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Motivation to Use IS: A Literature Review

Completed Research

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Abstract

Motivation to use information systems (IS) continues to be an important area of research given recent disruptive transformations in industries based on a host of new technologies and systems. Workers are increasingly called up to use these new technologies in their everyday work, regardless of background and expertise. This paper describes a literature review of research published on motivation to use IS. The endogenous motivation model is adopted to synthesize motivation constructs in the literature based on the perceived locus of causality. The review unveils actionable insights and opportunities for future research.

Keywords

Motivation, IS use, self-determination theory, intrinsic motivation, identified motivation, introjected motivation, extrinsic motivation.

Introduction

“Understanding motivation is one of the most important things we can do in our lives, because it has such a bearing on why we do the things we do and whether we enjoy them or not.”
- Clayton Christensen

Motivation, the drive to perform an activity, is an important aspect of all behavior in life. One example of such behavior is the use of information systems (IS), which is an action involving an information system being used by a person to perform a task (Burton-Jones and Straub, 2006). IS use is a behavior that has received unwavering attention from the IS discipline for decades, and user motivation to perform that behavior is thus an important area of study. Indeed, the role of motivation was emphasized by Malhotra, Galletta and Kirsch (2008) in their statement “to yield expected increases in productivity, new ITs need to be utilized effectively by highly motivated knowledge workers.” Further, a growing gap exists between career opportunities that require technology use and workers who have the technical proficiency to take on these opportunities (Rajgopal & Westly 2018). Understanding user motivation to use (or learn) an IS, whether the use of the IS is volitional or mandatory, is essential to increasing the use of IS across a wide range of potential users.

IS researchers have studied motivation to use IS in different contexts, and from different theoretical perspectives. Studies of IS use cover a variety of contexts from personal ones like games, to work-related ones like ERP systems and virtual collaboration platforms. This variety in environments and use circumstances adds all the more complexity to the topic of motivation. As a result, a wide range of motivation-related constructs have been considered to explain IS use, including perceived ease of use (e.g. Davis, 1989), perceived usefulness (e.g. Davis, 1989), microcomputer playfulness (Webster and Martocchio, 1992), perceived enjoyment (e.g. Venkatesh 1999), and hedonic motivation (Salehan, Kim and Kim, 2017), in addition to the traditional labels of intrinsic and extrinsic motivation. The wide range of constructs labeled as forms of motivation raise questions about the consistency and validity of IS motivation research. The purpose of this literature review is to explore the different types of motivation constructs used in IS research and document the current state of this research.

Self-determination theory (SDT, Deci and Ryan 1985; Ryan and Deci, 2017) and the sub-theory of organismic integration theory (OIT, Ryan and Deci, 2017) are widely accepted psychological theories on motivation that have been applied in a number of disciplines, including IS. Malhotra et al. (2008)

developed an IS adaptation of SDT and OIT, the endogenous motivation model, which distinguishes different types of motivation based on the perceived locus of causality (PLOC) and is utilized in this literature review to organize motivation constructs based on PLOC. Descriptive insights and future research opportunities are gained by mapping the literature on the chosen theoretical framework to answer following research questions (RQ):

RQ1. What constructs are being studied in the IS literature as forms of motivation to use IS?

RQ2. Which types of motivation (PLOC) are represented by existing constructs in the IS literature?

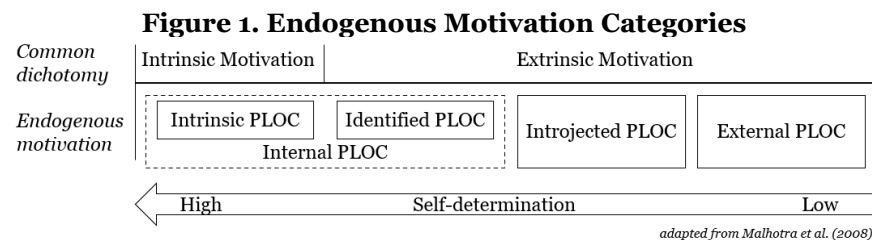
RQ3. How are these motivation-related constructs being operationalized in the IS literature (e.g. scale/treatment, antecedent/outcome)?

The remainder of this paper is structured as follows. In the next section, key psychological theories (SDT, OIT) are described, and the endogenous motivation model is presented. Next, the methodology for collecting a representative literature is described before the results of the review and the gained insights are reported and discussed. Last, limitations, future research and conclusions are described.

Theoretical Framework

Self-determination theory (SDT, Deci and Ryan 1985; Ryan and Deci, 2017) is a widely accepted theory on motivation and provides a solid theoretical background for the current research by considering both the magnitude and the multiple types of motivation that may influence behavior. One of the propositions of the theory and its sub-theories (i.e. organismic integration theory, OIT) is that extrinsic motivators, instrumentalities separable from the enjoyment of the activity, could result in regulated behaviors depending on how much people feel self-determined in the activity. This perception of whether, and by how much, people feel they are the originators of their own behavior is referred to as “perceived locus of causality” (PLOC) (Ryan and Deci, 2017).

Malhotra et al. (2008) adapted SDT and OIT framework to an IS context to categorize and distinguish four types of motivation based on PLOC, as presented in Figure 1, in decreasing order of self-determination. First, *intrinsic* PLOC refers to the drive to act out of pure enjoyment or pleasure in the activity. Second, *identified* PLOC originates from internalizing external stimuli or goals into alignment with personal values. Thus, an individual adopts external goals as personally valuable and performs it freely. Third, *introjected* PLOC pertains to a situation of conflict between personal values and social norms, or external pressures. The social norms and personal values are not aligned, and conflict may result as the individual feels resentment toward these external pressures. Fourth, *external* PLOC is the drive attributable to external institutions and not attributable to the users themselves. Malhotra et al.'s (2008) taxonomy of motivation, based on PLOC, provided a framework to organize the motivation constructs identified in the current literature review, as further described below.



Method

The literature search for this study was conducted using 13 high-quality peer-reviewed journals as shown in Table 1. Journals in the Senior Scholar Basket of IS journals (also known as the “Basket of 8”) (Association for Information Systems, 2011) were chosen along with 5 high-quality peer-reviewed journals in management and decision sciences which often publish IS-related research. Conference proceedings and other IS journals were not included at this time as the 13 journals in Table 1 provided a representative sample (Webster and Watson, 2002). Keywords for the search were selected based on the terms

“motivation” and “IS use”, and common synonyms for these terms. The search used queries such as: (“motivat*” OR “incent*” OR “reward*”) AND (“use” OR “train*” OR “learn*”). The wildcards “train*” and “learn*” were included in addition to “use” because some IS experimental studies were conducted in the context of training or learning a new system, which involved IS use. Within the non-IS journals, we add keyword “systems” to focus the results on IS-related articles.

Table 1: Journals Searched and Results

Journal	Basket of 8	Total Results	Included
European Journal of Information Systems	x	18	1
Information Systems Journal	x	14	3
Information Systems Research	x	52	2
Journal of Information Technology	x	5	0
Journal of Management Information Systems	x	62	2
Journal of Strategic Information Systems	x	8	0
Journal of the Association for Information Systems	x	21	4
MIS Quarterly	x	50	5
Decision Sciences		15	4
Decision Support Systems		73	1
Information & Management		33	2
Management Science		93	1
Organizational Behavior and Human Decision Processes		46	1
Total		490	26

The initial results from this search were 490 published articles. After assessing the research models and the construct descriptions in these articles, only 26 articles were retained for including constructs that were conveyed as “motivation” to use an IS. A total of 64 motivation-related constructs from these 26 articles are included in this literature review. Articles that were excluded include those articles that mention motivation but did not include any constructs that were described as a form of motivation. Articles that included motivation-related constructs but did not involve IS use were also not included (e.g., motivation to post an online review). Further, articles that measured related constructs, such as enjoyment, but did not describe the construct as a form of motivation were also excluded. Two meta-analyses papers discovered during the search (Gerow et al. 2013; Wu and Lu 2013) were also not included as these articles were based on a combination of IS empirical studies, and not all of the studies met the criteria used in the literature search for the current research.

Results from the Literature Review

The results of the literature review, the aforementioned 64 motivation-related constructs, are documented in Table 2 with their sources. Also provided in Table 2 are the construct definition, operationalization (i.e., scale or treatment), proposed role (i.e., whether the construct is an antecedent, focal construct, or outcome of motivation), reason for inclusion (i.e., justification for inclusion in the literature review), and PLOC categorization based on the Malhotra et al. (2008) framework. In summary, the columns provide the detailed information needed to answer the three research questions. In the paragraphs below, these 64 motivation-related constructs are further discussed based on the PLOC proposed in Table 2.

Intrinsic PLOC

Intrinsic PLOC represents the instinctive and spontaneous drive to perform an activity for the self-perceived enjoyment or fun within the activity (Malhotra et al., 2008). Based on this definition, 26 of the 64 constructs identified in the literature review involve pleasure or enjoyment as drivers of IS use behavior, under various construct labels. There were 12 constructs with definitions that included the term *enjoyment*, including “perceived enjoyment” (e.g. Venkatesh, 2000), “intrinsic motivation” (e.g. Venkatesh and Speier, 1999), or “hedonic intrinsic motivation” (Lowry et al., 2013), all of which pertain to the enjoyment and pleasure deriving from the activity without any external rewards. There were 6 constructs based on the state of flow (Csikszentmihalyi, 1975) or its IS adaptation, cognitive absorption (CA, Agarwal and Karahanna, 2000). These 6 constructs were labeled “intrinsic motivation” (Davis and Bostrom, 1994), “hedonic motivation” (Salehan et al., 2017), or the cognitive absorption sub-constructs, “joy”, “immersion”, “curiosity”, and “control” (Lowry et al., 2013). There were 3 other constructs based on uses and gratifications (U&G) theories, including “Pass time”, “Entertainment” (Luo, Chea and Chen,

2011) and “Internet process gratifications” (Stafford, Stafford and Schkade, 2004), all of which refer to pleasure or enjoyment in using the Internet. The remaining 5 constructs were conceptualized as intrinsic motivation toward accomplishment (IMap), intrinsic motivation to know (IMkw), and intrinsic motivation to experience stimulation (IMst) (Li, Hsieh and Rai; 2013); “other intrinsic motivation”, (Lowry et al., 2015) and “hedonic outcome expectancy”, (Yang et al., 2007). All 26 constructs were operationalized with measurement scales, from varied sources.

Identified PLOC

Although it is one of the two PLOC types that constitute what is called “internal PLOC”, the defining difference of identified PLOC is that despite the extrinsic nature of the stimuli, the user perceives herself/himself as the origin of the behavior. As such, identified PLOC is defined as the drive from people’s internalization of external goals, values and regulations as personally valuable and meaningful (Malhotra et al., 2008). In the literature review, 6 constructs were categorized with this PLOC type, including “interpersonal utility” (Luo et al., 2011), “social motivation” (Salehan et al., 2017), “internet social gratifications” (Stafford et al., 2004), and “social outcome expectancy” (Yang et al., 2007). All of these constructs address the personal benefits users gain from their social interactions through the use of a system, which fits the high internalization described by identified PLOC (Malhotra et al., 2008). Further, “perceived ease of use” (PEOU) (Cheng, 2011) and “convenience” (Luo et al., 2011) were related to IS being “easy to use”. For categorization purposes, we propose that “convenience” and PEOU are most related to identified PLOC because the heightened sense of competence with an easy-to-use IS (Davis et al., 1989) could be seen as personally important. All of these constructs were operationalized with measurement scales from varied sources.

Introjected PLOC

Introjected PLOC is defined as the learners’ perceived urges to perform an action out of socially rooted pressures such as guilt, shame or the maintenance of self-esteem, which comes from the misalignment and conflict between social and personal values (Malhotra et al. 2008). Only four motivation constructs in the literature review could be categorized as introjected PLOC: “social pressure” (Igbaria, Parasuraman and Baroudi, 1996), “superior pressure”, “peer pressure” and “conformity motivation” (Yang et al., 2007). These four constructs share a reference to socially rooted pressure from important individuals in general (Igbaria et al., 1996) or from a supervisor (Yang et al., 2007). All of these constructs were also operationalized with measurement scales from varied sources.

External PLOC

External PLOC corresponds to the users’ perception that the reason for the behavior is attributable to an external authority or compliance but not to themselves (Malhotra et al. 2008). This motivation type is well-studied in the collected literature with 22 constructs categorized as external PLOC due to the absence of personal value in the construct definition. System usefulness appears 15 times under the labels of “motivation to use” (e.g. Bostrom et al., 1990), “extrinsic motivation” (e.g. Lowry et al., 2013) and “perceived usefulness” (PU, e.g. Venkatesh, 1999). These constructs captured the belief that a system is useful and thus is linked to improved performance which will be rewarded based on TAM (Davis, 1989; Davis et al., 1989) and the motivation model (Davis et al., 1992). Other constructs captured the linked with favorable outcomes separated from the activity itself, including “internet content gratifications” (Stafford et al, 2004), “perceived importance of learning”, “utilitarian outcome expectancy” (Yang et al., 2007), “information seeking” motive (Luo et al., 2011) or “utilitarian motivation” (Salehan et al., 2017). Finally, an early study manipulated payment as an external incentive to motivate system use (Bhattacharjee, 1998). All constructs were operationalized with measurement scales from varied sources except for the treatments used to operationalize incentives in Bhattacharjee (1998).

Other Motivation Constructs

During the review, several motivation-related constructs were encountered that did not fit in our PLOC framework, including those capturing individual traits and those referring to general motivation rather than a specific PLOC type. The trait, “microcomputer playfulness”, appeared in 3 studies, measuring the

stable tendency to achieve a high degree of cognitive spontaneity in interacting with (micro)computers (Webster and Martocchio, 1992; Venkatesh, 2000; and Venkatesh and Bala, 2008). Also, general motivation constructs measuring actual usage or effort exerted appeared in the early 1990s, include “motivation to participate” (Doll and Torkzadeh, 1989), “behavioral intention” (Burton et al., 1992) and “motivation to use” (Olfman and Mandviwalla, 1994). These constructs were measured with scales, and were not assigned a PLOC category, as the trait constructs were best represented as antecedents to a state of motivation, and the general constructs as outcomes/behavior resulting from motivation.

Table 2. Constructs labeled “motivation” in prior research

Source	Original Construct	Original definition	Scale/ Treatment	Reasons for inclusion	Proposed role	Proposed PLOC
Bhattacharjee (1998)	Behavior-based incentives	Payment based on behavior i.e. hourly wage	Experimental treatment	Payment was used to motivate the use of the system	Focal construct	External
	Outcome-based incentives	Payment based on job outcome i.e. commissions based on sales	Experimental treatment		Focal construct	External
Bostrom, Olfman & Sein (1990)	Motivation to use	Definition not provided	Perceived usefulness (Davis, 1989)	Motivation construct measured by attitudes about system usefulness	Antecedent	External
Burton et al. (1992)	Behavioral intention	The strength of the intention to perform a specified behavior	Developed measure of effort exerted	Behavioral intention is labelled as motivation	Outcome	General
Cheng (2011)	Perceived enjoyment	Personal enjoyment of the activity, apart from the instrumental gains from use	Perceived enjoyment (Davis et al., 1992; Lee et al., 2005)	PE is proposed to reflect the intrinsic motivational aspect	Focal construct	Intrinsic
	Perceived ease of use	Beliefs that system use is free of physical and mental effort	Perceived ease of use (Davis, 1989; Ngai et al., 2007)	PEOU is proposed to reflect the extrinsic motivational aspect	Antecedent	Identified
	Perceived usefulness	Beliefs that using a system enhances job performance	Perceived usefulness (Davis, 1989; Ngai et al., 2007)	PU is proposed to reflect the extrinsic motivational aspect	Antecedent	External
Davis & Bostrom (1994)	Intrinsic motivation	The drive from within the person or the activity; the reward is within the transaction itself	Intensity of flow scale (Webster, 1989)	Motivation construct is measured with IS use as the focal behavior	Focal construct	Intrinsic
Doll & Torkzadeh (1989)	Motivation to participate	Desired involvement in end-user computing	Desired involvement (Lucas, 1978)	Motivation construct is used in the model	Focal construct	General
Hwang (2005)	Enjoyment	The extent to which the computer system use is perceived to be personally enjoyable aside from the instrumental gain	Perceived enjoyment (Davis et al., 1992)	Enjoyment is used as a typed of intrinsic motivation	Focal construct	Intrinsic
Igbaria, Parasuraman & Baroudi (1996)	Perceived enjoyment	The extent to which the computer use is perceived to be personally enjoyable aside from the instrumental gain	Developed scale	PE is one of the "three motivational variables"	Focal construct	Intrinsic
	Social pressure	Pressure to be perceived as technologically sophisticated by important individuals (i.e. peers, supervisors)	Adapted (Ajzen & Fishbein, 1975)	Social pressure is one of the "three motivational variables"	Focal construct	Introjected
	Perceived usefulness	Perceived probability that using a system increases job performance	Perceived usefulness (Davis et al., 1989)	PU is one of the "three motivational variables"	Antecedent	External
Lee, Cheung & Chen (2005)	Perceived enjoyment	The extent of enjoyment, apart from any performance consequences	Perceived enjoyment (Davis et al., 1992)	"[PE] is a form of intrinsic motivation"	Focal construct	Intrinsic
	Perceived usefulness	Degree of beliefs that system use enhances performance'	Perceived usefulness (Davis, 1989)	"[PU] is an example of extrinsic motivation"	Antecedent	External
Li, Chua & Lu (2005)	Perceived Enjoyment	Perception of the fun, enjoyment, and pleasure inherent in technology use	Perceived enjoyment (e.g. Davis et al., 1992)	"intrinsic motivation (i.e. enjoyment)" is part of the model	Focal construct	Intrinsic
	Perceived usefulness	"An evaluative belief about the communication technology that builds and maintains interpersonal relationships in a social context"	Adapted (e.g. Schmitz and Fulk, 1991; Davis, 1989)	"[PU] is an example of extrinsic motivation" in the model	Antecedent	External

Source	Original Construct	Original definition	Scale/ Treatment	Reasons for inclusion	Proposed role	Proposed PLOC
Li, Hsieh & Rai (2013)	Intrinsic motivation toward accomplishment (IMap)	Pleasure and satisfaction experienced while individuals are trying to solve problems or accomplish something	Adapted (e.g. Vallerand 1997)	Aspects of intrinsic motivations as constructs in the model	Focal construct	Intrinsic
	Intrinsic motivation to know (IMkw)	The experienced enjoyment when learning or exploring things	Adapted (e.g. Vallerand 1997)		Focal construct	Intrinsic
	Intrinsic motivation to experience stimulation (IMst)	The intensely pleasant feelings associated with performing certain activities	Perceived enjoyment (Davis et al., 1992)		Focal construct	Intrinsic
	Perceived usefulness	Perceptions of performance enhancement from using IS	Perceived usefulness (e.g. Davis, 1989)	PU is "an important aspect of extrinsic motivation"	Anteecedent	External
Lowry et al. (2013)	Joy	Pleasurable, fun, enjoyable aspects of the interaction	Adapted (Venkatesh, 2000) & modified scale	A sub-construct of Cognitive Absorption - a representation of intrinsic motivation	Focal construct	Intrinsic
	Immersion	Experiencing total engagement free of attentional demands	Adapted (Agarwal & Karahanna, 2000)		Focal construct	Intrinsic
	Curiosity	Experiencing aroused sensory and cognitive curiosity	Adapted (Agarwal & Karahanna, 2000)		Focal construct	Intrinsic
	Control	The perception of being in charge of the interaction	Adapted (e.g. Agarwal & Karahanna, 2000).		Focal construct	Intrinsic
	Perceived usefulness	"The usefulness of pursuing pleasure" with hedonic systems	Adapted (Venkatesh, 2000)	"[PU] was used to measure extrinsic motivation"	Anteecedent	External
Lowry, Gaskin & Moody (2015)	Hedonic intrinsic motivation	Behaviors motivated by the mere feeling of pleasure and arousal	Enjoyment (van der Heijden, 2004)	The proposed model accounts for three dominant forms of motivations and performance beliefs	Focal construct	Intrinsic
	Other intrinsic motivation	Behaviors induced by seeking satisfaction for other reasons, such as accomplishment, learning or enlightenment, and socialization	Learning/ knowledge growth (Chang, Yen and Cheng, 2009).		Focal construct	Intrinsic
	Extrinsic motivation	Behaviors induced through outcome desire or consequence avoidance	Usefulness (Bhattacharjee & Premkumar, 2004)		Anteecedent	External
Luo, Chea & Chen (2011)	Intrinsic motivation	Action driven by no apparent reinforcement other than the process of the activity	Perceived enjoyment (van der Heijden, 2004)	One of the motivations proposed by the motivation model (Davis et al., 1992)	Focal construct	Intrinsic
	Extrinsic motivation	Action driven by instrumental outcomes distinct from the activity	Perceived usefulness (Davis, 1989)		Anteecedent	External
	Pass time	"Reasons for using the Internet when there is nothing to do, to occupy idle time, and to relieve boredom."	Pass time (Papacharissi and Rubin, 2000)	One of the motivations proposed by the uses and gratifications (U&G) theory (Katz et al., 1974)	Focal construct	Intrinsic
	Entertainment	"Reasons for using the Internet for amusement and enjoyment."	Entertainment (Papacharissi and Rubin, 2000)		Focal construct	Intrinsic
	Convenience	"Reasons for using the Internet for an easy and cheap access to information or other(s) [users]."	Convenience (Papacharissi and Rubin, 2000)		Anteecedent	Identified
	Interpersonal utility	"Reasons for using the Internet to fulfill needs of affection, inclusion, expression, social interaction, and surveillance."	Interpersonal utility (Papacharissi and Rubin, 2000)		Focal construct	Identified
	Information seeking	"Reasons for using the Internet as an information tool to learn about people, places, and events."	Information seeking (Papacharissi and Rubin, 2000)		Focal construct	External
Olfman & Bostrom (1991)	Motivation to use	The likelihood that prospective users of a software package would use the software.	Perceived usefulness (Davis, 1985, 1989)	Motivation construct with IS use as the focal behavior	Anteecedent	External
Olfman & Mandviwalla (1994)	Motivation to use	"Whether the software was used on the job"	Measuring actual usage	Motivation is a training outcome focusing on use behavior	Outcome	N/A

Source	Original Construct	Original definition	Scale/ Treatment	Reasons for inclusion	Proposed role	Proposed PLOC
Salehan, Kim & Kim (2017)	Hedonic motivation	The use for "happiness, fantasy, awakening, sensuality, and enjoyment."	Adapted (e.g. Agarwal et al., 2000)	One of the motivations used in the model as antecedents to social networking service (SNS) use	Focal construct	Intrinsic
	Social motivation	The use for "gaining social benefits from establishing and maintaining social interaction"	Adapted (e.g. Boyd and Ellison, 2007; De Roure et al., 2009)		Focal construct	Identified
	Utilitarian motivation	The use for "goal-oriented, mission-critical, rational, and decision-effective user tasks"	Adapted (e.g. Strahilevitz and Myers, 1998)		Focal construct	External
Stafford, Stafford & Schkade (2004)	Internet process gratifications	Users being motivated by enjoyment of the usage processes of random browsing and site navigation.	Developed scale	[Gratifications] are considered a "'how and why' approach to understanding [...] motivations" in the uses and gratifications (U&G) theory	Focal construct	Intrinsic
	Internet social gratifications	Gratifications arising from consumer use of the Internet as a social environment	Developed scale		Focal construct	Identified
	Internet content gratifications	Users being motivated by the desire for specific site-related informational content	Developed scale		Focal construct	External
van der Heijden (2004)	Perceived enjoyment	The extent to which fun can be derived from using the system as such.	Perceived enjoyment (e.g. Change & Cheung, 2001)	"[PE] focuses on intrinsic motivation"	Focal construct	Intrinsic
	Perceived usefulness	Draws attention to an outside benefit, external to the system-user interaction: improving job performance.	Developed scale	"[PU] focuses on extrinsic motivation"	Anteecedent	External
Venkatesh (1999)	Intrinsic motivation	The pleasure and inherent satisfaction derived from a specific activity	Perceived enjoyment (Davis et al., 1992)	Motivation is a training outcome focusing on use behavior	Focal construct	Intrinsic
	Extrinsic motivation	The performance of a behavior to achieve a specific goal	Perceived usefulness (Davis, 1989)		Anteecedent	External
Venkatesh (2000)	Computer Playfulness	"the degree of cognitive spontaneity in microcomputer interactions", which is not system-specific	Microcomputer playfulness (Webster & Martocchio, 1992)	"Intrinsic motivation is conceptualized as computer playfulness"	Antecedent/ Moderator	Trait
	Perceived Enjoyment	The perceived enjoyment in the use activity itself, aside from any performance consequences	Perceived enjoyment (Davis et al., 1992)	"A conceptualization of intrinsic motivation that is system-specific is perceived enjoyment"	Focal construct	Intrinsic
Venkatesh & Bala (2008)	Computer playfulness	The degree of cognitive spontaneity in microcomputer interactions	Microcomputer playfulness (Webster & Martocchio, 1992)	The construct "represents the intrinsic motivation" in using any system	Antecedent/ Moderator	Trait
	Perceived usefulness	Instrumental beliefs regarding the benefits of using a system.	Perceived usefulness (e.g. Davis, 1989)	PU is "conceptually similar to extrinsic motivation"	Anteecedent	External
Venkatesh & Speier (1999)	Intrinsic motivation	The perceived enjoyment distinct from any performance outcomes	Perceived enjoyment (Davis et al., 1992)	Motivation construct with IS use as the focal behavior	Focal construct	Intrinsic
	Extrinsic motivation	Expectation that usage will result in enhanced performance/productivity	Perceived usefulness (Davis et al., 1992)		Anteecedent	External
Venkatesh, Speier & Morris (2002)	Intrinsic motivation	The pleasure/ satisfaction derived from a specific activity	Perceived enjoyment (Davis et al., 1992)	Motivation construct with IS use as the focal behavior	Focal construct	Intrinsic
	Extrinsic motivation	The performance of a behavior because of perceived instrumental gains distinct from the activity	Perceived usefulness (Davis, 1989)		Anteecedent	External
Webster & Martocchio (1992)	Microcomputer playfulness	the degree of cognitive spontaneity in microcomputer interactions	Microcomputer playfulness (Webster and Martocchio, 1992)	Playful individuals are more intrinsically motivated	Antecedent/ Moderator	Trait
Yang et al. (2007)	Hedonic outcome expectancy	The pleasure derived from the use of the system	Developed scale	One of the seven major motivational factors affecting IS use in the model	Focal construct	Intrinsic
	Social outcome expectancy	Beliefs that influence on others may lead to a desire for social outcomes.	Developed scale		Focal construct	Identified
	Utilitarian outcome expectancy	The tangible result of technology-enabled collaborative learning	Developed scale		Focal construct	External
	Perceived importance of learning	The beliefs that learning is important and is linked to utilitarian outcomes	Developed scale		Antecedent/ Moderator	External
	Superior pressure	Desire for guidance in learning that leads to eagerness to get approval	Developed scale		Focal construct	Introjected
	Peer pressure	Beliefs that peers put more effort into the ODF than the user does	Developed scale		Focal construct	Introjected
	Conformity motivation	Willingness to comply with external pressure	Developed scale		Focal construct	Introjected

Discussion

In summary, 64 motivation-related constructs were identified through the literature review and are documented in Table 2 above. The three research questions, (R1) constructs identified, (R2) constructs categorized based on PLOC, and (R3) construct operationalization, were answered based on the literature review work as described in the results section above. Finally, we describe 5 interesting insights drawn from the categorization of the motivation-related constructs within the theoretical framework of PLOC.

First, we observed that most of the 64 motivation-related constructs fall somewhere on the continuum of endogenous motivation proposed by the SDT-based endogenous motivation model (Malhotra et al., 2008). Understanding the granularity of motivation affords opportunities to reduce resistance by utilizing various external stimuli that could touch on users' personal values, leading users to internalize these external stimuli. Among these constructs, the intrinsic motivation constructs fit most neatly in the intrinsic PLOC type, given the shared definition of enjoyment and pleasure within the activity, independent of external rewards. On the other hand, motivation originating from external sources are more diverse in their definitions and effects, reinforcing the need for multiple PLOC types which allow for a more accurate evaluation of their effects.

Second, observations can be made about the attention to the different forms of motivation as specified through PLOC type. The intrinsic and external PLOC types have received the most attention with 26 and 22 constructs in those categories, respectively. Identified and introjected forms of PLOC have received much less attention with 6 and 4 constructs in these categories, respectively. This disproportionate attention is interesting, given that workplace contexts are often accompanied by peer and supervisor pressure and often require mandatory IS use. When users are surrounded by many sources of extrinsic stimuli, introjected PLOC and identified PLOC have the potential to explain acceptance or resistance of IS.

Third, although SDT (Ryan and Deci, 2017) and Malhotra et al.'s (2008) framework both acknowledge the potential transformation between motivation types (e.g. extrinsic to identified), no study in our search has studied this phenomenon. As self-determined behaviors are more sustainable than those perceived to be controlled by external forces (Ryan and Deci, 2017), research on IS acceptance and resistance should examine the potential transformation from external toward more internal PLOC for users, and identify mechanisms that may trigger a transition in the desirable direction, toward intrinsic motivation.

Fourth, the use of some motivation-related constructs may reflect the popularity of a commonly used theoretical model in IS research, rather than an alignment between these constructs and motivation. *Perceived usefulness* (PU) and *perceived ease of use* (PEOU) are core constructs in the technology acceptance model (TAM) (Davis, 1989), but are best described as antecedents to motivation, rather than being a form of motivation. For example, a system that is perceived as being easy to use (high PEOU) may result in increased feelings of control and competence for users, which increases motivation to use the system (Davis et al., 1989). Similarly, the perception that a system is very useful (high PU) induces beliefs of enhanced performance, which drives a user to use IS in exchange for external rewards. As a result, PU and PEOU are best treated as antecedents to motivation rather than being held out as forms of motivation.

Fifth, trait constructs examined in motivation studies should be considered antecedents to a motivation state rather than a form of intrinsic motivation. For example, microcomputer playfulness (Webster and Martocchio, 1992) is an important trait that can help predict whether a user is intrinsically motivated to use IS. If a user has high microcomputer playfulness, then they are more likely to be intrinsically motivated to use IS. Similarly, some early representations of motivation included actual usage (e.g. Olfman and Mandviwalla, 1994) as a measure of motivation. Usage is best represented as an outcome of motivation and more recent research has "opened the black box" of human psychological states, differentiating the state of motivation from the outcome of behavior.

Limitations and Conclusions

Limitations of this research include the literature search restriction to 13 journals. Due to time and proceedings space constraints, we prioritized 13 journals (with 8 IS journals) following Webster and Watson's (2002) suggestion for a first step in selecting relevant literature, and did not consider other IS

journals, conferences, or dissertations, which may have yielded additional constructs. Further, only studies that explicitly referenced “motivation” were included in the review. There are many other articles that reference related constructs, such as usefulness, but these articles did not describe usefulness as a form of motivation. The categorization of motivation constructs along Malhotra et al.’s (2008) taxonomy is subjective. While we propose the most appropriate PLOC types for the motivation constructs based on the authors’ definitions, there are arguably other perspectives for categorizing them. Future iterations of this literature review would extend on these coverage issues to enhance the review’s contributions.

Inspired by the rapid emergence of new technologies and the role of motivation in promoting acceptance and avoiding resistance, this paper adopts the psychology-grounded endogenous motivation model (Malhotra et al., 2008), reviews 64 motivation constructs from 26 peer-reviewed papers and discusses insights. Several contributions are highlighted. First, we re-introduce a holistic but little-applied perspective to study motivation in IS use. Second, we provide a snapshot of the current literature to reveal opportunities for future research in little-studied motivation types such as introjected or identified PLOC and the potential transformation between all of the types. Last, we call for a more consistent, direct assessment of motivation instead of using distant proxies, antecedents or trait constructs.

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