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The role of Health Locus of Control in value co-creation for standardized screening services.

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activities, and the delineation of self-generated and service-generated activities provides a holistic framework to understand the influence of HLOC on the co-creation of value in standardized screening services.

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Keywords: health service, co-creation, locus of control, microfoundation, cancer screening

Paper type: Research paper

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1. Introduction

Successful health-care management is related to the active involvement and interactions between health-care service providers and health-care service users (Holman and Lorig, 2000; Michie *et. al.*, 2003). These interactions involve both service-generated activities (Albinsson *et. al.*, 2016; Prahalad and Ramaswamy, 2004) and self-generated activities (McColl-Kennedy *et. al.*, 2012). Furthermore, user-centered models of understanding health-care management and the extension of customer value co-creation activities are on the rise, acknowledging the active and complementary roles that individuals play in their own health-care management (see McColl-Kennedy *et. al.*, 2012; Sweeney *et. al.*, 2015). Therefore, user-centered models offer an appropriate perspective from which to examine and understand how individuals engage in health-care management.

Despite the availability and the accessibility of standardized cancer screening services (hereafter referred to as standardized screening services), many individuals avoid participating in these services. The Australian Government has offered these standardized screening services to all Australians within the appropriate demographics, and yet usage of these is limited, with these services failing to meet the national targets. For example, the national breast screening program has a target of 70% of eligible women; however, the current rate is lower than the desired participation rate at 54% (AIHW, 2017). Thus, there is a need to increase standardized screening service participation rates. Understanding participation experiences and how health locus of control, contributes to value co-creation via service-generated and self-generated activities in standardized screening services is the overall purpose of this paper.

The interactive nature of service delivery and, in particular, the importance of self-

management of health care make co-creation of value particularly relevant in a health-care context. Value co-creation is a process in which an organization and customers interact at various stages of the consumption process to create the product/service experience (Prahalad and Ramaswamy, 2004). Prior studies on co-creation in the broader services literature, and health services in particular, have shown that co-creation occurs when engagement and participation are high (Parkinson *et. al.*, 2017). Cancer screening services, however, are standardized screening services, where the emphasis is on providing a uniform screening service for all consumers, generally provided by a network of service providers offering a similar quality of care (Stephenson *et. al.*, 2004). This eliminates the possibility of customised service delivery within the service interaction, however this paper shows that value can be co-created with standardized services when consumer responses to service offerings are understood. By understanding the needs of different consumer segments, health service providers can provide appropriate offerings to meet the preferences of each consumer segment.

Within the context of a service experience, there are two main areas of focus: activities/behaviors (see McColl-Kennedy *et. al.*, 2012) and the service experience environment characteristics (see Albinsson *et. al.*, 2016; Prahalad and Ramaswamy, 2004). This paper seeks to expand on current service research, extending the ideas of McColl-Kennedy *et. al.*'s (2012) customer value co-creation activities, more specifically the integration of service-generated aspects using the DART framework of co-creation (Prahalad and Ramaswamy, 2004). The DART framework outlines four elements of the service environment that can facilitate co-creation - dialogue, access, risk-benefit understanding, and transparency – thus creating the acronym DART (Prahalad and Ramaswamy, 2004). Moreover, value co-creation can be influenced by individual characteristics and also structures, systems, and processes called microfoundations (Felin *et. al.*, 2015). This paper

seeks to incorporate these microfoundations into the research. One such microfoundation that may influence the required interactions to facilitate service delivery is locus of control (LOC). Understanding the microfoundation of co-creation of value in both service activities/behaviors and service experience environment characteristics is important for conceptualizing the nature of co-creation of value in health-care services and explaining why consumers do and do not engage in co-creation activities. More specifically, in a cancer-screening context, improved well-being is the ultimate outcome for the service recipient while, for the service provider, increased uptake of standardized screening services is the ultimate outcome, with the contribution being made at the societal level from the positive impact of early intervention of cancer treatment.

The personal control that people believe they have over their own health conditions and the efficacy of health behaviors has been shown to affect how people interact with health care (Step toe and Wardle, 2001). To date, there is limited understanding of the impact of personal characteristics such as LOC on service interactions and how internal LOC influences likelihood to participate in standardized screening services. Internal LOC is often found to activate autonomous behavior, which is linked to health-promoting behaviors (Step toe and Wardle, 2001; Wallston, 1992). However, in some health contexts, such as medication adherence (Náfrádi *et. al.*, 2017), the powerful others LOC (a component of the LOC construct) has also been found to be health promoting as individuals see doctors and medical professionals as experts. Some consumers approach preventative health with a fatalistic view (whatever will be will be) while others take more control. Wallston *et. al.* (1978) suggest that (according to social learning theory) Health LOC (HLOC) is a specific LOC. While literature suggests that an internal LOC results in individuals taking more responsibility for their health, there is limited understanding of how this influences their participation in health services. Therefore, understanding individual differences in HLOC and how HLOC may

impact service participation is essential. HLOC is assumed to impact on how patients co-create value and their practices in relation to their health and thus the purpose of this paper is to explore how the microfoundation, HLOC, contributes to value co-creation via service-generated and self-generated activities in standardized screening services. Further, examining HLOC in standardized screening services supports the understanding of microfoundations and the impact on value co-creation in health-care services.

To address the managerial problem of participation in standardized screening services (specifically cancer screening services) and the theoretical gaps in the value co-creation literature, two research questions are posed:

RQ1 How do service-generated activities and self-generated activities contribute to value co-creation in a standardized screening service?

RQ2 How does HLOC influence the way individuals co-create value in standardized screening services?

This paper first explores value co-creation frameworks, and microfoundations of co-creation are also outlined. The literature review concludes with a discussion on LOC and HLOC. The method is then outlined and the findings presented. Finally, the theoretical and managerial contributions of the results are discussed to conclude the paper.

2. Literature review

2.1 Co-creation of value

Value co-creation occurs at various stages of the consumption process (Prahalad and Ramaswamy, 2004). There are two stages in the service process where value co-creation can occur: the service design/innovation phase (for an example see Helkkula *et. al.*, 2018) and during the actual service experience (Jaakkola *et. al.*, 2015). In the context of this research -

standardized services for cancer screening - there is little scope to co-create the design phase; however, as past health research indicates, there are significant opportunities for consumers to co-create within the service experience (McCull-Kennedy *et. al.*, 2012). Therefore, this research focuses on the service experience.

2.1.1 Self-generated and service-generated value co-creation

Within the service experience, two types of co-creation frameworks have been identified: the activities and behaviors that are led by the consumer (McCull-Kennedy *e.t al.*, 2012) and the co-creation activities that are led by the service-provider through the service experience environment (Prahalad and Ramaswamy, 2004). The dominant areas of research to date are on the activities and behaviors that are customer-led, with little research on the service-provider-led environment. Customer-led activities are classified as self-generated co-creation activities while the service-provider-led activities are classified as service-generated co-creation activities. Thus, this research addresses the first research question of “*How do service-generated activities and self-generated activities contribute to value co-creation in a standardized screening service?*”

McCull-Kennedy *e.t al.* (2012) developed eight customer value co-creation activities through research relating to the service experience of a cancer clinic. While McCull-Kennedy *et. al.* focus on treatment-oriented health rather than preventative health, the activities translate to preventative cancer screening. Furthermore, the authors call for further research of their framework in other contexts, with the view that the framework is translatable (McCull-Kennedy *et. al.*, 2012). The eight customer value co-creation activities are: cooperating (being compliant or accepting information from a service provider); collating information (sorting and assorting of information); co-learning (seeking and sharing information with other sources); connecting (establishing and maintaining relationships);

changing the ways of doing things (the need to adapt to long-term lifestyle changes); combining complementary services (usage of supplementary medication); cerebral activities (the metaphysical process of self-engagement to co-create value) and coproduction activities (helping to redesign treatment programs and rearrange one's medical team) (McColl-Kennedy *et. al.*, 2012).

The second framework underpinning the study is the DART framework which outlines four elements of the service environment that can facilitate co-creation - dialogue, access, risk-benefit understanding, and transparency – thus creating the acronym DART (Pralhad and Ramaswamy, 2004). The DART framework was one of the first conceptualizations of value co-creation and proposed how a firm could move from a product- and firm-centric view of value to a consumer-centric approach. While there has been significant research since 2004 on the topic of service value co-creation, there has been little empirical evidence that uses the DART model as a framework. One of the few studies using the framework was a scale-development article for the DART framework (Albinsson *et. al.*, 2016) which evaluated the characteristics of the service experience environment. The scale refines the precise meaning of each of the DART framework elements which can then be the basis for both qualitative and quantitative work in value co-creation.

2.1.2 Value co-creation activities framework

The elements in the DART framework align with the customer value co-creation activities (McColl-Kennedy *et. al.*, 2012) and thus the integration of these two frameworks form the conceptual foundation for the study. The DART element of “dialogue” aligns with co-learning, “access” aligns with combining complementary therapies, “risk-benefit” assessment aligns with cerebral activities and “transparency” aligns with both connecting and collating information (Albinsson *et. al.*, 2016). The remaining three activities (coproduction, changing

the ways of doing things, and cooperation), from the customer value co-creation activities, did not align with any DART elements and require an additional element to have a complete match. The common feature of these three activities is the tangible nature of executing the service, and thus execution has been added in this research as a fifth element in the service environment. The alignment between the two frameworks is shown in Figure 1.

[INSERT FIGURE 1 ABOUT HERE]

2.2 Microfoundations of co-creation

The exploration of microfoundations was initially used in strategy and organizational behavior to understand how interactions between individuals lead to organizational and collective levels of performance (Jansen and Chappin, 2015). Explained in the literature as providing understanding of the macro construct “at a level of analysis lower than that of the phenomenon itself” (Storbacka *et. al.*, 2016, p. 3008), microfoundations are deemed to be the individuals, social processes, and structures (and their interactions) at the micro level that facilitate the emergence of value co-creation, conceptualized as a macro construct. The study of microfoundations is always relative to the macro, taking its meaning in the understanding of the macro phenomenon under investigation (Jansen and Chappin, 2015). This is particularly pertinent in services because “service provision, which is value creation with others for the benefit of others, is a special case of value creation. To provide service means to facilitate others becoming better off” (Chen *et. al.*, 2012, p. 1540). This understanding of service helps to contextualize the macro or social outcome related to the microfoundations. These microfoundations of co-creation draw on individual characteristics and processes (summarized in Table 1).

[INSERT TABLE 1 ABOUT HERE]

Service literature tends to focus on interactions facilitated by service providers (e.g., Chen *et. al.*, 2012) or recipients (e.g., Sweeney *et. al.*, 2015); however, there is increasing focus on value co-creation and the interaction between parties (Ramaswamy and Ozcan, 2018). Value co-creation requires mutual interaction (Grönroos and Voima, 2013). This research therefore seeks to explore the individual's HLOC and participation in standardized screening services by extending McColl-Kennedy *et. al.*'s (2012) customer value co-creation activities and the DART framework. The current study aims to provide a richer understanding of how HLOC, as a microfoundation, contributes to value co-creation via service-generated and self-generated activities. This is particularly relevant because very few studies explore the role of microfoundations in value co-creation beyond the service setting (Sweeney *et. al.*, 2015); despite the understanding that value can be derived from behaviors distant from the service organization (Hilton *et. al.*, 2012).

2.3 Locus of control

Ramaswamy and Ozcan (2018) argue value co-creation is best explained as the result of interactional creation of value across multiple interactions (not just a dyadic provider–customer interaction) that include multiple platforms (both people and devices). LOC, with its origins in Rotter's (1954) social learning theory, draws on the influence of actors, processes, and artifacts (and their interactions) on individual value-creation activities. This means the service recipient's LOC could be deemed to be a microfoundation that influences the value co-creation process.

LOC is a personality attribute reflecting the degree to which one generally perceives events to be under one's control (internal locus) or under the control of powerful others

(external locus) (Rotter, 1966). Thus, internal control refers to the degree to which individuals expect that reinforcement or an outcome of their behavior is contingent on their own behavior or personal characteristics. External control, in contrast, refers to the degree to which individuals expect that reinforcement or the outcome is: a function of chance, luck, or fate; under the control of powerful others; or is simply unpredictable (Rotter, 1990). An external LOC has been proposed to be related to passive behaviour and learned helplessness (Rotter, 1992). Those with an external LOC tend to believe much of what happens is beyond their control (Ajzen, 2002). In contrast, those with an internal LOC see future outcomes as being contingent on their own decisions and behavior (Caliendo *et. al.*, 2015). Psychologists have long been interested in the determinants of health-related behavior, paying particular interest to the beliefs individuals hold about their health. One construct which has attracted a great deal of interest is the HLOC.

2.3.1 Health locus of control (HLOC)

Health LOC (HLOC) is derived from Rotter's (1966) LOC. HLOC refers to how much control individuals believe they have over the health events that happen in their life (Wallston *et. al.*, 1978). HLOC is frequently studied in relation to health behaviors and most studies adopt the Multidimensional Health Locus of Control (MHLC) scale developed by Wallston *et. al.* (1978). MHLC measures health-specific LOC beliefs along three dimensions: first, the extent to which individuals believe their health is a consequence of their own actions; second, the extent to which individuals believe their health is under the influence of powerful others; and, third, the extent to which individuals believe their health is due to chance or fate (Wallston *et. al.*, 1978). However, most research using the MHLC has focused on the role of internal HLOC beliefs. Internals are seen to take an active responsibility for their health. Thus, individuals with strong internal HLOC beliefs should be more likely to engage in a

range of health-promoting behaviors. However, studies using this scale have found mixed results. Internal HLOC beliefs have been found to influence health behaviors in some studies, while others have failed to find any relationship (for a review see Steptoe and Wardle, 2001). Overall, the relationship between HLOC beliefs and the performance of health behavior may be weak at best (Wallston, 1992). Norman (1995) argues the inadequacy of the HLOC scale may be due to its failure to pay attention to the importance people place on their health. HLOC is nevertheless important in health services because one's HLOC may influence how an individual will engage in value co-creation activities. If someone exhibits higher internal HLOC, for instance, then that person may be more predisposed to engage in certain activities such as being compliant with a health screening service provider. Thus, it is worth exploring in this context.

2.4 Health locus of control (HLOC) and value co-creation

To date there has been limited research in the area of HLOC and the co-creation of value. Norman (1995) explored the influence of HLOC on health behaviors. HLOC was found to tap into generalized expectancy beliefs with respect to health, rather than specific expectancy beliefs about behaviors. Internal HLOC was found to exert a stronger influence over health behavior among individuals who value their health highly compared with those with other priorities in life (Steptoe and Wardle, 2001). Thus, further research into the influence of HLOC on value co-creation in health services is warranted. This research therefore addresses the second research question, "*How does HLOC influence the way individuals co-create value in standardized screening services?*"

3. Method

3.1 Cancer-screening context

The Australian Government has developed a population-based screening framework, based on the World Health Organization (WHO) principles of screening (Australian Government Department of Health, 2016). Health screening is the presumptive identification of unrecognized disease or defects by means of tests, examinations, or other procedures that can be applied rapidly (Wilson and Jungner, 1968). Australia has had a history of offering population health screening, beginning with tuberculosis screening in the 1940s and then newborn bloodspot screening in the 1960s (for phenylketonuria, a metabolic disorder in babies) (Australian Government Department of Health, 2016). Currently, standardized screening services for breast, bowel, and cervical cancer are offered at no cost as part of three national population-based screening programs to reduce the incidence of cancer. However, screening rates are currently lower than target rates set by the Australian Government (AIHW, 2017).

3.2 Design

A purposeful stratified sampling strategy (Miles and Huberman, 1994) was used to ensure a range of individuals were selected for the study, and was based on eligibility of men and women to participate in national standardized screening services (as specified by the Australian Government Department of Health). Participants were also selected to ensure variation in age, gender, and education levels. This was achieved through referrals and snowballing (Patton, 2002). Ethical approval was provided by one researcher's university.

The data for the study were generated via in-depth interviews with 25 participants. Prior to the interview, each participant answered nine demographic questions and a separate health activity question sheet adapted from McColl-Kennedy *et. al.* (2012). This health activity sheet included six of the eight McColl-Kennedy *et. al.* (2012) customer value co-creation activities (cooperating, collating information, co-learning, connecting, co-production, and

cerebral activities). “Changing ways of doing things (long-term adaptive behaviors)” was adapted to “short-term adaptive behaviors” due to the preventative nature of the present research context and “Combining complementary medicines” was omitted for the same reason. These pre-interview questions assisted the interviewer in focusing the interview questions and did not detract from developing a conversational dialogue between the researcher and the participant. Each participant also completed the three HLOC subscale items – internal, powerful others, and chance – as this was the particular phenomenon of interest as a microfoundation of value co-creation. Each subscale includes six items and participants scored each item on a 5-point Likert-type scale. The minimum score for each subscale is 6 and maximum score 30 (refer Table 2). Using a median split method (Iacobucci *et. al.*, 2015), participants were identified as high (above the median score), medium (equal to the median) or low (below the median score) on the three subscales (refer to Table 2).

The semi-structured interviews followed a topic guide based on the elements in the DART framework (Prahalad and Ramaswamy, 2004) and the activities identified in Albinsson *et. al.'s* (2016) DART value co-creation scale. Participants were also asked to talk about their preventative health behaviours; for example, how they look after their health and how much they follow the advice of doctors. Moving from general questions to more specific questions, participants were asked about their cancer screening experiences; for example, what influences them to go for a free bowel/breast/cervical screening, and what makes the screening experience satisfactory or not satisfactory, and participation (or co-creation) through the process. The interviews were recorded and transcribed verbatim.

3.3 Sample

The sample characteristics of this research provide a contextual lens through which the findings should be viewed. The characteristics of age, gender, and HLOC scores are

summarized in Table 2. The sample shows a skew towards females, representative of the national skew because women are able to participate in two out of three standardized screening services, whereas men only participate in one standardized screening service. Consequently, breast and cervical screening were the dominant standardized screening services used. Ages of the interviewees ranged from 20–78, and although more participants were aged over 40 years, the participants provide representation from all generational cohorts within the age groups for standardized screening services. Almost one-third of the participants scored high internal HLOC, age did not appear to be a factor as to whether a participant was high or low internal HLOC and half were high on the chance subscale (refer Table 2).

[INSERT TABLE 2 ABOUT HERE]

3.4 Analysis

The method of analysis chosen for this study was a hybrid approach of qualitative methods of thematic analysis, and it incorporated both the data-driven inductive approach of Boyatzis (1998) and the deductive a priori codes approach outlined by Crabtree and Miller (1999). For this study, the codes were developed a priori, based on the research question and the two frameworks outlined in the literature review. This approach enabled the use of the codes as an initial basis for further exploration of themes. The rigor of the research process was supported by two of the researchers cross-checking codes and resultant themes. The analysis led to propositions that describe the interrelationships between these themes (Creswell *et. al.*, 2007).

4. Findings and discussion

This section presents the findings that address the two research questions to achieve the purpose of the paper. The findings discuss the service-generated and self-generated activities in a standardized screening service and then the HLOC and its influence on the value co-creation activities. From these findings, four propositions emerge, two for each research question. For Research Question 1, the propositions are:

- 1) Service-generated activities in standardized screening services elicit the reactive responses of compliance and dynamic relinquishing control; and,
- 2) Self-generated activities in standardized screening services elicit volitional responses of protection of self, understanding relationship needs, and gaining control.

In addressing Research Question 2, a further two propositions emerge:

- 3) Consumers' internal HLOC affects their willingness to exert effort in standardized screening services; and,
- 4) Internal HLOC affects emotional value co-creation in standardized screening services.

The following section addresses RQ1 and elaborates Proposition 1 and Proposition 2.

4.1 Value co-creation activities in a standardized screening service

The purpose of RQ1 is to understand value co-creating activities according to service-generated and self-generated activities in the research context. Value co-creating activities that are service-generated may occur during the service encounter or through the communication encounters temporally removed from the service encounter. For example, in breast screening services, the participants follow the service provider's instructions (timing of appointment, not wearing deodorant) so the medical professional can perform the service without complications, thereby enhancing accuracy. Self-generated activities, on the other hand, are volitional, initiated, and directed by the consumer (Sweeney *et. al.*, 2015). For example, in cervical screening services, participants make sure they prepare themselves

physically and emotionally to reduce embarrassment of a procedure they find very personal and private. Self-generated activities may be preparatory actions (e.g., managing emotions prior to screening) and/or activities that occur during and after the service encounter (e.g., sense-making of screening procedures and results). All of these activities are undertaken to achieve the shared goal of a positive health outcome for the consumer – either that they remain free of cancer or provide early detection of cancer allowing treatment.

4.1.1 Alignment between service- and self-generated activities

Service-generated and self-generated value co-creation response themes described by participants are mapped onto the McColl-Kennedy *et. al.* (2012) customer value co-creation activities (see Table 3). Three additional activities emerged from participants' responses in standardized screening services (see Table 3). Service-generated activities align with only one of the eight customer value co-creation activities identified by McColl-Kennedy *et. al.* (2012) - cooperating - while self-generated activities map onto cerebral activities. These findings are explained by the standardized and rigidly prescribed service process, where there are brief, infrequent service encounters, and where there is typically little opportunity for relationship building. The touchpoints of reminders, appointment, and results notifications, occur on the initiative of the service provider. Two-way dialogue remains at the functional level related to system and process knowledge. The emphasis on self-generated activities in value co-creation in standardized screening services that emerged from the data is evident in Table 3.

[INSERT TABLE 3 ABOUT HERE]

The health-care value cocreation practice style of connecting (McColl-Kennedy *et. al.*, 2012) – to build and maintain relationships – is not evident in the participants' value-creating

activities. The desire to share a screening experience with family and friends is markedly absent from the data. For example, one interviewee stated:

No, I'm not going 'round telling people they should get a screening... It's not really what I do ... It's not a lot of fun for many people ... No, I don't put it on Facebook I've just had my PAP smear! (Helen, F, 54 years, lo internal, hi chance, lo powerful others)

Moreover, there was little evidence of co-learning, collating information, changing ways of doing things, connecting with others, and customer value co-creation activities in the service-generated activities. The processes of the standardized screening service and the social norms that surround it as an activity (*"it's free, they wouldn't target me if I wasn't an important group"*) highlight the lack of questioning of efficacy, risk assessment, or information gathering and collating.

However, three additional activities emerged from the data (refer Table 3): dynamic control in both service-generated and self-generated value co-creating activities and empathic activities of emotional preparation in self-generated value co-creating activities. Two different dynamic control activities emerged, relinquishing control and regaining control. Empathic activities in the form of emotional preparation include empathy for the health practitioner and reduction of embarrassment activities. Empathic activities also include empathic preparation, those activities that are initiated by the consumer to "make it more pleasant" for the health professional. Embarrassment-reduction activities include preparation such as showering prior to screening to minimize risk to self emotionally due to the private and often intrusive nature of the screening.

The alignment between the elements in the DART framework and customer value co-creation activities, including the three additional activities, is shown in a new framework of

preventative health co-creation activities, the DART-E Framework of Preventative Health Co-Creation Activities (see Figure 2).

[INSERT FIGURE 2 ABOUT HERE]

4.1.2 Proposition 1: Service-generated activities in standardized screening services elicit the reactive responses of compliance and relinquishing control

Most service-generated, value-creating activities occurred in response to communication encounters, which the service provider carries out to interact with and prepare customers, not the service encounter itself (Payne *et. al.*, 2008). For example, responding to reminders and following instructions were often the only interaction participants had with the service provider. Participants described these activities as value creating due to the perceived transparency of the screening organization. Functional value, derived from the execution element of cooperating with the service provider's demands, included: helping the service to be effective, service convenience, and ease-of-use. Equally, these "simple activities" (McColl-Kennedy *et. al.*, 2012, p. 6) are also considered important emotional value-creating behaviors. From the consumer's perspective, taking action and adhering to the basic prerequisites of the service provided more than just low-level value co-creation:

Actually, I feel good when I've done it. Action is what makes me feel comfortable.

(Helen, F, 54 years, lo internal, hi chance, lo powerful others).

By taking action consumers can feel in control despite this being external to the service encounter. Unlike other service research contexts, where these simple activities are construed as low-level participation and minimal co-creation (McColl-Kennedy *et. al.*, 2012; Tommasetti *et. al.*, 2017), this research suggests that simple, functional activities are integral

to value co-creation in preventative screening.

Potentially, in some high involvement health-care contexts unquestioning cooperation and following instructions may be interpreted as being disengaged, in this context the opposite is the case. Cooperation with instructions is one of the few opportunities where the consumer can exercise an active role in such a rigidly standardized service. For example, the health screening could be the first step to being proactive in other treatments:

Well I can't get a result if I'm not compliant with them, it's just never going to get done.

(Kate, F, 20 years, lo internal, med chance, lo powerful others)

Co-creation activities can involve low levels of interaction, such as compliance and collating information (McColl-Kennedy *et. al.*, 2012). Therefore, consistent with McColl-Kennedy *et. al.*'s (2012) description of simple (low level) activities where there are low levels of interactions, cooperation is an engaged, lower level response to the procedural instructions.

Individuals relinquish control to the service provider as a response to accepting their professional expertise. For example, one participant explained how they relinquished control:

I guess I assume they know how it works and it's not for me to question. (Tania, F, 53

years, hi internal, lo chance, hi powerful others)

Some activities are complex and require more interactions than others for example, co-learning, actively seeking information and providing feedback (McColl-Kennedy *et. al.*, 2012). Therefore, consistent with McColl-Kennedy *et. al.*'s (2012) complex (high level) activities which are described as having high levels of interactions, relinquishing control is an effortful, high involvement response decision, acknowledging the professional expertise of the service provider. This apparent paradox that relinquishing control is empowering and

responsible is summed up by one participant as:

I think that I feel in control, because they remind me, here's when you come, so they're facilitating my management of my health. I feel like I'm in control. (Anna, F, 52 years, lo internal, lo chance, lo powerful others)

The sense of onerous responsibility in health decision-making (Broom *et. al.*, 2014) is evidenced when participants note how it comes as a relief to "do as I'm told", for example:

I'm worried to get it wrong ... I read and reread the instructions because I thought there's no point getting a false sense of security if I actually messed this up ... Should be the opposite but when someone says, 'do this for me I'll fix you up' it's sometimes easier. (Helen, F, 54 years, lo internal, hi chance, lo powerful others)

Do I want them to be an equal partner? No, I want them to provide a service to me. But, in the sense that they're professionals, I rely upon their expertise. In the sense that I'm a client and they're an expert. (Anna, F, 52 years, lo internal, lo chance, lo powerful others)

Furthermore, in contrast to other health-care services, participants readily acknowledged that a value co-creation activity was the absence of communication – “they would have told me if something was wrong”:

No, I just put it at the back of my mind and saying, “Well, if I haven't heard, it must be good.” (Marie, F, 54 years, med internal, lo chance, hi powerful others)

While the participants identified relinquishing control as a value-creating activity it was not considered to be risky.

Based on the findings, we deem that service-generated activities in standardized screening services elicit the reactive responses of compliance and relinquishing control.

4.1.3 Proposition 2: Self-generated activities in standardized screening services elicit volitional responses of protection of self, understanding relationship needs, and gaining control

Participants described a range of self-generated, value-creating activities that served as protection of self, including minimizing risk to self-esteem, emotion management in terms of fear reduction, minimizing risks due to loss of privacy, and managing physical and emotional discomfort. Interestingly, these volitional responses also included activities designed with the specific purpose of protecting the service provider from embarrassment and "*making it not super unpleasant and awkward for them*" (Kate, F, 20 years, lo internal, med chance, lo powerful others). From the consumer's perspective, the risk-benefit assessment of value co-creation emphasizes "self" beliefs and emotions, compared with the tangible "service" elements emphasized in the provider perspective of risk assessment of the DART framework. For example, minimizing embarrassment to self often overshadows the physical demands of the screening process:

Psychologically [uncomfortable] yes ... I felt a little bit embarrassed at the time to bring it up and ask her about it. Yeah, so I was more afraid of the emotional side than the physical side – that didn't bother me (Kim, F, 29 years, lo internal, hi chance, med powerful others)

Reassurance, relief from fear, and peace of mind contribute to consumers re-gaining control through a sense that they "*can give [themselves] the best chance ... more a sense of personal satisfaction*" (Helen, F, 54 years, lo internal, hi chance, lo powerful others). For

example:

That's why I go regularly because I'm afraid. (Marie, 54 years, F, med internal, lo chance, hi powerful others).

But to me, it's more like insurance. You're having it, and hoping that you don't have to use it. So, I'm having these checks and hoping that they'll just continue to give me good news. (Deirdre, 63 years, F, hi internal, lo chance, lo powerful others).

In addition, emotional value is described by participants as the comfort from taking action. Taking action enables participants to regain control in a standardized and tightly prescribed service delivery context:

...getting it done at the time that I need it scheduled. That's my control. I can't control anything else on the other end or the outcomes. But yeah, definitely the fact that I can control when. (Marie, 54 years, F, med internal, lo chance, hi powerful others).

The participant's pragmatic risk-reduction and taking responsibility for their preventative cancer screening extends beyond the consumer's self-benefiting activities to include activities that are described as “doing it right” for the service provider as well. Not only do these activities include following instructions but, importantly, participants expressed empathy toward service providers by emphasizing the importance of service preparation. For example, the dialogue of one participant sums this up concisely:

Participant: ... it's an intimate thing [cervical screening] ... I think I shaved ... I don't go when I'm super smelly ... I don't wear the worst ones [underwear] ... it's just making it not super unpleasant and awkward [for the doctor or nurse]...it's just about being polite and not yucky.

Interviewer: So, it's all about being courteous?

Participant: *Yeah*. (Kate, F, 20 years, lo internal, med chance, lo powerful others)

Interpreted as being part of the consumer's emotional value-creation for herself by protecting her self-esteem ("*so they [service provider] don't judge me*"), understanding relationship needs to protect the service provider from an unpleasant experience is a strong focus for this volitional self-generated activity. Notwithstanding the standardized service delivery model in standardized screening services, participants engaged in relational effort to enhance value co-creation. These self-generated activities go beyond the service-generated instructions (e.g., not wearing deodorant for a breast screen) allowing consumers to regain control by preparing and protecting themselves in procedures that are very personal and private. At the same time, consumers regain control by exercising empathy towards the service provider. However, participants also engaged in these types of activities for self-conscious reasons. Participants sought to reduce negative self-conscious emotions such as embarrassment. Participants undertook self-generated activities, such as showering and wearing clean underwear, in order to reduce the risk of feeling judged by the health professional or experiencing embarrassment, for example:

You want to try to make it as comfortable as you can, so you don't want to be embarrassed or anything. So yeah, I guess making sure you're all hygienic is important. And yeah, you know that they're not going to judge you, but at the same time, you don't want there to be the risk that they'll judge you. (Kim, F, 29 years, lo internal, hi chance, med powerful others)

In summary, participants actively engage in protection of self in terms of well-being, but also emotional self-protection. Individuals therefore manage their value by balancing the input/activities into the service with their emotional needs. Consumers of standardized

screening services regain control by exerting effort in self-protection and empathic protection of the health service provider. Hence the proposition is that self-generated activities in standardized screening services elicit volitional responses of protection of self, understanding relationship needs, and gaining control. By comparison, service-generated activities elicit reactive responses of compliance and relinquishing control as shown in Table 3. Drawing on the results in Table 3, Figure 2 highlights the three new service-generated and self-generated activities. The following section addresses RQ2 and elaborates Proposition 3 and Proposition 4.

4.2 Health locus of control and value co-creation activities

The aim of RQ2 was to explore how HLOC orientation affects value co-creating activities in a health-care context. Participants in this study all engaged in preventative cancer screening as part of the sample recruitment criteria and share similar expectations of service-generated activities; that is, to achieve their desired outcome, namely cancer-free test results. Recent research suggests internal HLOC is correlated with information seeking (Holroyd *et. al.*, 2017), suggesting internal HLOC orients individuals towards a willingness to learn, an important element in supporting the notion that individual actions can bring about personal agency (Rotter, 1966). Individuals with high internal HLOC have also been found to be more engaged in preventative health behaviors; however, the relationship between preventative health behaviors and external control dimensions have been less clear-cut (Náfrádi *et. al.*, 2017).

To understand how HLOC is a microfoundation of value co-creation in the research context and to address this research question, the analysis focused on a subsample of the participants who scored on the opposite extremes of the internal HLOC dimension and the powerful others dimension. Participants who were identified as high internal HLOC and low

powerful others (Jan, Deirdre, Angela and Sue) were compared with participants who were identified as low internal HLOC, high powerful others, and high chance (Diane, John, Barbara and Ted). Specifically, HLOC was found to influence co-creation of value through the willingness to exert effort and to minimize a negative emotional experience. The next two sections elaborate further on this finding.

4.2.1 Proposition 3: Consumers' Internal Health Locus of Control affects their willingness to exert effort in standardized screening services

High internal HLOC consumers appear to engage in standardized screening services for a range of value-creating benefits but, in particular, altruistic value. High internal HLOC participants tended to have a long-term focus for their reasons for undertaking screening activities. For example, some participants felt they were contributing to a national database of bowel screening results. Participating in screening activities in order to assist others thus provided altruistic value. While they believe they are in control of their own health outcomes they also like to assist those around them for the greater good, for example:

And so I am happy to ... Like especially the bowel cancer ... To be frank, I have a feeling I'm more participating to a poll. Like I'm helping to get database on ... that would be hopefully helping the future. Okay, maybe it picks up something. But I don't believe it, so it gives data [sic].... extra health data, you know, for later. (Jan, F, 55 years, hi internal, hi chance, lo powerful others)

High internal HLOC participants were also found to exert extra effort in a range of ways, including undertaking self-generated activities between screening and ensuring the inconveniences of screening are minimized. These active responses of self-protection may be due to the perception they are in control of their own health and the way they interact with

service providers:

But I do my own [breast] checking in the meantime, so I'm comfortable enough with two years. (Deirdre, F, 63 years, hi internal, lo chance, lo powerful others)

Oh, it's just that like I make an appointment for, like, Friday afternoon or Thursday afternoon so it's convenient for me. And then I go straight from work to the thing, and then I go home ... I just adapt so that it's easy. (Sue, F, 65 years, hi internal, lo chance, lo powerful others)

Low internal HLOC participants appear to rely on reacting to others' advocacy regarding preventative health behaviors – sometimes this is medical professionals, but often it is family and friends' insistence and service provider reminders that initiate preventative cancer-screening engagement. This reliance on others appears to be an effort-minimization strategy:

He's [husband] a sort of a person that is very much, "Get this done." He prompts me along. I keep meaning to do it, and I did it when he told me, just to shut him up. I think I would do it, but I'm a little bit slow to get it done. (Diane, F, 58 years, lo internal, hi chance, hi powerful others)

I just looked at it [bowel cancer screening letter] and thought, I'll talk to the doctor first. (Diane, F, 58 years, lo internal, hi chance, hi powerful others)

Thus, it appears that consumers' internal HLOC affects their willingness to exert effort in standardized screening services.

4.2.2 Proposition 4: Internal Health Locus of Control affects emotional value co-creation in standardized screening services

Interestingly, the co-creation of emotional value emerged from the data. This is in contrast to

previous cancer screening research which finds functional value (the utility of safeguarding one's health through screening) to be a stronger influence on perceived value and satisfaction than emotional value (Zainuddin *et. al.*, 2013; 2016). While high internal HLOC consumers indicated they feel in control, they undertake the screening as a goal-directed activity to obtain peace of mind. This provides them with a sense of personal satisfaction, happiness and creates emotional value for themselves. Participating in screening activities therefore not only provides emotional value, it also serves a purpose and provides additional utilitarian value (Holbrook, 1996), for example:

I'm in control for my own result, because I'm happy ... It's transparent in that they tell me it's positive or not. And that's all I'm after when I do that test. (Jan, F, 55 years, hi internal, hi chance, lo powerful others)

I know like they provide the service and if I make use of it then I'm avoiding the risk of getting cancer. So that is the main thing for me. (Sue, F, 65 years, hi internal, lo chance, lo powerful others).

Value co-creation in the form of managing emotional value also arises for low internal HLOC participants from knowing that others are engaging in the same preventative health behaviors:

I feel good because it's not only you doing it. My friend doing it, too ... It's nice to know that they ... [are] doing it, too. (Barbara, F, 53 years, lo internal, hi chance, hi powerful others)

For low internal HLOC participants, the relevance of preventative health behaviors and value co-creating activities are often determined by others in the participants' networks. The relationship between low internal HLOC and managing emotional value was characterized by

three factors: reacting to service-generated activities, rather than being proactive (e.g., “*Yeah, I think I do manage it [health] when the need arises.*” Diane, F, 58 years, lo internal, hi chance, hi powerful others); avoidance of emotional stress; and avoidance of effort.

Understandably, participants with low internal HLOC also acknowledged a degree of fatalism regarding health behaviors. For example:

Interviewer: *Do you believe that you're in control of your own health?*

Participant: *Major part, yes, except for that little bit that you don't have control of and you can't worry about that.* (Diane, F, 58 years, lo internal, hi chance, hi powerful others)

Most recognized that chance, luck, and heredity often play a part in health outcomes. This belief that one cannot overcome particular health outcomes due to externalities supports the avoidance of worry and the “just enough” involvement typical of low internal HLOC participants.

For high internal HLOC participants, it appears that an external value drives the screening behavior, which could be termed as *we-value*. Low internal HLOC participants experience internal value, which could be termed as *me or I value*, such as emotional value of reduced worry resulting in low effort. Low internal HLOC participants receive value from reducing or avoiding negative emotions experienced rather than increasing positive emotions.

Alternatively, for the high internal HLOC participants, experiencing good reports or adding to the national database or taking action contributes to increasing the positive emotional value experienced.

Low internal HLOC participants employ a threat-appraisal process by implementing an avoid strategy, whereas high internal HLOC participants employ a coping appraisal process, thus implementing an approach strategy for the adaptive behavior (Prentice-Dunn and

Rogers, 1986). Participants with low internal HLOC recognize the relevance of managing their own health (a cognitive activity), resulting in them engaging in preventative screening; however, a clear focus is on the avoidance of worry, as illustrated above. Among the participants, this emotional management manifested itself in two major ways, first through procrastination and, second, by allowing others to take charge.

The uncertainty of the outcome of the cancer-screening service can induce fear and worry, which in turn generates procrastination or delaying tactics. These tactics were used by most participants in the study. However, how these were operationalized varied across participants. Delaying tactics employed by participants with low internal HLOC allowed them to avoid diminishing emotional value by integrating the execution element of changing ways of doing things in the cancer-screening context, summed up as:

It's just procrastination...So it's just me thinking "I need a reason to delay" ... I don't need to worry about it until such time as I've done it ... Because until you've done it, there's gonna be no result, so no result means you don't have to worry about anything. (John, M, 55 years, lo internal, hi chance, hi powerful others)

It [cancer screening] helps you and you're thinking that you don't need to worry, that you [have] done it. (Barbara, F, 53 years old, lo internal, hi chance, hi powerful others)

Allowing others to take charge typically enables low internal HLOC participants to minimize personal effort across a range of health-related behaviors. Assessments of threat and coping factors combine to form the intervening protection motivation (Rogers, 1975). This arouses, sustains, and directs activities undertaken by participants. Low internal HLOC participants first appraise the threat, then evaluate the coping options in order to minimize negative emotions, such as worry. Therefore, Internal HLOC affects emotional value co-creation in standardized screening services, with different emotional value responses, including reducing negative

emotions and increasing positive emotions.

5. Contribution and implications

The purpose of this study was to explore how the microfoundation, HLOC, contributes to value co-creation via service-generated and self-generated activities in standardized screening services. Specifically, this research demonstrated how HLOC may influence participation experiences in standardized screening services and developed the DART-E framework of preventative health co-creation activities. This DART-E framework consists of service provider-initiated elements (DART-E) and two forms of customer value co-creation activities: service-generated and self-generated. This section outlines the theoretical, managerial, and societal contributions of the findings.

5.1 Theoretical contributions

There are two major contributions of this study and one minor contribution. The first theoretical contribution of this study is the development of a holistic co-creation framework, the DART-E Framework of preventative co-creation health activities (see Figure 3). This new framework combines the elements of the DART co-creation framework (Prahalad and Ramaswamy 2004) with the customer value co-creation activities (McColl-Kennedy *et. al.*, 2012) and adds a fifth element, execution element and the related activities (dynamic activities, regaining and relinquishing control, and empathic activities). The inclusion of this category of co-creation activities reflects the role of HLOC in self-generated and service-generated activities. The DART-E Framework of Preventative Health Co-Creation Activities provides a more nuanced understanding of how consumers interact with voluntary standardized screening services than either of the two previous co-creation frameworks. The addition of the execution element is important as tangible aspects of the service experience

controlled by the service provider facilitate consumer co-creation activities, such as coproduction and changing the way they do things. This element was not included in the original DART framework (Prahalad and Ramaswamy 2004). Without this element, three of the eight customer value co-creation activities from McColl-Kennedy *et. al.* (2012) would have been omitted. Ensuring that service execution facilitates, rather than inhibits, the service experience co-creation activities that are led by the customer, is an important facet of creating a holistic approach to the service experience. Servicescape features, such as the space/function and ambient conditions, influence the service experience (Bitner, 1992) and the physical environment needs to facilitate interaction between the service provider and customer (Jua *et. al.*, 2016).

The second contribution relates to the contextual nature of HLOC as a concept. Prior literature demonstrates that high internal HLOC individuals appraise the environment to understand how responsive and controllable it is and then adapt their behaviour accordingly (Johnson *et. al.*, 2015). High internal HLOC individuals believe the environment is responsive to personal agency; however, once they engage with the health expert in the screening activity they surrender control to the health expert momentarily. Consumers travel through the service journey and at times momentarily relinquish control to the service provider (service-generated activities) or undertake activities to gain control (self-generated activities) in order to create value. This is similar to the notion that high internal HLOC leads to a deliberate, critical evaluation of adherence to health and medical direction by either following or foregoing recommendations to participate in standardized screening services (Náfrádi *et. al.*, 2017).

The third and final contribution relates to the importance of emotion in service interactions for the co-creation of value. While there has been extensive research on discrete emotions in service interactions (e.g., anger, shame, pride) (Tombs *et. al.*, 2014), emotional contagion

(Du *et. al.*, 2011), and emotional labour (Medler-Liraz, 2016), there has been little research on the role of consumer emotional regulation in service encounters, particularly research outside the context of service failure (Balaji *et. al.*, 2017). The findings appear to indicate that service customers of standardized screening services use emotional regulation strategies differently based on their HLOC. Emotional regulation theory typically identifies five strategies; situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross and Thompson, 2007). Specifically those with low HLOC were more likely to procrastinate exhibiting a strategy of situation selection or allow others to take charge indicating a strategy of situation modification. These findings suggest that emotional regulation when co-creating value in a screening service is influenced by the HLOC of an individual.

5.2 Managerial implications

Insights on how the microfoundation, HLOC, contributes to value co-creation via service-generated and self-generated activities in standardized screening services can be used to inform managerial decision-making. Individuals who have a high internal HLOC and low powerful others exert goal-directed effort in self-generated co-creation activities to take control of the situation. Conversely, low internal HLOC and high powerful others individuals exert minimal effort in self-generated co-creation activities. This apparent association may be explained by protection motivation theory (Prentice-Dunn and Rogers, 1986). The sense of internal HLOC (microfoundation) through the intersection with service delivery processes thus helps explain the macro-level value co-creation phenomenon.

In particular, in this study, internal HLOC influences participants' value co-creating activities in the pre-service and post-service phases of their customer journey. Indeed, in the study context of highly prescribed services, pre-service and post-service activities are central

to participants' value co-creating activities. These areas of the service experience offer significant potential for standardized health-care service providers to leverage off to improve the overall service experience for consumers. Generally, it is expected that medical professionals would be unable to determine the HLOC of their patients, and therefore, service providers are encouraged to offer a range of value propositions and promotional styles to meet the needs of the various consumer segments. Understanding that differences in LOC exist is useful in understanding the different consumer segments that exist within a target population of a standardized service. This is similar to other marketing approaches, such as understanding personality; whilst these are not observable characteristics, understanding that different consumer segments exist based on these characteristics acknowledges that standardized service user targets are not homogenous. This allows services to develop more meaningful segmentation strategies in the development and delivery of their services. Some health service providers, such as some hospitals are increasingly providing patient profile surveys at the time of admission (Langewitz *et. al.*, 2006) and these surveys could enable service providers to understand the patients' needs, and could be provided for a number of medical services, rather than just hospital admission.

[INSERT TABLE 4 ABOUT HERE]

Managerial implications for various target groups are shown in Table 4 based on the findings of this research. The findings from this study indicate that service managers should provide relevant information about the service process to reassure participants as part of the pre-service activities, and then provide test results as part of the post-service activities. Including specific service activities in both the pre-service and post-service stages of the service experience have the potential for improving not only the current service experience,

but also repeat service use in the long term.

The extended customer value co-creation activities reveal activities that delay participation in cancer screening vary based on differing levels of HLOC. For example, low internal HLOCs may delay participation to alleviate worry and hand over control to reduce effort. Conversely, high internal HLOCs delay participation due to participation in other health-related behaviors – cancer screening is just one activity in their portfolio of self-initiated health behaviors. This highlights the importance of managers using segmentation in the targeting and positioning of health messages to differentiate these personality characteristics. For example, an appropriate call to action for high internal HLOC individuals would focus on preventative screening as an important part of their own portfolio of goal-directed health-enhancing behaviors that they can participate in “on their own terms”. Conversely, the service providers’ message to low internal HLOCs should focus on the emotional value from the sense of relief available and the reliance on powerful others’ expertise as the means to stay healthy; for example, emphasizing “we’ll take care of it” will appeal to low internal HLOCs’ preference for minimizing effort and being directed by others to participate in preventative screening.

Different HLOC requires different managerial approaches, including emotional support and accommodating delaying activities within the service process rather than trying to prevent them that could ultimately hold the key to increased participation rates. Understanding the different delaying tactics allows service managers to develop messaging and service touchpoints to assist consumers in moving through the customer journey. Rather than penalizing people for delaying, managers should focus on encouraging strategies. For high internals, they need to acknowledge their priorities and highlight how cancer screening can be integrated into their personal good health model to assist them in achieving their health and well-being goals. Delaying activities may not necessarily be an individual’s

rejection or negative response to standardized screening services and activities, rather it is part of their coping strategy. The coping strategy should be accommodated within the call to action.

In order for service execution to facilitate, rather than inhibit the service experience, co-creation activities led by the customer need to be considered to enable a holistic approach to the service experience. The DART-E Framework of Preventative Health Co-Creation Activities provides this holistic approach and is a useful tool for service managers to link self-generated activities to their other service delivery processes. For example, those with high internal HLOC participate in a range of self-generated activities which complement the service and can thus be leveraged by service providers. Having a tool to determine consumers' HLOC can help service providers develop appropriate value co-creation activities in standardized screening services to increase participation. Thus, identifying the influence of different types of internal HLOC, service providers can appeal to consumers' motivations allowing them to co-create value with the service, rather than solely focusing on behavioral activities.

The DART-E Framework of Preventative Health Co-Creation Activities provides a more comprehensive understanding of how consumers interact with a service and the differing reactions elicited by self-generated and service-generated co-creation activities. This is important for managers when (re)developing services as this understanding allows them to develop value propositions, touchpoints, and activities at the appropriate time in the customer service experience/journey.

Considering each element of the DART-E Framework of Preventative Health Co-Creation Activities enables managers to introduce strategies to improve service delivery outcomes for standardized screening services.

5.3 Societal implications

The results of this research have two key societal implications. First, testing healthy people for early signs of cancer (screening) can reduce the number of deaths due to breast, bowel, and cervical cancer (Siu, 2016). This is due to the early detection of cancer resulting in treatment of these cancers before they progress to terminal levels. Second, improved outcomes reduces the burden on health care systems, workplace productivity, and families. Improving the cancer screening experience has the potential to increase screening rates, resulting in early detection of cancer or peace of mind for those with a clean bill of health. The findings from this research may be used to develop strategies for non-participants to participate in standardized screening services. If the service provider acknowledges that some of these self-generated activities help participants to have a better experience, encouraging volitional responses such as empathic peace of mind and taking action may increase participation.

6. Conclusion, limitations, and future research

Health-care organizations look for ways to enhance the value of their services and quality of care (Nambisan and Nambisan, 2009). Understanding patient experiences and perspectives at the micro-level can be helpful to continue to develop patient-centric measures and health-care services. This exploratory research suggests that HLOC can be a valuable microfoundation of value co-creation deserving of further attention. In particular, the relationship between HLOC and the contextual variables at play in preventative health behaviors is a fertile area for future quantitative investigation. Understanding how HLOC can influence self-generated co-creation may hold potential for increasing rates of participation in standardized screening services. The knowledge gained will give service providers a greater capacity to reach patients to facilitate adopting appropriate strategies and practices as partners in the

development and delivery of improved health care.

Future research should empirically test the influence of LOC on willingness to co-create and the types of activities co-created, with the ultimate aim of increasing participation rates. In particular, researchers should examine the relationship of the HLOC sub-scales and emotions to provide additional insights for service managers on the provision of emotional support. This research is limited in that it only investigated standardized screening services. Future research should examine paid (non-subsidized) preventative services. This research used a convenience sample, primarily those with a high income and higher education than the general population. Future research should examine a more diverse sample to gain additional insights into participation in standardized screening services. A focus on consumer well-being and HLOC could also be addressed by researchers through the lens of Transformative Service Research (TSR) which is increasingly being addressed by service researchers. Finally, updated DART-E activities should be adopted in other preventative health-care service contexts to support healthy living such as immunisations, and sexual health, eye, and hearing checks for attaining better managerial and societal benefits.

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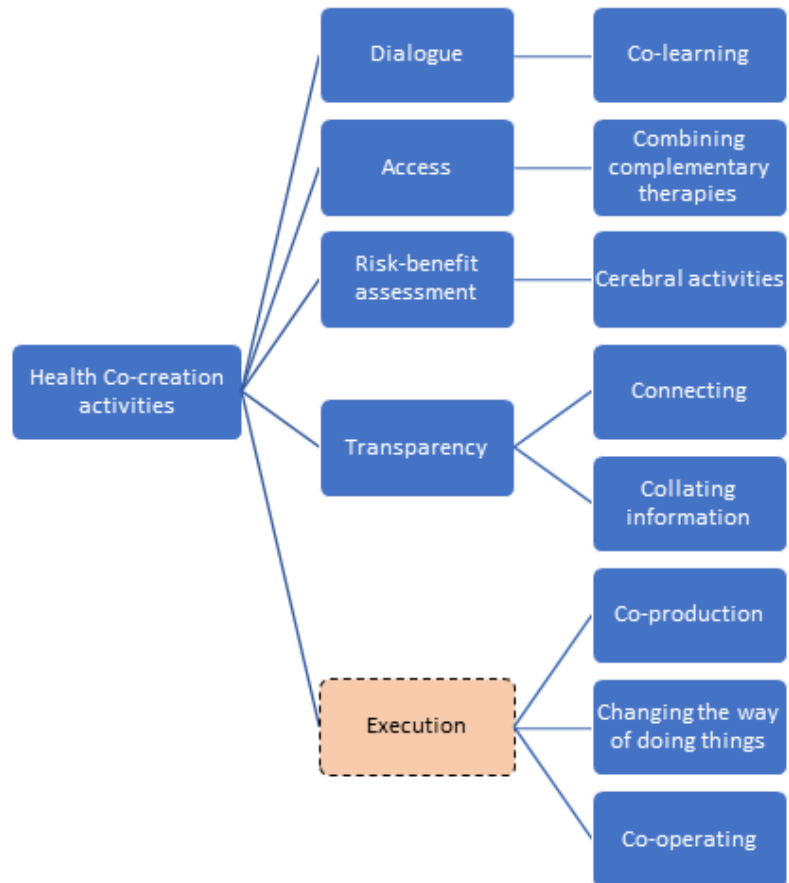
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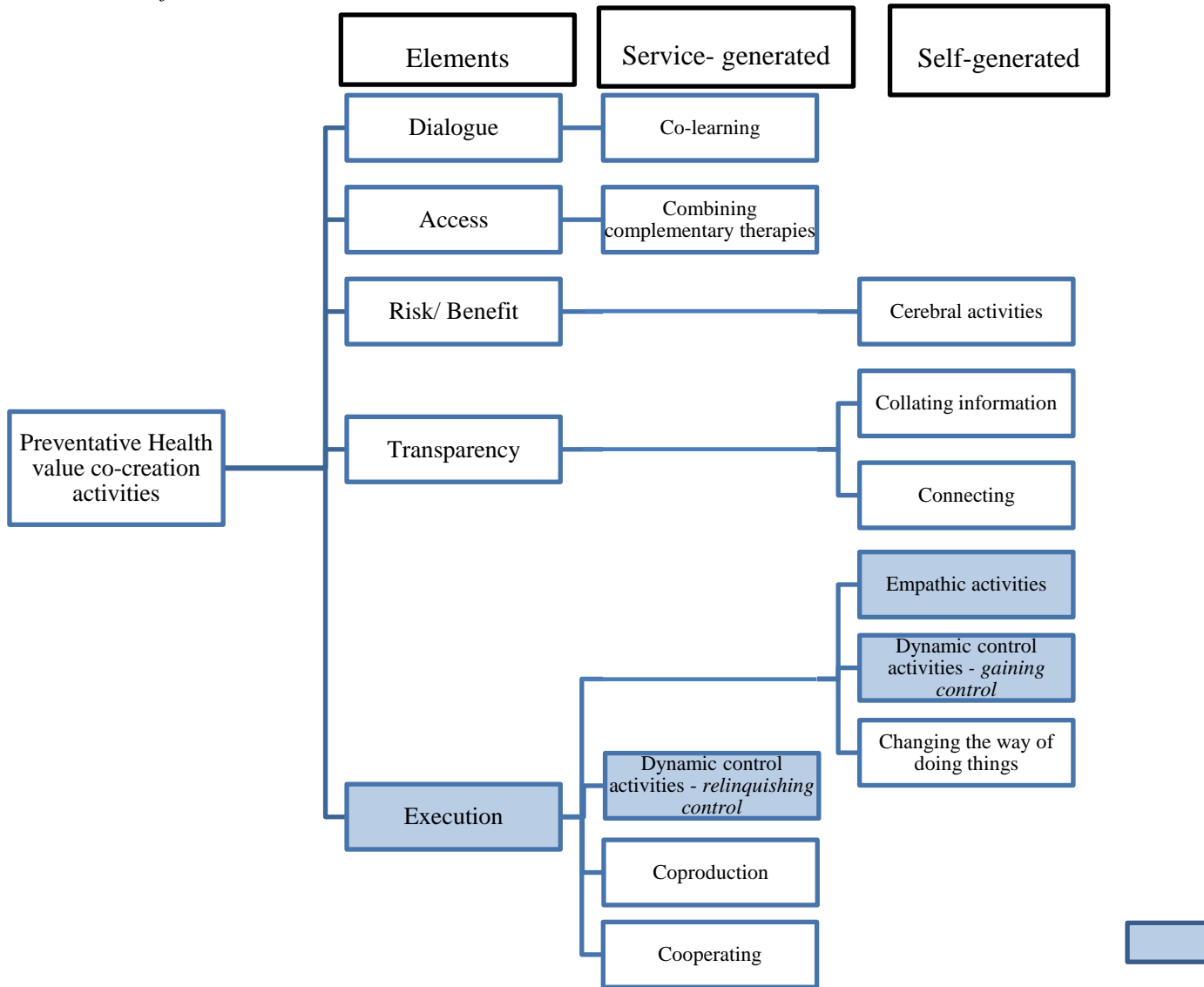
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Figure 1 Alignment of DART framework and customer value co-creation activities framework in standardized screening services



Sources: McColl-Kennedy *et al.*, 2012; Prahalad and Ramswamy, 2004.

Figure 2 DART-E Framework of Preventative Health value co-creation activities*




*DART-E includes a new element, and new service-generated and self-generated activities as depicted by 

Table 1 Key research on microfoundations of co-creation

Micro-foundation characteristics	Literature
Individual characteristics	
Engagement	Brodie <i>et al.</i> (2011), Jaakkola and Alexander (2014), Li <i>et al.</i> (2017)
Embeddedness	Laud and Karpen (2017)
Participation	Jaakola and Alexander (2014)
Effort	Sweeney <i>et al.</i> (2015)
Co-production	Lusch and Vargo (2006), McColl-Kennedy <i>et al.</i> (2012)
Customer contributory roles	Chen <i>et al.</i> (2012)
Customer “owned” resources	Harmeling <i>et al.</i> (2017)
Shared intentionality	Taillard <i>et al.</i> (2016)
Intent	Grönroos and Voima (2013)
Structures, systems, processes	
Platforms	Breidbach <i>et al.</i> (2014), Breidbach and Brodie (2017), Storbacka <i>et al.</i> (2016)
Virtual/technology platforms	Hollebeek (2017)
Usage processes	Kleinaltenkamp <i>et al.</i> (2017)
Organizational culture	Sharma and Conduit (2016), Wilden and Gudergan (2017)
Organizational capability, practice ability	Karpen <i>et al.</i> (2017)

Table 2 Participant characteristics and Health LOC subscale scores

Pseudonym	Age	Gender	HLOC subscale classification		
			Internal	Chance	Powerful others
Kate	20	F	Low	Medium	Low
Sally	20	F	High	Medium	Medium
Marie	54	F	Medium	Low	High
Anna	52	F	Low	Low	Low
Cath	73	F	Low	Medium	Low
Jan	55	F	High	High	Low
Barbara	53	F	Low	High	High
Josie	62	F	Low	Medium	Low
Christine	23	F	Medium	High	Low
Kim	29	F	Low	High	Medium
Helen	54	F	Low	High	Low
Deirdre	63	F	High	Low	Low
Angela	43	F	High	High	Low
Carol	45	F	Medium	Low	Low
Diane	58	F	Low	High	High
Sue	65	F	High	Low	Low
Tania	53	F	High	Low	High

Emma	35	F		Medium	High	High
Ted	70		M	Low	High	High
Murray	78		M	Medium	High	High
Don	70		M	High	Medium	High
Andy	51		M	Medium	High	High
John	55		M	Low	High	High
Peter	64		M	Low	Medium	Low
Steve	58		M	Medium	High	High
Total	25	18	7			
<u>HLOC Scores Range and Median</u>				Internal	Chance	Powerful others
Subscale Score Range				15-30	7-21	8-22
Subscale Median				22	14	15

Table 3 Mapping service-generated and self-generated activities onto customer value co-creation activities in standardized screening services

Value co-creation	Response type	Response themes	Explanation	Customer value co-creation activities in standardized screening services
Service-generated	Reactive	Compliance	Following instructions	Cooperating McColl-Kennedy <i>et al.</i> (2012)
		Relinquishing control	Accepting of expert knowledge	Dynamic relinquishing control activities New activity
Self-generated	Volitional	Protecting self and others	Emotion management and sensemaking	Cerebral activities McColl-Kennedy <i>et al.</i> (2012)
		Understanding relationship needs	Minimize relational awkwardness via preparation	Empathic activities New activity
		Gaining control	Risk-reduction actions external to and during service experience	Dynamic gaining control activities New activity

Table 4 Suggested service provider activities to enhance value co-creation in standardized screening services

DART-E Framework elements	Service provider activity	Purpose	Target group	
			Low internal HLOC	High internal HLOC
<i>Dialogue</i>	Reminders from powerful others e.g., at doctor’s appointments, using testimonials by valued community leaders	To incorporate the views of powerful others in marketing communications	✓	
	Encourage self-management of health with regular reminders – from the screeners, doctors, or advertising messages	To remind those motivated to self-manage		✓
<i>Access</i>	Provide workplace and mobile community screening facilities	To motivate participants to undergo screening with minimal personal effort	✓	
	Facilitate self-service e.g., increased home screening, improved procedural instructions.	To support busy, self-motivated people to just ‘get it done’		✓
<i>Risk-benefit understanding</i>	Acknowledge the stress and effort patients experience	To assist participants to avoid negative emotional experiences, including worrying	✓	
	Provide opportunities for sharing positive results and experiences	To allow participants to receive value from their social contribution / good citizenship		✓
	Provide emotional support for participants.	To assist participants to avoid negative emotional experiences, including worrying	✓	
		Improve trust and confidence in customer journey processes		✓

<i>Transparency</i>	Create touchpoints for communication throughout the customer journey	To acknowledge participants' delaying strategies and to encourage their participation	✓	
		To help participants integrate screening services with other self-initiated health services that are part of their routine		✓
<i>Execution</i>	Develop adaptive procedures to reduce delays	To accommodate patients' delaying tactics as a coping mechanism.	✓	
	Provide opportunities for participants to prepare for screening	To emphasize wellness and encourage empathic activities		✓
	Create supportive servicescapes	To emphasize wellness and encourage empathic activities.		✓
		To minimise negative emotional experiences	✓	