

What Are Basic Human Needs? A Challenge to the Self-Determination Theory in the SST Context

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Abstract

Self-determination theory suggests that autonomy, competence and relatedness are the sole basic human needs that foster volitional forms of motivation. Given that perceived control, ease of use and usefulness have been found to enhance intrinsic motivation in the context of self-service technology (SST), it is argued that these later factors are also basic human needs that nurture volitional forms of motivation. Hence, it is hypothesized that the relationships between perceived control, ease of use and usefulness and the use of SSTs are mediated by self-determined motivation. Results suggest that self-determined motivation mediated the relationships between ease of use, usefulness and the use of SSTs but not the relationship between perceived control and the use of SSTs. Thus, basic human needs are not limited to autonomy, competence and relatedness; perceived ease of use and usefulness may also need to be included. Theoretical and managerial implications are also discussed.

Keywords

Basic Human Needs, Self-Determined Motivation, SSTs, Ease of Use, Usefulness, Autonomy, Competence, Relatedness

1. Introduction

Technology has radically changed the business landscape in recent years (Gallaugh, 2010). By using technology, organizations can reduce costs as well as increase access to, and exchange of, information (Parham, Roberts, & Sun, 2001). Amongst different technologies, self-service technologies (SSTs) have attracted a great deal of attention from marketing academics and practitioners (Kelly, Lawlor, & Mulvey, 2010).

SSTs are defined as “technological interfaces that enable customers to produce a service independent of direct service employee involvement” (Meuter, Ostrom, Roundtree, & Bitner, 2000: p. 50). Examples of SSTs include automated teller machines (ATMs), pay-at-the-pump machines, automated hotel and grocery store checkouts, telephone banking, airline check-in systems for e-ticket holders, in-store kiosks for product information, web-based purchasing, Internet transactions and supermarket self-checkout systems (Yang & Klassen, 2008). As SSTs replace human-to-human contact with human-machine interaction (Parasuraman, 2000), consumers’ perceptions of how services are conceived, developed and delivered have changed (Meuter, Bitner, Ostrom, & Brown, 2005).

SSTs have become important contexts to further understand consumer motivation as customer’s willingness to participate in using SSTs determines their successful deployment (Vargo & Lusch, 2004; Mumani, Stone, & Wang, 2018; Taillon & Huhmann, 2019). Self-determination theory (SDT) has been used to understand consumers’ motivations to use SSTs (Leung & Matanda, 2013). It was found that basic human needs, such as autonomy, competence and relatedness, nurture volitional forms of motivation (Leung & Matanda, 2013). To date, limited research has questioned the dimensions of basic human needs. The current study aims to further understand the dimensions of basic human needs and test self-determination theory. Managerial implications are also suggested.

2. Theoretical Background

Self-determination theory (SDT) posits that human’s goals are achieved based on their psychological and cognitive responses to different levels of autonomy. According to SDT, different forms of motivation exist on a continuum (Deci & Ryan, 1991; Ryan & Connell, 1989).

Extrinsic motivation is regulated by different levels of autonomy or intra-psychic forces (Deci & Ryan, 2000a, 2012; Ryan & Connell, 1989). Extrinsic motivation comprises two forms of motivation: controlled and autonomous (Deci & Ryan, 1985, 1991). When behavior is not regulated by intrinsic forces (e.g., a sense of volition), motivation can be considered autonomous or self-determined. When behavior is regulated by external forces (e.g., coerced interpersonal forces), motivation can be considered controlled or not self-determined (Deci & Ryan, 2000b, 2012; Gagne & Deci, 2005).

Controlled motivation comprises external and introjected regulations, and autonomous motivation comprises identified and integrated regulations (Deci & Ryan, 1985, 2000b). External regulation is behavior that is regulated by intangible punishment or rewards (Deci & Ryan, 2000b, 2012; Gagne & Deci, 2005). Introjected regulation is behavior that is regulated by contingent consequences internal to individuals (Deci & Ryan, 2000b, 2012). Identified regulation is present when the underlying value of an individual’s behavior is accepted and recognized (Deci & Ryan, 2000b; Gagne & Deci, 2005). Integrated regulation is behavior that is internalized and fully integrated within one’s self (Deci & Ryan, 1985, 2000b, 2012).

Extrinsic and intrinsic motivations are inter-related, as shown in **Figure 1** (Deci & Ryan, 2000a, 2012; Gagne & Deci, 2005; Ryan & Connell, 1989). Intrinsic motivation is behavior initiated for an individual's own sake (e.g., due to personal interests, for excitement). When extrinsic motivation is relatively autonomous, it is similar to intrinsic motivation (Deci & Ryan, 1991). The type of motivation farthest from intrinsic motivation is a motivation, which refers to a lack of motivation.

Human behavior is driven when different forms of motivation are combined, which is referred to as self-determined motivation (Deci & Ryan, 2000a, 2012; Gagne & Deci, 2005). When motivation is self-determined, behavior is internalized (Deci & Ryan, 2000b, 2012; Gagne & Deci, 2005).

Empirical evidence suggests that self-determined motivation positively affects human well-being (Deci & Ryan, 2008) and is important to students' learning, perceived competence, and school performance (Deci, Koestner, & Ryan, 1999; Fortier, Vallerand, & Guay, 1995; Vallerand et al., 1992, 1993). It also affects school principals' performance (Fernet, 2011), dental clinics' patient attendance (Halvari et al., 2010), and the use of information and communication technology (ICT) (Techatassanasoontorn & Tanvisuth, 2008).

SDT suggests that a sense of volition drives human behavior and well-being (Deci & Ryan, 2000a). Autonomy, competence, and relatedness are basic human needs that foster volitional forms of self-determined motivation, the process of internalization, and engagement in activities (Deci & Ryan, 2000b, 2012). When extrinsic motivation is transformed into intrinsic motivation or the originally regulated motivation is assimilated into a personally endorsed value, it is referred to as the internalization process (Ryan, 1995).

Autonomy is defined as a situation "in which significant others offer choice, provide a meaningful rationale, minimize pressure, and acknowledge the target individual's feelings and perspectives" (Halvari, Halvari, Bjørnebekk, & Deci, 2010). SDT proposes that controlling social contexts hinder internalization, whereas autonomous social contexts enhance internalization (Deci & Ryan, 2000b). Self-determined and internalized behavior increases the likelihood that individuals will engage in uninteresting activities (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 2000a, 2012).

Competence or self-efficacy represents the degree to which an individual believes that he or she possesses the competence required to perform a task (Bandura, 1997). Individuals feel more effective and satisfied when engaging in activities

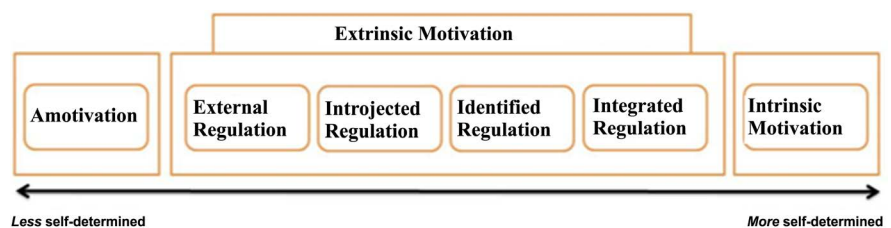


Figure 1. Continuum of motivations in SDT.

in which they feel competent (Deci & Ryan, 2000a), and therefore their behavior will be more internalized and self-determined (Deci & Ryan, 2000a). The internalization process is also enhanced by relatedness, which can be defined as the need to feel connected to others or a sense of belonging (Deci & Ryan, 2000a, 2000b, 2012). When individuals feel connected, their values are more internalized (Deci & Ryan, 2000a, 2012).

Autonomy, competence and relatedness were found to drive self-determined motivation in different contexts (Halvari et al., 2010; Techatassanasoontorn & Tanvisuth, 2008; Leung & Matanda, 2013). To date, limited research has questioned the dimensions of basic human needs set by SDT. The current study argues that perceived control, ease of use and usefulness foster volitional forms of motivation and the use of SSTs. Therefore, these factors can be considered as basic human needs in the SST context and discussed in the following sections.

3. Literature Review

Ease of use. Customers tend to feel more satisfied when SSTs are easy to use (Meuter et al., 2000). When an innovation is easy to understand or use, it can be considered as possessing perceived ease of use (Zeithaml, Parasuraman, & Malhotra, 2002). Perceived ease of use is the degree to which a person believes a particular system is free of effort (Davis, 1986). Perceived ease of use has positive effects on attitudes towards SSTs (Kim, Chun, & Song, 2009; Lanseng & Andreassen, 2007) and the usage of SSTs in different contexts (Guriting & Ndubisi, 2006; Hernan-dez & Mazzon, 2007; Wang, Wang, Lin, & Tang, 2003; Venkatesh, 2000; Venkatesh & Davis, 2000). In retailing, when consumers can easily handle technology, they exhibit positive attitudes towards SSTs (Rangarajan, Falk, & Schillewaert, 2007). As attitudes towards SSTs are antecedents to the use of SSTs (Dabhokar & Bagozzi, 2002; Wang & Namen, 2004; Lee, Castellanos, & Choi, 2012; Xie, Shen, & Zheng, 2011), perceived ease of use will be used as a determinant of the use of SSTs in the current study.

Usefulness. When technology is easier to use, customers perceive technology to be more useful because they do not have to figure out how to use it and can complete their tasks more efficiently (Bruner & Kumar, 2005). Perceived usefulness is defined as the subjective probability of using a technology to help a user complete a task (Eriksson, Bagozzi & Warshaw, 2001; Guriting & Ndubisi, 2006; Jaruwachirathanakul & Fink, 2005; Laforet & Li, 2005; Liao & Cheung, 2002; Polatoglu & Ekin, 2001). The usefulness of the SST service can positively affect users' continued use of Internet banking (Eriksson & Nilsson, 2007). Perceived usefulness has different effects in different SST contexts (Curran & Meuter, 2005). However, it can positively affect the use of SSTs in the retailing context (Lin & Chang, 2011). Because consumers tend to choose services with more potential benefits, SSTs perceived to be useful attract more consumers to use them (Meuter et al., 2000; Parasuraman, Zeithaml, & Malhotra, 2005).

Self-determined motivation. Self-determined motivation is important to the

use of SSTs because it is related to the internalization process, which has a positive effect on an individual's engagement in activities (Deci & Ryan, 2000b). Empirically, self-determined motivation enhances persistence (Teixeira et al., 2012), student competence and school performance (Fortier, Vallerand & Guay, 1995; Deci, Koestner & Ryan, 1999; Vallerand et al., 1992, 1993). Given that self-determined motivation has been identified as a mediator in different contexts, such as dental clinic attendance (Halvari et al., 2010), the use of ICT (Techatassanasoontorn & Tanvisuth, 2008) and retailing SSTs (Leung & Matanda, 2013), it can be considered a potential mediator of the use of SSTs in the current study.

4. Justification of the Mediating Effect

The justification of the mediating effects of self-determined motivation is based on the indirect effects of independent variables on dependent variables through the mediator (Judd & Kenny, 2010; MacKinnon & Luecken, 2008; MacKinnon et al., 2002; Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010). In other words, based on empirical evidence, we argue that links are present between the independent variables, e.g. perceived control, ease of use, usefulness, and the mediator, e.g. self-determined motivation. We also argue that a link is present between the mediator, e.g. self-determined motivation and the dependent variable, e.g. the use of SSTs.

5. Hypotheses and Conceptual Model

As customers are more intrinsically motivated when they can customize their experience, perceived control has been shown to have a positive effect on intrinsic motivation (Collier & Sherrell, 2010). Moreover, ease of use affects intrinsic motivation when options are more easily found and procedures are less ambiguous (Jaasma & Koper, 1999; Sargeant & Lee, 2004). Additionally, customers are more willing to learn how to use SSTs if they find the technology useful and advantageous (Meuter et al., 2005). Furthermore, self-determined motivation has a positive impact on the use of ICT (Techatassanasoontorn & Tanvisuth, 2008) and SSTs (Leung & Matanda, 2013). Considering these points, the direct effects of perceived control, ease of use and usefulness on self-determined motivation, and the direct effect of self-determined motivation on the use of SSTs are expected. Thus, the mediating effect of self-determined motivation on the relationship between perceived control, ease of use, usefulness, and the use of SSTs is inferred as depicted in **Figure 2**.

It is hypothesized that:

H1: Self-determined motivation mediates the relationship between perceived control and the use of SSTs.

H2: Self-determined motivation mediates the relationship between ease of use and the use of SSTs.

H3: Self-determined motivation mediates the relationship between usefulness and the use of SSTs.

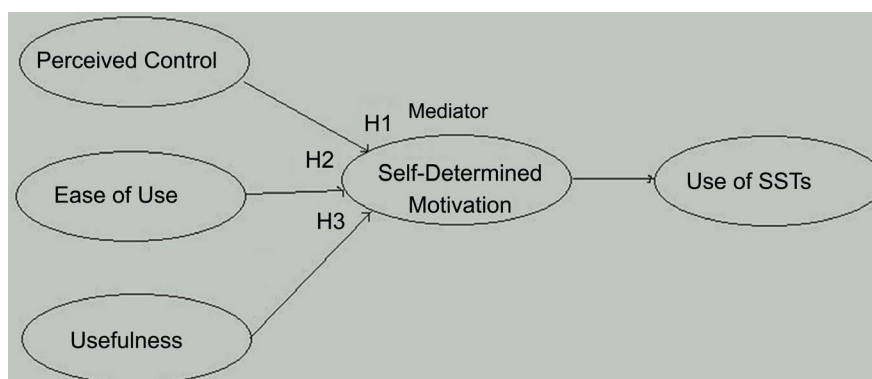


Figure 2. The conceptual model.

6. Method

6.1. Sample and Procedure

In the current study, a descriptive cross-sectional research design was used, because the major aim of the current study was to discover factors affecting the use of SSTs (Burns & Bush, 2006). We administered the questionnaire using the on-line panel through Qualtrics. Australian shoppers over 18 years old and who had used supermarket self-checkout systems in the previous 12 months were invited to fill in the questionnaire. Prior to the study, the questionnaire was first evaluated by 10 Australian shoppers, 3 SST experts from Australian universities and 1 Australian supermarket manager. Three hundred and sixty one participants completed the questionnaires with no missing values for further analysis.

6.2. Measures

All constructs in the current study were measured with seven-point Likert scales (1 - 7) (1—strongly disagree, 7—strongly agree) as discussed below:

Perceived control. Dabholkar (1996), Yen and Gwinner (2003) and Zhu (2002) conceptualized perceived control as a uni-dimensional construct and defined it as the degree of individuals' desire to exhibit mastery over the environment. In the current study, the conceptualization of perceived control in five items used by Dabholkar (1996), Yen and Gwinner (2003) and Zhu (2002) was used.

Perceived ease of use. Ease of use is also viewed as the degree of complication and confusion of using the SST in library self-checkouts (Dabholkar & Bagozzi, 2002; Zhao, Mattila, & Tao, 2008). The measure of ease of use from Dabholkar and Bagozzi (2002) and Zhao, Mattila and Tao (2008) was adopted for the current study. Five measurement items were used to measure ease of use.

Usefulness. Weijters, Rangarajan and Falk (2005) measured usefulness as the efficiency, speed of shopping and waiting time associated with using self-scanning. The measure of perceived usefulness from Weijters, Rangarajan and Falk (2005) was adapted for the current study. Four measurement items were used to measure usefulness.

Self-determined motivation. Halvari et al.'s (2010) study examined five di-

mensions: intrinsic motivation, integrated, identified, introjected and external motivation. The current study adopted Halvari et al.'s (2010) self-determination scale. Intrinsic motivation as well as integrated and introjected regulations was measured with five items, identified regulation was measured with six items and external regulation was operationalised as a seven-item measure.

The use of SSTs. Dabholkar and Bagozzi (2002) measured the use of SSTs as the likelihood or unlikelihood of an individual using the SST. Dabholkar and Bagozzi's (2002) study was adopted in the current study.

7. Results

7.1. Purification of the Measurements

The measurements were firstly purifying using exploratory factor analysis (EFA). The current study retained factors with eigenvalues greater than 1 (Hair, Black, Babin, & Anderson, 2006) and with factor loading higher than or equal to .30 and with cross factor loadings < .30 (Field, 2000). After the analyses using oblique rotation method, 19 items and 4 dimensions (integrated regulation, introjected regulation, external regulation, & intrinsic motivation) remained in self-determined motivation scale with Eigenvalues 7.27, 4.01, 3.35 and 6.85. These items including items of perceived control, ease of use, usefulness and the use of SSTs were then evaluated by confirmatory factor analysis. Items removed according to the modification index resulted acceptable chi-square value ($\chi^2(224) = 572.495, p < .001$), $\chi^2/df = 2.556$, RMSEA = .066, pclose < .000, GFI = .89, AGFI = .85, NFI = .93 and CFI = .96 (IFI = .96, TLI = .95). The correlation matrix of variables and demographic information can be found in **Appendix A** and **Appendix B**.

7.2. Testing the Reliability

Reliability is the consistency of a set of measurements (Hair, Black, Babin, & Anderson, 2010). Reliability was assessed using composite reliability (CR) and *p*-values of factor loadings in the current study (Zheng, 2006). The composite reliability of constructs in the current study ranged from .73 to .97, which exceeded the acceptable level of .70 (Fornell & Larcker, 1981). All factor loadings were also highly significant, with *p*-values less than or equal to .001. Therefore, all measures had sufficient consistency.

7.3. Testing the Validity

Validity refers to the ability of a measure to describe what it intends to measure (Haladyna, 1999). In validating the measurements for further analysis, the uni-dimensionality and convergent validity of constructs were tested (Steenkamp & Van Trijp, 1991).

Uni-dimensionality. Uni-dimensionality can be assessed through estimating measurement models by model fits using CFA. A better model fit indicates a higher level of uni-dimensionality of the constructs in a scale (Hattie, 1985; An-

Anderson & Gerbing, 1988). The model fit indices suggested that the model was acceptable. Thus, the uni-dimensionality of constructs was established.

Convergent validity. Convergent validity is a measure of the convergence of items of a construct. Convergent validity can be assessed using the average variances extracted (AVEs) (Fornell & Larcker, 1981; Farrell & Rudd, 2009) and the t-test for factor loadings (Anderson & Gerbing, 1988). The AVEs of the constructs in the current study ranged from .47 to .90. Because AVE is a more conservative test, AVEs above or close to the cut-off point of .5 indicated sufficient convergent validity (Batra & Sinha, 2000). Additionally, all factor loadings were more than twice their standard errors and the t-values ranged from 2.98 to 13.08. Thus, the convergent validity of the constructs was acceptable.

7.4. Validating the Simplex Structure of the Self-Determined Motivation Scale

To quantify self-determined motivation, a relative autonomous index (RAI) formula was used, e.g. $RAI = \text{external regulation} \times (-2) + \text{introjected regulation} \times (-1) + \text{integrated regulation} \times (+1) + \text{intrinsic motivation} \times (+2)$ (Ryan & Connell, 1989). Positive and negative relative autonomous indices represented high and low levels of self-determined motivation. The RAI was formed only if the correlations of different dimensions of self-determined motivation scale conformed to a simplex structure (Guttman, 1954). Li and Harmer (1996) proposed that when a simplex structure exists, the lower level of constructs should have stronger significant direct effects on the adjacent constructs than the indirect effects on distant constructs. The current study tested the existence of the simplex structure on self-determined motivation scale. The direct effects of each construct were added to its adjacent constructs to form an analytical model. This model, which was further analysed using SPSS AMOS 21 with maximum likelihood estimation (MLE), yielded a chi-square value ($\chi^2(34) = 118.21, p < .001$), $\chi^2/df = 2.32$, RMSEA = .06, pclose = .12, GFI = .95, AGFI = .93, NFI = .97 and CFI = .98. The results surpassed Li and Harmer's (1996) criteria that all direct effects to the adjacent constructs should be significant and all direct effects to the adjacent constructs were stronger than the indirect effects to more distant constructs. Thus, the continuum of motivation was assumed.

7.5. Testing the Common Method Variance (CMV)

The current research used the second lowest correlation as the unbiased proxy to evaluate the impact of CMV (Lindell & Whitney, 2001; Sharma, Yetton, & Crawford, 2010; Malhotra, 2006). As evident, the spurious correlation caused by CMV amounts from .00 to .02, and all significant positive correlations between the predictors and the criterion (unadjusted R) are above zero and remain significant (adjusted R) when the CMV is controlled. Sensitivity analysis also suggests that nearly all the positive correlations between the predictors and the criterion at different values of the lowest positive correlations ($R = .03, .06, .08, .09$) are above zero and statistically significant ($p < .01$), except the correlation between

introjected regulation and the use of SSTs, indicate that the relationships between predictors and the criterion—the use of SSTs cannot be accounted for by CMV. These findings attest that CMV only had a marginal effect on the relationships between predictors and the criterion.

7.6. Testing the Mediating Effect of Self-Determined Motivation

The assumptions of normality, linearity, multicollinearity and homoscedasticity were tested. The skewness (−.84 to −.22) and kurtosis (−.36 to .44) values were between −2.0 and +2.0 (Balanda & Macgillivray, 1988). Linearity was checked using partial regression plot analysis (Bray & Maxwell, 1985). All plotted graphs were visually inspected, and no curvilinear or other non-linear relationships were found between the dependent and independent variables. The VIF values of the independent variables in the current study ranged from 1.23 to 2.86, which was well below the minimum cut-off level of 4.0 (Rud, 2000). Homoscedasticity of variance was tested using Levene's tests (Bray & Maxwell, 1985). None of these nonmetric variables had more than two problematic metric variables (Hair et al., 2006). The mediating effect of self-determined motivation was then analysed with the bootstrapping method (Preacher & Hayes, 2008). In this process, 1000 samples were bootstrapped using the PROCESS program with a 95% confidence interval (Hayes, 2012).

As shown in **Table 1**, self-determined motivation did not significantly mediate the relationship between perceived control and the use of SSTs. Thus, H1 was not supported. However, self-determined motivation significantly mediated the relationship between ease of use and the use of SSTs ($b = .0262$, CIs 95% .0036 - .0530) and the relationship between usefulness and the use of SSTs ($b = .0162$, CIs 95% .0011 - .384). Thus, H2 and H3 were supported.

8. Discussion

SDT has been widely used to explain human motivation and behavior, e.g. Halvari et al. (2010), Techatassanasoontorn and Tanvisuth (2008) and Leung and

Table 1. The mediating effect of self-determined motivation on the relationship between perceived control, ease of use, usefulness and the use of SSTs.

Dependent Variable		Use of SSTs							
Mediator		Self-Determined Motivation					CI95%		
Independent Variable	H	a.b	S.E.	t-value		Lower	Upper		
Perceived Control	H1	.0076	.0060	1.2063	-	.0030	.0220	Not supported	
Ease of Use	H2	.0262	.0120	2.1301		.0036	.0530	Supported	
Usefulness	H3	.0162	.0100	1.6701		.0011	.0384	Supported	

CI 95% - 95% Confidence Interval a.b—Indirect effect, H—hypotheses.

Matanda (2013). SDT proposes that volitional forms of motivation are important, because they enhance human-activity engagement (Deci & Ryan, 2000a). Autonomy, competence and relatedness are proposed as basic human needs that foster volitional forms of motivation. Previous studies have paid limited attention to the dimensions of basic human needs. Hence, the current study attempts to extend the dimensions of basic human needs set by SDT.

Consistent with the prediction based on Jaasma and Koper (1999), Sargeant and Lee (2004), Techatassanasoontorn and Tanvisuth (2008) and Leung and Matanda (2013), self-determined motivation mediated the relationship between ease of use and the use of SSTs. Self-determined motivation also mediated the relationship between usefulness and the use of SSTs, which is consistent with the prediction based on Meuter et al. (2005), Techatassanasoontorn and Tanvisuth (2008) and Leung and Matanda (2013). Contrary to the prediction based on Collier and Sherrell (2010), Techatassanasoontorn and Tanvisuth (2008) and Leung and Matanda (2013), self-determined motivation did not mediate the relationship between perceived control and the use of SSTs. These results indicate that ease of use and usefulness can nurture volitional forms of motivation, hence the use of SST. In conclusion, ease of use and usefulness can also be considered as basic human needs in the SST context. Because perceived control did not enhance the use of SSTs through self-determined motivation, it is not considered a basic human need in this context.

Perceived control, ease of use and usefulness were shown to enhance intrinsic motivation to use SSTs (Collier & Sherrell, 2010; Jaasma & Koper, 1999; Sargeant & Lee, 2004; Meuter et al., 2005). The results indicate that ease of use and usefulness foster volitional forms of motivation. Ease of use has a close link with competence/self-efficacy (Dabholkar & Bagozzi, 2002). Competence is a form of basic human need that nurtures volitional forms of motivation. Therefore, as expected, ease of use also fosters volitional forms of motivation.

Moreover, usefulness is shown to foster volitional forms of motivation, but its links with autonomy, competence and relatedness are not clear. This finding reveals a drawback in the SDT framework and also indicates a necessity to review the dimensions of basic human needs, at least in the SST context. These findings further suggest that basic human needs are not limited to autonomy, competence and relatedness.

Additionally, perceived control does not foster volitional forms of motivation, although it appears to have a similar concept to autonomy. One plausible explanation is that customized options offered to customers (perceived control) may not create autonomous contexts, because they may still feel pressure to use SST because of the presence of other customers and/or long queues at service counters. This suggests that autonomous contexts may be created only if customers have freedom/autonomy to choose to use SST to complete their transactions (Leung & Matanda, 2013).

In addition to autonomy, competence and relatedness, retail managers can enhance the perceived usefulness of SSTs in customers, e.g. faster transactions or

shortened queues, to foster volitional forms of motivation. Managers can also simplify steps for customers to complete transactions in order to enhance the perceived ease of use of SSTs to further enhance volitional forms of motivation in customers. As volitional forms of motivation are fostered, managers can deploy SSTs in mutually beneficial and cost-effective ways. Customers can feel more satisfied using SSTs when an internalization process is facilitated, while managers can offer minimal external incentives, e.g. coupons or discounts, to encourage customers to use SSTs. Furthermore, enhancing customized options of SSTs is insufficient to facilitate an internalization process. Therefore, service counters need to be provided so that autonomous contexts can be created for customers to choose to use SSTs.

Limitations and Future Research

Whilst the current study offers insights into the dimensions of basic human needs, it is subject to some limitations. The current study could be expanded to other contexts or countries, as consumer behavior may be different in different contexts (Arnould & Thompson, 2005; De Mooij, 2010). As autonomy, competence and relatedness are considered sole basic human needs that drive students' motivations and school performances (Deci, Koestner, & Ryan, 1999; Vallerand et al., 1992, 1993; Fortier, Vallerand, & Guay, 1995), it is meaningful to investigate the effect of perceived ease of use and usefulness on students' motivations and school performances when using technology becomes more popular in educational contexts. The current study did not investigate the effects of situational factors, such as waiting time and queue length, or other moderators, such as age, gender differences. Examining these factors in future research could provide additional insight into the possible moderating effects of situational factors and their effects on the model.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix A

Correlation Matrix (N = 361)

Constructs	1	2	3	4	5	6	7	8
1. Perceived Control								
2. Ease of Use	.47**							
3. Usefulness	.52**	.42**						
4. Use Of SSTs	.70**	.56**	.65**					
5. External Regulation	.31**	- .04	.18**	.14*				
6. Introjected Regulation	.21**	- .24**	.03	- .03	.35**			
7. Integrated Regulation	.69**	.53**	.60**	.71**	.32**	.21**		
8. Intrinsic Regulation	.67**	.56**	.60**	.84**	.29**	.09	.80**	
Mean	12.74	14.62	14.95	14.61	12.29	7.51	12.01	12.97
SD	4.14	4.37	4.03	4.45	3.76	3.86	4.8	4.49
Composite Reliability	.89	.92	.91	.95	.73	.9	.92	.97
AVE	.72	.79	.77	.87	.47	.76	.79	.9
Square root of AVE	.85	.89	.88	.93	.69	.87	.89	.95

Notes: Sample size = 361, ** $p < .01$, * $p < .05$.

Appendix B

Demographic Profile of Respondents (N = 361)

Gender		N
Female	51%	184
Male	49%	177
Age		
19 - 20	4%	14
21 - 30	21%	76
31 - 46	26%	94
47 - 55	17%	61
56 - 65	21%	76
Over 66	11%	40
Income		
20,000 and under	14%	51
20,001 - 40,000	25%	90
40,001 - 60,000	21%	76
60,001 - 80,000	13%	47
80,001 - 100,000	10%	36
100,001 - 150,000	12%	43

Continued

Over 150,000	5%	18
Education Level		
Secondary (Year 7 - 10)	14%	51
High School (Year 11 - 12)	22%	79
TAFE/Commercial Institutes/Diplomas	31%	112
Bachelor Degree	22%	79
Post Graduate Level	9%	32
PhD and above	2%	8
Ethnic Background		
Australian	55%	199
European	28%	101
Asian	3%	11
African	2%	7
New Zealander	1%	4
Russian	1%	4
Torres Strait	1%	4
