On the other hand, some have questioned the impact of ICT on bonding strong ties (Bargh & McKenna, 2004). For example, Nie and Erbring (2000) reported that Internet use resulted in the neglect of one's close network. However, Howard, Rainie, and Jones (2001) found that the Internet allows people to increase their level of communication with close ties, and ICT tools were likely to extend social ties rather than detract.

Social capital allows a person to utilize resources from other members in the network (Ellison et al., 2007). Women micro-entrepreneurs with high bridging social capital could gain a broader set of information and opportunities as they more frequently interact with community members with diverse backgrounds. Also, women micro-entrepreneurs with high bonding social capital could gain emotional

and substantive resource support from one another through reciprocity (Williams, 2006). Additionally, social capital researchers have found that both forms of social capital are related to an increase in individual psychological well-being (Ellison et al., 2007; Helliwell & Putnam, 2004).

2.2.2. Self-efficacy

According to Bandura (1997), self-efficacy is one's belief in her capacity to employ the necessary resources needed in a particular situation. This process of inner transformation occurs when a woman recognizes both her ability to define her own self-interests and her entitlement to make her own decisions, and it has been suggested that women might require greater nurturing in self-confidence and esteem (Kabeer, 2001; Nussbaum, 2001; O'Neill & Viljoen, 2001; Sen, 1999). A low-level of self-confidence that served to reduce entrepreneurial impetus was reported by Preisendörfer, Bitz, and Bezuidenhout (2012), with Urban (2012) suggesting that entrepreneurial self-efficacy was an important motivational construct of rural entrepreneurs in South Africa. Individual self-evaluation traits, measured as a combination of locus of control, self-efficacy, emotional stability and self-esteem, have been found to positively influence psychological empowerment in the workplace (Seibert, Wang, & Courtright, 2011).

In general, individuals exert more effort and become more persistent as self-efficacy increases and, in doing so, learn how to deal with task-related obstacles (Chebat & Kollias, 2000; Gist, 1989). Task-Technology Fit theory provides support for a moderating effect of self-efficacy. According to Marcolin, Compeau, Munro, and Huff (2000), it is one's personal abilities, not how the technology is designed or the how the task is defined, that limits one's outcomes. A study in 2008 found that individuals who have relatively high self-efficacy experience lower innovation resistance due to the ability to dismiss negative doubts about their abilities (Cho & Chang, 2008). Previous studies also suggest that the impact on outcome (e.g., bridging or bonding social capital) depends on the fit between individual characteristics of the users (e.g., self-efficacy) and functionality of the technology (Goodhue & Thompson, 1995). Thus, the self-efficacy of women entrepreneurs may influence how they use technology to interact with one another and make new friends for bridging and bonding their social capital.

These findings lead us to consider the following hypotheses:

H2a. ICT use has a positive effect on a woman micro-entrepreneur's self-efficacy.

H2b. The relationship between ICT use and bridging social capital will vary depending on a woman micro-entrepreneur's self-efficacy.

H2c. The relationship between ICT use and bonding social capital will vary depending on a woman micro-entrepreneur's self-efficacy.

2.3. Empowerment

The empowerment of women is an important issue worldwide (World Health Organization, 2018). Babaei, Ahmad, and Gill (2012) suggested that empowerment is important for enabling marginalized individuals to gain access to resources and to value their own experiences. Empowerment is a multi-faceted, multidimensional, and multi-layered construct, with possibly different meanings to different individuals (Bartunek, 1995; Williams, 2005). Thomas and Velthouse (1990) denoted a difference between situational attributes of empowerment (e.g., management practices) and job incumbent cognitions about those attributes (e.g., psychological empowerment). In her work, Spreitzer (1995) suggested that organizational researchers tended to focus on empowering management practices, with psychological empowerment an overlooked construct in research, and she offered four dimensions of psychological empowerment: (1) Meaning, (2) Competence, (3) Self-Determination, and (4) Impact. Menon (1999, 2001) provided three dimensions of psychological empowerment: (1) Goal Internationalization, (2) Perceived Control, and (3) Perceived Competence.

To this end, the current research combined the works of Spreitzer (1995) and Menon (1999, 2001) and identified the psychologically empowered woman as someone who possesses a cognitive state characterized by the dimensions of goal internalization, perceived control, competence, and impact. Each of these dimensions served to operationalize empowerment for testing purposes. The first operational variable, goal internalization, measures the motivating property of an exciting objective or worthy cause provided by leadership and community. The second operational variable, perceived control, measures the extent to which women entrepreneurs have the authority and freedom to run their businesses as they see fit. The third operational variable, competence, measures role mastery to work effectively and belief in her skills and abilities to mentor others. The fourth operational variable, impact, is appraised as the degree of impact and influence over her business.

Social support from a peer network enhances perceptions of psychological empowerment (Seibert et al., 2011). Feelings of empowerment can foster flexibility, stimulate change, improve innovative behavior, increase job satisfaction, boost task performance, enhance organizational commitment, and reduce strain (Conger & Kanungo, 1988; Seibert et al., 2011; Thomas & Velthouse, 1990). In the context of micro-entrepreneurial endeavors, social support can provide women entrepreneurs with feelings of self-determination since, as an accepted member of her community, she has the right to determine her own business goals and scope. The access to a social network might enhance the woman entrepreneur's enthusiasm and inspiration in her work-related tasks and goals. Social support can also intensify feelings of task competence and impact because of the availability of resources, information, influence, and support needed to accomplish the work-related tasks and goals (Seibert et al., 2011). In general, scholars have viewed power as embedded in social interactions (Tew, 2006). Cattaneo and Chapman (2010) offered the Empowerment Process Model in which empowerment is an iterative process, where self-efficacy is the core element of the empowerment process. Self-efficacy can moderate relationships in the process, but it is also a part of the empowerment process itself.

We propose that higher bridging and bonding social capital and higher self-efficacy will lead to higher empowerment along all four operational variables. Thus:

H3a. For women micro-entrepreneurs, bridging social capital has a positive effect on empowerment as operationalized by goal internalization.

H3b. For women micro-entrepreneurs, bridging social capital has a positive effect on empowerment as operationalized by perceived control.

H3c. For women micro-entrepreneurs, bridging social capital has a positive effect on empowerment as operationalized by competence.

H3d. For women micro-entrepreneurs, bridging social capital has a positive effect on empowerment as operationalized by impact.

H4a. For women micro-entrepreneurs, bonding social capital has a positive effect on empowerment as operationalized by goal internalization.

H4b. For women micro-entrepreneurs, bonding social capital has a positive effect on empowerment as operationalized by perceived control.

H4c. For women micro-entrepreneurs, bonding social capital has a positive effect on empowerment as operationalized by competence.

H4d. For women micro-entrepreneurs, bonding social capital has a positive effect on empowerment as operationalized by impact.

Table 1
Reliability and validity indices for the measurement model.

Measurement items	Outer loadings (Outer weights)	t-Value for loading (t-Value for outer weight)	CA	CR	AVE
ICT					
Ease of use (Davis, 1989; Hess, McNab, & Basoglu, 2014)			0.79	0.87	0.62
My interaction with ICT to support my direct selling business is clear and understandable.	0.88	37.72			
I feel comfortable using ICT to support my direct selling business.	0.85	20.65			
It would be easy for me to become more skillful at using ICT sites to support my direct selling business.	0.74	12.23			
Overall, I find ICT sites easy to use to support my direct selling business.	0.66	9.43			
Perceived usefulness (Klein, 2007, Venkatesh, Morris, Davis, & Davis, 2003)			0.86	0.91	0.78
I depend on ICT to support my direct selling business.	0.87	31.02			
ICT is part of my everyday direct selling activities	0.92	45.11			
I find ICT useful in supporting my direct selling business.	0.85	23.36			
ICT use to support direct selling (Beninger et al., 2016)					
I use ICT to communicate about business-related issues with my direct selling community.	0.71 (0.02)	10.41 (0.25)			
I use ICT to communicate with other sales people in my organization.	(0.27)	11.97 (3.65)			
I use ICT to communicate with my direct selling customers/clients.	0.75 (0.15)	8.54 (1.41)			
I use ICT to be socially connected with my direct selling community	(0.34)	19.25 (3.47)			
I use ICT to learn about ways to improve my direct selling business.	(0.33)	17.51 (4.24)			
I use ICT to provide information to my current and potential customers about my direct selling products.	0.76 (0.14)	9.36 (1.38)			
Social capital					
Bridging (Ellison et al., 2007)			0.91	0.93	0.64
I feel I am part of the broader community of direct sellers.	0.80	32.22			
I am interested in what goes on in direct selling.	0.80	21.77			
Interacting with other female direct sellers makes me want to be creative in my business.	0.82	28.73			
Interacting with people in direct selling makes me feel like a part of a larger community.	0.86	22.96			
I am willing to spend time to support direct selling activities.	0.81	23.75			
I come into contact with new people all the time in my direct selling activities.	0.73	17.11			
Interacting with others in direct selling reminds me that everyone in the world is connected.	0.79	20.49			
Social capital					
Bonding (Ellison et al., 2007)			0.75	0.86	0.67
There are several people in my direct selling community whom I trust to help solve my problems.	0.87	33.44			
There is someone in my direct selling community I can turn to for advice about making very important decisions.	0.78	17.51			
The people I interact with in my direct selling community would be good referrals for me.	0.80	23.86			
Self-efficacy (Sherer et al., 1982)			0.79	0.85	0.54
If I make plans, I am certain I can make them succeed.	0.74	16.05			
I give up easily. (R)	0.73	16.38			
Failure just makes me try harder.	0.78	19.37			
When I decide to do something, I go right to work on it.	0.70	12.29			
If I cannot do a task the first time, I keep trying until I can.	0.72	12.53			
Empowerment (Menon, 1999, 2001; Spreitzer, 1995)					
Competence			0.75	0.85	0.66
I have the competence to work effectively in direct selling.	0.85	24.61			
I have the skills and abilities to do my direct selling tasks well.	0.78	20.38			
I believe I could sponsor/mentor other women who might be interested in direct selling.	0.81	25.07			
Perceived control			0.65	0.85	0.74
I have the authority to engage in direct selling the way I see best.	0.89	29.85			
I have the freedom to determine how I run my direct selling business.	0.83	16.28			
Goal internalization			0.76	0.86	0.68
I am inspired by the goals of the direct selling organization I am affiliated with.	0.79	17.51			
I am enthusiastic about working toward my direct selling organization's objectives.	0.90	69.18			
I am inspired by what others in direct selling are trying to accomplish.	0.77	13.28			
Impact			0.65	0.80	0.58
The impact I have on my direct selling business is large.	0.78	17.70			
I can influence the way other women engage in direct selling.	0.83	32.90			
I have a great deal of control over what happens in my direct selling business.	0.67	10.41			

H5a. For women micro-entrepreneurs, self-efficacy has a positive effect on empowerment as operationalized by goal internalization.

H5b. For women micro-entrepreneurs, self-efficacy has a positive effect on empowerment as operationalized by perceived control.

H5c. For women micro-entrepreneurs, self-efficacy has a positive effect on empowerment as operationalized by competence.

H5d. For women micro-entrepreneurs, self-efficacy has a positive effect on empowerment as operationalized by impact.

3. Data and empirical approach

The four major constructs explored in this research were ICT, Social Capital, Self-Efficacy, and Empowerment. ICT was operationalized using the variables of ICT usefulness, ease of use, and use; Social Capital was operationalized using the variables of bridging and bonding; Empowerment was operationalized using the variables of goal internalization, perceived control, competence, and impact. Multi-item measures were used to assess each of these major constructs via an online survey process. After a rigorous preparatory process for the survey instrument (including an extensive review of the literature, expert evaluation of the survey items, and in-person survey pilot testing/analysis with 50 women micro-entrepreneurs), the data collected were

analyzed via structural equation modeling.

3.1. Research context

Given the prevailing social norm of gender discrimination in South Africa (George, Corbishley, Khayesi, & Haas, 2016; Scheepers, Parbhoo, Swart, & Alexander, 2017; Witbooi & Ukpere, 2011), the South African government's focus on the importance of developing women entrepreneurs to attain equity in income and wealth distribution (O'Neill & Viljoen, 2001), and the fact that over a third of retail sales in South Africa occurred through informal outlets that are often integrated into households of the women micro-entrepreneurs supporting their families with low, erratic income from this informal sector (Ligthelm, 2004), South Africa was chosen an appropriate geographic location to conduct research on women micro-entrepreneurs.

Kelley, Brush, Greene, Litovsky, and Global Entrepreneurship Association (2013) reported that as many as 80% of women entrepreneurs in Sub-Saharan Africa sell directly to consumers. Crittenden and Bliton (2019) suggested that women comprise a large percentage of direct selling micro-entrepreneurs since the traditional barriers to small business ownership are removed with direct selling, noting that the micro-entrepreneurs are backed by established brands that provide them a business-in-a-box comprised of quality products, marketing tools, business training, and technological resources. Direct selling of manufactured consumer goods, with its low barriers to entry, offers a low-risk opportunity for the un(der)employed to become entrepreneurs (Dolan & Scott, 2009), and it moves the micro-entrepreneur beyond the informal enterprise into being a micro-entrepreneur with the support of a larger corporation that can provide access to manufactured products, training, and development. The Deputy Minister of Economic Development of South Africa noted, “More than simply creating jobs, direct selling provides an environment for learning, personal development and business building which are critical elements of entrepreneurship” (Mkhize, 2013). To this end, South African women micro-entrepreneurs engaged in the direct selling of products were determined to be an appropriate sample for this research.

3.2. Questionnaire design

Separate scales were used to measure each of the dimensions within each of the four major constructs explored. Scale items were derived and adapted from the previous research that described the variables used to operationalize the constructs. Table 1 provides an overview of each of the scale items and the source of each derivation. All variables, except ICT Use, were measured as reflective first order constructs. ICT Use was assessed as a formative first-order construct. In developing ICT Use in a direct selling business, a large pool of measurement items that were indicators of ICT Use was first identified based on an extensive literature review. The measurement items were selected and refined to ensure that the selected formative measures for ICT Use did not overlap and, in combination, covered all characteristics of the construct. Clarity and lack of ambiguity and avoidance of jargon were assured in accordance with recommendations by Diamantopoulos and Winklhofer (2001). Since general perceptions might suggest that ICT use could vary based on age and/or that there might be a relationship between time on ICT and direct selling income, age and income were utilized as control variables in the study. Use of these two variables was consistent with women empowerment research where empowerment could vary by age (Afshar & Alikhan, 2002) and income (Grasmuck & Espinal, 2000). Additionally, to avoid the interpretation that findings could be attributable to variation in the time spent on ICT every day, we controlled for this variable in the analysis. As well, a variety of descriptive data was collected for general informational purposes.

A draft of the final questionnaire was shared with a resident of South Africa to ascertain question phrasing and appropriateness of response categories. After this review, the questionnaire was pre-tested for reading and direct selling content accuracy with market research experts at three institutions of higher education and with five women engaged in direct selling in the USA. Revisions were made based on input from all parties. The revised version was then pre-tested in Johannesburg, South Africa.

This final pre-test of the survey instrument followed a rigorous process in which two of the researchers met face-to-face, over a four-day period, with 50 women micro-entrepreneurs affiliated with six companies engaged in direct selling in South Africa. Arrangements for these company interactions were made through the Direct Selling Association of South Africa. The pre-test process followed a structured process in which participants were informed as to the nature and scope of the research project. Following that brief introduction, each of the participants was asked to complete a paper and pencil version of the questionnaire. Time to complete the instrument was monitored closely, with times ranging from 10 min, 30 s to 28 min, 47 s. On average, the questionnaire took around 17 min to complete. After completion of the questionnaire, the de-brief engaged the women on a detailed breakdown of each major part of the questionnaire which included the introduction letter, empowerment questions, self-efficacy questions, social capital questions, technology use questions, and demographic questions. The de-brief discussion wrapped up with an open-ended discussion on general likes/dislikes about the response process.

Based on feedback from the pre-test in South Africa, minor changes were made to the final survey instrument. These changes were largely in regard to the demographic questions, although some minor adaptations with respect to wording within the direct selling vernacular were also made (e.g., “direct selling job” was used originally in some of the scale items and this was changed to “direct selling business”).

3.3. Sample description

The sampling process for the online survey targeted women engaged in direct selling within six companies in South Africa. Since the women targeted for the survey were independent micro-entrepreneurs of each of the companies, a process for making the personal connection between the researchers and the company contact was facilitated by a person in the South Africa Direct Selling Association.

The initial rollout of the survey resulted in 186 responses within the first 16 days the survey was open. After that, brief reminder emails were sent to the company contact to ensure that the email had been distributed. Since the survey dissemination was reliant upon an intermediary for dissemination to potential respondents, another email, similar to the first email request, was sent one month after the initial rollout. In total, there were 234 completed responses to the survey request. Following a review of the data, 30 straight-liners and 5 incomplete surveys were removed for a total of 199 valid responses.

Table 2 summarizes the general demographics of the responding women, and Table 3 provides an overview of ICT use by the women micro-entrepreneurs responding to the survey.

A wide range of ages, race/ethnicity, education, and marital status was represented in the sample set, with wellness and cosmetic/personal care products comprising the majority of products sold by these direct selling micro-entrepreneurs. Close to 68% of respondents worked outside the home in addition to running their own direct selling micro-entrepreneurial business, and 71.7% were the main contributor to the household income. With this, however, a little over 66% of the respondents reported an income of R5000 (~US$330) or less per month from their microenterprises.

WhatsApp was the ICT used most often by respondents to support their microenterprises. A messaging service, WhatsApp offers both reliable messaging and call capabilities. Following closely was the use of email and text messaging. Almost all of the women (96.5%) used their mobile phone in the direct selling process, and the micro-entrepreneurs spent, on average, more than 1 h per day using ICT to support their microenterprises.

Table 2
Demographic information of the respondents.

Description	Frequency	Percent
Which product category best describes the product(s) you sell?		
Wellness	72	36.2
Cosmetic and personal care	87	43.7
Household goods and durables	14	7
Clothing and accessories	1	0.5
Financial services	1	0.5
Home care	4	2
Food and beverages	1	0.5
Insurance	4	2
Missing	15	7.5
Please indicate your age:		
20–29	20	10.1
30–39	47	23.6
40–49	47	23.6
50–59	56	28.1
60–69	15	7.5
70 or older	4	2
Missing	10	5
Please give the range which best describes your DIRECT SALES AVERAGE MONTHLY INCOME:		
R1–R500	27	13.6
R501–R1000	27	13.6
R1001–R2000	30	15.1
R2001–R5000	37	18.6
R5001–R10,000	23	11.6
R10,001–R20,000	18	9
Greater than R20,000	21	10.5
Missing	16	8
Description	Frequency	Percent
Which race/ethnicity best describes you?		
Black	30	15.1
Coloured	18	9
Indian/Asian	10	5
White	127	63.8
Missing	14	7
What is the highest level of education you have completed?		
Some high school	5	2.5
Matric (Grade 12)	31	15.6
Some university work completed	51	25.6
University degree completed	100	50.3
Missing	12	6
What is your current marital status?		
Single	30	15.1
Married or living together	139	69.8
Divorced	17	8.5
Widowed	2	1
Separated	1	0.5
Missing	10	5
Are you the person who contributes most to the household income?		
Yes	83	41.7
No	106	53.3
Missing	10	5
Do you work outside your home in addition to running your direct selling business?		
Yes	135	67.8
No	54	27.1
Missing	10	5

3.4. Analytical process

A structural equation modeling (SEM) with partial least square (PLS) approach was used to test the proposed model and hypotheses. Partial Least Squares (PLS-SEM) is a variance-based approach to structural equation modeling, with the goal to predict key target constructs (Hair, Hult, Ringle, & Sarstedt, 2016). PLS-SEM was selected for the following reasons: (1) it is flexible in analyzing a complex predictive model with a large number of variables and relationships (Hair et al., 2016; Hair, Ringle, & Sarstedt, 2011), (2) it incorporates reflective and formative measurement models easily and is capable of producing robust results with both large and small sample sizes (Hair et al., 2016), and (3) it accommodates the exploratory nature of research.

Table 3
ICT use of the respondents by application and device.

Technology application	% using
WhatsApp	91.5%
Email	87.4%
Text messaging	72.9%
Facebook	61.8%
LinkedIn	15.1%
Instagram	14.6%
Twitter	12.1%
YouTube	9.5%
Pinterest	6.0%

ICT device	% using
Mobile phone	96.5%
Laptop computer	72.9%
Tablet	42.2%
Desktop computer	38.2%

The measurement model was validated using SmartPLS 3 software (Ringle, Wende, & Becker, 2015). Appropriate validation procedures were followed to evaluate both reflective and formative measures. Internal consistency, convergent validity, and discriminant validity were evaluated to check the measurement validity of the reflective constructs (Straub, 1989; Gefen & Straub, 2005; Hair et al., 2016). Both discriminant validity and multicollinearity were examined for the formative measures.

Starting with the reflective measures, outer loadings of each construct were examined. Based upon previous suggestions, any items lower than 0.7 were considered for elimination if the indicator deletion improved internal consistency reliability (Bagozzi, 1980; Hair et al., 2016). Two items had loadings less than 0.7 but greater than 0.4. Removing those indicators did not improve internal consistency reliability above the recommended threshold. Thus, the two reflective items were retained in the model. In regard to convergent validity, all indicators were significant and loaded on the appropriate constructs. The internal consistencies of the reflective measures had Cronbach alphas greater than 0.65 (acceptable in exploratory research), composite reliabilities greater than 0.70, and average variance extracted greater than 0.50. Therefore, as shown in Table 1, the results met the established benchmarks that provide evidence of convergent validity and internal consistency reliability (Fornell & Larcker, 1981). To evaluate discriminant validity, HTMT results were examined (Hair et al., 2016) using a threshold value of 0.90 given the conceptual similarities among the constructs (e.g., empowerment-impact and empowerment-goal internalization) (Henseler, Ringle, & Sarstedt, 2015). After examining appropriate HTMT ratios (Table 4), discriminant validity was confirmed (Anderson & Gerbing, 1988; Fornell & Larcker, 1981).

Table 4
Summary of discriminant validity (HTMT) in final measurement model.

	1	2	3	4	5	6	7	8	9
Bonding social capital									
Bridging social capital	0.87								
Ease of ICT use	0.55	0.41							
Empower-competence	0.78	0.77	0.46						
Empower-goal internalization	0.77	0.87	0.34	0.73					
Empower-perceived control	0.68	0.64	0.47	0.70	0.73				
Empower-impact	0.78	0.75	0.39	0.81	0.90	0.83			
ICT usefulness	0.56	0.47	0.70	0.57	0.35	0.49	0.50		
Self-efficacy	0.49	0.49	0.35	0.60	0.46	0.25	0.64	0.34	

Convergent validity for the formative construct was supported through redundancy analysis. The results yielded a path coefficient of 0.76, which was above the recommended threshold of 0.70 (Hair et al., 2016). The VIF values were uniformly below the threshold value of 5 (Hair et al., 2016), with the highest VIF value of 2.45 for "I use ICT to be socially connected with my direct selling community." As such, it was safe to conclude that collinearity was not an issue for the estimate of the PLS path model.

Next, the outer weight and confidence intervals assessed formative indicator significance at the 5% level. The results showed that items "I use ICT to communicate about business-related issues with my direct selling community," "I use ICT to communicate with my direct selling customers/clients," and "I use ICT to provide information to my current and potential customers about my direct selling products" were not significant. Analysis of the outer loadings of these formative indicators indicated that loadings for the three indicators were significant at greater than or equal to 0.5. Thus, the indicators were retained even though they were not significant as recommended by Hair et al. (2016). Prior research also provided support for the relevance of these indicators in capturing how women micro-entrepreneurs used ICT to support their direct-to-consumer enterprises (Beninger et al., 2016). Considering the results, all reflective and formative constructs displayed satisfactory quality of the measurement model. The structural model was estimated using the bias-corrected and accelerated bootstrapping procedure with 5000 resamples (Efron, 1987). The hypothesized relationships are presented in Fig. 2 and Table 5.

4. Results

Three items on the survey assessed lack of access to technology. Lack of access was not significant to ICT use and, thus, did not preclude ICT use or inhibit empowerment. Therefore, the analysis proceeded with the testing of the hypotheses with respect to ICT ease of use, usefulness, and use. Hypotheses 1a, 1b, and 1c proposed that higher levels of ICT ease of use and usefulness would have a positive relationship with ICT use to support direct selling activities. The path relationships between ICT ease of use and usefulness ($\beta = 0.59$, $p < .01$), ICT ease of use and ICT use ($\beta = 0.17$, $p < .05$), and ICT usefulness and ICT degree of use ($\beta = 0.72$, $p < .01$) were all positive and significant. Therefore, the hypothesized relationships were supported.

Hypothesis 2a proposed that ICT use would have a positive impact on self-efficacy. The path relationship between ICT use and self-efficacy ($\beta = 0.31$, $p < .01$) was positive and significant. Hypotheses 2b and 2c posited that self-efficacy of women micro-entrepreneurs would positively moderate the relationship between the use of ICT and social capital bridging and bonding. The moderated relationship between use of ICT and social capital bridging was supported and in the right direction ($\beta = 0.14$, $p < .05$). The relationship between ICT use and bridging social capital increased by the size of the interaction term ($0.50 + 0.14 = 0.64$). Contrary to the prediction, the moderated relationship in regard to self-efficacy impact on the use of ICT and bonding social capital ($\beta = 0.09$, $p > .1$) was not significant. Thus, H2a and H2b were supported and H2c was not supported. However, self-efficacy had a direct significant positive relationship with bonding social capital ($\beta = 0.217$, $p < .01$), and the relationship between ICT use and bonding social capital increased by the size of the direct path ($\beta = 0.52$, $p < .01$).

Hypotheses 3a-3d and 4a-4d proposed that social capital bonding and bridging would have a positive impact on different dimensions of empowerment. The path relationships between social capital bridging and goal internalization empowerment in H3a ($\beta = 0.59$, $p < .01$), social capital bridging and perceived control empowerment in H3b ($\beta = 0.32$, $p < .05$), social capital bridging and competence empowerment in H3c ($\beta = 0.35$, $p < .01$), and social capital bridging and impact empowerment in H3d ($\beta = 0.29$, $p < .01$) were all positive and significant. Moreover, the path relationships between social capital bonding and perceived control empowerment in H4b ($\beta = 0.29$, $p < .05$), social capital bonding and competence empowerment in H4c ($\beta = 0.23$, $p < .05$), and social capital bonding and impact empowerment in H4d ($\beta = 0.22$, $p < .05$) were also positive and significant. However, the relationship between social capital bonding and goal internalization in H4a ($\beta = 0.12$, $p > .1$) was not significant, and, thus, not supported in this research.

Hypotheses 5a-5d proposed that self-efficacy would have a positive impact on the different dimensions of empowerment. The path relationship in H5c between self-efficacy of women micro-entrepreneurs and competence empowerment ($\beta = 0.16$, $p < .05$) and in H5d between self-efficacy of women micro-entrepreneurs and impact empowerment ($\beta = 0.25$, $p < .01$) were both positive and significant. However, no significant relationships were found between self-efficacy and goal internalization ($\beta = 0.07$, $p > .1$) or self-efficacy and

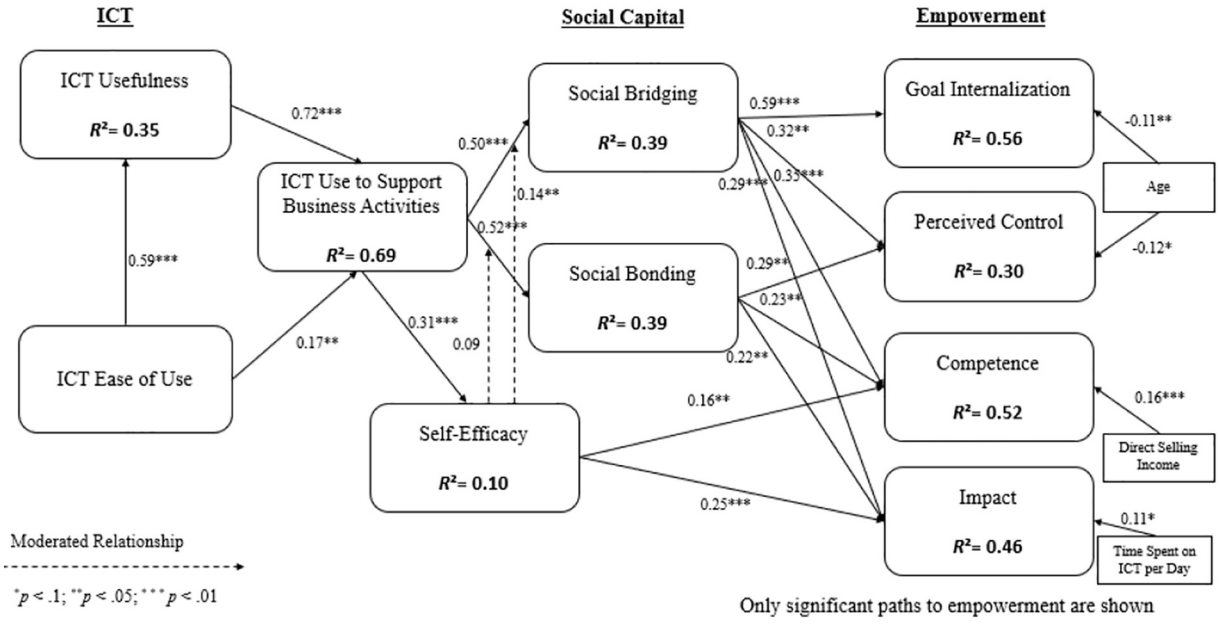

Fig. 2. Operational model results.

Table 5
Structural model results.

Hypothesis	Path relationship	Path coefficient	*t*-value	*p*-value	Result
Hypothesis 1a	ICT ease of use > ICT usefulness	0.59	8.47	0	Accepted
Hypothesis 1b	ICT usefulness > ICT use to support direct selling	0.72	12.65	0	Accepted
Hypothesis 1c	ICT ease of use > ICT use to support direct selling	0.17	1.99	.04	Accepted
Hypothesis 2a	ICT use to support direct selling > self-efficacy	0.31	4.53	0	Accepted
Hypothesis 2b	ICT use to support direct selling > social bridging (moderated by Self-efficacy)	0.14	2.27	.02	Accepted
Hypothesis 2c	ICT use to support direct selling > social bonding (moderated by Self-efficacy)	0.09	1.26	.21	Rejected
Hypothesis 3a	Social bridging > Empowerment (goal internalization)	0.59	6.91	0	Accepted
Hypothesis 3b	Social bridging > empowerment (perceived control)	0.32	2.46	.01	Accepted
Hypothesis 3c	Social bridging > empowerment (competence)	0.35	3.40	0	Accepted
Hypothesis 3d	Social bridging > empowerment (impact)	0.29	2.63	.01	Accepted
Hypothesis 4a	Social bonding > empowerment (goal internalization)	0.12	1.45	.12	Rejected
Hypothesis 4b	Social bonding > empowerment (perceived control)	0.29	2.57	.02	Accepted
Hypothesis 4c	Social bonding > empowerment (competence)	0.23	2.47	.01	Accepted
Hypothesis 4d	Social bonding > empowerment (impact)	0.23	2.11	.04	Accepted
Hypothesis 5a	Self-efficacy > empowerment (goal internalization)	0.07	0.94	.35	Rejected
Hypothesis 5b	Self-efficacy > empowerment (perceived control)	−0.05	0.66	.51	Rejected
Hypothesis 5c	Self-efficacy > empowerment (competence)	0.16	2.17	.03	Accepted
Hypothesis 5d	Self-efficacy > empowerment (impact)	0.25	3.27	.00	Accepted

perceived control ($\beta = -0.05$, $p > .1$). Thus, H5a and H5b were not supported in this research.

The impact of ICT use on social capital bridging and bonding and the dimensions of empowerment was significant and meaningful. In scholarly research, R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables are respectively described as substantial, moderate, or weak (Hair et al., 2011; Hair et al., 2016; Henseler, Ringle, & Sinkovics, 2009). Upon reviewing the R^2 values of the endogenous latent variables, the R^2 values of ICT usefulness (35%), ICT use to support direct selling (69%), social capital bridging (39%), social capital bonding (39%), goal internalization empowerment (56%), perceived control (30%), competence empowerment (52%), and impact empowerment (46%) were all moderate, while self-efficacy (10%) was weak according to the recommended rule of thumb (Hair et al., 2011; Henseler et al., 2009).

The blindfolding procedure was performed (omission distance = 7) to estimate Stone-Geisser's Q^2 value (Geisser, 1974; Hair et al., 2016). Stone-Geisser's Q^2 is a measure of external validity to analyze the structural model predictions. Positive values indicate predictive relevance for the endogenous constructs (Hair et al., 2016). Following the suggested values (Hair et al., 2016), it was evident that good predictive relevance was achieved.

The analysis of the control variables revealed a significant positive path between direct selling income and competence ($\beta = 0.16$, $p < .01$) and average time spent on ICT per day and impact ($\beta = 0.11$, $p < .1$). On the other hand, there was a negative significant relationship between age and goal internalization ($\beta = -0.11$, $p < .05$) and age and perceived control ($\beta = -0.12$, $p < .10$).

5. Discussion

The current study attempted to capture how women are using ICT to build social capital and self-efficacy and how that use, in turn, impacts empowerment. The results indicate that women engaged in creating their own entrepreneurial businesses in which they sell direct to the consumer the products of large direct selling companies are utilizing mobile devices and ICT technologies to: (1) connect socially with peer groups, (2) share with, and learn from, other salespeople in the direct selling organization, and (3) communicate with customers to both introduce and sell product. The ease of use and usefulness of these technologies are positively impacting the woman entrepreneur's use of ICT to facilitate the development of social relationships. Moreover, the easier it is to use ICT to support her direct selling business, the more ICT becomes a part of the woman micro-entrepreneur's direct selling daily activities.

With respect to social capital, the findings suggest that ICT use can help women micro-entrepreneurs accumulate and maintain bridging social capital. The use of ICT allows women micro-entrepreneurs to maintain community ties cheaply and easily because ICT lowers the barriers to connect with others. Thus, women micro-entrepreneurs who might otherwise not initiate communications with someone whom they were not acquainted are enabled to do so through ICT affordances (e.g. WhatsApp, Email, text messaging, Facebook). The results identified a self-efficacy interaction between ICT use and bridging social capital. That is, the women micro-entrepreneurs who had high self-efficacy (i.e., a belief in her ability to succeed in a specific situation) and used ICT reported higher bridging social capital. One explanation consistent with this interaction effect is that ICT provides benefits such as increased access to community, information, and opportunities that women with high self-efficacy can use to further integrate into their direct selling community.

Bonding social capital explored the extent to which women could rely on support from close-ties in their direct selling community. Using ICT (e.g., group text, Facebook post), women micro-entrepreneurs can communicate quickly and effectively and, when a problem arises, they can connect with other women in their close-circle community to seek advice and support. Contrary to the prediction, self-efficacy did not moderate the relationship between ICT use and bonding social capital. Instead, it had a significant direct effect. Women micro-entrepreneurs with high self-efficacy experienced higher bonding social capital. The resourcefulness of these women has likely resulted in them having created strong ties in the direct selling community.

Regarding the different dimensions of empowerment, bridging social capital had a large effect size on goal internalization, and bonding social capital had the largest effect size on perceived control. Since goal internalization focuses on the goals of the direct selling organization and accomplishments of others in the organization, weak ties with other direct sellers in the online community play a key role in the woman entrepreneur's decision to integrate and eventually fully transform the business goals into her own meaning system (Ryan & Deci, 2000). This internalization is expected to have a strong effect on an individual's motivation to contribute to the business (Hemetsberger, 2003). Consistent with this thinking, the woman micro-entrepreneur engaged in direct selling is less likely to see the goals of the direct selling company as a shared project with her close family and friends. Thus, the insignificant effect between bonding social capital and goal internalization could be due to the differences in engaging in shared project goals as found with bridging social capital and believing in shared values as found in bonding social capital since the social networks are held together on different behavioral grounds (Davis, 2014). Perceived control

relates more closely to the woman micro-entrepreneur's personal authority and freedom. The strength of connections with like-minded people (e.g., family and friends) likely nurtures those feelings of independence.

The positive impact of a woman micro-entrepreneur's self-efficacy on competence and impact empowerment reaffirms the notion that belief in one's self is critical to success. The woman micro-entrepreneur who makes plans, does not give up, and keeps trying until the job is done will continue to strengthen her skillset and work ethic, which will likely lead to positive rewards both economically and socially. The incredible power of belief in one's self to enable their competence and their impact came through clearly in the data from these women micro-entrepreneurs. However, self-efficacy had no significant effect on perceived control. This is in-line with previous literature establishing that self-efficacy expectations do not necessarily correspond to perceived internal control factors (Ajzen, 2002). Similarly, self-efficacy did not predict goal internalization. It appears as if one can be highly self-efficacious but regulated externally by other factors such as the social capital accrued through connections with other direct sellers in her online community.

Three of the control variables entered into the model with significant relationships. There was a positive relationship between income and competence empowerment. That is, women who earned higher incomes from their direct selling microenterprises were also experiencing greater competence in their workplace abilities. These women micro-entrepreneurs likely attributed their higher income to their personal skills and abilities in having mastered the tasks at hand and in mentoring other direct selling women toward success. This same idea was consistent with the positive relationship between time spent in ICT use per day and impact. The more time the woman micro-entrepreneur spent engaging with customers and other women in her direct selling community, the greater the impact empowerment felt by the woman micro-entrepreneur.

With respect to the third control variable, age, the data from the sample respondents suggested that older women were less likely to feel empowered in terms of goal internalization and perceived control. These two forms of empowerment focus on inspiration/enthusiasm and independence/authority. It may be that older women are cognizant of the attention that direct selling companies are directing toward the younger generation (e.g., Millennials) both in terms of the next generation of micro-entrepreneurs and customers (Harriss, 2016; Martin, 2017), leaving them feeling as though they are not important to the future of the company. All of the women who participated in the online survey were independent micro-entrepreneurs affiliated with large direct selling organizations and, thus, had access to the direct selling articles in which the direct selling companies worldwide were reporting on the impact of millennials (Martin, 2017). Additionally, while the younger woman might be looking toward longevity with the firm as a long-term career path, the older woman might see herself having less energy to devote to the company and its generally ever-expanding product offerings. Finally, longitudinal studies have shown that perceived control increases as one enters young adulthood but begins to decline after a period of stability during middle age (Kaur, 2017; Vitelli, 2013). Thus, there might be some feelings of pessimism toward the control that a woman might actually have in crafting a business around products distributed by a large, global company.

6. Theoretical and practical implications

6.1. Theoretical implications

Women entrepreneurship has been explored from many theoretical perspectives, e.g., institutional theory, career theory, feminist theories, and expectancy theory to name only a few (Yadav & Unni, 2016). The current study presents an important contribution for entrepreneurial research. TAM has been used extensively as the theoretical foundation for exploring the acceptance of technology, but its use has been limited with respect to understanding the outcomes of technology usage among entrepreneurs and, in particular, women entrepreneurs. Thus, the proposed additions of social capital bridging and bonding, self-efficacy, and empowerment represent important theoretical advances in technology acceptance and usage. Further, past research has found mixed evidence for ICT impact on social capital bonding and bridging, with some finding that ICT resulted in one neglecting one's close network (Nie & Erbring, 2000). Our findings show that women micro-entrepreneurs with higher self-efficacy exhibited a stronger relationship between ICT use and their ability to increase their weak-ties interactions with other women in the network. Thus, the findings both support and extend the results by Donath and Boyd (2004) on the role of ICT to increase weak-ties with little effort and cost. Additionally, ICT use helped women strengthen their strong-ties network with other women to help them solve their problems and make important decisions, supporting previous work on strong-ties networks by Howard et al. (2001).

Another contribution to theory is related to offering a comprehensive operationalization of empowerment by combining the work of Spreitzer (1995) and Menon (1999, 2001) into four empowerment dimensions of goal internalization, perceived control, competence, and impact. This current research extends previous work on empowerment by looking at the relationship between the different dimensions of empowerment and social capital bridging, social capital bonding, and self-efficacy. Some of these relationships were expected, such as an increase in one's weak ties increases perceived control, while others were surprising such as the non-significant influence of social capital bonding on goal internalization. Although the current study offers a rich understanding of determinants of different aspects of empowerment, there is still a need for developing an integrative view of attitudes exhibited by the micro-entrepreneurs as mediators between ICT use and empowerment.

Theoretically, knowledge gained with respect to women micro-entrepreneurs and the use of ICT for greater empowerment is likely applicable to underserved communities in other countries and regions of the world. According to Weiser, Kahane, Rochlin, and Landis (2006), underserved communities tend to be misunderstood in the marketplace. Rather than being a drain on a nation's economy, an underserved community offers increased sales opportunities, a qualified workforce, marketable innovations, reduced costs, and increased quality.

6.2. Practical implications

From a practical perspective, the current research suggests that the direct selling industry is conducive to creating micro-entrepreneurial opportunities that can result in both economic and social value in emerging and frontier economies. There is publicly available data that will offer insight into the general adoption and use of ICT around the world. Entering new markets that have readily available technological infrastructure will help ensure a direct selling company's ability to tap into ICT for both economic and social gain.

In addition to understanding the benefits accorded to women through the use of ICT, the results of this study offer several implications for women micro-entrepreneurs. Goyal and Yadav (2014) reported that women entrepreneurs in developing countries face challenges of higher magnitude as compared to male entrepreneurs and called for scholars to address these complex challenges in a more comprehensive manner. The results provided in the current study offer clear evidence that the social capital of women micro-entrepreneurs in the emerging economy of South Africa is enhanced via the increased communication, social connections, and learning opportunity from other women micro-entrepreneurs in the network. The benefits of such connections enabled the women micro-entrepreneurs to build new business relationships with women they did not know and, at the same time, helped the women strengthen their existing relationships with their strong ties.

The results also indicate that women with stronger self-efficacy were better able to establish new relationships with others in their network. Thus, training programs to build self-efficacy will be important for women micro-entrepreneurs in emerging markets. Additionally, direct selling companies can recommend and offer ICT solutions that may allow micro-entrepreneurs to form social networks, build their self-efficacy, and resolve the challenges of running a business or work-related problems. For instance, the direct selling company might introduce a new micro-entrepreneur into company-specific women social support networks on mobile phone apps, such as WhatsApp, or on social media, such as Facebook, to help facilitate social capital and self-efficacy building that in turn will lead to empowerment.

Additionally, understanding the use of ICT can also indicate to the direct selling company the types of turnkey material and communications that should be available to the micro-entrepreneur. Since perceived usefulness and perceived ease of use exhibited a positive relationship with usage, as suggested by the TAM, it is important for direct selling companies to offer and design platforms that direct sellers feel they can use easily to grow their businesses.

7. Study limitations and future research

As with any research project, there are limitations to the current study. Some limitations often offer several avenues for future research, while others are inherent in the nature of the study design and ensuing methodology. Because the current study was centralized in one geographic area, there is the opportunity to expand this research to other emerging markets to capture possible country differences in the role of ICT in empowering women. Additionally, since the context here was direct selling, there is also the opportunity to broaden the study to include women micro-entrepreneurs engaged in direct selling in a wider number of direct selling firms than the six companies represented in the current dataset. Future research can also consider different types of entrepreneurial formats (e.g., small and medium-sized startup ventures) that are created and managed by women entrepreneurs.

The current research shows that the intermediary on survey distribution (the contact at the direct selling company) with a central drop site for survey completion (via the URL distributed in the email sent to the women) works well to reach independent micro-entrepreneurs affiliated with direct selling firms. Additionally, the excitement of the company executives and the women micro-entrepreneurs included in the pre-test group shows that the direct selling context is ripe for continued exploration of ICT and women empowerment. This context is particularly timely given the worldwide focus on the sharing economy and the suggested importance of technology in direct selling companies (Harrison & Hair, 2017). In summary, expanding the research to more emerging economies and including more women micro-entrepreneurs in the direct selling context offer fruitful avenues for development.

An inherent limitation of the study is that the sample is cross-sectional in nature and, thus, does not allow causality from the findings. Cross-sectional data limits the results to reflect a single point in time, and future studies could examine the various impacts of ICT use over time via longitudinal study. Furthermore, the current study used self-reported measures and the data were collected via survey design. As such, there was the possibility of common method bias. However, appropriate tests concluded that this bias was not a significant concern in the study.

8. Conclusion

This work adds to the research on ICT use and its outcomes by developing a better understanding of how it facilitates empowerment (i.e., goal internalization, perceived control, competence, and impact). Based on the model results, it is clear that fostering ICT use to support women micro-entrepreneurs is critical and can be accomplished by providing ICT tools that are useful and easy to use. In addition to testing the original TAM constructs of usefulness and perceived ease of use, the work described here extended the TAM theory to understand ICT use outcomes. ICT use played a strong role in affecting social capital building and bridging and self-efficacy, both directly and indirectly. Conceptualizing empowerment at the dimension level not only helped develop a deeper understanding of the different types of empowerment, but also helped distinguish the influence of self-efficacy and social capital bonding and bridging on empowerment. Overall, the nomological network of the impact of ICT described here can be leveraged for future work on social capital creation, self-efficacy building, and empowerment outcomes.

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