Determinants of Customer Intentions to Use Self-Service Technology-Based Options for Recoveries

A thesis submitted to the University of Adelaide in fulfilment of the

requirement for the degree of

Doctor of Philosophy (Business)

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May 2020

Abstract

Service firms continually seek innovative ways to meet customer needs while improving efficiencies. Self-service technologies (SSTs) (i.e., ATM, self-service checkouts in supermarkets, and self-check-in at airports) have offered solutions that enable such benefits. Unfortunately, while SSTs can provide tremendous benefits for services, they also inevitably fail. SST failures present a unique challenge to service firms because problems generally happen without the presence of service personnel. To counter this problem, a different form of recovery has emerged – SST-based recovery, which refers to SST-facilitated recovery in which customers fix the SST failure by themselves, using a self-service technological interface (e.g., help-guide, virtual onscreen assistant, autonomous robot, chatbot). SST-based recovery is a highly suitable recovery solution for the SST context where service personnel availability is often limited.

SST-based recovery also introduces a very different kind of service experience to the traditional employee-led recovery (i.e., increased customer responsibility, highly technological-based, low employee presence), therefore it is difficult to apply the knowledge from the existing service recovery literature in traditional contexts to the SST-based recovery context. This form of recovery has also received limited attention from marketing scholars despite the growing importance of it to service managers. Thus, more research with a specific focus on SST-based recovery is required to provide a better understanding of this form of recovery. Centred on SST-based recovery, this thesis contributes to the current literature by improving the understanding of customer response to SST-based recovery. It provides a framework for the way in which customers' perception of the SST-based recovery shapes their intentions towards the recovery option. The thesis consists of three self-contained, but interrelated, papers.

In paper 1, a conceptual framework is presented, which extends the stress and coping theory to delineate the process of customer cognitive appraisal and its role in shaping customer intention towards using SST-based recovery. Specifically, the framework proposes failure appraisal and recovery appraisal as two components of the customer cognitive appraisal process. The framework also puts a specific focus on customer emotions, which are posited to result from failure appraisal and directly influence intentions towards SST-based recovery. Finally, relevant individual characteristics that influence customer failure and recovery appraisals are also identified and discussed. Managerial implication and an agenda for future research are provided in the paper.

Building on the conceptual development in paper 1, paper 2 takes a narrower focus and empirically tests a model of customer intentions to use SST-based recovery, as a result of the customer's perceived control and risk. Drawing on control theory, perceived control is proposed to be a key factor in customers' decision towards using SST-based recovery. The central proposition is that customers who perceive a heightened level of control towards the SST-based recovery believe that they can exert power over the process and outcome of SST-based recovery, and will show a greater intention towards the recovery option. Furthermore, when customers believe that they have control over the SST-based recovery, this reduces perceived risk, which, in turn, increases intentions to use the SST-based recovery process. Results from an online panel database provides support for the research model. The theoretical and managerial implications of this study are discussed.

Consistent with paper 2, paper 3 further explores the role of perceived control as a key factor in a customer's decision to use SST-based recovery. The findings from paper 2 are expanded on through an investigation of the dual impact of personal control, a state of being, and the contextual circumstance of perceived control of the SST recovery process. Drawing

on learned helplessness theory, the study's proposition is that customers who have a low degree of personal control will exhibit a low perception of control towards SST-based recovery; the opposite is true for individuals with a high degree of personal control. In turn, the customer's perception of control over SST-based recovery will have a positive impact on efficiency and positive anticipated emotions associated with SST-based recovery, both of which ultimately drive customer intention towards the recovery option. The empirical results support the research model. By investigating both the antecedent and the impact of perceived control of SST-based recovery, this paper enriches understanding of this essential concept in the SST recovery context. Additionally, the identification of personal control as an important predictor of customer perception of control towards SST-based recovery provides the first step in the application of individual difference variables that can aid SST managers in managing customer perception in the SST recovery domain.

The collected data were analysed through SPSS, PROCESS, and SmartPLS. The empirical results provided by paper 2 and 3 indicate that perceived control, risk, efficiency and positive emotions have a direct impact on customer intentions towards using SST-based recovery. Perceived risk, efficiency, and positive emotions demonstrate mediating effects on the relationship between perceived control and intentions towards using SST-based recovery. Additionally, personal control exhibits a positive effect on perceived control.

Overall, the conceptual framework (paper 1) together with the empirical results (paper 2 and 3) unravel the processes by which SST customers come to their recovery decisions. The research sheds light on the set of variables that shape customer intentions to use SST-based recovery following SST failures and, in particular, the importance of a customer's perceived control of the SST-based recovery process. The current thesis highlights the need for a customer-focused perspective in explaining customer decision-making on using SST-based

recovery. Service firms can utilise the research findings to improve their recovery strategies

and derive successful tactics for encouraging customer use of SST-based recovery.

Acknowledgements

I would like to acknowledge my supervisors for their supervisions and support. My immense appreciation also goes to Prof. Jodie Conduit for her invaluable guidance and support during the final stage of my thesis. This thesis would not have been possible without her encouragement. I am grateful for the advice and encouragement from my colleagues at the University of Adelaide. I also acknowledge the financial support from the University of Adelaide which provided the scholarship and research funding to complete my thesis. I also thank Tina Morganella for her assistance with editing my final thesis.

Most important, I would like to thank my family. I am always grateful for their unfailing support throughout this journey.

Thesis declaration

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Chapter 1: Introduction

1.1. Introductory Background

1.1.1. Self-service-technology (SST) Failures

This thesis is set in the context of self-service technology (SST) which is defined as any technological interface that allows consumers to make a service delivery independent of direct service employee involvement (Fan et al., 2016; Hilton & Hughes, 2013; Meuter et al., 2000). Examples of SST include ATMs, self-service checkouts in supermarkets, and self-check-in kiosks at airports. SSTs offer both service firms and customers a great number of valuable advantages over face-to-face service settings, including reduced service delivery time, lower labour costs, greater control over the service encounter for the customer, enhanced service efficiency and privacy, and increased service customization (Meuter et al., 2000; Walker et al., 2002). Thanks to these added values, SSTs have expanded across a variety of service sectors (Fernandes & Pedroso, 2017).

The expansion of SSTs also means that it is becoming increasingly common for customers to experience SST failures (Collier et al., 2017; Nili et al., 2019; Robertson et al., 2012). The unique qualities of SST (e.g., devoid of service personnel and high-technology-based) makes this form of transaction especially vulnerable to service failure (Yi & Kim, 2017; Zeithaml et al., 2006), and makes SST failure recovery very difficult (Forbes, 2008a; Robertson et al., 2012). Furthermore, due to the self-service aspect of SST, it is not uncommon for SST failures to go unnoticed and unresolved by service providers. Unaddressed service failures can lead to a range of damaging customer behaviours such as voiced complaints, revenge, negative word-of-mouth (WOM), and switching, which negatively impacts service providers (Michel, 2004). Hence, the frequency of SST failures, together with the recovery

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obstacles, present a significant challenge to businesses. In the existing literature on SST failure and recovery, researchers have studied the differences between SST failures/recoveries versus interpersonal service failures/recoveries (Forbes, 2008b; Forbes et al., 2005); Holman, Sheldon, & Buzek, 2004), customer responses to SST failures (Fan et al., 2016; Fan et al., 2018; Fan et al., 2019; Robertson et al., 2016; Robertson & Shaw, 2009), and customer responses to SST recoveries (Collier et al., 2017; Dabholkar & Spaid, 2012; Dong et al., 2008; Dong et al., 2016). However, much of this literature has considered recovery processes in which a service provider is directly involved – there has been scant consideration given to recovery processes which continue to engage consumers through SST.

1.1.2. SST-based recovery

This thesis focuses on the use of SSTs to resolve SST failures. The use of SSTs in the marketplace has radically and rapidly changed the nature of customer service experiences at different stages of the service process. SSTs have now expanded beyond a mediation tool for service transactions, to also being used to remedy service failure. SST-based recovery refers to any form of recovery in which customers use SST-based tools to address the failure themselves instead of interacting with service staff (e.g., virtual onscreen assistant, autonomous robot, chatbot). For example, customers who experience an error while using a self-checkout machine can seek assistance from a built-in virtual onscreen assistant (SST-based recovery) as opposed to seeking personal assistance from service staff (staff-based recovery). In the traditional recovery process customers let service staff solve the problem for them; now, SST-based recovery allows the customer to resolve problems without service staff assistance, using SST interfaces.

Existing studies on SST recovery have mainly looked at recovery implemented by the service provider/staff or joint recovery between service staff and the customer (Dong et al.,

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2016). There appears to be limited research on recovery that is carried out solely by the customer. Whilst there are exceptions (Nili et al., 2019; Zhu et al., 2013), these works have examined only cases where customers resort to their own initiatives to recover from failure (e.g., repeat the service process upon failure without seeking help from the service provider). Studies on the application of technologies in facilitating SST recovery are scant.

It is in the interests of both service firms and customers to shift to SST-based recovery for three reasons. First, the lack of service personnel situated in SST settings means that customers are increasingly expected to fix their own service problem (Forbes, 2008b; Nili et al., 2019; Zhu et al., 2013). Second, from a practical perspective, there is already a fixed cost associated with installing an SST – by utilizing it for recovery purposes as well, firms can further reap the benefits of using SST over face-to-face encounters (i.e., reduced labour costs and improved efficiency) with little or no extra operational cost. Third, using SST for service transactions offers many advantages for customers over interpersonal options (Curran & Meuter, 2005; Lee & Allaway, 2002; Robertson et al., 2016) and similarly the use of SST-based recovery processes also benefits customers (e.g., time saving, ease of use, flexibility, convenience, etc.) Additionally, SST customers are generally experienced users who are capable of handling the technical challenges of newly-introduced SST features (Zhu et al., 2007). This suggests that SST customers will more readily accept SST-based recovery options, despite being unfamiliar with this form of SST. Moreover, research has shown that many SST customers deliberately choose to use SSTs to avoid interaction with service staff (Bulmer et al., 2018). Hence, SST-based recovery, which aligns with customers' needs to avoid interaction with service staff, should be well-received by customers.

1.1.3. Customer perceived control

Control perception is a long-established construct which refers to a whole set of belief systems about how effective one can be in producing desired and preventing undesired outcomes (Skinner, 1995, 1996). Perception of control comes with an awareness of contingency between one's behaviour and the outcome of importance, hence, it contributes to the psychological functioning and wellbeing of the individual (Fiske & Dépret, 1996; Rothbaum et al., 1982; Skinner, 1995). As a result, people strive to maintain a desirable level of perceived control over their environment (White, 1959). Such motivation for control directs people's behaviours and attitudes, such that people tend to gravitate towards activities that they perceive to be under their control and move away from activities where they think they have little control.

In SST use and adoption contexts, perceived control has been found to be an important driver of consumer behaviour. Customer perceived control in the SST context refers to a customer's belief about the amount of control they have over the process and outcomes of SSTs (Collier & Barnes, 2015; Hui & Bateson, 1991). As opposed to regular service customers who are generally passive receivers of services, SST customers take on greater responsibility and play an active role in producing their own services, and this co-producer role increases the importance of having control (Collier & Sherrell, 2010; Guo et al., 2016; Lee & Allaway, 2002). Unsurprisingly, studies have found that perceived control is a direct predictor of customer intentions towards using SST options (Hsu & Chiu, 2004). Research has also indicated that perceived control is positively associated with satisfaction with SST experiences (Chih-Hung Wang, 2012; Robertson et al., 2016). Similarly, evidence shows a positive relationship between perceived control and customers' SST-related evaluations (Dabholkar et

al., 2003, Collier and Sherrell, 2010). However, there has been little consideration of the role of perceived control in an SST recovery context.

Specific to the context of SST recovery, customer perception of control is expected to play an important role in the process. Specifically, while research has suggested that in SST adoption and use contexts (i.e., non-recovery) perception of control and other instrumental factors (e.g., efficiency, convenience) may contribute equally to service outcomes, perceived control is likely to play an even greater role in SST recovery outcomes. This is because a service failure, which presents an undesirable loss (Smith, Bolton, & Wagner, 1999), is likely to cause customers to experience a lack of control. Such a lack of control experience during the *service* process accentuates the customer's motivation to gain control in the *recovery* process (Guo et al., 2016). In contrast, in the case of non-recovery SST (i.e., adoption, continued use), customers experience no explicit threat to their control over the environment and thereby generally have a lower motivation for control (compared to customers in the case of SST failures). Moreover, as SST recovery is not a common encounter, most customers are unfamiliar with such situations. From these discussions, it is logical to assume that the determining power of perceived control on customer behaviour should be especially emphasized in SST recovery contexts. However, despite a great deal of research attention on the role of perceived control in SST service encounters, little is known about this concept in the SST recovery setting.

1.2. Research problems

New research on SST-based recovery is necessary due to its unique context in comparison to other research domains such as SST adoption and regular service failure. First, despite its apparent similarity to SST adoption (i.e., both focusing on the use of new SSTs), customer usage of SST-based recovery represents a very different phenomenon. The most

fundamental difference lies in the purpose of the SST tools. While SST-based recovery refers to the use of SSTs to address service failures, SST adoption refers to the use of SST to facilitate service transactions. Addressing a service failure (e.g., ambiguity, lack of control) is a much greater source of stress for customers, compared to simply engaging in service transactions. This stress could affect the customer's decision-making process. Hence, it is unlikely that knowledge gleaned from the customer decision-making process during SST adoption is applicable to SST-based recovery.

Moreover, service failure research in the personal service context is also very different from service failure in the SST context. Due to the absence of service personnel, as well as differences in service settings (e.g., greater customer responsibility, customer using SST-based tools), recovering from SST failures presents a very unique experience compared to failures of personal services (Baron et al., 2005; Collier et al., 2017; Forbes, 2008a; Robertson et al., 2012; Sousa & Voss, 2009). That is, research on personal service failures is often based on assumptions that consumers are passive and attribute blame of failure to others when it occurs. On the other hand, there is evidence that suggests that SST customers could attribute the failure to themselves (e.g., due to lack of knowledge, experience, and skills) (Nili et al., 2019). As a result, recent SST research has challenged the commonly assumed concepts from personal service research and suggests that SST consumers instead might blame themselves for the failure as opposed to only blaming the service provider or service staff and that SST customers are generally more willing to take greater responsibility in recovering service failures (Harris et al., 2006; Zhu et al., 2013). This difference in customer responses between personal services and SSTs makes it difficult to apply knowledge from the traditional service failure research to SST contexts.

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Overall, the unique setting of SST-based recovery presents the need for its own research. However, the existing SST literature has focused predominantly on SST initial adoption, whilst research on SST recovery solutions, such as SST-based recovery, in scant. SST-based recovery should play an important role in the management of SST-based businesses because if service personnel are not available to address SST errors, then it is especially important to encourage customers to recover on their own using SST-based recovery options. Hence, there is a need for SST researchers to identify the determining factors of customer intention to use SST-based recovery options.

1.3. Research gaps

Given the increased frequency of SST failures and the predominant advantage of SST-based recovery to address the failure, a better understanding of SST-based recovery would be helpful for SST managers. However, research in the area of SST recovery is lacking (Fan et al., 2016; Fan et al., 2018; Lee & Cranage, 2018). Existing studies may offer a starting point for future investigations, but are limited in four respects, outlined below.

(1) Most SST recovery research has focused on the traditional recovery option of having service employees fix the problem for the customer. There has been little investigation into alternative forms of recovery, especially those that reflect the current progress of technological innovation (Collier et al., 2017; Nili et al., 2019; Zhu et al., 2013), such as SST-based recovery.

(2) There is no integrating theoretical framework that can offer service providers a more comprehensive explanation of customer decision-making in SST recovery. The lack of integrated theories has resulted in ambiguity in this domain. For example, while some researchers have reported that customers prefer to switch out of the self-service mode and let service personnel take over the SST recovery (Collier et al., 2017), other studies have demonstrated the opposite tendency (Mattila & Cho, 2011). These inconsistencies can be

attributed, in part, due to differences in the research focus. For example, to determine customer recovery intentions, some studies have focused on the role of the SST-related constructs (Fan et al., 2019; Zhu et al., 2013), while others have sought to account for the impact of failure-related constructs (Dabholkar & Spaid, 2012; Mattila et al., 2009). Research has also attempted to explain recovery outcomes via individual customer characteristics (Dong et al., 2016). However, the scope of these studies is limited because they focus on only a fragment, instead of considering a more complete picture of the customer decision-making process, making it difficult for SST managers to generalize and unify the knowledge from these studies. This points to a need to establish a unifying framework that covers the relevant elements in customer decision-making, and provides a common frame of reference associated with the customer SST recovery decision. This framework could then also guide future research.

(3) Most SST recovery papers have disregarded the role of customer emotions. The important role of emotion in the customer experience has been well recognized, and service experiences set within a technological context are no exception (Bagozzi et al., 2016; Brave & Nass, 2007; Johnson & Stewart, 2005). This determining factor becomes especially relevant in the service failure context where customer decision-making is often charged with emotion (Balaji et al., 2017; Chebat & Slusarczyk, 2005). Surprisingly then, thus far SST recovery research examining the role of emotions is scant.

(4) Perceived control has been recognized as a key concept driving customer intention to use SSTs for initial service encounters (i.e., non-recovery) (Chan et al., 2016; Oyedele & Simpson, 2007), yet it has remained largely unexplored in the SST recovery context. The role of this construct is further emphasized as service failures often cause customers to feel a lack of control (Guo et al., 2016). Despite its potential effect on customer responses, little is known

about this construct in the SST recovery domain (e.g., how does control influence customer decision-making, and what is the cause of variations in levels of customer perceived control?).

Thus, given these major gaps, it is evident that greater progress is both possible and necessary in this research area.

1.4. Research objectives

Motivated by the gaps in the literature, the current thesis specifically focuses on an emerging form of SST recovery, which is SST-based recovery. The overall objective of this thesis is to provide a better understanding of customer intention to use SST-based recovery.

The specific objectives of this thesis are:

o   to develop an integrated framework that explains customer intention to use SST-based recovery

o   to establish the importance of control factors in shaping customer intentions towards using SST-based recovery (e.g., perceived control and personal trait of control)

o   to identify and empirically examine key determining factors of customer intention to use SST-based recovery (e.g., perceived risk, efficiency, positive anticipated emotions).

1.5. Research questions

The specific research questions are as follows:

i)   What is the overarching picture of the cognitive appraisal process that determines customer intentions towards using SST-based recovery?

ii)   How do perceived control, perceived risk, efficiency and positive anticipated emotions influence customer intentions to use SST-based recovery?

iii) How do the dynamics between perceived control (control as a situational appraisal) and personal control (control as a personal trait) impact customer intentions to use SST-based recovery?

1.6. Overview of the three research papers

This thesis contains three separate research papers which share the common objective of expanding the current knowledge on the determining factors of customer intentions to use SST-based recovery. The overview of each of the three papers is provided below.

The first paper explores research question (i) and develops an overarching conceptual framework that delineates the cognitive appraisal process that explains how customers choose whether to use SST-based recovery or switch to human service when SST failures occur. The framework analyses how an individual's evaluation of an SST failure and the recovery option may serve to explain their responses to an SST-based recovery option. Stress and coping theory (Lazarus & Folkman, 1984a; Lazarus & Folkman, 1984b) underpins the theoretical framework. Stress and coping theory (Folkman, 2013; Lazarus, 1991) describes the process by which people respond to negative or stressful situations. The concept of appraisal refers to the individual's continuous evaluation of his or her relationship with the environment with respect to its significance to personal goals and well-being. The theory places a great emphasis on individual appraisal of the environment as the main influence on behaviour, as opposed to the objective characteristics of environment. Motivated from an individual perspective, the theory addresses not only the cognitive but also emotional component of behavioural drivers, which have often been overlooked by SST recovery researchers. The theory is well-suited to studying underlining psychological mechanisms of customer behaviour in stressful situations (Zourrig et al., 2009). Extending on stress and coping theory, the paper provides a comprehensive description of the psychological process that shapes customer intention towards using SST-

based recovery. In this first paper, the framework sheds light on the cognitive appraisal process that customers engage in to come to their recovery decisions, which encompasses failure appraisal and recovery appraisal. First, failure appraisal incorporates the customer's evaluation of the characteristics of the SST failure, which determines how threatening and harmful the SST failure is to their well-being. Outcomes of failure appraisal are suggested to elicit different emotional reactions that directly influence a customer's intentions towards using SST-based recovery. Second, recovery appraisals involve the customer's assessment of the SST recovery options in terms of potential benefits. This paper contributes to the SST recovery literature by developing an interdisciplinary and multilevel framework synthesizing relevant knowledge from SST, service failure and human behaviour. The framework offers a balanced and comprehensive description of the psychological process underpinning customer recovery choices, incorporating both failure- and recovery-related factors as well as both cognition and emotion. The conceptual framework, therefore, offers an overarching map for unifying and guiding future research. This will enable future SST recovery research to focus on a specific aspect of the customer decision-making process and interpret results in accordance with their relative position in the proposed framework. Thus, the unifying insights provided by the framework offers management useful information with which to design and implement recovery strategies that cater to the individual customers (i.e., appraisals, emotions) beyond simple utility.

The next two papers explore research questions (ii) and (iii). Both papers specifically focus on providing empirical evidence for the effect of key variables in customer appraisal of SST-based recovery on intentions towards using SST-based recovery (i.e., perceived control, perceived risk, efficiency and positive anticipated emotions).

The second paper sheds light on customers' perceptions of control as the key factor that drives intentions towards using SST-based recovery. In addition to the direct relationship between control and intentions, the paper also analyses the effect of perceived control on perceived risk which ultimately contributes to customer intention to use SST-based recovery. Control theory is used to justify the importance of perceived control and risk on customer decision-making in an SST recovery context. Based on the cybernetic hypothesis, control theory uses the negative feedback loop as a central means for explaining human action (Klein, 1989). Specifically, the negative feedback loop models how an individuals' perception of the discrepancy between actual and desired states can motivate ensuing behaviour (Guo et al., 2016; Landau et al., 2015; Latham et al., 2018). Using control theory's negative feedback loop model, it is proposed that customer motivation to reduce this discrepancy activates customer tendency to gain control (perceived control) or reduce risk of further loss (perceived risk). The key contribution of this paper is the establishment of the key role of perceived control and risk beyond the initial service encounter to service recovery stage.

Following paper 2, paper 3 continues to explore the concept of perceived control – using it as the key factor in shaping a model of customer intention to use SST-based recovery. This paper adds to the previous paper by (1) examining the dual impact of the personality state of personal control in conjunction with the contextual influence of perceived control over the recovery process, and (2) further exploring the impact of perceived control on the customer's evaluation of firms' recovery solutions, in terms of efficiency and positive emotion. The study applied learned helplessness theory to explain the mechanism underlying the relationships between personal control and perceived control. This paper adds to the literature in two ways. First, the paper expands the understanding of control factors in the SST recovery context (e.g., its antecedents and effects). Second, it offers a more balanced view of the impact of control, influencing both efficiency and positive emotion (representing functional and hedonic aspects

of SST-based recovery). The results show that a high level of personal control enhances the customer's perceived control over SST-based recovery. In addition to the main effect of perceived control on customer intentions to use SST-based recovery, perceived control also positively influences customer evaluations of SST-based recovery in terms of efficiency perception and positive anticipated emotions. Finally, customer intentions to use SST-based recovery are driven by both efficiency and positive anticipated emotions. This finding demonstrates that, from an SST recovery perspective, efficiency or the utilitarian value of the service option may not be the only goal of the customer. Positive anticipated emotion, reflecting the hedonic value of the recovery option, is also a significant predictor of customer decision

1.7. Research models

Failure appraisal
- Outcome desirability
- Agency

Negative Emotions
- Anger
- Anxiety
- Guilt

Individual characteristics
- Control-related
- Technology-related
- Social-related

Recovery appraisal
- Functional value
- Emotional value
- Social value

Intention to use SST-based recovery

Paper 1
(Conceptual framework)

Recovery appraisal

Perceived control

Perceived risk

Intention to use SST-based recovery

Paper 2

Recovery appraisal

Efficiency

Individual characteristics

Personal control

Perceived control

Positive anticipated emotions

Intention to use SST-based recovery

Paper 3

As can be seen from the research model presented above, this thesis analyses the way in which customers appraise SST failures and SST-based recovery, and how this influences their intention towards choosing a recovery option. The thesis consists of three papers, each with a proposed research model. In paper 1, a conceptual framework is presented, which delineates failure and recovery appraisal as two components in the customer cognitive appraisal process that determines their intention to use SST-based recovery. The framework specifically focuses on customer emotions which are posited to result from failure appraisal and directly influence intentions. The final component in the framework identifies individual characteristics which are proposed to influence customer failure and recovery appraisals. Paper 2 empirically investigates and tests the relationship between the customer's recovery appraisal and their intention to use SST-based recovery, which is a result of customer perceived control and risk. Drawing on control theory, perceived control is proposed as a key factor in a customer's decision to use SST-based recovery. Two components of customer recovery appraisal were examined, including perceived control and perceived risk towards SST-based recovery. Following paper 2, paper 3 further explores the role of perceived control as the key factor in a customer's decision to use SST-based recovery. Recovery appraisal expands beyond perceived control to further incorporate perceived efficiency and positive anticipated emotions towards SST-based recovery. Further, the model is expanded to also encompass the individual characteristic of personal control. Personal control is proposed to be an antecedent of customer perceived control over SST-based recovery

1.8. Overview of the methodology

Paper 1 conceptually develops a framework of customer intentions towards using SST-based recovery. The paper follows a theory synthesis approach for conceptual research, which aims to provide conceptual integration across multiple theories or literature streams (Jaakkola,

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2020). Such a conceptual-based methodology contributes to research knowledge by summarizing and integrating extant knowledge across different streams of literature in order to provide a new and enhanced explanation of a concept or phenomenon. Thus, paper 1 draws on various literature streams (i.e., information technology adoption, service failure/ recovery, psychological behaviour) to identify relevant elements that are important for determining customer intentions towards using SST-based recovery.

Next, Paper 2 and 3 follow a quantitative approach and are based on a positivistic epistemological paradigm. Epistemology is concerned with the nature of knowledge and how the knower can obtain it (Marsh & Stoker, 2002; Schwandt, 1997). There are two broad epistemological positions: positivist and interpretivist (Tuli, 2010). The positivist paradigm reflects the worldview that the social reality exists apart from the individual and is governed by stable laws of cause and effect. In contrast, an interpretivist paradigm reflects the worldview that the social reality is created through personalized interactions with each other and the complex social systems. Positivist research aims to formulate law for prediction and generalization of phenomenon, while interpretivist research aims to interpret or generate deeper understanding of phenomenon. Quantitative methodologies are underpinned by positivist assumptions, while qualitative methodologies are underpinned by interpretivist assumptions (Tuli, 2010). Paper 2 and 3 predict and investigate relationships between customer appraisals of SST-based recovery (i.e., perceived control, perceived risk, efficiency, positive anticipated emotions) and customer intentions towards the recovery option. Positivistic assumptions are consistent with this approach of predicting and generalizing relationships between variables, as opposed to the interpretivist's concern with discovery and interpretation (Levers, 2013). In addition, the research models are grounded on existing literature (e.g., SST use and service research) which is characterized by maturity. The research questions guiding the models are also clear and well-defined. All of these characteristics are inherent to a quantitative

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perspective (Creswell & Creswell, 2017). Therefore, a quantitative methodology has been adopted for paper 2 and 3. The following section discusses the methodology used for paper 2 and 3.

1.8.1. Survey method

As discussed above, the research uses an empirical and quantitative research design to test the proposed hypotheses. This is done through a survey-based method. The survey-based method refers to a technique of obtaining a quantitative or numeric description of trends, attitudes or opinions by posing questions to a sample of a population (Creswell & Creswell, 2017; Sontakki, 2010). Surveys can be conducted via internet, mail, telephone, email or interview. Compared to telephone or face-to-face interviews, an online survey, which is conducted through a self-administered questionnaire, has higher perceived anonymity and low interviewer bias issues (Sontakki, 2010). The cost and time required to administer an online survey are also lower than that of most other survey methods (Gosling & Johnson, 2010). Thus, due to the advantages in validity and efficiency, an online survey was used in the research. The survey design is cross-sectional because the purpose of this research is to identify factors affecting customer intentions to use SST-based recovery – time and changes in different moment of times are of no concern.

1.8.2. Scenario-based approach

The survey design in this thesis employs a scenario-based approach which seeks to simulate the SST failure experience. Scenario-based surveys outline a scenario to put participants in a hypothetical situation then poses questions to assess their responses to the situation (Ramirez et al., 2015). This research tool is widely-used in service failure research, and is proven to be an effective way to elicit and assess customers' reactions to service failure as well as service recovery (Collier et al., 2017; Gabbott et al., 2011; Strizhakova et al., 2012;

Tsarenko & Strizhakova, 2013). Compared to other methods, such as recall-based survey and field study, the scenario-based survey has multiple advantages. First, the scenario-based survey allows for the simulation of a failure experience in a selective and controlled environment, free from potential biases caused by memory limitations, reasonable tendency, and consistency factors, which are generally present in recall-based research (Smith et al., 1999a). Second, a scenario-based survey offers advantages with regards to expenses, time and ethical concerns which are commonly associated with the re-enactment or observation of actual service failure/recovery incidents in a field study (Gabbott et al., 2011; McCollough et al., 2000).

However, the key drawback of the scenario-based survey is the possibility that participants are unable to project themselves in the scenario and provide responses that actually reflect what they would do in a real situation (McCollough et al., 2000). To minimize these problems, the scenario used in this thesis was carefully tested for realism before being used in the actual studies. The scenario context – a self-service car rental kiosk – was also selected after careful consideration.

The car rental scenario was chosen for the following reasons. First, car rental is one area of service where the use of SSTs has been well-assimilated, which increases the realism and applicability of the scenario. Second, the car rental context has been successfully used in prior SST failure research and proved a suitable context for establishing the relationships between SST-related factors (Dong et al., 2016; Zhu et al., 2013). The findings of this thesis are expected to be applicable to other SST settings, despite the research context being limited to a single SST setting (car-rental kiosk). This is because the thesis focuses on the cognitive factors related to customer perception of SST-based recovery (e.g., control, risk, efficiency, positive anticipated emotions) which should be relatively generalizable regardless of the specific characteristics of the SST context.

1.8.3. Data analysis

In the research surveys, previously used measurement scales were adopted to operationalize the constructs under study, including perceived control, perceived risk, efficiency, positive anticipated emotions, and sense of personal control. Hence, all scales used in the research were already validated by previous empirical data. Data was collected and analysed using SPSS, PROCESS macro in SPSS, and SmartPLS software. The statistical analysis techniques used to investigate the significance of proposed relationship are Partial least squares structural equation modelling (PLS-SEM), Hayes (2017) PROCESS, as well as ANOVA. PLS-SEM is a useful tool for estimating path coefficients and variances explained in endogenous latent constructs in complex models (Hair et al., 2011). Furthermore, PLS-SEM works well for small sample sizes and complex models, and requires no data distribution assumption (Reinartz et al., 2009). The PROCESS procedure (Hayes, 2017) is a useful tool for analysing mediation, moderation, and conditional process modelling. PROCESS estimates the coefficients of a model using ordinary least squares regression for continuous outcomes or maximum likelihood logistic regression for dichotomous outcomes. PROCESS also uses bootstrapping to estimate statistical significance of effects (Hayes et al., 2017). ANOVA, or Analysis of Variance is a statistical method used to determine statistical differences between two or more means (Kaufmann & Schering, 2014). ANOVA is one of the most commonly used statistical techniques for comparing the effects of two or more fixed groups (Kaufmann & Schering, 2014).

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1.9. Thesis structure

The rest of the thesis is structured as follows.

Chapter 2 - Paper 1

The first paper in this thesis develops a comprehensive conceptual framework that explains the customer decision-makings process leading to their intention towards using SST-based recovery. The framework is centred on the cognitive appraisal process that customers use to evaluate the SST failure and recovery solution. The cognitive appraisal process encompasses customer appraisal of SST failure and appraisal of SST-based recovery which are the two key variables in the framework. Individual characteristics are proposed as determiners of the customer cognitive appraisal process. The process of theorization also goes beyond existing knowledge in the SST domain and includes literature from different research areas (i.e., information technology adoption, service failure/recovery, psychological behaviour). Overall, the framework gives a comprehensive picture of the customer decision-making process for recovery choice, incorporating failure appraisal, recovery appraisal, as well as individual characteristics. To the best of my knowledge, this is the first attempt to provide a conceptual understanding of the cognitive appraisal process of customers during the SST failure and SST-based recovery process.

Chapter 3 - Paper 2

Paper 2 empirically tests a model on customer intention to use SST-based recovery which is a result of customer perceived control and risk. Drawing on control theory, perceived control and perceived risk are proposed key factors in a customer's decision towards using SST-based recovery. Furthermore, the mediating effect of perceived risk on the perceived control – intention relationship – is also proposed and tested. Results from an online panel

database provide support for the research model. The theoretical and practical implications of this study are then provided.

Chapter 4 - Paper 3

Adding to paper 2's findings, paper 3 continues to explore the important role of the key concept – perceived control. The paper explores the impact of perceived control on the customer's evaluation of firms' recovery solutions, in terms of efficiency and positive anticipated emotions, which, in turn, shape customer intention to use SST-based recovery. In addition, paper 3 goes a step further to examine the individual characteristics (personal control) that potentially impact the key concept of perceived control, hence providing a more complete view of the role of customer control in the decision to use SST-based recovery. The empirical results provide support for the proposed hypothesis. The paper provides important implications which could potentially aid SST managers with managing customer recovery perception and choice.

Chapter 5 - Conclusion

In this chapter, the research findings are discussed and linked to the thesis objectives. It also elaborates on the research contributions and limitations.

Statement of Authorship

Title of Paper	Understanding what determines customer recovery choice in a self-service technology failure

Publication Status	☐ Published ☐ Accepted for Publication
	☐ Submitted for Publication ☑ Unpublished and Unsubmitted work written in manuscript style

Publication Details	

Principal Author

Name of Principal Author (Candidate)	Nghi Thuc Le		
Contribution to the Paper	conducting literature review conception and design of the framework writing the manuscript		
Overall percentage (%)	80		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	20/05/2020

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i.   the candidate's stated contribution to the publication is accurate (as detailed above);

ii.   permission is granted for the candidate in include the publication in the thesis; and

iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Sally Rao Hill		
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Signature		Date	26/05/2020

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Contribution to the Paper	Conceptualisation; theorisation framing; write-up.		
Signature		Date	26/05/2020

Chapter 2: Paper 1- Understanding what determines customer recovery choice in a self-service technology failure

Abstract

The shift to self-service technologies (SSTs) has increasingly reshaped the service experience by changing the way various tasks are performed. One important progression of SST usage is the technology's application in SST failure recoveries. With the current expansion of SSTs and the associated risk of SST failures, SST-based recovery (a recovery solution in which the customer fixes the SST failure themselves through an SST interface) has been a promising tool for businesses. Yet, this innovative recovery option remains poorly understood by SST researchers. In response, this paper proposes an integrated framework that theoretically explains customer intentions to use SST-based recovery. The paper adapts a two-level cognitive model (failure appraisal and recovery appraisal) from stress and coping theory and articulates that customer appraisals of the characteristics specific to the SST failure and SST-based recovery play a determining role. The paper also discusses relevant individual characteristics that are important antecedents of customer cognitive appraisals. An important implication, illustrated via our framework, is that customer cognitive appraisal and its psychological underpinnings, as opposed to the actual characteristic of the situation itself, play a key role in determining customer recovery intentions. The paper also offers a salient agenda for future research.

2.1. Introduction

Customers today can choose from a diverse range of channels to purchase products and services. One such channel, increasingly gaining popularity, is the self-service technology (SST). Examples include banking (e.g., ATMs), airport check-in kiosks, supermarket check-

out lanes, self-service gasoline stations, online tax returns, online payments, online registrations, automobile licensing kiosks, and airport customs gates. Recently, the use of SSTs has extended beyond initial service delivery to the service recovery domain – in which SST enables customers to fix service failures by themselves, without employee assistance. For example, SST customers may follow an automatic help-guide to resolve a problem on their own, without the need for employee assistance. Specifically, this paper employs the term SST-based recovery to refer to any recovery solution in which customers resolve SST failures themselves using some form of technological interface (e.g., automatic help-guide, virtual onscreen assistant, robot, chatbot). SST-based recovery is potentially a valuable tool for managers. The rapid expansion of SSTs, together with the fact that SST failures are unavoidable, means that there is a growing need for SST managers to provides customers with effective recovery solutions unique to the SST context. SST-based recovery, which allows customers to solve their own transactional problems, is an effective measure for accommodating the lack of employee assistance in SST failures (Collier et al., 2017). Furthermore, the benefits of using SST-based tools have also been well-recognized (e.g., cost-effective, convenience). Hence, SST-based recovery can be a promising platform for service recovery. However, in the current SST recovery literature, little is known about SST-based service recovery and its nuances. While there have been studies on customer recovery in the SST context, these works have mainly focused on customer self-recovery without intervention from service providers (Nili et al., 2019; Zhu et al., 2013). Given that insights on how to encourage customers to use SST-based recovery can be of considerable value for SST services, research on SST-based recovery appears to be relevant and timely.

Within the SST recovery literature, three critical gaps can be identified. First, the existing studies on SST recovery have followed very fragmented and diverse approaches in their investigation of the phenomenon, with research tending to elucidate the phenomenon from

different perspectives. Three main groups of determinants can be identified, including SST-related characteristics (Fan et al., 2019; Zhu et al., 2013), SST failure-related characteristics (Dabholkar & Spaid, 2012; Mattila et al., 2009), and individual characteristics of customers (e.g., efficacy) (Dong et al., 2016). Though each of these perspectives individually contribute to the discipline, such a fragmented approach underlines the lack of understanding about the subject matter and hinders business implementation. This issue highlights a need for a substantial theoretical foundation that can unify the diverse perspectives and clarify theoretical confusions. Second, despite the practical value of using SST-based recovery, research into this phenomenon has been largely neglected in the literature. The existing research on SST recovery has mostly looked at recovery implemented by the service provider or service staff (Collier et al., 2017; Dabholkar & Spaid, 2012), while research on recovery that is carried out by customers themselves is sparse. The few exceptions that do look at customer recovery have mostly examined cases in which customers use their own resources to recover from failures (e.g., repeat the service process upon failure), without getting assistance from service providers The unique characteristics of SST-based recovery mean that while the available studies of other SST recovery options (i.e., those with human interaction or those with customer self-initiated attempts) may provide some useful findings, these findings are insufficient and could lead to an incomplete understanding of SST-based recovery. Hence, this underlies the necessity for research attention specifically targeting the context of SST-based recovery. Third, little effort has been made to extend the role of emotions in SST failure and recovery contexts (Gohary et al., 2016; Gyung Kim et al., 2010; Zhou et al., 2014). This lack of attention exists despite the role of emotions having been well-established in traditional service contexts, especially in service failure situations where customers are often emotionally affected (Mattila & Ro, 2008; Smith & Bolton, 2002; Strizhakova et al., 2012). Given the influential role that emotional components play in not only face-to-face experiences (i.e., customer and recovery service

staff), but in encounters between humans and technology (Brave & Nass, 2007; Peter & Beale, 2008), the lack of equivalent research studying customer emotions in the SST failure and recovery context is considered a significant gap.

To fill these gaps, an overarching framework focusing on SST-based recovery is developed, which seeks to unify and advance the existing theoretical understanding on the phenomenon. Our framework aims to:

(1)   develop an integrated conceptual analysis of customer intention to use SST-based recovery which coherently links the previously disparate elements in the literature (e.g., customer evaluation of failure-related, SST-related characteristics, as well as individual customer characteristics);

(2)   provide a comprehensive and concise conceptualisation of customer recovery appraisal which specifically caters to the SST-based recovery context. Particularly, our conceptualization of customer appraisal covers several relevant characteristics of the SST-based recovery that are appraised by customers;

(3)   extend the span of SST recovery literature to include the role of emotional components in shaping the customer decision-making process (e.g., which emotions are experienced as a result of SST failure and the role of those emotions in forming customer intentions);

(4)   advance a dynamic research agenda on this topic.

We draw on stress and coping theory (Lazarus, 2006), which delineates the cognitive appraisal process through which individuals evaluate events occurring to them, to provide the theoretical underpinning for the framework that incorporates customer failure appraisal, customer recovery appraisal, as well as the antecedent variable of individual characteristics. The framework provides a detailed discussion of the components of failure appraisal and

recovery appraisal, which together combine to make up the customer's cognitive appraisal process. Drawing on the literature of service failure, customer failure appraisal is proposed to encompass customer appraisal of causal agency and appraisal of outcome desirability specific to the SST failure situation. Emotions are posited to result from customer failure appraisal, which, in turn, drive customer intentions towards SST-based recovery. As for recovery appraisal, drawing on a value-based perspective, it is proposed that customer recovery appraisal of the SST-based recovery encompasses three aspects, namely, functional, social, and emotional values associated with the use of SST-based recovery. The value-based perspective has been well-utilised because of its ability to capture multiple facets specific to SST options (Collier & Barnes, 2015). Prior SST recovery research has predominantly focused on the functional or utilitarian-based aspects of SST recovery solutions. However, there has been evidence to suggest that, in a service recovery situation, customers might not be entirely driven by functional benefits, but also by the social and emotional benefits provided by the recovery (Collier et al., 2017; Forbes, 2008a; Gelbrich, 2009; Lu et al., 2012). Finally, individual characteristics are proposed to be antecedents of both customer failure appraisal and recovery appraisal.

The structure of the paper is as follows. We first provide a summary of relevant aspects of the stress and coping theory to set the stage for the development of the framework. An overview of the framework is then provided. Following this, we offer our conceptual framework and elaborate on the propositions, starting with the main focus of the framework – customer cognitive appraisal. This is followed by a description of individual characteristics. We conclude by summarizing the framework and its propositions. A discussion of the managerial implications as well as research agendas for future research on SST-based service recovery are provided.

2.2. Theoretical foundation

Using insights from stress and coping theory (Lazarus & Folkman, 1984a), it is posited that following SST failures, customers go through a cognitive appraisal process to assess the failure situation and decide how to recover the failure. Cognitive appraisal refers to an individual's evaluation of his or her environment in relation to its impact on his or her personal goals, values, and beliefs (Folkman, 2013). The cognitive appraisal model proposed by stress and coping theory has been widely applied in service failure research to explain a wide variety of customer behaviours, such as complaining intention, revenge, switching intention, and need for compensation (Sembada et al., 2016; Stephens & Gwinner, 1998; Zourrig et al., 2009). The cognitive appraisal process encompasses two elements: primary appraisal – individual evaluation of whether the event is harmful or threatening to one's personal stake, and secondary appraisal – individual evaluation of the possible coping options for dealing with the stressful event (Folkman, 2013; Stephens & Gwinner, 1998). Applying this to our context (i.e., SST-based recovery), primary appraisal is analogous to customer appraisal of the initial SST failure, that is, whether the SST failure is harmful or threatening. We, henceforth, refer to primary appraisal as 'failure appraisal'. On the other hand, customer secondary appraisals are equivalent to customer evaluation of the SST-based recovery options and refers to customer assessment of the benefits offered by SST-based recovery in addressing the SST failure. Hence, in this study, secondary appraisal is termed 'recovery appraisal'.

Stress and coping theory further proposes a systematic path from cognitive appraisal (what one thinks) to emotions (how one feels), and ultimately, to one's behaviour. According to the theory, individuals' appraisals of a situation generate the corresponding emotions they experience in the context (Lazarus, 1991). As each emotion, once aroused, carries a different motivating goal, the experience of emotions then motivates different behaviours. Hence, in the

context of this study, it is proposed that customer emotions are aroused following customer appraisal of the SST failure (failure appraisal). In turn, emotions are also proposed to be direct determiners of customer intentions to use SST-based recovery.

2.2.1. Overview of Conceptual Framework

Our framework proposes that the experience of SST failure leads customers to engage in a cognitive appraisal process, which encompasses both failure and recovery appraisal. The first component, failure appraisal, refers to the customer's assessment of the degree of harm or threat of the SST failure. Failure appraisal influences intentions through the elicitation of different emotions. Depending on the content of failure appraisal, negative emotions are generated, including anger, guilt and anxiety. Negative emotions, in turn, are proposed to directly shape customer intentions towards SST-based recovery. The second component of the customer cognitive appraisal process, recovery appraisal, consists of three distinct value dimensions: functional, emotional, and social. The framework proposes that recovery appraisal has a direct influence on customer intentions to use SST-based recovery.

Finally, because the cognitive process is dependent on personal beliefs and resources, the customer's appraisal of the SST failure, as well as SST-based recovery, can vary according to individual characteristics. The proposed framework incorporates individual characteristics as antecedents of customer cognitive appraisals so as to better account for individual differences in their cognitive appraisals. Individual characteristics shape customer failure and recovery appraisals by guiding the way customers interpret and evaluate the impact of the failure as well as the benefit derived from the recovery (i.e., social values, control-benefit) (Dabholkar & Bagozzi, 2002; Mattila & Wirtz, 2004; Meuter et al., 2005).
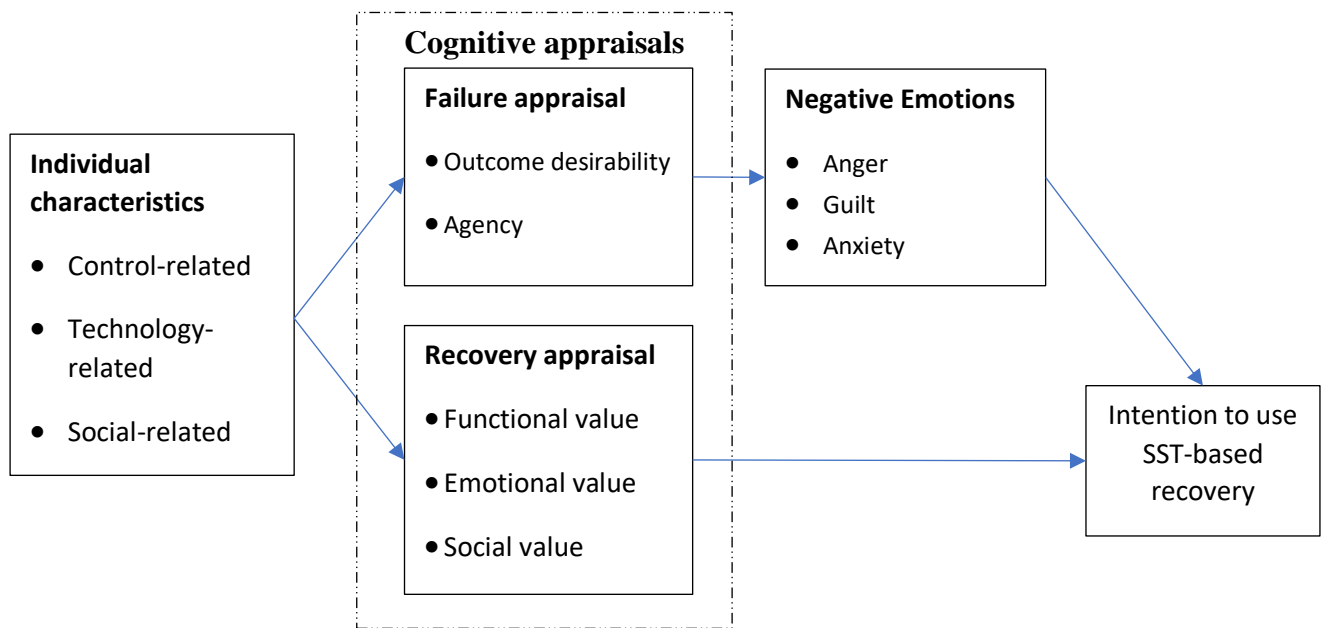
Figure 2-1: Conceptual framework

2.2.2. Failure appraisal

When considering their intention to use SST-based recovery processes, customers engage in a cognitive appraisal process in which they appraise both the SST failure (failure appraisal) and the SST-based recovery (recovery appraisal) (see Figure 2-1). This section begins by discussing failure appraisal. According to prior research, following a service failure, customers immediately engage in failure appraisal in order to assess the failure and its implications (Gabbott et al., 2011; Obeidat et al., 2017; Watson & Spence, 2007). Failure appraisal is defined as the customer's evaluation of the threatening and harmful effects of SST failures. Current service failure literature has provided extensive evidence on customer appraisals of service failure being the key factor involved in the customer's responses to service failures and recoveries (Gabbott et al., 2011; La & Choi, 2019; Sembada et al., 2016; Tsarenko et al., 2018; Tsarenko & Tojib, 2012).

Following stress and coping theory (Lazarus, 2006), failure appraisal encompasses two elements, namely outcome desirability and agency, which together shape customer perception

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of the failure severity. Research suggests that customer appraisal of service failure in terms of outcome desirability and agency are among the two important components in determining customer emotional response (Lee & Cranage, 2018; Nguyen & McColl-Kennedy, 2003; Stephens & Gwinner, 1998; Zourrig et al., 2009). Appraisal of outcome desirability refers to the overall evaluation of how positive or negative the outcome of the SST failure is, with respect to customer desire (Watson & Spence, 2007). The more the SST failure is appraised to be divergent from the customer's desired outcomes, the greater the customer's perceived harm and loss; hence, the more likely failure appraisal will be negative.

Moreover, customers also evaluate the SST failure by weighing the responsibility for the failure (Zhu et al., 2013). The second component of customer failure appraisal is agency appraisal which refers to customer assessment of who or what is responsible for the SST failure (Johnson & Stewart, 2005; Watson & Spence, 2007). Agency appraisal encompasses the controllability dimensions and reflects the entity that bears responsibility for the situation, not just simply the entity that causes the situation (Watson & Spence, 2007). Hence, an agent is responsible for an event if it is believed that they have control over the event, otherwise the event is attributed to circumstances. In the case of SST failures, customer agency appraisal can indicate that the agent responsible for SST failure is external, internal or circumstance-caused (Dabholkar & Spaid, 2012; Robertson & Shaw, 2009; Watson & Spence, 2007). Customers appraise the agent responsible for the failure to be external if they appraise that the SST failure is under the control of the service provider/staff and could have been prevented from happening (e.g., poor technology design and poor service policy) (Lee & Cranage, 2018; Liao & Cheng, 2013). In contrast, if the customer believes that the SST error is uncontrollable and that nobody bears the responsibility for the situation, then the causal agency is attributed to circumstances (circumstance-caused agency) (Iglesias, 2009). Finally, if the customer holds himself or herself responsible for the failure (e.g., customer mistake), then the agency is appraised as internal

(Robertson & Shaw, 2009; Zhu et al., 2013). The following section discusses the association between failure appraisal and customer emotions.

2.2.3. Emotions as results of failure appraisal

The next component in the conceptual framework (Figure 2-1) is emotions, which are proposed to be elicited by failure appraisal. Emotions are defined as a mental state of readiness for actions that are caused by individual appraisals of situations (which is the SST failure in the case of this study) (Bagozzi et al., 1999; Beaudry & Pinsonneault, 2010). Failure appraisal and its effect on emotions have been one of the major focuses of research on regular service failures (Scherer et al., 2001; Smith & Bolton, 2002). However, specific to the SST failure and recovery literature, while there have been some studies that give consideration to the nature of customer failure appraisal (e.g., Lee and Cranage (2018); Zhu et al. (2013)), few have considered the emotional consequences that arise from failure appraisal or the effects of this emotional response with regard to customer recovery choice. Furthermore, due to the unique setting of SST, the pattern of customer emotional responses to SST failures is different from that which occurs during regular services (Dabholkar & Spaid, 2012; Gelbrich, 2009). This difference invariably hinders the application of the established knowledge and literature about customer emotional response from regular service failure to SST failure contexts. This section will discuss customer emotions and how they arise from SST failure appraisal. An understanding of the emotional consequences of failure appraisal is important in studying the customer response since it may help marketers to better predict and explain customer behaviour in this setting. Prior research has suggested that emotions are better predictors of customer responses than cognitive appraisals, due to the motivational content of emotions (Bougie et al., 2003).

The current framework discusses negative emotions as a result of customer appraisal of SST failures. This is grounded on stress and coping theory which holds that emotions result from specific patterns of cognitive appraisals of situations (Lazarus, 2006). Even though emotions can be either positive or negative, service failures, which are usually undesirable experiences, generally elicit only negative emotions (Patterson et al., 2009; Smith & Bolton, 2002). The framework examines three specific negative emotions, namely anger, guilt, and anxiety. These emotions are included for their common association with service failures (Gelbrich, 2009; Johnson & Stewart, 2005; Obeidat et al., 2017; Stephens & Gwinner, 1998; Zourrig et al., 2009). The following section discusses how the two dimensions of failure appraisal (outcome desirability and agency) determine customer emotions in the context of SST recovery. Guided by stress and coping theory and the related literature on consumer emotion (Johnson & Stewart, 2005; Lazarus, 2006; Watson & Spence, 2007), it is proposed that whereas agency appraisal determines the specific emotions that are elicited (i.e., anger, guilt, or anxiety), outcome desirability appraisal determines the intensity of the elicited emotion. The section extends our previous knowledge of the effects of agency on emotions in service research, as that agency can be directed in multiple ways in the SST failure context. Insights on the effect of outcome desirability on emotion intensity are also extended from the perspective of service research to SST failure contexts.

2.2.3.1. Appraisal of agency and emotions

Agency appraisal identifies the target responsible for the failure and the target then becomes the focus of the elicited emotion. Drawing on prior service research, we know that when the agency for the negative situation is judged to lie with the external source (i.e., service provider and service employee), this creates a perception of injustice as well as negative evaluations towards the attributed source (Iglesias, 2009; Liao & Cheng, 2013). Such perceptions have been shown to elicit customer anger (Zourrig et al., 2009). Whereas in regular

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service, it is obvious where customer anger is directed (i.e., toward the service staff/ provider), in an SST context, the direction of that anger is less obvious. Consistent with service research, it is expected that when the agency appraisal of an SST failure is attributed to an external source, this will also evoke feelings of anger in the customer, directed at the SST or the organization associated with the SST. However, when the agency is attributed internally to the customer themselves, this leads to customers feeling responsible for the situation (Johnson & Stewart, 2005). To attribute an outcome to oneself implies that one has some level of control over the situation and is therefore more capable of doing something about it (Scherer et al., 2001). Such a sense of responsibility and the belief that something could be done about the SST failure is likely to compel customers to experience guilt rather than anger. Compared to regular service contexts, the co-producer role of the customer in SST transactions makes it possible and more likely for the SST customer to blame themselves for failures (Forbes et al., 2005; Harris et al., 2006; Zhu et al., 2013), which should increase the prevalence of guilt in this context. In line with the arguments above, it is proposed that, following an SST failure, appraisal of external agency should generate anger, while internal agency generates guilt.

Hypothesis 1: A customer's appraisal of an SST failure having external agency, will lead to the customer expressing anger as an emotional response

Hypothesis 2: A customer's appraisal of an SST failure having internal agency, will lead to the customer expressing guilt as an emotional response

Finally, agency appraisal which indicates that no person or object can be held responsible for the SST failure (circumstance-caused agency) is likely to make customers feel out of control of the situation, thinking that little can be done to alter the circumstances; this perception creates feelings of uncertainty and apprehension (Ellsworth & Smith, 1988; Watson & Spence, 2007). In addition, SST failures stemming from circumstance-caused agency are

also unlikely to induce negative customer evaluation of service firms (Liao & Cheng, 2013), hence are unlikely to elicit anger. As a result, customers who appraise an SST failure to be circumstance-caused are expected to develop feelings of anxiety, stemming from the uncertainty and lack of control associated with this agency appraisal. The occurrence of anxiety should also be more common in SST failures, because the lack of employee involvement and the ambiguity of the technological process may make it difficult to determine the actor responsible for the failure.

Hypothesis 3: A customer's appraisal of an SST failure having circumstance-caused agency, will lead to the customer expressing anxiety as an emotional response

2.2.3.2. *Appraisal of outcome desirability and emotions*

Customers generally enter a service experience with a predetermined expectation of desired outcomes and if the actual service outcome falls short, it will create perceptions of loss (e.g., loss of money, time, or psychological resources) (Smith et al., 1999b). According to stress and coping theory (Lazarus & Folkman, 1984a), such perceptions of loss should have a negative implication on customer personal stake, hence, induce the corresponding customer emotional response. Situations which diverge significantly from one's desired outcome thereby hold greater implication of loss and should result in more intense emotions (Johnson & Stewart, 2005; Watson & Spence, 2007). For example, with respect to loss of time, customers would experience a milder emotional reaction to a 10-minute delay (which causes a minor loss with regards to personal stake) than they would to a one-hour delay (which causes a significant loss). From these arguments, it is proposed that, the more the SST failure is appraised as being divergent from the customer's desired outcomes, the more intense the customer's emotions.

Hypothesis 4: The more negative the customer's appraisal of a desired outcome, the more intense their negative emotions.

2.2.4. Emotions affecting intentions

The conceptual framework (Figure 2-1) also discusses the direct role of emotions in influencing customer intentions towards using SST-based recovery. While the impact of emotions in regular service failure settings has been demonstrated (Bonifield & Cole, 2007; Donoghue & de Klerk, 2013; Johnson & Stewart, 2005), there is little understanding of the effect that emotions have on post SST failure and customer recovery decisions. The current framework is one of the first attempts to link a customer's emotional response to their intentions towards using SST-based recovery. This is considered quite a distinct scenario due to the different emotional response patterns to SST failures as well as the novelty of the SST-based recovery setting. For regular service customers, anger is generally the more common emotion resulting from service failure, due to the service customer's tendency to deflect responsibility for failure away from themselves while blaming external sources (e.g., service provider/staff) (Gelbrich, 2010; Poon et al., 2004). In contrast, the elimination of service personnel's role in the SST context makes it less likely for customers to blame the service person for SST failure and, therefore, feel angry toward service personnel and their associated organization. In addition, customers are more likely to accept responsibility for SST failures (Harris et al., 2006), and therefore experience feelings of guilt post SST failure. Moreover, feelings of anxiety are also more likely to occur during SST failure rather than regular service failure due to the lack of control typical in human-technology interactions (Meuter et al., 2003). The distinct differences with regard to the customer's emotional experiences during SST failure, as opposed to regular services, highlight the need for research into the role of emotions in customer behaviour in this context. While parallels with the general service failure literature will be drawn, where appropriate, the specific context of SST-based recovery will require distinct theorizing.

Our propositions to explain the relationships between emotions and customer intention towards using SST-based recovery are underpinned by stress and coping theory, which suggests that emotions specifically influence behaviour through the associated motivational goal carried by each emotion (Bagozzi & Pieters, 1998; Lazarus, 1991). Of the three understudied emotions, anger resulting from perceived other-responsibility motivates customers to express their emotions outwardly and directly at the source of anger. In the consumer literature, anger has been linked to confrontational goals, where customers seek to confront the responsible agent in order to vent their negative feelings or get back at the target (Zourrig et al., 2009). However, in the context of SST there is no agent present for the customer to vent their anger on (Gelbrich, 2010), and therefore there is a need to understand how anger is expressed and translated in the customer response to SST recovery. As such, it can be inferred that, following SST failures, angry customers will be less willing to proceed with the SST to fix the failure independently. This is also consistent with evidence of the association between anger and customer retaliatory behaviours such as revenge, negative word-of-mouth, and complaint behaviour (Bonifield & Cole, 2007; Bougie et al., 2003; Zourrig et al., 2009). Angry customers, motivated to retaliate against service firms for the failure, are more likely to look for service staff to vent their anger on, instead of fixing the failure by themselves. Hence, it is reasonable to assume that feelings of anger should lower customer intentions to use SST-based recovery.

Hypothesis 5: Feelings of anger associated with the SST failure will have a negative association with the customer's intention to use SST-based recovery.

Feelings of guilt, arising from perceived self-responsibility, motivates the person to alleviate their negative feelings by taking corrective actions as well as engaging in reconciliatory behaviours (Ellsworth & Smith, 1988; Li et al., 2010). Furthermore, as guilt

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stems from feelings of self-efficacy and control over the associated situation (as opposed to feeling helpless), such a feeling also facilitates the perception that one is capable of rectifying the situation (Bohns & Flynn, 2013; Duhachek et al., 2012). Indirect support for this claim can be found in the evidence that customer's self-blame for SST failure (i.e., guilt) is positively associated with customer belief in their effectiveness in resolving the SST problem (Zhu et al., 2013). Based on these findings, feelings of guilt are likely to drive SST customers to rectify the failure by themselves, not only because customers self-blame for the problem but also because of their perception that their action can resolve the problem. As a result, guilt should increase customer intentions to use SST-based recovery.

Hypothesis 6: Feelings of guilt associated with the SST failure will have a positive association with the customer's intention to use SST-based recovery.

Anxiety, which occurs when individuals perceive that the problem is out of everyone's control, is associated with feelings of helplessness, uncertainty and apprehension about the future (Grillon, 2008; Menon & Dube, 2004). Hence, feelings of anxiety tend to discourage actions while inducing avoidance, passivity and a loss of motivation (e.g., causing the person to withdraw or distance themselves from the problem) (Corr, 2011; Ellsworth & Smith, 1988). In an SST failure context, customers' feelings of anxiety towards the SST failure indicate that customers feel helpless and uncertain about the SST and the situation. Such perceptions, therefore, should discourage customers from trying to fix the failure by themselves, preferring to have service providers deal with it instead. This claim is consistent with previous findings on the need for the service provider to offer instrumental support to anxious customers (Gelbrich, 2009; Menon & Dube, 2004). Thus, it is proposed that anxiety is negatively related to customer intention to use SST-based recovery.

Hypothesis 7: Feelings of anxiety associated with the SST failure will have a negative association with the customer's intention to use SST-based recovery.

2.2.5. Recovery appraisal

The second part of customer cognitive appraisals is recovery appraisal. As can be seen from Figure 2-1, recovery appraisal is posited to directly determine customer intention towards using SST-based recovery. Recovery appraisal, in the context of this study, is defined as the customer's assessment of the effectiveness of SST-based recovery in terms of the value it offers. Within the SST recovery literature, while the notion of customer appraisal (i.e., perception, evaluation) of SSTs has been considered, research in this area has tended to focus exclusively on the functional-related qualities of SST (Dong et al., 2008; Zhu et al., 2013). This gap is surprising given how customers are not only motivated by the functional aspect but also by the social and emotional aspects of the recovery experience (Collier et al., 2017; Guo et al., 2016; Smith & Bolton, 2002). Hence, the current framework takes an integrated approach in its conceptualization of customer recovery appraisal, incorporating not only functional but also social and emotional aspects of customer appraisal of SST recovery. Specifically, we adopt a value-based perspective to conceptualize a three-component recovery appraisal that encompasses three different characteristics of SST-based recovery that customers consider in their appraisal of the recovery option, namely functional, emotional and social values (Sweeney & Soutar, 2001; Ulaga, 2003). The three value components reflect the benefits offered by the SST-based recovery option, which can be viewed as an exchange to compensate for the loss and harmful effects due to SST failures.

With SSTs being a utilitarian-focused service channel, it is unsurprising that SST recovery research has predominantly focused on the functional component of SST when studying recovery outcomes (Dong et al., 2008; Zhu et al., 2013). However, SST failure, being

a negative social experience, does not only affect customers in terms of functional consequences but also emotionally (i.e., negative emotional experiences) and socially (i.e., public embarrassment) (Collier et al., 2017; Forbes, 2008a; Gelbrich, 2009; Lu et al., 2012). As service recovery is meant as an exchange of gains that is equivalent to the loss from implications of service failure (Smith et al., 1999b), it is critical for the recovery to address all relevant implications of the failure on customers, hence, not just functionally but also socially and emotionally. In light of this, we propose that, in evaluating the effectiveness of the SST-based recovery, customers should appraise of the recovery option in terms of its functional, social and emotional values. These three values are equivalent to the negative implications associated with the SST failure experience, and therefore, should be addressed by the recovery solution. These three characteristics of SST-based recovery and their links with customer intentions are discussed in more detail next.

2.2.5.1. *Functional value*

Functional value is defined as customer anticipation of the prospective utilitarian outcomes (i.e., responsiveness, reliability, efficiency, ease of use) of the SST recovery option (Lin & Hsieh, 2011). Functional value refers to whether the recovery option serves its purpose (e.g., the SST-based recovery can actually correct the SST failure and process the customer's transaction) (Kao & Lin, 2016). As the customer's original goal for using SSTs is to attain desired service outcomes (Meuter et al., 2005), arguably, the functional value of the recovery option is the most relevant when a customer is considering their recovery choices. Consistently, past research about technological-based products and services have shown that customer evaluations of functional values of the self-service technologies serve as foundations for their appraisals as well as their intention toward using SST (Abbott, 1955; Davis, 1989; Venkatesh et al., 2003; Venkatesh et al., 2012; Wang et al., 2012). In a similar vein, in the case of SST

failure, customers are likely to rely on their appraisals of functional values as a basis for their SST recovery choice.

Hypothesis 8: Customer recovery appraisal of functional values is positively related to intentions to use SST-based recovery processes.

2.2.5.2. Emotional value

Another beneficial value that customers can gain from the SST recovery option is related to their emotions. Emotional value is the customer's anticipated emotional outcomes of performing the recovery process (Bagozzi et al., 2003; Perugini & Bagozzi, 2001). That is, the emotional value of the recovery option results from the cognitive appraisals about how one would feel upon using SST-based recovery. Emotional values in the context of this study, hence, can be considered equivalent to the concept of anticipated emotion (Perugini & Bagozzi, 2001). As a fundamental building block of human experience, emotions pervade every aspect of human interactions, be it between humans, or between humans and technology (Brave & Nass, 2007; Peter & Beale, 2008). In addition, as SST failure often elicits negative customer emotions, customer decision-making during or following service failure can be emotionally-driven (Chebat & Slusarczyk, 2005; Schoefer & Diamantopoulos, 2008, 2009). Thus, customers are likely to consider the emotional implication of the recovery option as they would prefer the option that can compensate for the emotional consequences resulting from the SST failure.

Moreover, when facing new or unexpected situations (i.e., SST failures and recoveries), customers typically have little information to draw on for making their recovery choice (especially in terms of functional characteristics), thereby they have to rely on their internal sources of information which includes their emotions and feelings (i.e., how will this recovery

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option make me feel?) (Homburg et al., 2006). Hence, we argue that customer appraisals of the emotional values of SST recovery choice will influence their recovery decision.

Hypothesis 9: Customer recovery appraisal of emotional values is positively related to intentions to use SST-based recovery processes.

2.2.5.3. *Social value*

Social value is another aspect encompassed in customer recovery appraisals. Social value can be defined as the customer's anticipated social outcomes of using the recovery option (Rintamäki et al., 2006). Specifically, social value relates to how the process of using the particular recovery option promotes the customer's self-image or personal values to others (i.e., gain acceptance, make an impression) (Rintamäki et al., 2006). SST failures, especially those that happen in public (i.e., onsite SSTs) can cause embarrassment to customers (Forbes, 2008a). This fact constitutes the social cost of the customer being perceived as incompetent by others. When this is the case customers will naturally put more emphasis on the social values associated with the recovery options so as to identify the best option that will compensate or address the social cost brought forth by SST failure. For example, Collier et al. (2017) found that SST failures which occur in the presence of others lead customers to seek recovery options that allow them to show a more socially desirable image to others around (i.e., being fully capable of using the SST to complete their transaction, without needing employee assistance). Furthermore, the determining role of social value also applies to SST failures that do not happen in the presence of others (service staff, other customers). This is because service or SST failures create either a perception of being treated unfairly (e.g., "This service provider does not respect me"), or of being technologically incompetent (e.g., "I am no good with technologies"), both of which threatens one's ego (i.e., ego identity, self-esteem, personal values) (Nguyen & McColl-Kennedy, 2003; Zourrig et al., 2009). As ego identity is a result of

customer self-evaluation, the effect of ego involvement threat remains, regardless of the presence of other people. As a result, it is intuitively evident that customers are bound to place greater priority on the social value of the recovery solution as a means of restoring their sense of social worth and, ultimately, boost their self-perception of ego identity (i.e., increase self-esteem). Hence, it is suggested that customer recovery appraisals in terms of social values influence customer recovery choice.

Hypothesis 10: Customer recovery appraisal of social values is positively related to intentions to use SST-based recovery processes.

2.2.6. Individual characteristics

Our framework proposes that individual characteristics influence customer failure and recovery appraisal. Individual characteristics influence the way customers interpret and evaluate the service failure as well as the values of the recovery option (Dabholkar & Bagozzi, 2002; Lee & Yang, 2013; Stephens & Gwinner, 1998). Due to personal idiosyncrasies, individuals make different subjective assessments of whether a service experience is considered threatening or harmful and which value of service recovery is important to them (Dabholkar & Bagozzi, 2002; Liang & Xue, 2009). While there is existing research on the role of individual characteristics in explaining consumer SST appraisals (or evaluations) (e.g., Blut et al. (2016); Dabholkar and Sheng (2009); Gelbrich (2010); Gelderman et al. (2011); Lee and Lyu (2016); Meuter et al. (2005)), it tends to focus on a limited set of individual characteristics, particularly on customer technology-related traits characteristics (e.g., Blut et al. (2016); Gelderman et al. (2011); Lee and Yang (2013); Macdonald and Uncles (2007); Wang et al. (2013)). To ensure a complete understanding of the role of customer characteristics within SST failure and recovery contexts, we synthesise into our conceptual framework both previously studied and new individual characteristics that have not been recognized in the context thus

far. Specifically, drawing on a wide range of literature (e.g., information technology, service consumer, and behavioural psychology) we identify three categories of individual characteristics that are relevant to customer cognitive appraisals, namely technology-, control-, and social-related characteristics. We discuss these three categories of individual characteristics and how they influence customers' SST recovery below in more detail.

2.2.6.1. *Control-related characteristics*

When it comes to cognitive appraisals of threatening and negative situations (i.e., service failures) the individual characteristic of control (i.e., personal control belief, desire for control, locus of control) has often been considered one of the most important determining factors (Skinner, 1996; Stephens & Gwinner, 1998). In the self-service context, a considerable body of research has identified that customer characteristics related to control (i.e., need for control, perception of control, control belief, locus of control, self-efficacy) are important determinants of customer evaluation of technological products and services (Bobbitt & Dabholkar, 2001; Chan et al., 2016; Chih-Hung Wang, 2012; Collier & Sherrell, 2010; Oyedele & Simpson, 2007; Robertson et al., 2016). The underlying mechanism behind this relationship is attributable to the implication of SSTs on the individual innate need for control. That is, SSTs allow customers to initiate and operate the transactional process at their own desired rates, which facilitates perceptions of having control over their environment, satisfying the customer's innate need for control. It is, thus, unsurprising that control-related characteristics are amongst the most important predictors of customer appraisals of SST (Dabholkar et al., 2003; Nysveen et al., 2005; Oyedele & Simpson, 2007).

We argue that control-related characteristics influence failure and recovery appraisals. The influence of control-related characteristics on individual behaviours has been found to be particularly relevant during stressful and undesirable events such as service failures (Deci &

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Ryan, 1985; Goldstein et al., 2002; Woodward & Wallston, 1987). It is well-established that high-control individuals are confident in their ability to exert control on their environment and expect positive outcomes from their actions (Chen, 2018; Folkman, 1984; Lachman & Firth, 2004). Hence, customers with high control-related characteristics will be more confident in their ability to exert control over and recover from an SST failure compared to low-control characteristic individuals. This should lead to more favourable appraisals towards the SST failure as well as the SST-based recovery from individuals with high control-related characteristics. As a result, customer control-related characteristics are expected to be a critical factor in predicting customer failure and recovery appraisals.

Hypothesis 11: Control-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery.

2.2.6.2. *Technology-related characteristics*

The next important variable in explaining the customer appraisal process in the SST failure context is customer technology-related characteristics. In the SST adoption context, it has been widely established that customer cognitive appraisals (or evaluations) towards SSTs are subject to customer technology-related characteristics (Alalwan et al., 2016; Blut et al., 2016; Ferreira et al., 2014; Lee & Yang, 2013). Some notable constructs for customer technology-related characteristics can be identified in the literature, namely technology readiness (Chen et al., 2013; Parasuraman, 2000), innovativeness (Gelderman et al., 2011), savviness (Macdonald & Uncles, 2007), and technology self-efficacy (Alalwan et al., 2016; Ozturk et al., 2016).

We argue that technology-related characteristics influence both failure and recovery appraisals. Customer technology-related characteristics directly reflect the customer's deeply held attitudinal beliefs regarding performance and outcomes of technology usage (i.e.,

technologies can be controllable or not, be easy to use or not) (Parasuraman et al., 2002). For example, a customer with a high (vs. low) level of technology readiness will hold positive (vs. negative) beliefs about the use of technologies as a result of their favourable (vs. unfavourable) experiences with using technologies in the past. Given individuals' tendency to evaluate experiences in a way that reinforce their prior held beliefs, customer technological-related characteristics are likely to influence customer cognitive appraisals of the SST failure and the expected outcomes of SST-based recoveries (Yen et al., 2004). Furthermore, individuals with high levels of technology-related characteristics tend to have better knowledge and confidence in their ability to perform technology-related tasks (Lin & Hsieh, 2007; Macdonald & Uncles, 2007), as well as to find these tasks less cognitively demanding (Dabholkar & Bagozzi, 2002; Ozturk et al., 2016). Thus, it can be inferred that these beliefs will induce customers with high-technological related characteristics to appraise the SST failure and SST-based recovery in a more favourable light compared to customers with lower levels of technology-related characteristics.

Hypothesis 12: Technology-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery.

2.2.6.3. *Social-related characteristics*

Aside from control- and technology-related characteristics, social characteristics also play an important part in shaping customers' appraisals in the SST failure and recovery context. We identify two relevant social-related characteristics that impact customer failure and recovery appraisals, namely, social anxiety and the need for human interaction. Firstly, the need for human interaction has been a frequently discussed factor in SST research. The characteristic is defined as the importance of human interaction to the customer (Dabholkar, 1996). It has been established that a need for human interaction lies in parallel with avoiding

technology-based services (Dabholkar & Bagozzi, 2002; Gelderman et al., 2011; Lee et al., 2010; Lee & Lyu, 2016; Lee & Yang, 2013). This is because customers with a high need for human interaction lack intrinsic motivation to use technology-based options as this option is not compatible with their personal values (Dabholkar & Bagozzi, 2002). Thus, when an SST failure happens, such individual characteristics may instigate negative appraisals towards the SST failure as well as the SST-based recovery option.

Compared to the need for human interaction, social anxiety falls on the opposite end of the spectrum and describes the individual tendency to avoid social situations for fear of being evaluated negatively as a social object (Fenigstein et al., 1975; Miller & Ross, 1975). Being averse to social interaction, customers with high levels of social anxiety tend to avoid high-contact services (Bearden et al., 1998). Hence, it is likely that social anxiety may deter customers from getting help from service personnel following SST failure, and thus, show a stronger preference for SST-based recovery where there is low human interaction. Alternatively, in situations where others are watching, social anxiety may disorient customers and make SST usage seem more difficult (Demoulin & Djelassi, 2016). Thus, this negative impact of social anxiety may influence customer evaluations of both the SST failure and SST-based recovery. Overall, we propose that social-related characteristics (e.g., social anxiety and need for human interaction) have an impact on the customer failure and recovery appraisals.

Hypothesis 13: Social-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery.

2.3. Conclusion

2.3.1. Summary of the Conceptual Framework and its theoretical implications
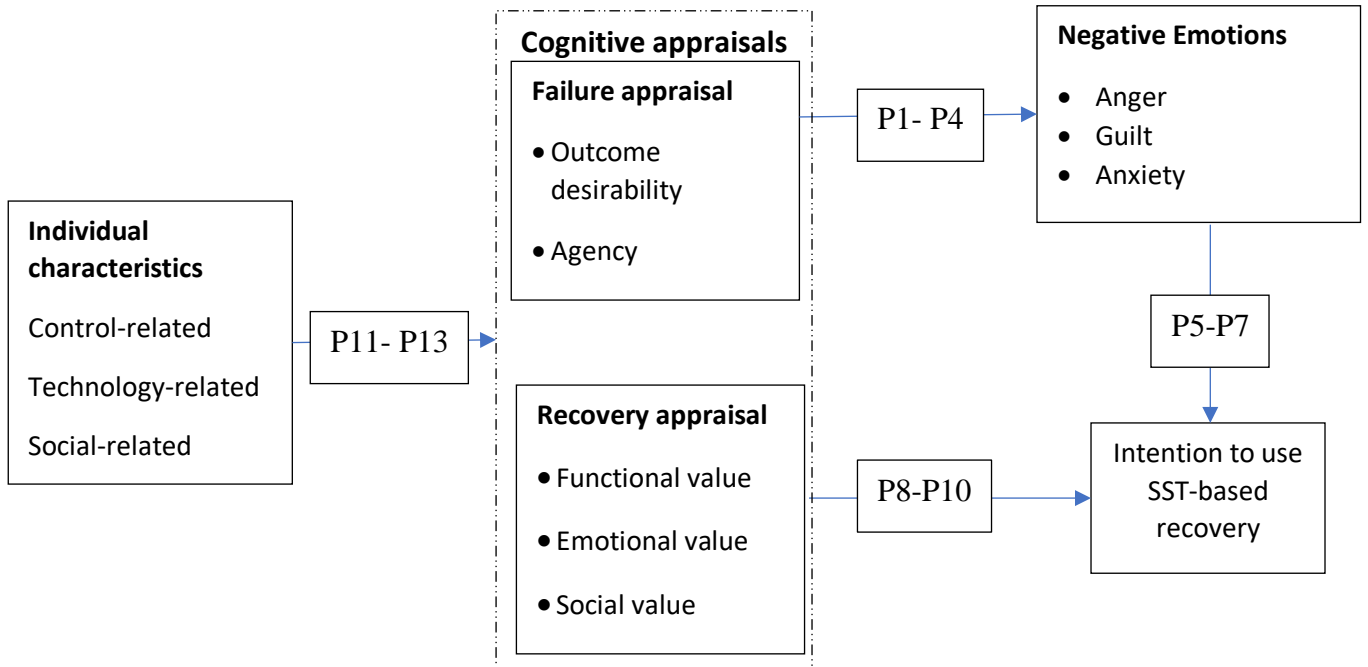
Figure 2-2: Conceptual framework and linked **hypotheses**

Table 2-1: List of **hypotheses**

Elements in framework	Hypotheses
Failure appraisal and emotions	**Hypothesis 1:** A customer's appraisal of an SST failure having external agency, will lead to the customer expressing anger as an emotional response
	Hypothesis 2: A customer's appraisal of an SST failure having internal agency, will lead to the customer expressing guilt as an emotional response
	Hypothesis 3: A customer's appraisal of an SST failure having circumstance-caused agency, will lead to the customer expressing anxiety as an emotional response
	Hypothesis 4: The more negative the customer's appraisal of a desired outcome, the more intense their negative emotions.
Emotions and Intentions	**Hypothesis 5:** Feelings of anger associated with the SST failure will have a negative association with the customer's intention to use SST-based recovery.
	Hypothesis 6: Feelings of guilt associated with the SST failure will have a positive association with the customer's intention to use SST-based recovery.
	Hypothesis 7: Feelings of anxiety associated with the SST failure will have a negative association with the customer's intention to use SST-based recovery.
Recovery appraisal and intention	**Hypothesis 8:** Customer recovery appraisal of functional values is positively related to intentions to use SST-based recovery processes.

	Hypothesis 9: Customer recovery appraisal of emotional values is positively related to intentions to use SST-based recovery processes.
	Hypothesis 10: Customer recovery appraisal of social values is positively related to intentions to use SST-based recovery processes.
Individual characteristics and cognitive appraisals	**Hypothesis 11:** Control-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery.
	Hypothesis 12: Technology-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery
	Hypothesis 13: Social-related characteristics influence a customer's appraisal of *both* the SST failure and SST recovery.

This research has conceptualized a new framework for understanding customer intention to use SST-based recovery. The rapid expansion of SSTs and the corresponding risk of SST failures without employee support (Robertson et al., 2012) highlights the importance of the SST-based tools in service recoveries (i.e., SST-based recovery) which allow customers to resolve the failure independently. Moreover, the advantage of SST-based recovery do not only come from the recovery's suitability for the SST services context (i.e., devoid of personal support, technology-based), SST-based recovery also enables customer participation in the recovery process, which provides several benefits (i.e., increased customer empowerment, trust in SSTs, and satisfaction) (Esmark et al., 2016; Fuchs et al., 2010; Harrison & Waite, 2015; Pranic & Roehl, 2012). Hence, motivated by the important implications of SST-based recovery and the corresponding lack of research, the paper provides a unified and grounded theoretical

frame that embodies 13 fundamental **hypotheses** specific to customer intention towards using SST-based recovery (Table 2-1).

The framework proposes that following an SST failure, customers conduct cognitive appraisals to assess the situational factors (SST failure and SST-based recovery) to determine their intention towards using SST-based recovery. Failure appraisal encompasses two components – appraisal of agency and appraisal of outcome desirability. The content of the failure appraisal elicits different emotions, which then influence customer intentions towards SST-based recovery. Recovery appraisal integrates three components, namely functional, emotional and social values of SST-based recovery. Each of these values plays an important role in shaping customer intentions towards using SST-based recovery. Finally, individual characteristics combine to determine how the individual customer appraises the SST failure and the values offered by SST-based recovery (Dvořáková et al., 2019; Stephens & Gwinner, 1998). Individual characteristics that are relevant to this understudied scenario can be categorized into three groups, namely control-, technology-, and social-related.

The framework provides three theoretical contributions. First, we develop an integrated conceptual analysis of customer intention to use SST-based recovery, which coherently links the previously disparate elements in the literature. Using insights from stress and coping theory, the framework organizes the various characteristics of SST failure and SST-based recovery that are appraised by customers into two components of cognitive appraisal process, namely failure appraisal and recovery appraisal. The framework also accommodates the relevant individual characteristics and their relationship with customer cognitive appraisals. In developing the framework, a multidisciplinary approach was adopted which integrates different streams of literature, including service failure and recovery, user acceptance of information system (IS), SST failure and recovery, and behavioural psychology. The paper contributes to the SST literature by being amongst the first to propose an integrated framework

that defines and integrates the dispersed set of elements that determine customer SST recovery choice into a single framework.

Second, the framework also advances current SST recovery research by verifying and shaping an integrated conceptualisation of customer SST-based recovery, which covers the relevant characteristics that may or may not have been considered by previous research. The conceptualization of the recovery appraisal integrates all functional, social and emotional values of SST-based recovery. With this, the paper challenges the functional-based focus that prevails in most models of SST recovery research. The framework suggests that in complicated and negative consumption situations, such as SST failure, customer decision-making is influenced by different aspects of the service recovery option, rather than just its functional properties.

Third, the framework highlights the role of emotional components (i.e., specific emotions resulting from failure appraisal and emotional values of SST-based recovery). In the SST context, emotional components have been the least studied element when explaining customer recovery decisions and outcomes. However, evidence suggests that SST failures elicit emotional responses from customers (Gelbrich, 2010; Krone et al., 2002), which should invariably affect customers' responses to firms' recovery efforts. Hence, by providing new perspectives on the role of emotional components and the relationship with other well-studied components in the literature, the current framework reinforces the robust role of the emotional component in consumer behaviour.

2.3.2. Managerial Implications

From a practitioner's perspective, as service personnel are not always available to address SST errors immediately (Forbes, 2008b), SST-based recovery which lets customers

recover without employee assistance is undeniably an ideal recovery solution. SST-based recovery provides a range of benefits to firms, particularly with regard to lower financial costs and positive productive outcomes (i.e., service flexibility, reduced-labour cost). Given the benefits of implementing SST-based recovery, it is logical for SST managers to take the first step in designing effective SST-based recovery strategies that cater to customer needs, and developing effective marketing strategies that encourage customers to use SST-based recovery. Hence, this paper, which offers insight into the influence of different factors on customer evaluation of and intention to use SST-based recovery, provides important guideline for service managers in deriving strategies and tactics for successful use of SST-based recovery.

From a managerial perspective, this research sheds light on possible recovery strategies that align with customer appraisals of the SST failure and the recovery options. The current research provides three specific implications. First, our framework focuses on the important role of customer cognitive appraisals which is a process that relates to the customer's internal processing and may not necessarily reflect the actual situation. This suggests the need for effective strategies that can influence the customer's internal processing. As an example, this can be achieved via communication tools that can directly communicate the values and benefits of recovery option to customers, as it is primarily customer cognitive perceptions rather than the actual situation that determine their recovery choice. Second, in shaping customer intention towards using SST-based recovery, the framework identifies three important components of customer recovery appraisals, namely functional, emotional, and social values of SST-based recovery option. This is a strong hint to SST managers that, besides from the necessary functional values, emotional and social values should also be consciously incorporated into the design of SST and its recovery process. To invariably focus on only one of the three aspects of the recovery process may result in only partially succeeding in fulfilling customer needs. SST managers can facilitate this by involving and consulting customers in the design of the SST

recovery process to ensure that it addresses relevant needs. The utilization of all three values ensures the effectiveness of SST-based recovery in addressing all relevant implications of SST failure, therefore better motivating customers to use the option. Third, the paper also highlights the need to develop recovery solutions that are tailored to individual characteristics (i.e., control-, social-, and technological-related characteristics) as those are important determining factors of customer cognitive appraisals. By understanding the unique dynamics between a customer's individual differences and their appraisals, management can establish effective recovery strategies tailored to each customer. Overall, from a managerial perspective, our research highlights the benefits of a customer-centred approach (e.g., cognitive process and individual characteristics) in the design and implementation of recovery strategies.

2.3.3. Developing a research agenda for SST recovery

This paper takes an important step towards a comprehensive framework for SST recovery. While SST literatures that investigate the determinants of SST usage have mainly focused on the functional or utilitarian aspects of customer use of SST options, this paper presents a well-integrated approach in examining customer appraisals and decision-making. We incorporate the roles of both cognition and affect in our investigation of customer cognitive process following SST failures. The next step is to empirically examine and further develop the theoretical framework. Table 2-2 provides suggestions for future research, using our theoretical framework as a basis. Additionally, as our framework does not explore the potential impact of contextual/situational factors, future research can further develop the proposed framework by incorporating these elements. Our framework offers promising research opportunities across a broad spectrum of SST use contexts (e.g., complex non-routine versus simple, routine SST, internet versus non-internet SST, remote SST) as well as failure types

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(e.g., technological failure, customer failure, company policy/design issues) (Forbes, 2008b; Forbes et al., 2005; Lee & Cranage, 2018; Robertson et al., 2016).

Table 2-2: Future research opportunities in SST recovery

Research Framework Elements	Research Opportunities
Individual characteristics	• What are the relevant individual characteristics that determine customer cognitive appraisals of SST failure and SST-based recovery? • What role do individual characteristics (e.g., control-related, social-related, technological-related characteristics) play in determining customer cognitive appraisals and recovery intention? • To what extent do they contribute favourably or negatively to customer cognitive appraisals and recovery intention?
Cognitive appraisals and emotional responses	• How do failure and recovery appraisals impact customer recovery choice? • Do certain aspects of customer appraisals (failure and recovery appraisals) tend to impact customer recovery choice more predominantly? • What is the role of emotions in customer recovery choice? • When and how (in terms of failure and recovery situations) should firms offer SST-based recovery as an option to customers?

Outcomes of SST-based recovery	• What are the post-recovery outcomes (e.g., empowerment, satisfaction, trust) associated with different recovery options and how does one measure those outcomes?
	• How do different recovery options affect each outcome differently?
	• How do different options for SST recovery affect outcomes differently, depending on individual characteristics?
	• Does delivering a more personalized SST recovery (recovery that caters to customer failure/recovery appraisals and individual characteristics) offer higher value to customers and thereby foster stronger loyalty?
	• Alternatively, what recovery approaches or strategies can be used to improve the recovery outcomes?

The advancement of SSTs is increasingly reshaping the customer service experience by changing the way various tasks are performed. One important progression of SST has been the application of SST-based tools to let the customer resolve SST failures by themselves (SST-based recovery). Given the shift from service personnel to SST, together with the well-recognized benefits of SST tools, SST-based recovery has been a promising platform for resolving SST failures. Motivated by the potential of SST-based recovery application in service management, the proposed framework is built on the SST-based recovery context. This paper provides an integrated and grounded theoretical lens, analysing the determinants of customer recovery choice. Specifically, it draws on different streams of literature (i.e., service failure, technology adoption, SST, and behavioural psychology) to identify various types of determining factors and synthesizes these dispersed insights into a framework of SST-based recovery. The paper specifically highlights customer cognitive appraisals, which may not be

something immediately obvious to service providers, nor the necessity for its investigation. However, understanding customer cognitive appraisals is imperative as it is only through this knowledge that we are able to draw an extensive explanation for how customers come to choose recovery options. This makes the understanding of the customer cognitive process imperative for developing service recovery strategies. Based on the proposed conceptual framework, future research could investigate the hypothesized relationships across different contextual backgrounds. Service managers could also take advantage of the framework to develop effective SST recovery strategies with a customer focus.

Bridging from paper 1 to paper 2

In paper 1, a conceptual framework has been presented, which delineates main drivers of customer intentions towards using SST-based recovery, namely individual characteristics, failure appraisal, recovery appraisal, and emotions. Following this, paper 2 takes an empirical approach and takes the first step towards empirically examining the role of recovery appraisal in customer intention to use SST-based recovery. Upon considering whether to use the SST following a failure experience, an evaluation of SST-related characteristics has been identified that they are important factors in customer intentions (Zhu et al., 2013). Consistent with this, the current research prioritises recovery appraisal in examining customer intention towards using SST-based recovery.

Recognizing the importance of customer recovery appraisal in determining recovery choice, paper 2 specifically investigates two key but understudied components within recovery appraisal: perceived control and perceived risk, both of which represent functional values of SST-based recovery. While emotional and social values are deemed to be important components of recovery appraisal, this preliminary investigation prioritised understanding the functional value, as it is deemed to be the most pertinent in the simple contextual example investigated (i.e. car rental). Perceived control is proposed to be a key factor determining customer intention towards using SST-based recovery. When a service failure occurs, it is likely to threaten the customer's sense of control, leading to a tendency to avoid the technology altogether. Perceived control over the SST-based recovery, hence, should play a key role in determining whether the customer is willing to stay with the SST and use the SST-based recovery. Along with perceived control, perceived risk is also included as an antecedent of customer intention towards using SST-based recovery. Perceived risk is included as it captures the intangible and uncertain nature of SST-based options (Kleijnen et al., 2007), and is

especially relevant to the SST-based recovery context. Furthermore, perceived risk is one factor that has commonly been tightly linked to perceived control. Control theory was used to explain the mechanism behind the importance of perceived control and perceived risk in customer decision-making in the SST recovery context.

Statement of Authorship

Title of Paper	Perceived control and perceived risk in self-service technology recovery
Publication Status	☐ Published ☑ Accepted for Publication ☐ Submitted for Publication ☐ Unpublished and Unsubmitted work written in manuscript style
Publication Details	Le, N., Rao Hill, S. and Troshani, I (forthcoming). Perceived control and perceived risk in self-service technology recovery, Journal of Computer Information Systems.

Principal Author

Name of Principal Author (Candidate)	Nghi Thuc Le
Contribution to the Paper	conceptualizing and designing the research model and the data collection process acquiring research data analysising and interpreting research data writing the manuscript
Overall percentage (%)	55
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.
Signature	Date 25/05/2020

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);

ii. permission is granted for the candidate in include the publication in the thesis; and

iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

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Contribution to the Paper	Conceptualisation, theorisation framing; argument construction; write-up and revision.
Signature	Date 26/05/2020

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Contribution to the Paper	Conceptualisation; theorisation framing; contribution construction; argument construction; write-up and revision; handling submission and resubmission.
Signature	Date 26/05/2020

Chapter 3: Paper 2 - Perceived control and perceived risk in self-service technology recovery

Abstract

The widespread use of self-service technology (SST) has changed the way customers experience service encounters and how they deal with service failure and recovery. Indeed, a growing number of service providers now offer SST-based recovery options that allow customers to fix service failures using SST-enabled applications. Yet, gaining customer acceptance for this emerging form of service recovery presents challenges to service firms. There is a need to improve current understanding of the factors that influence customer decisions. Drawing on control theory, the study examines the role of customer perceptions of control and risk in determining intention towards SST-based recovery. We provide empirical evidence that perceived control and risk over SST-based recovery significantly influence the intention of consumers to use this recovery option. Additionally, we find that whilst perceived risk of SST-based recovery mediates the effect of perceived control on usage intention, personal control moderates the relationship between perceived risk and intention to use SST-based recovery.

3.1. Introduction

Self-service technology (SST) is being increasingly used across a wide range of industries for its benefits to both customers and service providers. SSTs include ATM, self-service checkout kiosks at supermarkets, and self-check-in kiosks at airports. For customers, SSTs offer value in terms of empowerment, service speed and customization while for service providers service improvements materialise as efficiency, reliability, and reduced operational cost (Harrison & Waite, 2015; Lee & Allaway, 2002; Meuter et al., 2005; Walker et al., 2002).

As use of SSTs becomes increasingly pervasive, many service providers are also using the same technology-enabled platform for recovery from SST-based service failure. SST-based recovery, or recovery in which customers recover from SST service failure by using SSTs, is becoming increasingly promising for service providers. Specifically, customers using SST-based recovery can rely on the same forms of technology-enabled interfaces (e.g., automatic help-guide, virtual onscreen assistant, chatbots) to fix problems they encounter instead of seeking human service for recovery. Indeed, SST-based recovery is becoming particularly important given the unprecedented growth of SSTs (Nili et al., 2019; Simon & Usunier, 2007; Zhu et al., 2013). SST-based recovery offers many of the same advantages as SSTs in service delivery. As such, it is highly beneficial to service providers to improve SST uptake for both service provisioning and recovery when failures occur, reducing or even potentially eliminating reliance on human service.

Much of prior SST research has looked at the motivating factors for customers in choosing SST-based services over traditional services. However, prior research predominantly focuses on SST adoption while little research has explored what customers do and their underlying motivations when SSTs fail during service delivery (Collier et al., 2017; Nili et al., 2019; Zhu et al., 2013). Furthermore, the limited research focusing on SST recovery has mostly looked at recovery implemented by the service provider or customer service staff (Collier et al., 2017). There appears to be limited research on recovery that is carried out by the customers themselves. Whilst there are exceptions looking at customer recovery (Nili et al., 2019; Zhu et al., 2013), these works have examined only the cases where customers use their own resources to recover from failure (e.g., repeat the service process upon failure without seeking help from service providers). Research into how customers use SST-based recovery after SST failure has been largely neglected in the literature. This gap is problematic, as gaining a better understanding of SST-based recovery is crucial, given the expanding role of SSTs in the service

provisioning landscape, and the ongoing reduction of service personnel available to support SST failures. Indeed, if not properly managed by service providers, SST failure can result in customer dissatisfaction and missed sales opportunities, which go beyond technology abandonment implications, common to traditional technology adoption settings (Zhu et al., 2013).

Importantly, SST failure recovery is unique for many reasons. First, extant research has established that SST failure recovery is often ill-defined, open and challenging, which may involve solutions that are not clear cut, based on ongoing interaction between affected customers and tools accessible to them at point of failure (Nili et al., 2019). Specifically, the source or cause of failure can be difficult to identify and may be attributable to many factors, ranging from poor technology design to errors made by customers (Meuter et al., 2005; Zhu et al., 2013). Similarly, outcomes are likely to be unpredictable or uncertain at the time of failure. That is, outcomes can range from failure recovery using SST, to identification of workaround solutions that do not necessarily address the failure completely, to abandonment of attempts to recover from the failure (Nili et al., 2019).

Second, SST failure is a perceptual phenomenon. That is, SST failure is the gap or discrepancy between the customer's service expectation and their perception of the service they actually receive. This calls into question whether an SST failure actually occurred (or not). There is evidence that customers using SSTs often misunderstand both SSTs and failure due to their limited knowledge, experience, and skills (Nili et al., 2019). Third, existing self-service research is often based on assumptions that self-service customers are passive and attribute blame of failure to others when self-service failures occur. Recent SST research has challenged these assumptions by finding that (i) customers are active in service recovery because service failure heightens the need customers have to restore control lost due to the failure (Guo et al., 2016), and (ii) when SST failures occur customers tend to attribute blame for the failure to

themselves (as opposed to the service provider or their support staff), which also means that customers are more likely to assume greater responsibility in the service recovery process (Harris et al., 2006; Zhu et al., 2013).

To address this shortcoming, we focus on SST-based recovery where customers use the SST platform as means of recovering from failure. The present study seeks to answer the broader question: '*What are the underlying factors that guide customer choice to use SST-based recovery?*' Specifically, we examine the role of perceived control and perceived risk in customers' choice for SST-based recovery. We assess how perceived control influences perceived risk, and how both affect customers' intention towards SST-based recovery. Furthermore, we also examine the moderating role of customer personal control in the relationship between perceived risk and intention to use SST-based recovery.

We use control theory to inform our study. Control theory uses the negative feedback loop as a central means for explaining human action (Klein, 1989). Specifically, the negative feedback loop models how an individual's perception of the discrepancy between actual and desired states can motivate ensuing behaviour (Guo et al., 2016; Landau et al., 2015; Latham et al., 2018). Using control theory as a foundation, we propose that customer motivation to reduce this discrepancy activates factors that either help customers gain control (perceived control) or reduce risk of further loss (perceived risk).

Overall, the key contribution of the study is threefold. First, we enhance current understanding of failure recovery with SST. SST use for service and recovery is becoming increasingly pervasive whilst current understanding of SST-based recovery remains limited. We contribute by offering a nuanced understanding of key recovery drivers that operate in the unique and under-researched SST failure context. Second, we highlight the effectiveness of control theory to explain the important role of customer perception of control and risk in the

context of SST failure and recovery, thereby both validating this theory in the emerging SST-recovery setting but also offering novel explanations for customer behaviours in this setting. Third, the study contributes to the literature analysing the effect of perceived control and perceived risk on the customer's intention to use an emerging form of SST-based recovery. Our contribution to the improved understanding of the unique role of risk and control can help management better design and implement SST-based recovery strategies that cater to the unique context of SST failure. Through control theory, we explain how SST failure represents a largely different setting from SST adoption. Thus, management must better understand customer motivations for choosing SST-based recovery and how these differ from traditional recovery. Consequently, the strategies to promote customer adoption of SST-based recovery may have to be altered accordingly.

The paper is structured as follows. We first introduce control theory and discuss how it is used to explain the proposed model of the study. Next, we present the constructs in our model and hypothesised relationships. We then discuss our method and findings before concluding the paper with key implications.

3.2. Theoretical background and hypothesis development

3.2.1. Control theory: how SST failures can increase motivation for control

Control theory (also known as cybernetic theory) was originally developed to explain self-regulating systems. Early use of the theory can be traced back to the work of Weiner (1948) and it was later adopted in cybernetic engineering research (e.g. Locke (1991); Powers (1978)). These works applied control theory and its underlying self-regulation idea to mechanical systems and inanimate objects, such as thermostats and torpedo systems. For example, a thermostat (the object) compares environment temperature (i.e., input) to a pre-set temperature (standard), and invokes programmed action (i.e., output) when a discrepancy is identified.

In a landmark study, Carver and Scheier (1982) adapted control theory in their attempt to explain social psychology phenomena observed in human behaviour. They argue that self-regulation can explain the functioning of human behaviour. Specifically, they operationalise self-regulation by using the notion of the negative feedback loop, a key motivating factor of human action (Hyland, 1987; Klein, 1989). Accordingly, a negative feedback loop occurs when an individual (object) identifies a discrepancy between the outcome of their behaviour (input) and their goals (standard). Under these conditions, an individual attempts to reduce the discrepancy by either increasing effort to meet the goal or by changing the goal (output) (Klein, 1989). Unlike earlier applications of control theory with inanimate objects, human volition, intentionality and cognitive judgement (the comparator) play a key role in the ongoing assessment of discrepancies (Latham et al., 2018).

We adopt control theory to explain the role of perceived control in the context of SST failure. Accordingly, customer control and risk perceptions play important roles in the context of SST failure and recovery. We apply the negative feedback loop to explain how behaviours of SST users are formed as they interact with their SST environment when failure occurs and the effects that emerge as a result of the failure (Carver & Scheier, 1982, 2001). We argue that the feedback loop can effectively explain the importance of the effect of perceived risk and perceived control on customer behaviour when applied in the context of SST failure and recovery. Accordingly, when SST failures occur, customers fail to manage their environment to achieve their desired outcome (e.g., a service consumption goal). A key implication of this outcome is that it diminishes customers' perceptions of control over their environment. Using SST to recover from failure may be seen by customers as a vehicle that helps restore their sense of control and empowerment when it has been damaged due to the SST failure (Guo et al., 2016; Karande et al., 2007).

Specifically, our argument is that control theory's negative feedback loop becomes operational when perceptions of control loss cause a discrepancy between the customer's existing state, i.e., the point when they have experienced SST failure (input), and the state in which they wish to be (standard). The discrepancy triggers behaviours (output) that aim to alter the control level at failure in order to achieve the desired state. Attempts to increase control by using SST as the means available to a customer to recover from failure to achieve a desired state are reasonable, based on the current assumptions that SST customers are active and responsible in their role in recovery (Harris et al., 2006; Zhu et al., 2013). So, a customer may attempt to use the SST as a means to recover from service failure, a behaviour that would make them feel they are back in control or that they are doing something to reduce the risk of further control loss. This means that the customer perceptions of control and risk over SST-based recovery directly determine recovery intention. That is, to increase perceived control when it has been lost due to the SST failure, a recovery option might be perceived as a means of regaining control as well as reducing the risk of further loss of control.

3.2.2. Perceived control

Perceived control is an important factor to SST customers. In this study, perceived control over SST-based recovery refers to customer's situational assessment of the amount of control they have over the process and outcomes of SST-based recovery (Collier & Barnes, 2015; Hui & Bateson, 1991). As service providers hand over control to SST customers, the role of the customer's perception of control has often been highlighted in the SST literature (Collier & Barnes, 2015; Collier & Sherrell, 2010; Guo et al., 2016; Lee & Allaway, 2002). SST customers are prone to put greater emphasis on the idea of control as they take on greater responsibilities for their transactions (Collier & Sherrell, 2010). The increased control offered by SST serves as a major contributor to the customer's willingness to consider shifting from

human services to SST-based services. Arguably, SSTs heighten customer perceptions of control over service encounters with humans (Lee & Allaway, 2002). In SST failure and recovery contexts, this important role of perceived control is accentuated because the loss of control during SST failure may trigger motivation for control during the recovery process (Guo et al., 2016; Landau et al., 2015). This suggests that one could expect that a customer assessment of their level of control over the recovery process should have a significant impact on their recovery decision.

Empirically, research has shown a positive association between perceived control and SST-related outcomes (Collier & Sherrell, 2010; Lee & Allaway, 2002; Pavlou & Fygenson, 2006). For example, Collier and Barnes (2015) found that customer perceived control over the SST option increases customer perception of SST efficiency or the optimization between SST performance and the required amount of customer resources. Similarly, perceived control over SST was found to increase perceptions of SST quality (Fernandes & Pedroso, 2017). Meanwhile, Marzocchi and Zammit (2006) acknowledge that perceived control over SST has a positive influence on satisfaction with SST. These studies provide evidence that customers tend to have greater motivation for control over their SST-based service experience and that their perceived control conjures a positive impact on their evaluation of the service option.

3.2.3. Perceived control and intention to use SST-based recovery

SST research has shown a positive association between perceived control and customer evaluation of various aspects of SST-based services (Collier & Sherrell, 2010; Lee & Allaway, 2002; Pavlou & Fygenson, 2006). For example, Collier and Barnes (2015) found that customer perceived control over the SST option increases perception of the system efficiency or the optimization between system performance and the required amount of customer inputs (e.g., effort, time). Similarly, customer perceived control over SST was found to enhance customer

perception of SST quality (Fernandes & Pedroso, 2017). Marzocchi and Zammit (2006) suggest that perceived control over SST has a positive influence on customer satisfaction with SST. Accordingly, if customers perceive that an SST-recovery option gives them control, it may evoke a positive perception toward the option. Accordingly, greater perceived control may boost customer's intention to use the option. Additionally, in the context of SST failure and recovery, the loss of control caused by SST failure experience is likely to increase customer tendency to seek the recovery option that can give them control (which can be attributable to the operation of the negative feedback loop) (Carver & Scheier, 1982). Consequently, we predict that when customers perceive that SST-based recovery will provide them with greater control over the recovery process, this will positively influence customer intention to use SST-based recovery. Thus, we hypothesise that:

Hypothesis 1: Perceived control over SST-based recovery positively influences intention to use SST-based recovery.

3.2.4. Perceived risk

In the SST context, perceived risk can be defined as the subjective assessment of possible losses or perception of uncertainty of using an SST-based service (Featherman & Pavlou, 2003). Purchasing products/services inherently involve some uncertainty. Customers are therefore likely to form perceptions of risk when making consumption choices (Featherman & Pavlou, 2003). Perceptions of risk can also come in different categories, including performance, social, financial, psychological, and physical (Stone & Grønhaug, 1993).

Risk is a key factor in customer use of SSTs since SSTs are a specific type of information technology (IT) (Barua et al., 2016; Lee, 2019; Martins et al., 2014). This is because the outcome of using such an IT system depends heavily on the performance of the system which cannot be fully controlled by customers. In addition, the absence of face-to-face

interaction in this context also increases risks perceived by users. Furthermore, the early stages of the process of adopting SSTs also pose greater risk to customers who use SSTs since they are less familiar with SSTs (Littler & Melanthiou, 2006). Accordingly, limited knowledge about SSTs can lead to higher risk perceptions (Lee, 2019).

When presented with the option of using SST-based recovery, customers effectively face a similar situation to that of the early stages of the new information system. Indeed, SST-based recovery is likely to be unfamiliar to most customers (at least until it becomes an industry norm or standard and widely adopted). Thus, limited knowledge of SST-based recovery can create uncertainty for customers. Since risk perceptions play a key role in customer action and behaviour (Featherman & Pavlou, 2003), it is plausible to expect that perceived risk is relevant in customer decisions to use SST-based recovery.

3.2.5. Perceived control and perceived risk

When customers perceive a higher degree of control over SSTs, it means that they have greater confidence in their ability to use SSTs (Chih-Hung Wang, 2012). In addition, perceiving that an SST can be controlled also implies that customers trust that the technology will perform as expected (Collier & Sherrell, 2010; Johnson et al., 2008; Manganari et al., 2014). Taken together, one's ability to use SSTs and trust in their performance are likely to lead to greater perceptions of certainty that the required outcome will be achieved by using the SST-based service, hence, reducing perceived risk. By contrast, when customers perceive that the SST-based recovery cannot be controlled it can cause uncertainty about the possibility of suffering loss due to use of the SST, hence, increasing perceived risk. Thus, we predict that customer's perceived control over SST-based recovery negatively influences customer perceived risk over the recovery channel. Thus, we hypothesise that:

Hypothesis 2: Perceived control is negatively associated with perceived risk.

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3.2.6. Perceived risk and intention to use SST-based recovery

Prior research on perceived risk has consistently shown that perceiving higher risk in using SSTs leads to lower intention to use/adopt the system (Alalwan et al., 2016; Hanafizadeh et al., 2014; Herrero & San Martín, 2012; Im et al., 2008; Taylor & Strutton, 2010; Wu & Wang, 2005). Reasons behind this association can be attributed to the fact that customers who perceive low risk in using the SST have a tendency to perceive it as being useful in performing its designated task (Featherman & Pavlou, 2003; Martins et al., 2014). Similarly, perceived risk has been shown to induce perceptions of personal threat as well as feelings of worry and anxiety for customers. Such feelings, in turn, cause customers to avoid the risk-inducing interactions. Thus, it is expected that if customers perceive a high level of risk to be associated with SST-based recovery, then they are likely to exhibit lower intention to use SST-based recovery (e.g., by way of avoidance). Thus, we hypothesise that:

Hypothesis 3: Perceived risk is negatively associated with intention to use SST-based recovery.

From the above discussion, we expect that perceived control will also influence customer intention via perceived risk. That is, higher perceived control increases customer intention to use SST-based recovery, but also decreases perceived risk, which in turn increases intention to use SST-based recovery. Hence, we hypothesise that:

Hypothesis 4: Perceived risk mediates the relationship between perceived control and intention to use SST-based recovery.

3.2.7. The moderating role of personal control

Personal control refers to the personal belief about the amount of control one has over life events (Folkman, 1984; Skinner, 1996; Ward, 2013). Personal control is different from

perceived control over SST-based recovery: personal control is a person's perception of one's general control in life. By contrast, perceived control is a person's perception over SST-based recovery, and captures perceptions concerning control of a specific situation that is tied to the specific object, in our case, SST-based recovery. A strong sense of personal control is an indicator of healthy beliefs about personal effectiveness in interacting with one's environment (Lachman et al., 2011), hence, it is an important contributor to one's well-being and healthy development (Skinner, 1996). Previous research has shown that personal control can be momentarily increased/subdued through semantic cues (e.g., recalling past experience of high/low perceived control) (Cutright & Samper, 2014; Faraji-Rad et al., 2016; Kay et al., 2009).

Individuals with a strong sense of personal control perceive higher capability in influencing the environment to achieve their goals (Bandura, 1986; Lachman & Firth, 2004; Lachman et al., 2011; Lachman et al., 2008; Skinner, 1996). As a result, high personal control individuals are more likely to act in ways that allow them to achieve their desired goals. By contrast, low personal control individuals tend to inhibit their behaviours and potentially give up on their goals (Bukowski & Kofta, 2016; Maier & Seligman, 2016). When engaging in consumption behaviour, generally customers aim to avoid losses, which is potentially enhanced in the context of SST failure where potential losses from the failure become salient. In turn, the goal-oriented characteristics of high personal control customers should increase their likelihood of aversion to loss. Because risk is inherently associated with potential for loss, high personal control individuals might be expected to want to avoid recovery that is associated with high perceived risk. Hence, we propose that high personal control will strengthen the negative relationship between perceived risk and customer intention towards SST-based recovery. Hence, we hypothesise that:

Hypothesis 5: Personal control moderates the relationship between perceived risk and intention to use SST-based recovery, such that the negative effect of perceived risk on intention to use SST-based recovery will be stronger for customers with higher personal control.

3.3. Method

3.3.1. Research design

We employed a self-administered online questionnaire. We recruited US participants from the online panel Amazon Mechanical Turk. To qualify for the survey, participants had to have used one or more forms of SSTs in the past 3 months. Approximately 10% of the participants had to be excluded from the analysis because they failed to correctly respond to attention check questions. A final sample of 173 usable responses were analysed in the study. The sample was approximately equally divided in terms of gender (49.1% male and 49.7% female). The majority of respondents (43.9%) fell in the 18 to 30 year-old age range. Approximately 38.2% of respondents indicated they held a bachelor's degree. Most of the participants (47.5%) have used various forms of SSTs for more than four years. Demographic information of the sample is shown in Table 3-1.

Table 3-1: Demographic information

Variables	Categories	%
Age	18-30 years old	43.9
	30-40 years old	38.2
	40-50 years old	13.3
	> 50 years old	4.6
Gender	Female	49.7
	Male	49.1
	Other	1.2
Education	Bachelor's degree in college (4-year)	38.2

Doctoral degree	1.7
High school graduate (high school diploma or equivalent including GED)	12.1
Master's degree	11.6
Professional degree (JD, MD)	0.6
Some college but no degree	25.4

The study uses a 2 factor (level of personal control high *versus* low) between-subjects quasi experimental design. Participants were randomly assigned to one of the two manipulation tasks. In the high personal control condition, participants were asked to recall a past event in which they had control over what happened. In the low personal control condition, participants were asked to recall a past event in which they had little control over what happened. These manipulations of personal control were successfully used in previous control research (Faraji-Rad et al., 2016).

3.3.2. Scenario

The participants were given a scenario of a fictitious SST failure before being asked a number of questions about their reactions to SST service recovery. After the pre-test, a car rental self-service kiosk was chosen as the scenario. Participants were asked to imagine themselves using a car-rental self-service kiosk. While using the kiosk, an error occurs which prevents participants from completing the transaction. Such a situation illustrates the failure of a core service (Smith et al., 1999b). Participants were then shown two recovery options: staff-based recovery in which a service employee would help them resolve the issue, and the SST-based recovery in which customers would follow an on-screen guide to resolve the issue independently. After reading the scenario, the participants' control perception over SST-based recovery and their intention to choose SST-based recovery over staff-based recovery were

assessed. Finally, participants were asked to answer demographic questions concerning age, education, and gender.

3.3.1. Manipulation and scenario realism check

The manipulation check for personal control was adopted from Cichocka et al. (2018) and asked participants to indicate agreement with four statements: "I feel I have little control over my life" *versus* "I feel I have great control over my life", "I have little influence on my fate" *versus* "I have great influence on my fate", "There are many things in my life I cannot influence" *versus* "There are few things in my life I cannot influence," and "Things that are happening in my life are simply a matter of coincidence" *versus* "Things that are happening in my life are not a coincidence." All items for personal control manipulation check were measured on a 7-point Likert scale ($\alpha = .69$, M = 4.73, SD = 1.06). The results showed that the manipulation was successful ($t(171)=-4.29$, BCa 95% CI [-0.96,-0.34], $p<0.001$). The results indicated that participants in the high-control condition reported a higher level of personal control (M=5.03; SD= 0.94) than those in the low-control condition (M= 4.37; SD=1.09).

Scenario realism was checked using three 7-point Likert scale items adapted from Zourrig et al. (2014): "The situation described is realistic"; "The situation described is likely to happen in real life", and "I have no difficulty imagining myself in the situation". Participants perceived the scenarios to be highly realistic as indicated by an average rating of 6.39 (SD = 1.42).

3.3.2. Measures

The measures for the variables used in this study were adapted from existing research with slight modifications to suit our study's context. We adapted our measurement for perceived control over SST-based recovery from Collier and Barnes (2015)'s 7-point scale (1 = strongly disagree, 7 = strongly agree; $\alpha = .93$, M = 4.5, SD = 1.58). The constructs of intention to use SST-based recovery were adapted from Dees et al. (2010) 7-point scale ($\alpha = .97$, M =

4.83, SD = 1.95). Four items measuring perceived risk were adapted from Walker and Johnson (2006) 7-point scale (1 = strongly disagree, 7 = strongly agree; α = .806, M = 4.23, SD = 1.36). The reliability of all scales exceeded the conventional minimum of .70 (Nunnally, 1978). The items and factor loadings are shown in Table 3-2. Given the overall high internal consistency of the items for all scales, we used the mean value of each scale for our analyses.

Table 3-2: Results of testing measurement model

Construct	Item	Factor loading	Composite reliability	Cronbach's alpha	AVE
Perceived control	The recovery option would let me be in charge of the issue-handling process.	0.919	0.940	0.930	0.843
	The self-service aspect of the recovery option would let me be decisive.	0.857			
	I would feel in control with the recovery option.	0.948			
	The self-service aspect of the recovery option would give me more control over the recovery process.	0.945			
Perceived risk	I am concerned about the performance of the recovery option if I have no contact with anyone.	0.859	0.869	0.806	0.627
	In using this recovery option, I am concerned about the consequences of making a mistake.	0.690			
	I worry that this recovery option may not work as I want them to.	0.855			
	This recovery option would be reliable.	0.752			
Intention	Improbable… probable	0.976	0.980	0.970	0.944
	Impossible … possible	0.962			
	Unlikely … likely	0.977			

3.3.3. Data analysis and results

We employed the partial least squares (PLS) method (F. Hair Jr et al., 2014) (using SmartPLS version 3.2.8) to assess the hypothesised relationships between our constructs. We follow a two-phase approach to analyse the PLS model: 1) evaluation of the reliability and validity of the measurement model, and 2) evaluation of the structural model (Hair Jr et al., 2016).

3.3.3.1. Measurement model

The measurement model was tested by examining both convergent and discriminant validity (Hair Jr et al., 2016). For testing convergent validity, we assess both item reliability and construct reliability. All indicator loadings exceed 0.7 (only one item measuring risk perception had a loading below 0.7), indicating acceptable item reliability. Composite reliability (CR) and Cronbach's alpha values of all constructs exceeded the recommended level of 0.7, demonstrating construct reliability (Bagozzi et al., 1998). Finally, the average variance extracted for each construct exceeded the minimum required value of 0.50, further supporting the convergent validity of the measure constructs (Fornell & Larcker, 1981). Having established convergent validity, we then evaluated discriminant validity by checking whether the square roots of AVE for each construct are higher than the bivariate correlations between that and all other constructs (Fornell & Larcker, 1981). Table 3-3 summarizes the test for discriminant validity – all constructs show adequate discriminant validity. Overall, all evidence indicates the adequacy of the measurement model. This leads to the next stage of testing the structural model.

Table 3-3: Squared pairwise correlations and assessment of discriminant validity

	Intention to use	Perceived control	Perceived risk
Intention to use	0.97	-	-
Perceived control	0.67	0.92	-
Perceived risk	-0.60	-0.55	0.79

3.3.3.2. *Structural model*

First, we assess the structural model for collinearity issue by calculating the variance inflation factor (VIF) (Becker et al., 2015). Following the process described by Hair Jr et al. (2016), we assess two sets of (predictor) constructs for collinearity: (1) perceived control as predictor of perceived risk, and (2) perceived control and perceived risk as predictors of intention. All VIF values are below the threshold value of 3 (Max VIF = 1.47), indicating that collinearity is not an issue amongst the constructs (Becker et al., 2015).

The structural model's explanatory power is assessed by looking at the explained variance (R^2) value of the final dependent construct (Hair et al., 2011). The final dependent construct in this study has an R^2 value of 0.53, indicating that the model has a moderate predictive power that accounts for 53% of the variance in the dependent variable (Hair et al., 2011).

Next, we analyse the hypothesized relationships. Supporting Hypothesis 1, perceived control is found a significant predictor of customer intention to choose SST-based recovery ($\beta = 0.480$, $t = 7.051$, $p < 0.001$). Perceived control is also negatively associated with perceived risk ($\beta = -0.553$, $t = 8.929$, $p < 0.001$), supporting H2. Perceived risk shows a significant association with

intention to use SST-based recovery ($\beta = -0.329$, t = 5.367, p < 0.001). Hence, Hypothesis 3 is also supported. In addition, the results show a significant indirect effect of perceived control via perceived risk on intention to choose SST-based recovery option ($\beta = 0.182$, p <0.001, 95% CI = 0.112 to 0.268). As both the direct and indirect effects are significant, perceived risk partially mediates the relationship. Hence, Hypothesis 4 is supported. The analysis showed a significant positive effect of perceived control on intention to use SST-based recovery.
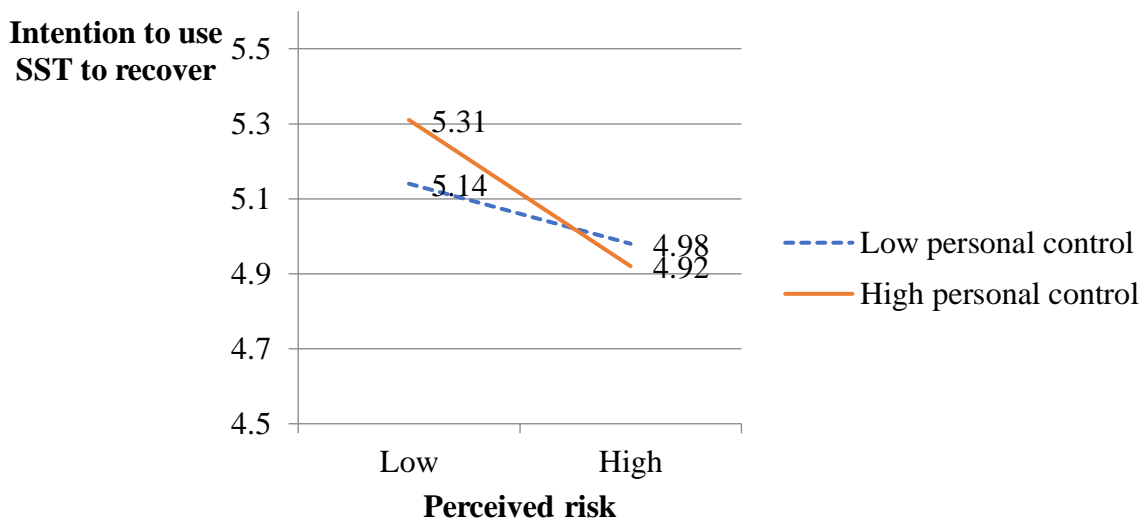
Figure 3-1: Interaction effect between perceived risk and personal control on intention to use SST to recover from failure

Finally, Hypothesis 5 predicts that personal control moderates the relationship between perceived risk and intention to use SST-based recovery. This hypothesis is also supported ($\beta = 0.097$, t = 2.09, p = 0.036). The two way interaction between perceived risk and personal control on intention to use SST-based recovery was significant ($F (2, 170) = 42.79.51$, p < .001), indicating that the customers with higher personal control score were more likely to use SST-based recovery (M $_{High Personal Control}$ = 4.98) than those with lower personal control score (M $_{Low Personal Control}$ = 4.92) when the perceived risk is high. This suggests that the negative

effect of perceived risk on SST usage intent to recover is more pronounced for customers with high personal control. Figure 3-2 depicts the results of the hypotheses testings.
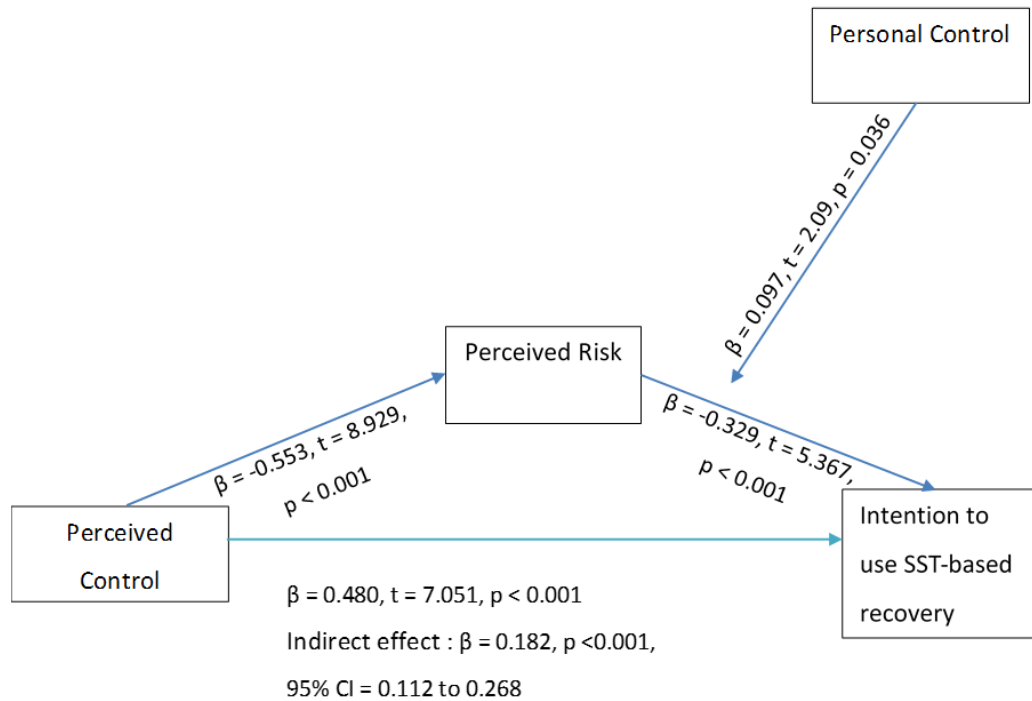
Figure 3-2: Path analysis results

3.4. Discussion

In this study, we focus on the customers' perspective in the context of SST failure and recovery. The study provides empirical evidence of the factors that influence customer SST recovery decisions. We looked at how factors concerning customers' personal ability and beliefs, in relation to perceived control and perceived risk influence their intention to use SST-based recovery when SSTs fail. Evidence from our results supports the key role of perceived control and risk, which by itself, accounts for a significant variance in predicting customer intention to choose SST-based recovery over the option of seeking human help for failure recovery. Hence, such prioritization for control and risk characteristics of the SST recovery option can be thought of as a customer coping mechanism which restores their feelings of

control and empowerment where they might have been lost because of SST failure (Guo et al., 2016).

As predicted, customer perceptions that they can exert control over SST-based recovery leads to more favourable intentions towards using SST-based recovery. We also find evidence that customer perceptions of risk in using SST-based recovery have a negative effect on intention towards using SST-based recovery. Our empirical evidence is consistent with previous research and further illustrates the importance of the role of the customer's perceived risk and perceived control in both a normal SST context (Alalwan et al., 2016; Barua et al., 2018; Chang, 2008; Lu et al., 2011) and failed SST context (Zhu et al., 2013).

Another interesting finding of this study concerns the mediating role of perceived risk in the relationship between perceived control and intention to use SST-based recovery. This study extends research concerning the behavioural effect of consumer control perceptions of SST by including perceived risk as a mediator of this effect (Collier & Sherrell, 2010). Our evidence suggests that part of the effect of perceived control on customer intention can be explained by the effect of perceived risk. Risk perception was found to be exacerbated when customers exhibit low perceived control over SST-based recovery. This indicates that when customers do not expect to have control over SST-based recovery, they will place greater attention on the risk aspects of SST-based recovery, hence, leading to greater perception of risk associated with this recovery option.

Finally, we found that customer's personal control moderates the relationship between perceived risk and intention to use SST-base recovery. This suggests that the more customers inherently feel in control of their personal life, the greater the effect of perceived risk on customer intention toward SST-based recovery. In contrast, the negative effect of perceived risk on intention to used SSTs is weakened when personal control is low.

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3.5. Theoretical Implications

This study makes several contributions to existing literature. First, applying control theory, we demonstrate the important role of control and risk in explaining a customer's choice amongst different recovery options (SST-based recovery *vis-à-vis* human-based recovery). This is especially important as it underscores the key role of control and risk (as a result of SST failure threatening a customer's perceived control) that distinguishes the nature of customer choice when using SST-based services between SST-based recovery and human-based recovery. Control theory was useful in explaining the underlying mechanisms of the observed relationship. Future research might further test the suitability of control theory to further investigate and explain the effect of other factors in customer choice of SST recovery and outcomes. Second, the study highlights the role of control factors in influencing customer choice of SST-based recovery, thereby contributing to the existing literature on the effect of control. Our study suggests that if customers perceive that the SST-based recovery option facilitates their control perceptions (as indicated by a high level of perceptions of control over the SST-based recovery), customers would then exhibit favourable intention towards using SST-based recovery. This is an important contribution as it highlights the nuances of these construct relationships in the unique setting of SST use for recovery from SST failure. Third, we found that perceived risk is a significant predictor of intention to use SST-based recovery. Finally, our findings show that personal control can play a key role in translating customer perceived risk into their behavioural intention towards the SST-based recovery. Specifically, the negative effect of perceived risk on customer intention to use SST-based recovery is strengthened as an individual's sense of personal control increases. In other words, high-personal-control customers tend to be more risk-averse when choosing their SST recovery option as compared to customers with low personal control. Overall, these findings have

enriched current understanding of customer motivation to use SST-based recovery as opposed to the traditional staff-led recovery.

3.6. Managerial implications

Our study offers managerial implications for service firms using SST-based service and recovery. Customer perceptions of service options regarding control and risk play an important part in managing customer's behavioural intention. Specifically, our findings show that perceived control leads to lower perceived risk which ultimately shapes customer intention towards the SST-based recovery. Hence, our results highlight the novel idea of strengthening customers' control perceptions when they carry out transactions using SSTs. Such that, customer perceptions of control can inform design of recovery intervention options so as to motivate customers to stay with the SST and adopt SST-based recovery instead of attempting to seek help from service staff when an SST failure occurs. Hence, it is suggested that effectively devised SST-based recovery that successfully enhances customer perception of control can help firms manage customer responses to SST failure and prevent the potential damage caused by unsatisfied customers. In addition, recovery interventions that are catered to customer's personal sense of control can also be implemented by SST managers using practical control boosting interventions. Such influence in customer personal control can impact customer perception of risk which directly determines customer recovery choice.

3.7. Limitations and future research

This study has several limitations. Firstly, it employs a scenario-based approach, which may affect its generalizability to a real-world situation. Future research may consider adapting the proposed model to a field study design. Second, our study considered only a particular form of SST-based recovery option (e.g., interactive help-guide). To further enhance the generalizability of our findings, future research could assess other forms of SST-based recovery

(e.g., chatbots). Furthermore, future research should closely examine the outcomes of SST-based recovery as well as how these outcomes vary depending on individual and situational characteristics.

Another limitation relates to the lack of situational factors in our model as we consider the effect of only customer's personal control and control perceptions. Further research could add to our findings by examining the effect of variables specific to the failure situation (e.g., the severity of the failure, type of failure, types of SST) into the current research model and consider their links to the existing variables. Differences in situational factors could interact with customer control factors to influence service outcomes. With our context being SST-based recovery failure, which is different from SST adoption, we see a need to go beyond the established constructs and theories from SST adoption to include variables that are specifically relevant to our failure and recovery context.

Bridging from paper 2 to paper 3

With Paper 2 successfully identifying the key role of perceived control in customer intentions to use SST-based recovery, paper 3 further explores the impact of control in a SST-based recovery. Firstly, it considers the role of personal control as an individual characteristic that impacts on SST-based recovery intentions both directly and also through its impact on a customer's contextual perceptions of control. Individual characteristics have been proposed to be important antecedents of customer recovery appraisal, as per the conceptual framework (paper 1). Accordingly, individual characteristics in the conceptual framework were conceptualized to include three different categories: control-, social-, and technology-related. Paper 3 examines a control-related variable which is personal control. A control-related variable was incorporated into the model for two reasons. First, the key concept in the model is perceived control which has a tight-knit association with individual characteristics of personal control (Folkman, 1984). Second, while both technology- and social-related variables have been studied before in the SST context (Dabholkar & Bagozzi, 2002; Demoulin & Djelassi, 2016; Lee et al., 2010), to the best of my knowledge, there have been no studies on control-related variables in this context. Specifically, personal control is included in the paper as an individual characteristic that potentially shapes customer perceived control over SST-based recovery. It is proposed that knowledge on this construct can potentially aid in the management of customer perceived control, and ultimately, customer intentions towards using SST-based recovery.

Furthermore, paper 3 further identifies efficiency and positive anticipated emotions as part of the customer recovery appraisal. Efficiency and positive anticipated emotions are two factors that represent the functional and hedonic values of the SSTs, as determinants of customer intentions. The inclusion of customer perception of functional and emotional values

of SST-based recovery provides a more thorough explanation of variation in customer recovery intention. From paper 1 (conceptual framework), customer appraisal of SST-based recovery composes not only functional aspects but also emotional aspects of the recovery options. Hence, this paper brings forth both functional and emotional aspects of customer perception towards SST-based recovery as determiners of customer intentions towards SST-based recovery. Finally, the paper also proposes perceived control as a determinant of perception of efficiency and positive emotions. This offers new insights into the role of perceived control in customer evaluations of and intentions towards using SST-based recovery.

Overall, building on paper 2's foundation of perceived control being a key factor in customer intentions to use SST-based recovery, paper 3 further strengthens the understanding of customer intentions toward SST-based recovery in three ways: (1) it offers further support and evidence of the important role of perceived control in shaping intentions and evaluations of SST-based recovery, (2) it explores the role of efficiency and positive anticipated emotions associated with the value appraisal of intentions to use SST-based recovery, and (3) it explores the role of the individual characteristic of personal control on the SST-based recovery process; hence, providing more detailed knowledge of the impact of customer control both from a personal state and contextual perspective..

Statement of authorship

Title of Paper	Staying in control: the impact of personal and perceived control in self-service technology-based recovery
Publication Status	☐ Published ☐ Accepted for Publication ☐ Submitted for Publication ☑ Unpublished and Unsubmitted work written in manuscript style
Publication Details	

Principal Author

Name of Principal Author (Candidate)	Nghi Thuc Le		
Contribution to the Paper	conception and design of the project acquiring research data analysing and interpreting research data writing the manuscript		
Overall percentage (%)	100		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	25/05/2020

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

    i.   the candidate's stated contribution to the publication is accurate (as detailed above);

    ii.   permission is granted for the candidate in include the publication in the thesis; and

    iii.   the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Chapter 4: Paper 3 - Staying in control: the impact of personal and perceived control in self-service technology-based recovery

Abstract

The widespread use of self-service technology (SST) and its associated elimination of the need for service staff has changed not only the way customers experience a service encounter but also how they deal with service failure and recovery. Following SST failures, service providers now offer SST-based recovery options, which allow customers to fix service failures using SST-facilitated tools. Yet, gaining customer acceptance for this emerging form of service recovery presents a significant challenge to service firms. With the existing literature having limited information on what influences customer recovery choice, there is a need to identify the relevant factors that are involved in customer choice. This paper provides an understanding of how perceived control, efficiency, and positive anticipated emotions impact customer intention to use SST-based recovery. Utilising learned-helplessness theory and value-in-use through service experience, perceived control is proposed to be a key factor that drives both efficiency and positive anticipated emotions in influencing a customer's decision. Furthermore, the paper demonstrates the impact of the individual characteristic of personal control on perceived control and, hence, indirectly on intentions to use SST-based recovery. Overall, to the best of our knowledge, this is one of the first papers to illustrate the effect of perceived control on efficiency and positive anticipated emotions within the context of SST-based recovery. Managerial implications are discussed, along with research limitations and directions for future research.

4.1.Introduction

Imagine a customer is using a self-service kiosk to rent a car when the machine suddenly fails to process the transaction. As in most cases of self-service, there is no service staff around and the customer is left alone, feeling lost in the situation. What could be an optimal solution to this problem? This unique situation of SST failures is the focus of this paper, which examines the use of SST in the recovery process that enables customers to resolve SST failure without staff assistance. We term this phenomenon SST-based recovery. Examples of SST-based recovery include an interactive help-guide, virtual onscreen assistant, autonomous robot, and chatbot.

SST-based recovery is highly advantageous for both service providers and customers. First, SST-based recovery can solve the challenges associated with the SST setting where failure often happens when service personnel is not around (Nili et al., 2019; Simon & Usunier, 2007; Zhu et al., 2013). Second, SST-based recovery can provide customers with more flexibility and convenience in the recovery process, overcoming the need for customers to get help from a service employee. Hence, given the benefits of SST-based recovery, gaining a better understanding of this form of recovery is important for successful management of the expanding role of SSTs across services. However, the current research literature on SST-based recovery is sparse.

The goal of this study is to explore the determining factors of customer intentions to use SST-based recovery. Specifically, we propose that perceived control plays a key role in a customer's decision to use SST-based recovery. Perceived control has long been recognized as a key factor in customer acceptance of SST options in which customers take the co-producer role for their services (Bateson, 1985; Collier & Sherrell, 2010; Lee & Allaway, 2002). Importantly, the implication of control should be even greater when it comes to the use of SST-

based recovery, given that this form of recovery could lead to potentially grave consequences as customers not only engage in a new SST process (with little to no formal guidelines) but also receive limited personal assistance in the process. Furthermore, the fact that the SST has failed may decrease customer trust in the SST. Hence, having a perception of control over the process is imperative if customers are to accept using SST-based recovery rather than service personnel assistance. However, while it is well-recognized that control is important for self-service, the role of this concept in the SST failure and recovery context has not received enough attention.

The role of control has not been well understood within the setting of SST recovery and SST-based recovery. There is a lack of understanding of how and why this important concept influences customer intentions to use SST technology in the recovery process. Therefore, this study explores how perceived control influences a customer's intention to use SST-based recovery, in particular considering the mediating role of perceived efficiency and positive anticipated emotions in this process. These mediating factors represent customers' perceived functional value and the hedonic value of SST-based recovery. In the SST literature, together with perceived control, functional and hedonic values of SSTs have been linked to customer intentions (Choi, 2018; Collier & Barnes, 2015; Marzocchi & Zammit, 2006). Efficiency, which reflects the functional value of the SST, has been one of the recurring themes within SST research where service experience is generally non-personal and utilitarian-focused; however, it has received little attention with respect to SST recovery. The role of hedonic values such as positive emotions, has received relatively less attention throughout SST literature altogether (Collier & Barnes, 2015). We argue that the inclusion of customer emotions in explaining customer intentions to utilise SST in this context is understudied, but is necessary as emotions have been proven to be important drivers of customer responses to service failures (Balaji et al., 2017; Surachartkumtonkun et al., 2013).

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Furthermore, although prior SST research has provided evidence of the effect of customer technology-related characteristics (i.e., technology readiness, technology efficacy, and innovativeness) (Lee & Lyu, 2016; Yang, 2012; Zhu et al., 2007), little is known about the control-related characteristics of customers – how it may strengthen or diminish customer perceptions towards SST options. Hence, this study addresses this gap by providing further insights regarding the role of personal control in determining customer perceived control over SST-based recovery. Both personal control and perceived control refer to the control belief or one's judgement of their ability to manage and influence the environment to attain desired outcomes. However, the former is a trait-like belief concerning the perception of control one has in life, while the latter is a situational appraisal of the possibility of control specific to a particular situation/object (in this case, SST-based recovery) (Bateson, 1985; Collier & Sherrell, 2010; Folkman, 1984). Personal control is specific to each individual and remains relatively stable across situations, whereas perceived control is specific to the situation/object of concern. Importantly, this study applies learned helplessness theory (Maier & Seligman, 1976; Maier & Seligman, 2016) to explain the relationship between personal control and perceived control.

Overall, this paper aims to increase understanding of SST-based recovery, in which perceived control plays a key role. The current paper attempts to answer two questions centred on customer perceived control in the SST-based recovery context. First, we attempt to investigate the influence of perceived control on different SST-related contributors of customer intentions, hence, providing insights on the way perceived control influences customer recovery decisions. Thus, our first question is, 'How does perceived control directly and indirectly influence intentions to use SST recovery?'. To develop further understanding of the impact of perceived control on intentions, it is important to consider not only the direct relationship between perceived control and intention to use SST-based recovery but also the

impact that perceived control has on other important determining factors of intentions. This leads to our second question, which is, 'What role does perceived control have in influencing perceived efficiency and positive anticipated emotions in the context of SST recovery?'. Adopting Sandström et al. (2008) theory of value-in-use, perceived efficiency and positive anticipated emotions are identified as two important determinants of customer intentions towards using SST-based recovery, both of which are ultimately influenced by perceived control. The third question is, 'What role does the individual characteristic of personal control have in determining perceived control?'. Here, personal control is investigated for its impact on varying degrees of perceived control toward the SST-based recovery option.

Our research, thus, makes four contributions to the SST literature. First, we introduce the role of personal control construct into the SST recovery literature. Even though extant SST research has examined different individual characteristics in explaining customer SST usage/intention (Dong et al., 2016; Elliott et al., 2013; Yang, 2012; Zhu et al., 2013), these studies tend to limit their scope only to individual characteristics that are directly associated with the SST technology (e.g., customer innovativeness, technology self-efficacy, and readiness). Though these studies have made important inroads into SST recovery literature, there is a need to extend the research scope beyond the SST-related factors. Second, the current study simultaneously examines both personal control and perceived control over SST-based recovery (situational control) in our model. To the best of our knowledge, no research has examined the joint effect of both personal control and perceived control in the context of SST on customer recovery decisions. Third, we explore the influence of both perceived efficiency and positive emotions in determining customer recovery intention, highlighting the importance of both functional and emotional aspects of the recovery experience to customer recovery choice. Finally, though there has been ample research on the impact of perceived control on intentions, the how and why of such an important relationship is unclear in SST recovery

literature (Choi, 2018; Collier & Sherrell, 2010). Thus, this paper offers new insights into the influence of perceived control by examining efficiency and positive emotion as mediating variables between perceived control and customer intentions.

The structure of this paper is as followed. The authors first discuss the conceptualization of control. This is followed by a discussion on the theoretical basis of our model conceptualizations – helplessness theory and value-based theory. Next, our hypothesis development is presented. The empirical results of the studies follow, then a discussion of the theoretical and managerial implications and limitations.

4.2. Theoretical background

4.2.1. Control

Control refers to the ability to produce desired outcomes from one's environment (Skinner, 1996). Research has shown that having control is a fundamental human need, such that people generally strive to maintain control in their environment both objectively (actual amount of control) and subjectively (perception of control) (Lachman & Firth, 2004; Rudski, 2004; Whitson & Galinsky, 2008). The different constructs that describe control can be categorized based on their specificity or generalizability, ranging from extremely situation-specific (situational control) to highly generalized beliefs (permanent, trait-based control) (Law et al., 1994; Skinner et al., 1988). This paper includes two forms of control: (1) personal control, which is the generalized, dispositional belief of the amount of control one has over their environment (Folkman, 1984; Skinner, 1996; Ward, 2013), and (2) situational control, which is the situational evaluation of the amount of control particular to the SST-based recovery option (termed henceforth as 'perceived control over SST-based recovery') (Collier & Barnes, 2015; Hui & Bateson, 1991; Zhu et al., 2007). While the former is a general, dispositional trait that is inherent to each individual, the latter is a situation-specific outcome that is particular to

the situational conditions (in this case, the use of SST-based recovery) (Folkman, 1984; Skinner, 1995). Personal control is proposed here to influence perceived control over SST-based recovery. In turn, perceived control over SST-based recovery is posited to directly (and indirectly) determine customer intentions.

4.2.2. Perceived control

The key concept in this paper is perceived control. As opposed to personal control (which is a trait-like belief), perceived control refers to situational appraisals of control which are specific to the particular person–environment relationship (Folkman, 1984). In the SST context, perceived control is defined as a belief in the amount of influence a customer has over the process and outcome of a self-service encounter (Collier & Sherrell, 2010; Johnson et al., 2008). For this study, perceived control is defined as the extent to which customers believe that they have influence over the process and outcome of SST-based recovery. Perceived control is proposed to be the key factor in driving customer recovery choice. Having control in an SST context means that customers can determine the pace and flow of the transaction, the degree of interactivity, and ultimately the outcome of the service (Collier & Sherrell, 2010; Kleijnen et al., 2007). Hence, having control means that customers have the ability to influence the service process to match their desired goal (Choi, 2018). As a result, the connotation between control and goal achievement makes perceived control a significant determinant of customer intention and behaviour. Unsurprisingly, perceived control has been found to be a significant determinant of a wide range of important outcomes, such as customer perception of SST usefulness, convenience, ease of use, perceived value, intention and satisfaction (Chih-Hung Wang, 2012; Choi, 2018; Collier & Sherrell, 2010; Kleijnen et al., 2007; Lee & Allaway, 2002).

In the service recovery context, customers are expected to put a large emphasis on the role of perceived control during recovery, as service failures often cause customers to feel a lack of control (Guo et al., 2016; Landau et al., 2015). However, there has been limited empirical evidence on the pivotal role of perceived control in influencing customer choice of SST recovery. Furthermore, very limited understanding exists regarding the relationship between control and other important determiners of customer recovery choice (i.e., how perceived control affects a customer's perception of the values experienced in the SST recovery process). To fill this void, the current study examines the effect of perceived control on perceptions of SST-based recovery efficiency and positive anticipated emotions – both of which are proposed to be determinants of customer intentions to use SST recovery. To the best of our knowledge, the present study is one of the first to attempt to examine the impact of perceived control on perceived efficiency and positive anticipated emotions in a SST-based recovery setting.

4.2.3. Personal control and learned helplessness theory

As opposed to perceived control over SST-based recovery, which is a part of a customer's evaluation of the SST-based recovery process, personal control is a general, dispositional trait which refers to the extent to which one believes that they exert mastery over their environment (Folkman, 1984; Stephens & Gwinner, 1998). Personal control has been empirically associated with many aspects of human behaviour (Cutright & Samper, 2014; Deci & Ryan, 1985; Keeton et al., 2008; Ryon & Gleason, 2014; Woodward & Wallston, 1987). The power of personal control is especially relevant in situations that involve stress, in which case, personal control plays a key role in influencing how people perceive and respond to a stressful situation (Folkman, 1984). As SST failure can be a stressful experience for customers, one can argue that personal control should play an important role in this context. This study

employs learned helplessness theory (Maier & Seligman, 1976; Maier & Seligman, 2016) to provide an explanation for the impact of personal control on customer perception of control over SST-based recovery.

Sense of personal control is formed by the dynamic of one's accumulated past experience with controllability and/or uncontrollability (Wallston, 1989). Prolonged experience of uncontrollability is essentially a reflection of a diminished sense of personal control while experience of controllability constitutes a strong sense of personal control. Learned helplessness theory proposes that past experience that involves prolonged and stable exposure to uncontrollability, which should be associated with a diminished sense of personal control, is linked to a state of learned helplessness in which individuals continue to respond to future events as if they have little or no control (Maier & Seligman, 1976). In contrast, past experiences that involve prolonged exposure to controllability, leading to a high sense of personal control, facilitate a state of mastery where the person forms a high control belief or expectation for future events. As a result, when facing an adverse event, a low sense of personal control is associated with a range of passive- and anxiety-induced behaviours such as avoidance, disengagement, freezing and lowered response initiation, which essentially reflects the individual's perception of their inability to manage or control the situation (Burger & Arkin, 1980; Maier & Watkins, 1998). High personal control, on the other hand, is associated with a range of proactive coping behaviours such as action-taking, dominance, and persistence in adversity, which reflects their perception of being able to control and change the situation (Christianson et al., 2009). Thus, learned helplessness theory provides an explanation for why and how the effects of personal control are enacted and fostered (Peterson & Stunkard, 1992). This explains the variation in coping responses to seemingly similar events (Christianson et al., 2008).

Applying this to the current study, customers with a high sense of personal control will be more likely to respond to SST failures with mastery-oriented tendency (i.e., believing they have control over the situation). In contrast, customers who possess a low sense of personal control will respond with greater helplessness-oriented tendencies (i.e., believing the situation is out of control).

4.2.4. Value-in-use through service experience theory

There are a variety of theoretical perspectives dealing with determinants of technology use, such as theory of planned behaviour (TPB), technology adoption model (TAM), and theory of resource matching. These works, however, share one shortcoming in their exclusion of affective aspects (e.g., affects and emotions), and are concerned primarily with the utilitarian aspect in their conceptualization of the customer decision-making process (Collier & Barnes, 2015; Perugini, 2004; Wolff et al., 2011). However, service failures can be a source of stress and negative feelings, and such an experience could potentially steer a customer's priority towards the experiential aspects of the recovery process (Guo et al., 2016; Kalamas et al., 2008; Park & Ha, 2016; Xu et al., 2014). Hence, it is intuitive that these theories, while being appropriate for use in an initial transaction context where SST-based options are generally understood as a means for customers to accomplish utilitarian-based goals, may be limited in accounting for the dynamic influences in SST recovery.

In contrast, the value-in-use through service experience theory, which explains service outcomes through customer perceived value of various aspects of service experiences (Sandström et al., 2008), should provide a more thorough understanding of SST recovery outcomes. Value-in-use perspectives propose that service values emerge from customer cognitive evaluation of their experience during the service process. Hence, rather than the outcome of the service, it is the experience customers get from their participation in the SST

process that creates value for them and ultimately determines service outcomes (Conduit et al., 2019). Specifically, the value-in-use through service experience theory highlights two sources of service values in SST contexts, namely functional (e.g., utilitarian, physical, technical) and emotional (e.g., hedonic). Functional value refers to the feature of the SST process that serves its purpose relating to the physical performance (Sandström et al., 2008). Emotional value refers to the non-physical feature of SST process that relates to its capacity to arouse affective states (Sweeney & Soutar, 2001).

Drawing on value-in-use through service experience theory, it is expected that, in seeking recovery of SST failure, customers may not only care about the utility goals (i.e., service completion) but also the emotional (i.e., hedonic) value provided within the recovery experience. In our model, we investigate the impact of efficiency and positive anticipated emotions on customer intention towards using SST-based recovery. Efficiency represents the functional value and refers to customer belief about the ease and speed of accessing SST-based recovery (Parasuraman et al., 2005). Positive anticipated emotions represent the emotional value and is defined as customer anticipated affective outcomes that will emerge from successful use of SST-based recovery (Loewenstein et al., 2001; Perugini, 2004).

4.3. Research hypotheses

4.3.1. Personal control and perceived control over SST-based recovery

As discussed above, learned helplessness theory provides an explanation for how low personal control leads to a generalized belief of inability to exert control over the environment. This effect of personal control, which is universal (Lee & Allaway, 2002), should be applicable to the SST recovery context. As a result, we propose that following SST failures, low levels of personal control create a generalized perception of uncontrollability over one's environment, hence, lowering customer perception of control over SST-based recovery. In contrast, high

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levels of personal control should give rise to higher perceptions of control over the recovery option, despite a previous SST service failure.

Hypothesis 1: Personal control positively influences perception of control over SST-based recovery.

4.3.2. Perceived control over SST-based recovery

Individuals tend to orient toward and persist with activities that let them be in control, while moving away from activities that they have no control over (Rothbaum et al., 1982; Skinner, 1995). This tendency could be attributed to the fact that one is more likely to achieve desirable outcomes when one has greater control over what they do. The literature on SST adoption and usage has shown perceived control to be a key factor for customers to accept the SST option (Collier & Barnes, 2015; Collier & Sherrell, 2010; Oyedele & Simpson, 2007), which could be similarly attributed to the likelihood of a successful experience, associated with the higher perceptions of control. Specific to the SST recovery setting, SST-based recovery should present a significant source of risk and uncertainty given the lack of employee support and the customer's unfamiliarity with the recovery option (Collier et al., 2017). As having control increases the likelihood of success, for customers to agree to using the seemingly risky option of SST-based recovery, a high degree of control is essential. If customers believe that they have control over the SST-based recovery option, they therefore believe that there is a high chance of achieving successful outcomes using SST-based recovery, and it is rational to assume that customers will be more likely to choose that option.

Hypothesis 2: Customer perception of control over SST-based recovery will have a positive relationship with intentions to use SST-based recovery.

In the current research, we are also interested in the relationship between perceived control and positive anticipated emotions. Studies have shown that perceiving that one is in control promotes a sense of emotional satisfaction, facilitated by a more positive self-perception of one's value and capability (Lachman et al., 2011; Lachman & Weaver, 1998; Patrick et al., 1993; Robinson & Lachman, 2016). In a similar vein, in service recovery contexts, research has found that customers who perceive that they have control over the recovery option exhibit greater self-esteem (Guo et al., 2016), and show more optimistic belief in their ability to resolve the service problem (Zhu et al., 2013). These impacts of perceived control on customer identity-relevant judgments in a service recovery context is likely to promote positive emotions. Given the above discussion, it is proposed that upon evaluating the SST-based recovery option, the degree of control a customer perceives that they have over the recovery option can serve as a cue for customers' anticipations regarding the emotional experience provided by SST-based recovery. High control perception, which induces a positive perception of oneself, should trigger greater anticipation of positive emotions in the service recovery process. Therefore, it is proposed that a high perception of control will increase positive anticipated emotions.

Hypothesis 3: Perceived control will have a positive relationship with positive anticipated emotions.

We further propose that the level of customer perceived control over SST-based recovery will influence the level of customer perception of SST-based recovery efficiency. As having control means that the customer can effectively influence the service process according to their desires, a perception of control facilitates a more optimistic expectation of service outcomes (Choi, 2018; Zhu et al., 2013). Consistent with this, research in SST transaction (non-recovery) settings has documented positive relationships between perceived control and

customer perception of SST performance, including customer trust in SST (Collier & Sherrell, 2010; Lui & Jamieson, 2003), speed of SSTs (Collier & Sherrell, 2010), perception of SST usefulness and ease of use (Choi, 2018), and the perceived value of SST usage (Kleijnen et al., 2007). Of most relevance, Collier and Barnes (2015) have found a positive effect of perceived control on customer perception of SST efficiency. Overall, these findings suggest that control perception conjures a positive impact on customer perception or expectation of SST performance. Because the implication of perceived control on more optimistic customer perception of the service option is considered relatively universal, regardless of the setting specificities, findings from SST non-recovery settings should be applicable to SST-based recovery settings. Hence, this study proposes that when customers perceive that they can control the process and outcome of SST-based recovery, they will be more likely to regard the recovery option as efficient.

Hypothesis 4: Perceived control will have a positive relationship with perceived efficiency.

4.4. Efficiency and positive anticipated emotions

4.4.1. Positive anticipated emotions

Customer intention towards using SST-based recovery is expected to be driven by the positive anticipated emotions associated with the recovery option. The determining power of anticipated emotions resides in the fact that individuals tend to take into consideration the potential emotional consequences of their actions as input for decision-making (Bagozzi & Pieters, 1998). Within the literature on consumer behaviour, there has been ample evidence of the effect of anticipated emotions on customer behaviours (Ahn & Kwon, 2020; Bagozzi et al., 2016). Specific to the SST context, though limited, there is also some evidence that the emotional-related aspect of the SST option plays a part in customer experience (Chiu et al.,

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2018; Collier & Barnes, 2015). Hence, it is rational to suggest that customer intention towards SST-based recovery should also be influenced by the emotional aspect associated with SST-based recovery, particularly, by customer anticipation of the positive emotions provided by the option.

In addition, when compared to non-recovery SSTs, the role of the emotional aspect of the SST-based recovery option in recovery decision-making should be even more important. This is because customers often experience negative emotions due to service failures, which emphasizes the importance of the emotional implication of service recovery (Balaji et al., 2017; Grégoire et al., 2010; Sengupta et al., 2015; Strizhakova et al., 2012). Moreover, the way SST-based recovery lets customers participate in the service recovery process could potentially enhance the customer's feeling of self-worth and, therefore, make the recovery option an emotionally rewarding experience (Dong et al., 2008; Guo et al., 2016). This emotional implication of SST-based recovery could make customer anticipation of positive emotions a substantial motivation to use the recovery option.

Hypothesis 5: Positive emotions will have a positive relationship with intention to use SST-based recovery.

4.4.2. Efficiency

The current research further proposes a link between SST-based recovery efficiency and customer intention toward the option. Being a utilitarian-based service option, the key value that drives a customer to adopt and use SSTs is its transaction efficiency (i.e., time saving, convenience) (Collier & Barnes, 2015). The more customers perceive SSTs to be efficient, the greater their perception of SST values or benefits, and hence, their willingness to use the option (Jing & Yoo, 2013; Johnson et al., 2008; Llach et al., 2013; Zavareh et al., 2012; Zehir et al., 2014). Along similar lines, we expect that in an SST recovery context, if customers perceive

the SST-based recovery to have a high level of efficiency, this will lead to favourable customer evaluations of the recovery option. That is, being regarded as efficient will make SST-based recovery appear a more favourable recovery option to customers, which increases customer intentions to use it. Thus, in the event of an SST failure, the customer's choice of recovery is expected to be influenced by the efficiency offered by SST-based recovery.

Hypothesis 6: Efficiency will have a positive relationship with intention to use SST-based recovery.

Figure 4-1: Research model
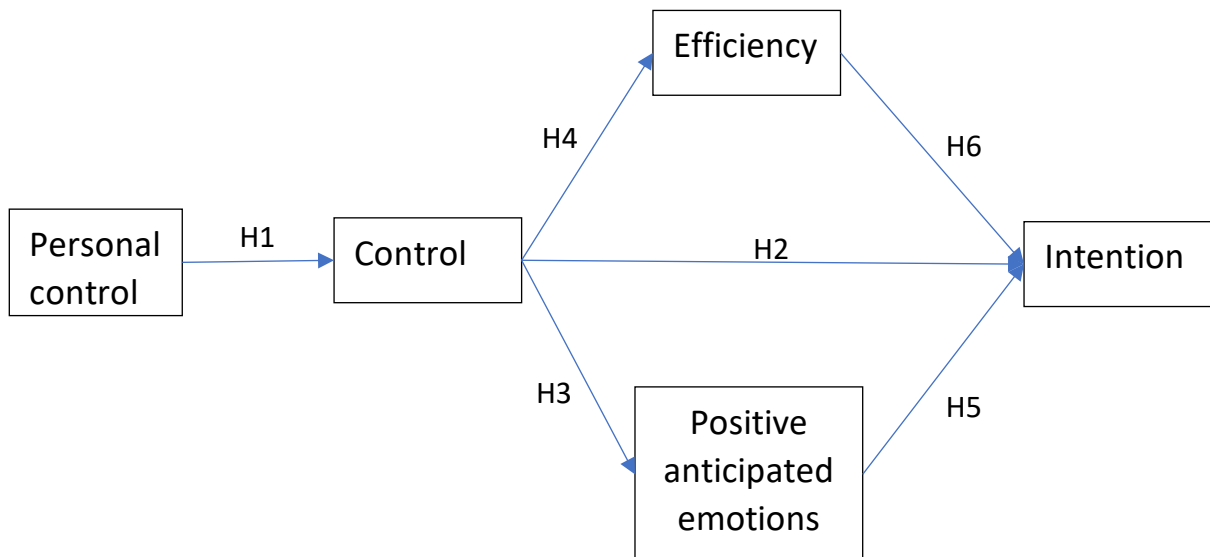
Two studies were conducted to test our hypotheses. The research model shown in figure 4-2 presents all developed hypotheses.

4.5. Study 1

4.5.1. Sample and data collection

We recruited 180 US participants from the online panel Amazon Mechanical Turk and 180 Australian participants using a survey panel company (Qualtrics Panel). US and Australian samples were used as they are two of the leading countries adopting SST (ABC Radio Perth,

2017; Tillster, 2019). To qualify for the survey, respondents had to have recently used some forms of SSTs. A screening question at the beginning of the survey asked, 'Have you used any form of self-service technologies in the past 3 months? (Yes/No)'. Only those who responded 'Yes' to this question were able to participate in the survey. Two responses from the US sample and 8 responses from the Australian sample were eliminated as they did not pass attention check questions. A total of 349 responses are included in the final sample (53.6% 18-30 year-old, 65% females) (see Table 4-1 for more details). Before the actual study, a pre-test was conducted to validate the scenario as well as the measurement scales. Based on feedback collected from the pre-test, minor modifications to the wordings were made.

Table 4-1: Demographic Characteristics of the Sample

Variables	Categories	US (%)	Australia (%)
Age	18-30 years old	56.7	48.3
	30-40 years old	32.6	46.7
	40-50 years old	10.7	5.0
Gender	Female	57.9	72.5
	Male	42.1	26.9
	Other	0.0	0.6
Education	Less than high school degree	1.7	7.0
	High school graduate (high school diploma or equivalent including GED)	10.7	31.6
	Some college but no degree	27.5	18.7
	Associate degree in college (2-year)	12.9	5.8
	Bachelor's degree in college (4-year)	35.4	32.7
	Master's degree	7.9	3.5
	Doctoral degree	2.2	0.6
	Professional degree (JD, MD)	1.7	7.0

4.5.2. Scenario

A scenario-based survey was employed to simulate the failure situation and investigate the proposed hypotheses. A car rental service setting, which has been successfully used in previous SST research, was adopted for the scenario (Dong et al., 2016; Zhu et al., 2013). In the survey, participants were given a scenario which describes a fictitious failure with a car rental self-service kiosk. Specifically, the customer in the scenario was using the self-service kiosk when an error occurred which prevented the customer from completing the transaction. The customer was then offered two different options to resolve the failure: (1) staff-based recovery in which a service employee solves the issue, and (2) SST-based recovery in which the customer follows an on-screen guide to solve the issue (See Appendix A for the scenario).

Scenario realism was checked using 3 items adapted from Zourrig et al. (2014) 7-point scale (1=strongly disagree, 7= strongly agree): "The situation described is realistic", "The situation described is likely to happen in real life", and "I have no difficulty imagining myself in the situation". Participants perceived the scenarios to be realistic as indicated by an average rating of 5.74 (SD= 0.88).

4.5.3. Measures

At the beginning of the survey, participants completed the 'sense of personal control' scale. All participants were then presented with the scenario. Participants were then asked about their evaluation of the SST-based recovery options (referred to as the 'self-help option' in the scenario), and their subsequent intentions towards the option.

The measures for the variables used in this study were adapted from existing research with slight modifications to suit the study's context. We measured perceived control over SST-based recovery using items adopted from Collier and Barnes (2015). The measure for intention

to use SST-based recovery was adopted from Dees et al. (2010). Five items measuring efficiency were adopted from Collier and Barnes (2015). The measure for positive anticipated emotion (four items) was adapted from Perugini and Bagozzi (2001) and asked the customer about anticipation of positive emotion if they used the SST-based recovery successfully. To measure participants' personal control, we adopt Lachman and Weaver's (1998) 12-item scale assessing two subscales – personal mastery and perceived constraints. To calculate an overall measure for personal control, first, all items for personal mastery and perceived constraints were summed to create composites for each measure. The scores were reverse coded for personal mastery. Then, both measures were standardized and summed to yield a composite score of sense of personal control (Kraus et al., 2009). A higher value indicates a higher level of personal control ($\alpha = 0.876$).

See Appendix B for all questions asked in the survey. All concept operationalizations consisted of 7-point scales (1 = strongly disagree, 7 = strongly agree). To test our hypothesis, a partial-least-square structural-equation model (PLS-SEM) was implemented. We used SmartPLS software version 3.2.8 to analyse the data. PLS-SEM was used as it is well-suited for exploratory research (Thompson et al., 1995). In addition, PLS-SEM allows for reflective measurement models as well as single-item constructs to be modelled and assessed (Hair et al., 2019). A two-step approach was adopted for the data analysis, as recommended by (Hair Jr et al., 2016). The first step is the measurement model, which establishes the reliability and validity of the measures. The second step tests the structural model by assessing the structural relationship between the constructs. All variables were input into the SmartPLS model as latent variables with their associated indicators. In the model, personal control was input as a singular variable which was indicated by its composite score. The calculation of composite scores of latent variables, which can then be applied as variables' indicators in structural equation

modelling has been frequently observed in past research (i.e., Plewa et al. (2015); Winke (2013); Wu et al. (2020))

4.5.4. Measurement model

The measurement model was evaluated based on the criteria of reliability, convergent validity, and discriminant validity (Hair Jr et al., 2016). Reliability was assessed using composite reliability and Cronbach's alpha values. All of the constructs' composite reliability and Cronbach's alpha values are above the recommended threshold of 0.7 (Fornell & Larcker, 1981) (see Table 4.3) which indicates acceptable reliability. The convergent validity was examined by two criteria: (1) all indicator outer loadings should be significant and exceed 0.7, and (2) the average variance extracted (AVE) by each construct exceeds the minimally acceptable value of 0.5 (F. Hair Jr et al., 2014; Fornell & Larcker, 1981). The analysis showed that all of the items had a loading higher than 0.7 and all of the AVEs were higher than 0.5 (see table 4.2 and 4.3). Thus, convergent validity was established. Discriminant validity was evaluated in terms of two criteria: (1) an indicator's outer loading on the associated construct should be greater than any of its cross-loadings, and (2) the square root of each construct's AVE should be greater than its highest correlation with any other construct (Hair Jr et al., 2016). As can be seen in Table 4.4, this was true for all of the latent variables and their corresponding items, which indicated that the measurement model has acceptable discriminant validity. Overall, all measures in the model were reliable and valid.

Table 4-2: Standard loadings

Constructs	Measured items	Standard loadings
Intention	Improbable… probable	0.940
	Impossible … possible	0.879

	Unlikely … likely	0.944

Perceived control	The self-help option would let me be in charge of the issue-handling process.	0.883
	The self-service aspect of the self-help option would let me be decisive.	0.888
	I would feel in control with the self-help option.	0.876
	The self-service aspect of the guide would give me more control over the issue.	0.909

Positive anticipated emotions	Glad	0.899
	Happy	0.923
	Satisfied	0.899
	Delighted	0.792

Efficiency	Using the self-help option would allow me to quickly get the problem solved.	0.896
	Using the self-help option would require little effort.	0.865
	Using the self-help option would be a fast way to get the problem solved.	0.934
	I would have to exert little energy to get the problem solved using the self-help option.	0.809
	The self-help option would let me move at a fast pace to get the problem solved.	0.926

Table 4-3: Reliability and validity indices for the measurement model

	Mean	SD	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)

Intention	5.343	1.695	0.911	0.944	0.849
Perceived control	5.141	1.198	0.912	0.938	0.791
Efficiency	4.791	1.294	0.932	0.948	0.787
Personal control	4.971	0.876	-	-	-
Positive anticipated emotions	5.962	0.96	0.901	0.932	0.774

Table 4-4: Square-root of Average Variance Extracted (AVE)

		1	**2**	**3**	**4**	**5**
1.	Intention	**0.922**				
2.	Perceived control	0.577	**0.889**			
3.	Efficiency	0.638	0.672	**0.887**		
4.	Personal control	0.115	0.163	0.107	**Single item construct**	
5.	Positive anticipated emotions	0.369	0.46	0.362	0.179	**0.88**

4.5.5. Hypothesis tests

Before assessing the hypotheses, the constructs' inner variance inflation factors (VIF) were assessed for possible common method bias problem (Hair Jr et al., 2016; Kock, 2015). Each construct's VIF value was below the threshold of 3.30, suggesting no serious evidence of common method bias within the model. Next, Table 4.5 provides a summary of the coefficient estimates, t-value, and p-value of the hypothesized relationships.

Table 4-5: Results of analyses on hypothesized relationships

Hypothesis		Standardized Coefficient	t-value	p-value	Status
H1	Personal control -> perceived control	0.2**	3.099	0.002	Supported
H2	Perceived control -> Intention	0.235***	3.951	<0.001	Supported
H3	Perceived control -> positive anticipated emotions	0.389***	7.547	<0.001	Supported
H4	Perceived control -> Efficiency	0.621***	16.551	<0.001	Supported
H5	Positive anticipated emotions -> Intention	0.115**	2.631	0.009	Supported
H6	Efficiency -> Intention	0.452***	9.091	<0.001	Supported

Notes: ***p<0.001, **p<0.01, *p<0.05

The results show that personal control is significantly positively related to perception of control over SST-based recovery (β=0.2; $p < 0.000$) confirming H1. Perception of control over SST-based recovery has a significantly positive relationship with intention (β= 0.235; $p < 0.000$), confirming H2. Perception of control over SST-based recovery is positively related to positive emotion (β= 0.389; $p < 0.000$), thus supporting H3. The positive relationship between perception of control over SST-based recovery and efficiency is also statistically significant (β= 0.621; $p < 0.000$). Thus, H4 is supported. As per H5, results show that the positive relationship between positive emotion and intention is significant (β= 0.115; p=0.009). Supporting H6, results reveal that efficiency is significantly and positively related to intention

($\beta= 0.452$; $p<0.001$). In addition, positive anticipated emotions show a weaker effect on intention, compared to efficiency.

Table 4.6 shows the analysis results for indirect effects of control on intentions. As shown in the table, the indirect effects of control on intention when mediated by efficiency was significant. The indirect effects of control on intention when mediated by positive anticipated emotions was also significant, though weaker in strength compared to that of efficiency. These results, together with the significant effect of perceived control on intentions indicate partial mediatory roles of efficiency and positive anticipated emotions.

Table 4-6: Indirect effects of perceived control on intentions test results

	Standardized Coefficient	t-value	p-value
Perceived control -> efficiency -> Intention	0.28 ***	7.698	0.000
Perceived control -> positive anticipated emotions -> Intention	0.045*	2.228	0.026

Notes: ***$p<0.001$, **$p<0.01$, *$p<0.05$

Finally, to test for our model's robustness, a multi-group analysis procedure was used to examine the differences in hypothesized relationships between the US and Australian samples. The analysis results (Table 4.7) showed that there is a significant difference between the two path coefficients for the relationship between control and efficiency ($p = 0.004$). The difference for all other relationships is insignificant.

Table 4-7: Multigroup analysis test results

Hypothesis	Standardized Coefficient	Group difference analysis

		US	Australia	t-value	p-value	Different
H2	Personal control -> Control	0.135*	0.250***	1.153	0.25	No
H3	Control -> Intention	0.289**	0.199*	0.735	0.463	No
H4	Control -> Positive anticipated emotions	0.470***	0.355***	1.234	0.218	No
H5	Control -> Efficiency	0.695***	0.502***	2.717	0.004	Yes
H6	Positive anticipated emotions -> Intention	0.081$^{n.s}$	0.127*	0.496	0.62	No
H7	Efficiency -> Intention	0.431***	0.464***	0.311	0.750	No

Notes: ***$p<0.001$, **$p<0.01$, *$p<0.05$
n.s – not significant

4.5.6. Discussion for study 1

The data demonstrated that personal control affects perceived control. Those with high personal control perceive greater control over SST-based recovery, whereas those with low personal control perceive less control over SST-based recovery. Perceived control, in turn, results in enhanced customer perception of SST-based recovery in terms of efficiency and positive anticipated emotions, providing consistent evidence, as per previous findings, on these relationships in a SST delivery context (Choi, 2018; Collier & Barnes, 2015). In addition, efficiency and positive anticipated emotions are positively related to intentions to use an SST-based recovery option. Furthermore, results reveal that efficiency has a stronger impact on intention than anticipated positive emotion does. Hence, it appears that, upon making their recovery choice, SST customers put greater emphasis on the functional value of SST-based recovery than the emotional value. Our findings also provide empirical support for the mediating role of efficiency and positive anticipated emotions, such that perceived control was found to enhance efficiency and positive anticipated emotions. These two constructs, in turn,

lead to greater customer intentions to use SST-based recovery. As such, both efficiency and positive anticipated emotions represent a mechanism that underlies the relationship between perceived control and intentions. This finding on the partial mediation of these relationships, therefore, adds value to the understanding of how perceived control influences customer decision-making about recovery choice. However, as there remains a direct path between perceived control and intentions to use SST recovery, other unexplained factors also act as a mechanism in this relationship. Finally, there is a difference in the relationship between perceived control and efficiency amongst the US and Australian sample with the US sample showing a much stronger control-efficiency relationship than the Australian one. This finding suggests a potential influence of culture-related factors which could be further explored by future research.

4.6. Study 2

Study 2 specifically focuses on the relationship between control factors and intentions. The study tests whether the relationship between personal control and perceived control would conceptually replicate when personal control was manipulated rather than measured. This allows us to establish the causal role of personal control and turn down the alternative explanation of unknown correlations.

From previous research, there is an understanding that customers' sense of personal control can be cognitively embedded, and thus affect their behaviour in subsequent situations, regardless of where the personal control originated (Faraji-Rad et al., 2016; Greenaway et al., 2016). This study demonstrates that the manipulation of customer personal control could alter their perception of and response to SST recovery option. This contributes to understandings of the dynamics of customers' psychological processes during the SST recovery process and potential application in service management.

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4.6.1. Method and procedure

We employed a self-administered online questionnaire and recruited US participants from the online panel Amazon Mechanical Turk. To qualify for the survey, participants had to have used some form of SST recently. This was enforced by including a screening question at the start of the survey ('Have you used any form of self-service technologies in the past 3 months?' Yes/No). Only participants answering yes to the question could participate in the survey. A total of 200 participants were recruited (of which 52% were male, 44.5% were 18-25 years old, 38.8% held a Bachelor's degree). The participants were randomly assigned to one of two conditions of a 2 (level of personal control: high vs. low) between-subjects design.

4.6.2. Manipulation of personal control

We used a recall task to manipulate the state of personal control. In the high personal control condition, participants were asked to recall a particular incident in which they had control over what happened. In the low personal control condition, participants were asked to recall a particular incident in which they had little control over what happened. This manipulation method for personal control has been successfully used in previous research (Faraji-Rad et al., 2016; Whitson & Galinsky, 2008). The participants were instructed to think carefully about the experience and describe it in detail: What happened? How did they feel? After completing the manipulation task, participants responded to manipulation check questions.

Following this, the study employed the same scenario from study 1 to simulate an SST failure experience. After reading the scenario, participants' control perception over SST-based recovery and their intention to choose SST-based recovery over staff-based recovery were assessed.

4.6.3. Measures

The same measures for perceived control and intention from study 1 were used. The measure for perceived control over SST-based recovery was adapted from Collier and Barnes (2015) 7-point scale (1 = strongly disagree, 7 = strongly agree; α = 0.944, M = 4.53, SD = 1.62). The measure for intention to use SST-based recovery was adopted from Dees et al. (2010) (α = .964, M = 4.89, SD = 1.94). The reliability of all scales exceeded the conventional minimum of 0.70 which indicates good internal consistency (Nunnally 1978). Finally, participants were asked to answer demographic questions related to age, education, and gender.

4.6.4. Manipulation and scenario realism check

The manipulation check for personal control was adopted from Cichocka et al. (2018) 4-item scale and asked about participants' agreement with four statements: "I feel I have little control over my life" versus "I feel I have great control over my life,"; "I have little influence on my fate" versus "I have great influence on my fate,"; "There are many things in my life I cannot influence" versus "There are few things in my life I cannot influence," and "Things that are happening in my life are simply a matter of coincidence" versus "Things that are happening in my life are not a coincidence." (α = 0.708, M = 4.72, SD = 1.08). Results from a one-way analysis of variance (ANOVA) indicated that the manipulation was successful, $F(1, 198)$ = 18.064, $p < .001$. Participants in the high-control condition reported a higher level of personal control (M=5.01; SD= 0.954) than those in the low-control condition (M= 4.38; SD=1.135). We used the same measurements used in study 1 for scenario realism. Results indicates that the scenario was perceived as realistic by our participants (M = 6.05, SD = 0.923).

4.6.5. Data analysis and results

A one-way ANOVA was conducted to test the effect of personal control on intentions and perceived control. The analysis was conducted using SPSS version 26.0. Exposing participants to personal control manipulation has a significant effect on intention to use SST-based recovery ($F(1,198) = 6.364$, $p = 0.012$, $\eta^2 = 0.03$). Participants in the high personal control condition (M= 4.791, SD =1.6) showed higher intention to use SST-based recovery than those in the low personal control condition (M= 4.505, SD =2.023). Exposure to personal control manipulation also had a significant effect on perceived control over SST-based recovery ($F(1,198) = 6.016$, $p = 0.015$, $\eta^2 = 0.03$). Participants in the high personal control condition (M= 4.791, SD =1.6) had higher perceived control over SST-based recovery than did those in the low personal control condition (M= 4.233, SD =1.59). This further provides support for H1.

Furthermore, we followed Hayes (2013) PROCESS to assess the mediatory role of the perceived control construct. PROCESS is a widely-used modelling tool that relies on OLS regression. The model was estimated using the PROCESS macro version 3.5 for SPSS (Model 4, 95 % bias-corrected confidence intervals [Cis]; 5000 bootstrap sample). The model included personal control as the independent variable, perception of control over SST-based recovery as the mediator, and intentions towards SST-based recovery as the dependent variable. The analysis confirms the positive effect of personal control on perceived control (β= 0.558, $p = 0.0147$, 95% CI = 0.111 to 1.004). It also shows a significant positive effect of perceived control on intention to use SST-based recovery ($\beta = 0.79$, $p <0.001$, 95% CI = 0.663 to 0.916), which further provides support for H2. The results also showed a significant indirect effect of personal control on intention to use SST-based recovery through perceived control over SST-based recovery, and the confidence interval does not include zero ($\beta = 0.441$, 95% CI = 0.0925 to 0.823). This means that perceived control plays the intermediary role in effect of personal

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control on intention. The direct effect of personal control on intention after we controlled for perceived control was non-significant ($\beta = 0.244$, $p = 0.242$), which provided the evidence of a full mediating effect of perceived control. Figure 4-2 illustrates the results.
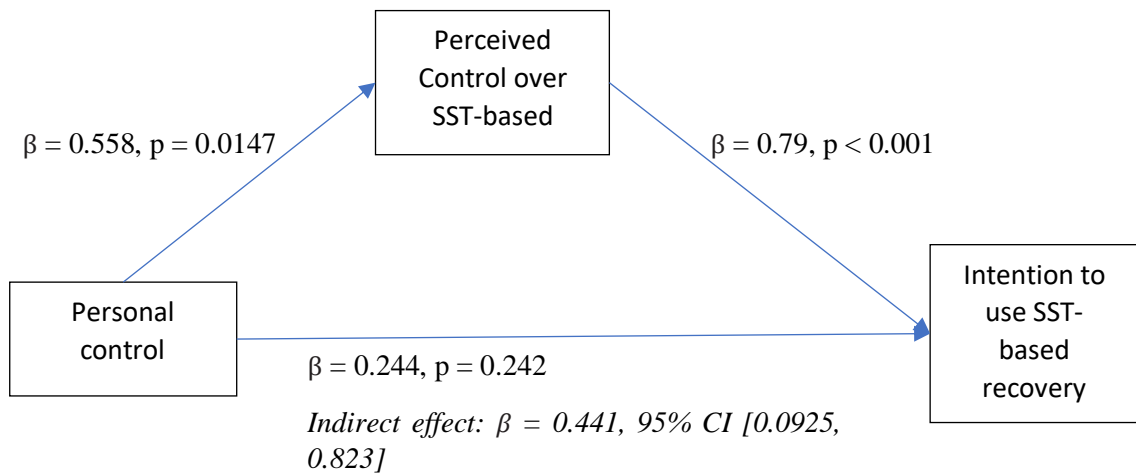

Figure 4-2: Personal control – Perceived control Model

4.6.6. Discussion for study 2

Study 2 presents several important findings. First, our results complement study 1 and provide confirmation for the role of control factors in SST recovery context such that (a) individuals' trait of personal control increased their perception of situational control (in the form of SST-based recovery) and (b) perceived control is an important determinant of customer decision-making in SST recovery choice. Second, using a different methodological technique (i.e., through priming manipulation), the study demonstrates the malleability of personal control, which subsequently impacts perceived control over SST-based recovery. From this perspective, priming methods of personal control could be of use when managing customer SST recovery experience.

4.7. Conclusion

Our research examines determining factors of customer intention to use SST-based recovery following SST failures. The paper answers Zhu et al. (2013) call for more research on alternative recovery options (other than switching to service staff) that customers might take following SST failures. We discover that customer intention to use SST-based recovery is positively related to both personal control and perceived control over SST-based recovery. Moreover, personal control has a positive effect on perception of control over SST-based recovery. We also found that perceived control over SST-based recovery positively influences efficiency and positive anticipated emotion which, in turn, contribute to customer intentions to use SST-based recovery. Both efficiency and positive anticipated emotion determine customer intentions towards SST-based recovery intention, though the impact of emotions is relatively weaker than that of efficiency. This difference in determining strength, which indicates that SST customers place more emphasis on the functional values of SST compared to hedonic aspects, is consistent with prior SST research (Kim & Han, 2009, 2011). Overall, control factors (personal control and perceived control) play a central role in customer SST recovery choice which influences the customer's decision both directly and indirectly through shaping customer perception of efficiency and positive anticipated emotions towards the recovery option.

4.7.1. Theoretical Implications

This paper offers several contributions to the existing literature. First, the study provides new insights into the importance of control in shaping customer intention towards using SST-based recovery. The study extends previous SST service research on perceived control (Chih-Hung Wang, 2012; Collier & Sherrell, 2010) by showing that the impact of perceived control on customer intentions extends beyond the initial SST transaction to be also

relevant in SST recovery. In addition, by examining both personal and situational control and their relationship in the SST recovery context, the study emphasizes the importance of control constructs (both personal- and situational-based) in influencing customer decisions.

Second, our research provides new evidence on the effect of customer personal control in the SST context. We find that personal control can elevate customer control perception towards SST-based recovery which ultimately directs customer recovery intention. Hence, our research contributes to the existing control literature by further establishing the universality of the concept of personal control in explaining human behaviour across situational contexts (Dion, 2004; O'Connor & Shimizu, 2002). The paper also draws on learned helplessness theory to provide a fresh conceptual explanation for the mechanism underlying how personal control influences perceived control in the SST recovery context. Our unique approach of jointly examining both personal control and situational appraisal of control (perceived control) also answers research calls from extant psychological research which has recommended the incorporation of different combinations of control constructs in research models, as such an approach allows for more comprehensive explanation of individual behaviour (Skinner, 1995).

Third, perceived control was found to not only have a direct influence on customer intentions but also impact customer perception towards the values that could be experienced during the SST based recovery process in terms of efficiency and positive anticipated emotions. Previous research has often established the direct effect of perceived control on customer intentions (Demoulin & Djelassi, 2016; Yang, 2012), but has failed to capture the explanatory power of this effect. This study explains that perceived control is a key factor in predicting functional (efficiency) and hedonic values (positive anticipated emotions) in the SST-based recovery process, which ultimately contributes to intentions.

Finally, this paper provides a better understanding of customer intentions to use SST-based recovery by simultaneously examining the role of both the utilitarian and hedonic variables. SST literature has been predicated on utilitarian variables, while giving limited attention to hedonic aspects of customer experience (i.e., positive emotion) (Collier & Barnes, 2015; Wei et al., 2016). By incorporating both efficiency and positive anticipated emotions into our model, the current research answers calls from prior SST research for more attention on hedonic factors in the SST context (Collier & Barnes, 2015). Value-in-use through service experience (Sandström et al., 2008) was extended to provide theoretical justification for the inclusion of both functional and emotional factors in explaining customer SST recovery intentions.

4.7.2. Managerial implications

Service failures are inevitable, which makes failure recovery an important part in maintaining relationships with customers. It is important, therefore, for management to have the necessary knowledge and tools to implement SST-based recovery solutions. Motivated by this, the present study offers several promising implications for practitioners. First, our findings show that perceived control of SST-based recovery plays an important role in shaping customer evaluation of the recovery option in terms of efficiency and positive emotion, both of which are important determinants of customer intentions. This sheds light on the advantages of providing a sense of control to customers, because when customers feel in control of the recovery option, their perception towards important values (e.g., efficiency and positive anticipated emotions) of the option also improves and so does intention.

Recognizing the importance of customer control perception, this paper provides insights into the individual characteristic of personal control which can potentially influence customer perceived control. Prior research has suggested that personal control can be instigated

and changed using different manipulation methods (Cutright et al., 2013; Cutright & Samper, 2014; Landau et al., 2015). This suggests that acknowledging the role of personal control in influencing customer perceived control over SST options and utilizing such knowledge in the SST setting can be a promising platform for managing customer perception of control. Hence, we suggest that SST managers can develop strategies that cater to customer personal control. For example, prior research has shown effective and practical ways to prime a customer's personal control state through various control-boosting cues such as furniture (Chen et al., 2001), body postures/posing (Carney et al., 2010; Huang et al., 2011), and slogans (Sembada et al., 2016). Service managers might be able to utilize personal control-induced measures in their service settings so as to raise customer personal control and thereby favourably influence the important control perception. This approach of improving control perception through personal control also offers a novel perspective to the existing control management method of increasing customer perceived control by giving customer actual control in the service process (e.g., involving customers in the decision-making process and delegating producer tasks to customer). While increasing the customer's actual control could potentially backfire (i.e., some customers may not wish to take on the control and associated responsibility) (Joosten et al., 2016), personal control-induced methods have been consistently found to be desirable to the customer because of its adaptive benefits with regard to enhancing one's well-being (Lachman et al., 2011).

Finally, the research found that, together with efficiency, positive anticipated emotions also play a role in shaping customer SST recovery choice. This suggests that besides improving the efficiency of the SST, creating a hedonic experience for SST customers is also necessary for encouraging customer adoption of SST-based option for recovery. One way can be achieved is by incorporating hedonic factors into the design of the SST interface. Emotional cues can be expressed through the SST interface using different tools such as system voice, words and topic

choice, and emoticons (Brave & Nass, 2007; Li et al., 2019). For example, emotion could be encoded into the message verbally (i.e., this is a happy experience). This way, customers are likely to feel positive emotions when using the SST and consequently develop positive anticipation towards the emotional aspect of the SST-based recovery.

4.8. Limitations and future research directions

This study has several limitations. Firstly, our study considered only one form of SST-based recovery option (e.g., interactive help-guide) and one SST setting (e.g., car-rental kiosk), which may limit the generalizability of the research finding. Future research could consider testing the model across different options of SST-based recovery (e.g., virtual assistant, chatbot) and SST settings. Secondly, this study relied on a scenario-based approach to stimulate the SST failure experience. Although this is a common approach in service failure research (e.g., Collier et al. (2017); Gelbrich (2009); Lee and Cranage (2018)), participants' reactions to a scenario situation may differ from their reactions to a real situation. Future research may consider adapt the proposed model to a field study design. Another limitation relates to the lack of situational factors in our model. Further research could add to our findings by examining the effect of variables specific to the failure situation (e.g., the severity of the failure, type of failure) or to the service contexts (i.e., presence of other customers, perceived waiting times) into the current research model and consider their links to the existing variables (Collier et al., 2017; Collier et al., 2015; Dabholkar & Bagozzi, 2002; Sembada et al., 2016; Tsarenko & Tojib, 2012). In addition to these limitations, the data sample has a slight gender bias in that female participants account for a higher percentage than male participants. It is possible that this gender disparity might impact the research findings as there has been evidence of the influence of gender differences in the SST context (Brauner et al., 2017; Johnson et al., 2008). Finally, this study seeks to establish the generalization of our model by using data from two

different developed countries – US and Australia. Though the research model was designed with data from both countries, there is a slight difference in the relationship strength between control-efficiency in the two samples. Further research could expand on this finding by incorporating country- or culture-specific factors into the model in order to explain the mechanism behind the strength difference. Additional empirical research should also be conducted with data from more countries to allow for the generalization of the results.

Overall, the current research sheds lights on the key role of customer perceived control over SST-based recovery in determining customer intention towards this recovery option. The research also incorporates personal control as an important antecedent of perceived control, as well as efficiency and positive anticipated emotions as dependents of perceived control. By investigating both the antecedent and the impact of perceived control of SST-based recovery, this paper enriches understanding of this essential concept in the SST recovery context. We also extend the application of learned helplessness and value-in-use through service experience theory in the SST recovery contexts to provide an explanation for the research model. Insights from the paper should aid SST managers in managing customer perceptions in the SST recovery domain.

Chapter 5: Conclusion

5.1. Discussion

The main objective of the thesis was to investigate an emerging SST recovery context: SST-based recovery. Previous SST studies have focused on SST adoption and use, and the SST-based recovery context remains under-researched. The first objective of the study was to develop an integrated framework that explains customer intention to use SST-based recovery. Hence, the thesis began with the development of a conceptual framework (paper 1) that describes in-depth the cognitive appraisal process that customers use in making decisions about using SST-based recovery. According to the framework, the experience of SST failure triggers the customer cognitive appraisal process which incorporate failure appraisal and recovery appraisal. First, failure appraisal is the customer's evaluation of the severity of the consequences of SST failure. Failure appraisal is determined by two elements: agency appraisal and outcome desirability appraisal. The result of failure appraisal then evokes different negative emotions from customers, including anger, guilt or anxiety. The second component of cognitive appraisal is recovery appraisal, which involves customer evaluation of the effectiveness of SST-based recovery to address the SST failure. Recovery appraisal comprises three elements – functional, social, and emotional values. Ultimately, customer emotional states and the recovery appraisal jointly determine customer intention towards SST-based recovery. Finally, individual characteristics are positioned as important predictors of the customer cognitive appraisal process. Three categories of individual characteristics are identified as relevant to the SST-based recovery context, namely control-, technology- and social-related characteristics. The proposed framework provides a comprehensive and well-balanced discussion of the determining factors of customer intention to use SST-based

recovery, incorporating both cognitive and emotive factors, as well as both characteristics of the failure context and the recovery option.

The research objectives also sought to provide an empirical examination of key determining factors of customer intention to use SST-based recovery, and more specifically, shed light on the pivotal role of customer perceived control construct. Hence, paper 2 and 3 took an empirical approach and focused on the effect of recovery appraisal on customer intention to use SST-based recovery. Both papers bring attention to the role of customer control perceptions over SST-based recovery in determining customer intention toward the recovery option. The mechanism underlying the significant role of perceived control in the customer recovery decision is proposed to be the fact that experience of SST failures drives customer need for having control over the recovery process (which is explained in paper 2). This enhanced importance of customer perceived control resonates with findings from previous studies which discuss customers' participation in the creation of the service recovery (Guo et al., 2016). Findings from paper 2 provide the initial evidence that, when customers feel in control of the SST-based recovery option, this significantly increases their intention to use the option. In addition, together with perceived control, paper 2 also examines the role of perceived risk in determining customer intentions toward using SST-based recovery. Customer intentions to use SST-based recovery are determined by both perceived control and perceived risk. In addition, perceived risk also plays an intermediary role in the relationship between perceived control and intention. That is, as a customer's perception of control increases, they perceive less risk associated with the use of SST-based recovery, which in turn, leads to greater intention to use SST-based recovery. Overall, these findings extend previous SST research on customer perceived control and demonstrate that the determining power of perceived control extends beyond SST adoption and use (i.e., non-recovery contexts) to its critical role in customer

intention towards using SST-based recovery (e.g., Collier and Sherrell (2010); Lee and Allaway (2002); Oyedele and Simpson (2007)).

Building on paper 2, which uncovered the importance of perceived control in the SST recovery context, paper 3 aimed to provide a more in-depth understanding of this important construct by examining its antecedent and outcomes. Specifically, paper 3 further investigated the impact of perceived control on customer perception of SST-based recovery in terms of efficiency (functional value) and positive anticipated emotions (emotional value). This extended our understanding from paper 2, which only considered aspects of functional value (perceived control and risk). The results indicated that, ultimately, perceived control, efficiency, and positive anticipated emotions are all positively linked with intentions to use SST-based recovery.

Importantly, the relationship between individual characteristic of personal control and perceived control over SST-based recovery was examined. The results showed that personal control, which is a trait-like characteristic, has a positive impact on customer perceived control over SST-based recovery – a situational-based perception. As indicated by the conceptual framework (paper 1), customer appraisal of SST-based recovery is influenced by individual characteristics which include technology-, social-, and control-related dimensions. Out of all three dimensions, control-related characteristics have received little attention from SST researchers compared to both technology-related (e.g., SST self-efficacy, technology readiness) and social-related characteristics (e.g., need for human interaction) (Chen et al., 2018; Dabholkar & Bagozzi, 2002; Fan et al., 2019; Lee & Lyu, 2016). This lack of SST research on individual characteristics regarding control further highlights the importance of the current study. By examining the role of personal control, the study not only advances previous service research on customer personal control (e.g., Cutright (2011); Cutright and Samper

(2014); Faraji-Rad et al. (2016)) by demonstrating that the impact of personal control on customer behaviours extends beyond the traditional service delivery to SST recovery contexts, but more generally contributes to the SST research on customer individual characteristics (e.g., Demoulin and Djelassi (2016); Yang (2012); Yang and Forney (2013)) which demonstrates the importance of customer differences on their responses to SST options. Overall, the research findings indicate that perceived control, perceived risk, efficiency and positive anticipated emotions, which reflect customer perceptions towards SST-based recovery, are all important factors in shaping customer intention towards using SST-based recovery. Importantly, perceived control, as the key determinant, not only affected intention directly but also indirectly through perceived risk, efficiency and positive anticipated emotions. In turn, perceived control can be influenced by the individual characteristic of personal control.

5.2. Theoretical contributions

This thesis centres on SST-based recovery, which answers the call for more work on alternative SST recovery solutions (Zhu et al., 2013). The thesis enhances the theoretical understanding of the factors that play a determining role in customer intentions towards using SST-based recovery. The current research has extended the application of a number of theories to understanding customer intention towards using SST-based recovery. First, stress and coping theory (Lazarus & Folkman, 1984a) was extended to the SST-based recovery context in order to provide a guiding frame for organizing and linking important determiners of customer recovery intentions. Second, the research applied the negative feedback mechanism proposed by control theory to demonstrate and explain the mechanism underpinning the importance of perceived control and risk to customer recovery choice (SST-based recovery *vis-à-vis* human-based recovery). Third, by applying value-in-use through service experience theory (Sandström et al., 2008) to link efficiency (functional value) and positive anticipated

emotions (emotional values) to customer recovery intentions, the research provided evidence for the generalizability and robustness of the theory in explaining SST recovery decisions. Finally, learned helplessness theory (Maier & Seligman, 1976; Maier & Seligman, 2016) was extended to the SST recovery context to explain the relationship underpinning personal control and perceived control over SST-based recovery.

Specifically, paper 1 contributes to the conceptual understanding of the way in which customers evaluate the SST failure situation and the SST-based recovery to come to their recovery decision. The paper draws on stress and coping theory to show a dual-cognitive appraisal process which incorporate both customer failure appraisal and recovery appraisal, as well as cognitive and emotive dimensions. Our framework, hence, provides a balanced approach to study the psychological processes underlying the relationship between the way customers appraise their situations and their resulting intentions. Prior research in customer responses to SST failure and recovery has often focused on either only failure or recovery appraisal while ignoring or only considering a small part of the other appraisal element (Dabholkar & Spaid, 2012; Robertson et al., 2012; Zhu et al., 2013).

As for paper 2 and 3, findings from these papers indicate that perceived control plays a key role in determining customer intention to use SST-based recovery. The papers collectively provide support for previous research which has established that perception of control is one of the strongest determinants of a customer's decision to use SST options (Collier & Sherrell, 2010; Lee & Allaway, 2002), but the papers further extend the significance of this concept beyond the initial SST transaction to the SST recovery context. Moreover, the papers further contribute to the understanding of the influence of perceived control by showing that perceived control also influences intentions through enhancements in customer perception of SST-based recovery (i.e., reduced risk, increased efficiency, positive anticipated emotions). Furthermore,

the findings indicate that individual variables such as personal control can account for the variation in customers' perception of control over SST-based recovery. By encompassing both personal control and perceived control into the research model, the research contributes to understandings of the impact of control from a more comprehensive perspective, looking at the control factor from a personal trait perspective as well as its manifestation in the contextual domain of the perceived control over the novel context of SST-based recovery. Importantly, our finding on the determining role of personal control on perceived control over SST-based recovery also suggests a new direction for building customer perceived control, which further adds to existing SST literature on approaches to enhance control perception (Zhu et al., 2007).

Finally, along with perceived control, the thesis also identifies perceived risk, efficiency, and positive anticipated emotions to be key variables in driving customer intentions. These findings are in line with the value-based perspective which emphasizes the joint effect of both functional and hedonic values of SST usage on customers (Collier & Barnes, 2015; Sandström et al., 2008)

5.3. Managerial Implications

The combined findings from the three papers provide several options for managers. First, one contribution of this thesis has been to identify customer cognitive appraisal, or customer evaluation of SST failure and SST-based recovery, as the key element in their intentions towards using SST-based recovery. Thus, the framework suggests that being able to make sense of and consciously apply knowledge on how customers assess their environment and come to their decision-making should be the priority for managing customer response to SST failure and recovery. In addition, the detailed specification of important elements of customer cognitive appraisals in our framework should provide service providers with a clear picture of how customers appraise their environment (SST failure and SST-based recovery) to

come to their decision for recovery choice. This knowledge may assist service providers to keep track of the various factors that affect customer intentions. Furthermore, the framework also sheds light on how differences in individual characteristics affect the way customers appraise the SST failure and SST-based recovery. For example, a customer may appraise an SST failure as stressful, but a different customer may appraise the same failure as only a minor issue. The thesis highlights a need to develop proactive contingency plans that are customer-centric and adaptive to dynamic individual characteristics.

As indicated by the research findings, the thesis highlights the important role of perceived control which was found to positively impact intentions as well as customer perception of different values of SST-based recovery (i.e., risk, efficiency, positive anticipated emotions). This suggests the importance of strengthening customer perceived control, in order to motivate customers to use SST-based recovery, instead of switching to personal support. Hence, SST managers could use perceived control as metrics that can guide their development of recovery strategies.

The next contribution of this study is the identification of personal control as an important determinant of perceived control. SST managers should be equipped with the knowledge that psychological characteristics such as personal control could play a role in guiding customer evaluation and perception, hence, influencing the outcome of recovery management. In addition, prior research has shown that personal control can be temporarily influenced using certain personal control-induced methods (Faraji-Rad et al., 2016). It is suggested that, using practical control boosting interventions, service providers could incorporate the use of recovery interventions that cater to a customer's personal sense of control. Some examples of practical control boosting interventions that can be utilized in the service settings include control-inducing furniture (Chen et al., 2001), body postures/posing

(Carney et al., 2010; Huang et al., 2011) and slogans (Sembada et al., 2016). Hence, service managers might be able to utilize these personal control-enhancing measures to potentially enhance customer control perception over SST-based recovery to drive usage. On the other hand, managers should also be informed of the effects of diminished personal control which has a negative impact on the customer's perceived control over an SST recovery solution, and ultimately, reduces their willingness to use the recovery option.

Finally, along with perceived control, the thesis also identifies perceived risk, efficiency, and positive anticipated emotions to be key variables in driving customer intentions. Hence, customers may not only care about the functional benefits (e.g., efficiency and risk), but also the hedonic benefits associated with the recovery option (e.g., positive anticipated emotions). Along with the control factor, it is recommended that service firms who wish to motivate customer SST-based recovery intentions, highlight the benefits of the recovery option in terms of both functional and hedonic aspects. Particularly, SST managers could benefit from using both functional and hedonic elements in their service designs and setups.

5.4. Limitations and future directions

As with most research, this thesis has several limitations. These are discussed below.

First of all, the generalizability of the two empirical papers (paper 2 and 3) is restricted for several reasons. The research employed a scenario-based survey approach, which may limit the generalizability of the thesis results to real-world situations. In addition, the research sample was restricted to only two countries (e.g. Australia and US) which may limit the generalizability of research data to customers from different countries. The current research also used a cross-sectional design which may limit its internal validity (Goodwin & Goodwin, 2016). Another concern is related to the setting used for the empirical studies, which was confined to one single industry (i.e., car rental) and only one form of SST-based recovery (i.e.,

interactive help-guide). Hence, future research could expand the research model by incorporating different SST contexts, different forms of SST-based recovery (e.g., chatbots) and nationalities. Future research could also employ different research designs and methodologies, such as longitudinal, experimental, or field study, in order to provide further insights into the research model and increase generalizability.

Furthermore, additional research is needed to fully explain the effect of perceived control in the SST recovery context. This thesis did not perform a qualitative analysis of perceived control. Hence, future research could benefit from a qualitative analysis to identify which additional constructs are important to the conceptualization of perceived control in SST recovery contexts.

The empirical research design (1 single SST failure condition) is deemed suitable for the intention of the study, which was to identify relevant SST-based recovery-related factors (recovery appraisal) and their effects on customer recovery intentions. However, as suggested by paper 1 (conceptual framework), customer recovery intentions are likely to also be shaped by customer failure appraisal. Thus, questions remain about the extent to which different failure characteristics may affect customer failure appraisals and consequently, their recovery intention. To achieve this, we encourage future research to start by manipulating customer failure appraisals by using different failure conditions (e.g., failure settings, failure types) and tracing the resultant emotions, recovery appraisals and ultimately, intentions. For example, future research could simultaneously use two failure contexts – airport check-in machine as well as car-rental kiosk – to uncover different failure characteristics (e.g., failure types, failure severity) and measure their impact on customer recovery choice.

The conceptual framework from paper 1 also establishes the important role of individual characteristics in customer decision-making associated with SST-based recovery.

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Customer individual characteristics have not been fully examined in this thesis as it only investigated one characteristic (personal control). This brings forth the need for a more comprehensive examination of these personal factors. Knowledge of how these characteristics and their interactions influence customer decision-making would aid our understanding of customer recovery choice.

Another area of interest that arose from our results is the potential impact of culture-specific factors on customer evaluation of SST-based recovery. As per paper 3, the effect of control on efficiency was found to be different between the Australian and US samples. Additional research is needed to further explore and understand this phenomenon.

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APPENDICES

Appendix A

SCENARIO

Please imagine that you use a car rental kiosk (self-service machine) to rent a car. You follow the prompts on the screen and specify your rental order step-by-step (i.e., pickup/return date, type of car).

Before you make it to the payment page, a message appears, indicating that your transaction cannot be processed. The screen also shows two options for you to choose from:

(1) Self-help : Follow the step-by-step prompts shown on-screen to solve the issue.

(2) Staff help: Seek assistance from customer support staff.

Below is the screenshot of the car rental machine's screen at the time when the problem occurs.

Measurement scales

Constructs	Measured items	Authors
0.944	Improbable… probable Impossible … possible Unlikely … likely	Dees et al. (2010)
Perceived control	the self-help option would let me be in charge of the issue-handling process the self-service aspect of the self-help option would let me be decisive I would feel in control with the self-help option the self-service aspect of the guide would give me more control over the issue	Collier and Barnes (2015)
Positive anticipated emotion	Glad Happy Satisfied Delighted	Perugini and Bagozzi (2001)
Efficiency	Using the self-help option would allow me to quickly get the problem solved. Using the self-help option would require little effort. Using the self-help option would be a fast way to get the problem solved. I would have to exert little energy to get the problem solved using the self-help option. The self-help option would let me move at a fast pace to get the problem solved.	Collier and Barnes (2015)
Personal control	**Personal Mastery** I can do just about anything I really set my mind to. When I really want to do something, I usually find a way to succeed at it. Whether or not I am able to get what I want is in my own hands. What happens to me in the future mostly depends on me. **Perceived Constraints** There is little I can do to change the important things in my life.* I often feel helpless in dealing with the problems of life.*	Lachman and Weaver (1998)

	Other people determine most of what I can and cannot do.*	
	What happens in my life is often beyond my control.*	
	There are many things that interfere with what I want to do.*	
	I have little control over the things that happen to me.*	
	There is really no way I can solve the problems I have.*	
	I sometimes feel I am being pushed around in my life.*	
	Reverse code items in perceived constraints subscale	
Scenario manipulation checks	The situation described is realistic	Zourrig et al. (2014)
	The situation described is likely to happen in real life	
	I have no difficulty imagining myself in the situation	