

**Boosting Consumer Behavior: An Interdisciplinary Inquiry into Adaptive
Decision-Making Interventions and their Role in Consumer Empowerment**

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Summary

Interventions into consumers' cognitive processes can be cost-efficient tools to influence consumer behavior in a desirable direction. They have been extensively discussed as tools to empower consumers' pursuit of well-being. Recent research, however, increasingly features unanticipated effects of interventions as well as varying effect sizes and points to a conceptual stagnation of choice intervention research. These issues can be due to an empirical emphasis on direct behavioral outcomes rather than processes, neglect of contextual contingencies, and an often-narrow focus on a singular intervention mechanism as opposed to several promising ones. Currently, cognitive intervention research yields abundant potential for empirical and conceptual explication.

This dissertation approaches these research opportunities from different disciplinary and methodical angles with the target of contributing to a developing consumer interventions theory. Article 1 is one of the first works which demonstrates that intrapersonal differences as context factors play an important role in predicting intervention success. Across three online experiments, perceived decision importance and perceived time pressure significantly alter the effectiveness of two choice architecture interventions. Article 2 outlines the new research field *transformative consumer interventions* through an integration of transformative service theory, extant interventions research, and behavioral decision theory. On that theoretical fundament, the novel intervention construct *consumer boosting* is conceptualized, followed by an analysis of different interventions' potential unintended consequences. Article 3 demonstrates that empowering activities increase customer engagement, which makes interventions an important marketing tool. Using a large-scale international survey and two experimental studies, the research also shows that the effect on engagement is largely mediated by consumers' perceived control and perceived learning.

Overall, the articles in this dissertation confirm that cognitive interventions can be important tools for consumer empowerment, but that substantial research is required for the robust evaluation of situational virtues and risks associated with the utilization of different interventions. It furthermore showcases how different disciplines can contribute to this research program and provides important empirical and conceptual findings which may boost context-aware cognitive interventions research.

Zusammenfassung

Interventionen in die kognitiven Prozesse von Konsumenten können kosteneffizient Verhalten in gewünschte Richtungen steuern und das Wohlergehen von Individuen unterstützen. Zunehmend diskutiert die Forschung in dem Gebiet jedoch unvorhergesehene Konsequenzen sowie schwankende Effektgrößen von Interventionen und thematisiert die mögliche konzeptionelle Stagnation des Forschungsfeldes. Es gibt diverse Herausforderungen in der Forschung zu kognitiven Interventionen, welche umfassendes Potential für empirische und konzeptionelle Unterfangen bieten. Dazu zählen die Erörterung von Interventionseffekten über direkte Verhaltensänderungen hinaus, die Berücksichtigung von Kontext-Effekten, sowie die Betrachtung von verschiedenen Mechanismen als mögliche Hebel für die Befähigung von Konsumenten.

Die vorliegende Dissertation nähert sich diesen Herausforderungen von diversen disziplinären und methodischen Perspektiven mit dem Ziel, zu einer sich entwickelnden Theorie der Konsumenteninterventionen beizutragen. Artikel 1 zeigt auf, dass intrapersonelle Unterschiede wichtige Kontextfaktoren für den Erfolg von Interventionen sind. In drei Online-Experimenten ändern empfundene Entscheidungswichtigkeit und empfundener Zeitdruck signifikant die Effektivität zweier Choice Architecture-Interventionen. Artikel 2 entwickelt das neue Forschungsfeld „Transformative Consumer Interventions“ durch die Integration dreier relevanter Theorien. Auf diesem Fundament wird der neue Interventionsmechanismus „Consumer Boosting“ konzipiert, gefolgt von einer Analyse der unvorhergesehenen Konsequenzen verschiedener Interventionen. Artikel 3 zeigt auf, dass die Ermächtigung von Konsumenten zu Customer Engagement führt. Somit können ermächtigende Interventionen ein wichtiges Marketinginstrument sein. Drei empirische Studien bestätigen zudem empfundene Kontrolle und empfundenes Lernen als Mediatoren der Wirkung auf Customer Engagement.

Insgesamt bestätigen die drei Artikel, dass kognitive Interventionen wichtige Tools für die Ermächtigung von Konsumenten sein können. Zugleich ist umfangreiche Forschung für ein robustes Verständnis situativer Vorteile und Risiken von Interventionen vonnöten. Des Weiteren zeigt diese Forschung, was verschiedene Disziplinen zu kontext-sensitiver Interventionsforschung beitragen können.

Introduction

Motivation and State of Research

Thus far, the 21st century has seen an unprecedented surge in academic research on how consumers can be guided toward better behavior, “as judged by themselves” (Thaler & Sunstein, 2008, p. 5). It is broadly accepted that subtle interactions with consumers’ cognitive processes can bring about desirable changes in their behavior (van Bavel et al., 2020; Weber & Johnson, 2009). Such cognitive interventions are a promising tool for firms and other non-governmental organizations who cannot regulate consumer behavior to efficiently influence it. Two intervention constructs which have been proposed are nudging and boosting (Hertwig & Grüne-Yanoff, 2017). Nudges, also called choice architecture interventions, predictably influence the likelihood that certain choices are being made through slight alterations of the way the choice is presented to consumers (Thaler & Sunstein, 2008). Boosts, on the other hand, seek to improve consumers’ repertoire of heuristic decision-making capabilities and, consequently, choice outcomes (Grüne-Yanoff & Hertwig, 2016). The present dissertation builds on extant research on boosting, nudging, and other relevant theoretical entities and contributes to their further elaboration. This work contributes to interdisciplinary research on cognitive interventions in several ways. First, evidence of the influence of consumers’ intrapersonal context on the effectiveness of choice architecture interventions is presented. Second, a consumer-centric research area is outlined through the integration of several theories, followed by the development of a new intervention construct on that basis. Finally, it is explored whether and on what conceptual pathways interventions that set out to empower consumers lead to desirable firm outcomes like consumer engagement.

Disciplines as diverse as consumer psychology and marketing (Fischhoff & Broomell, 2020; Johnson et al., 2012), service research (Wunderlich, Kranz, Totzek, Veit, & Picot, 2013), public policy and economics (Grüne-Yanoff, Marchionni, & Feufel, 2018), and behavioral medicine (Nahum-Shani et al., 2018) study non-coercive interventions into consumers’ cognitive processes. Among other factors, this common interest can be explained by the disciplines’ desire to increase individual and societal welfare. Interventions which can predictably alter population behavior at relatively low cost are a promising tool to that end. Thus, cognitive intervention mechanisms have

been successfully used to influence behavior in categories such as consumption (Russo, Krieser, & Miyashita, 1975), sustainability (Bernedo, Ferraro, & Price, 2014), financial decision-making (Bradt, 2019), pro-social behavior (Shang & Croson, 2009), nutrition (Romero & Biswas, 2016), and health (van Bavel et al., 2020). Beyond their effectiveness, interest in interventions is increased by recent technological advancements. Unlike some decades ago, today's mobile and wearable technologies enable interventions that dynamically capture consumers' context and interact with them in a meaningful way (Nahum-Shani et al., 2018; Wittkowski et al., 2020).

Despite this progress, various challenges in intervention research have not yet been resolved. Recently, the frequency of calls for the assessment of the role of context in decision-making has increased (Jachimowicz, Duncan, Weber, & Johnson, 2019; Münscher, Vetter, & Scheuerle, 2016). It has long been established that consumers' context influences their decision-making processes, and therefore their choice outcomes (Bettman, Luce, & Payne, 1998; Swait & Adamowicz, 2001). As interventions interact with cognitive processes, it follows that their success depends on the context in which they are situated. However, to date, efforts to categorize and assess the effects of context attributes on interventions remain sparse. A related concern is that most interventions research focuses solely on the immediate impact of the mechanisms, neglecting indirect and potentially undesirable consequences. An understanding of side effects such as boomerang effects, annoyance, or perceived manipulation would however be required for a robust understanding of a construct's situational merits or shortcomings (Dolan & Galizzi, 2015). Consequently, an acknowledgement of interventions' contextual success determinants and their unintended consequences would be required to advance interventions theory and, for instance, formulate frameworks that allow for the flexible selection of situationally appropriate constructs. Another still underexplored research question is how consumer interventions can be leveraged to contribute to desirable firm outcomes beyond immediate behavior. For instance, consumer engagement has been established as an important marketing construct which signifies individuals' motivational, behavioral, and cognitive bonds with a brand. While there is reason to believe that some interventions can increase consumer engagement, no relevant empirical evidence exists yet.

With a multi-method, interdisciplinary approach, the present dissertation addresses these gaps. The articles herein represent three different parts of a nascent

research program. They first empirically assess the phenomenon of context-dependent intervention effectiveness, then develop theoretical entities addressing that phenomenon, and finally discuss downstream consequences of those constructs. The following section introduces the different research perspectives assumed throughout this dissertation.

Research Perspectives

The different articles herein share a common focus on cognitive interventions as mechanisms to increase consumer well-being. Furthermore, they consistently acknowledge that as a function of changing contextual attributes, all choice processes are individually different. Context considerations inherently increase the complexity of academic endeavors (Akaka, Vargo, & Lusch, 2013). Contexts unfold dynamically, are often subjectively evaluated by consumers, and are thus challenging to predict (Greenberg, 2001). Nevertheless, where research is stagnant, context considerations can be an important driver of academic progress. This is especially the case in research related to human behavior and choice, which always depends on the environment it is situated in (Johnson, 2013). To fully grasp the relevance and impact of individual differences and how interventions can be tailored accordingly, an analysis of situational choice processes as opposed to choice outcomes is required. To that end, all articles incorporate a discussion of psychological processes situationally resulting from interventions. The common themes in this dissertation are related to substantial real-world phenomena that are of importance to a variety of disciplines. This reflects in the diversity of the intended publishing outlets for the different articles, that is, consumer psychology (Article 1), service research (Article 2), and marketing (Article 3). As they share a focus on consumer processes and outcomes, this dissertation is best classified as a work in consumer research which revolves around consumer behavior as a class of phenomena (MacInnis & Folkes, 2010) and to that end draws on various existing bodies of literature. Commonalities and differences between the three articles are summarized in Figure 1.

For more than half a century, consumer research has developed and utilized an extensive toolkit of quantitative methods, yielding vast insights as to when and why people behave in certain ways. At the same time, there are recurring concerns that the discipline advances knowledge on an increasingly incremental level with a limited

impact on other disciplines or the public discourse (Lehmann, McAlister, & Staelin, 2011; Lynch, Alba, Krishna, Morwitz, & Gürhan-Canli, 2012; Schwarz, 2020). To develop contributions that are relevant to a variety of stakeholders, research programs benefit from breaking implicit boundaries and integrating complementary epistemological, disciplinary, theoretical, and methodical perspectives (Block, Argo, & Kramer, 2020; MacInnis et al., 2020). Attempting to contribute to the developing interdisciplinary research field of consumer interventions, each article challenges one or several conventions that characterize much of consumer research.

Most consumer research is conducted in a positivist paradigm, which is related to a higher likelihood of quantitative, confirmatory approaches (Deshpande, 1983). However, a research program can benefit from the incorporation of multiple epistemological perspectives (Lee, 1991). The articles in this dissertation assume varying epistemological stances, leaning toward an interpretivist perspective. While positivism presumes an objective reality which with quantifiable construct interrelations, interpretivism suggests that no such objective reality exists (Anderson & Ozanne, 1988). Unlike in the natural sciences, no universal laws for the behavior of humans can be formulated, as behavior depends on the context it is embedded in (Willis, 2007). This emphasis on the role of context is most pronounced in constructivism, a philosophical lens which reflects in seminal works in behavioral decision theory (Bettman et al., 1998; Payne, Bettman, & Johnson, 1993). The three articles consistently incorporate interpretivist notions by discussing psychological processes in relation to their context as perceived by consumers. Article 1 and 3 can nevertheless be categorized as positivist works, as they seek to uncover and validate conceptual relations. On the other hand, interpretivist works are well suited for the development of new theoretical entities out of real-world phenomena or existing theories (Anderson & Ozanne, 1988; Deshpande, 1983). Article 2 is an interpretivist, exploratory endeavor which uses logical deduction to guide the phenomenologically motivated inquiry into context-dependent consumer interventions.

Second, this dissertation breaks boundaries by drawing on various disciplines that have valuably contributed to research on interventions. As introduced above, these disciplines include consumer research and related disciplines as much as public policy, behavioral economics, psychology, behavioral medicine and others. This interdisciplinary perspective often unveils astonishing parallels between the research

areas. For instance, whereas behavioral decision theory has long discussed the notion that consumers adaptively select decision strategies when they encounter a choice task (Payne, Bettman, & Johnson, 1988), the logical implication of adaptive interventions was first formulated in the field of behavioral medicine (Nahum-Shani et al., 2018). Focusing on the exploration of these overlaps may prove to be an efficient strategy for consumer intervention research. Several disciplines coming to the same conclusions despite different theoretical and methodical perspectives is an indication for robust findings and relevant phenomena. The fact that these parallels can only be detected when overcoming disciplinary silos motivated the interdisciplinary approach for this dissertation.

Third, apart from commonalities such as the shared paradigm of bounded rationality (Simon, 1956), the theories underlying the different articles are diverse. Article 1 primarily focuses on choice architecture theory, but also draws on the larger behavioral decision-making literature. Article 2 takes a broader approach, integrating different literature streams to outline a research area and conceptualize a new construct (MacInnis, 2011). The three bodies of research central to the article are behavioral decision theory, transformative service research, and the existing interventions literature, which encompasses all research on nudging, choice architecture, and heuristic boosting. Finally, Article 3 incorporates psychological empowerment theory as well as the literature on customer engagement. The diverse theoretical fundament of this dissertation also reflects in the fields of application this research is relevant for, reaching from charitable behavior to health and financial well-being. The progression toward a (transformative) consumer intervention theory is consequently relevant to policymakers, non-governmental organizations and businesses alike.

Last, resulting from the different philosophical and theoretical perspectives discussed thus far, the different parts of this research also leverage various methodologies for the generation and analysis of data. For the first and third article, empirical data were created through an international online survey, several online experiments, and a lab experiment. Beyond descriptive analyses, those data were analyzed with linear and logistic regression analyses, likelihood ratio tests and conceptual process modeling. Article 3, on the other hand, fully draws on prior research. This existing knowledge is analyzed, consolidated, and integrated to formulate new theoretical entities.

	Article 1	Article 2	Article 3
Research Object(s)	context-dependent cognitive interventions in charitable giving	transformative value co-creation with cognitive interventions in health	consumer empowerment and engagement in complex services
Common Themes	consumer behavior, cognitive interventions, psychological processes and states, consumer well-being (transformative value)		
Target Discipline	Consumer Psychology	Service Research	Marketing / Consumer Research
Research Approach	confirmatory	exploratory	exploratory + confirmatory
Epistemological Perspective	positivism	interpretivism	positivism
Considered Literature Streams & Theories	choice architecture theory, behavioral decision-making	interventions literature (nudging, choice architecture, boosting), behavioral decision theory (adaptive decision making, preference construction), transformative service research (co-creation, transformative value)	consumer empowerment, consumer engagement
Data Generation Method(s)	3 online experiments	interdisciplinary literature analysis	large-scale survey panel, lab experiment, online experiment
Data Analysis Method(s)	Chi-squared tests, logistic regression modeling	conceptual integration	linear regressions, mediation analyses

Figure 1: Overview of Philosophical, Theoretical, and Methodical Perspectives in this Dissertation

Article Summary and Key Implications

Article 1: Embracing the Context of Context: Empirical Evidence on the Unanticipated Effects of Psychological States on Choice Architecture Interventions

Martin Bieler

To date, intrapersonal differences are rarely considered in choice architecture research. At the same time, it is widely acknowledged that decision-making processes depend on the context choice agents find themselves in and how they perceive that context. Consequently, calls for the scrutiny of interactions between choice architecture interventions and consumer-based contexts are increasing. It is expected that the systematic consideration of situational influences on choice architecture effectiveness will yield a basis for the necessary theoretical advancement, foster essential insights on when (not) to rely on certain intervention mechanisms, and ultimately facilitate progress toward the development of holistic choice architecture frameworks.

Article 1 marks an important early step on the journey toward a systematic understanding of context in choice architecture research. Three online experiments find that perceived decision importance and time pressure influence the effects of two well-established choice architecture interventions: In a donation choice task, they significantly alter the effectiveness of default settings and social norm interventions. This confirms the relevance of inquiries into context attributes as perceived by individuals. At the same time, the partially unanticipated directionality of the observed effects demonstrates the currently lacking ability of choice intervention theory to predict important interaction effects, highlighting the need for a multi-pronged investigation. While empirical efforts can help pinpoint generalizable effects, choice architecture context research also requires the advancement of relevant theorizing. Practitioners will benefit from an emerging catalogue of context-intervention interactions by being able to better predict the situational effectiveness of interventions, thus guiding their selection, as well as by altering contextual conditions in a desirable way whenever it is in their power. In that vein, the present research finds that decision importance can enhance intervention effectiveness, while varying effects are observed for social norms. In a charitable giving setting, choice architecture can guide consumers to desirable decisions, especially if the choice is important to consumers.

The article is currently under review at the Journal of Consumer Psychology.

Article 2: Enabling Co-Creation with Transformative Interventions: An Interdisciplinary Conceptualization of Consumer Boosting

Martin Bieler, Peter Maas, Lukas Fischer, and Nele Rietmann

Consumer interventions which seek to increase well-being can unintentionally hurt businesses as well as individuals. Current debates surrounding different intervention tools show that there is no consistently preferable intervention construct. The conceptual understanding of when and why interventions result in unintended consequences is limited, as is the elaboration of criteria for the selection of situationally appropriate constructs. Nevertheless, new theoretical perspectives are rarely introduced to interventions research and, relative to vast empirical achievements, conceptual progress is sparse. To date, there is neither an intervention construct which relies on consumer theories, nor one that acknowledges how changing contexts affect the virtues and shortcomings of interventions.

Article 2 sets out to overcome these limitations through the conceptualization of theoretical entities. First, it introduces a new theoretical lens to interventions research which draws on extant literature about cognitive intervention mechanisms as well as transformative service research and behavioral decision theory. On this broad theoretical basis, the research area “Transformative Consumer Interventions” (TCI) is introduced, which seeks to consolidate and align research with the common goal of increasing transformative value or consumer well-being with interventions. Second, the novel intervention mechanism “consumer boosting” is conceptualized. Consumer boosting is the first TCI construct and describes interventions that enhance consumers’ capabilities to co-create transformative value, acknowledging individual consumer contexts. Third, consumer boosting and two other popular intervention constructs are being discussed in light of potential unintended consequences they can incur.

Future research will benefit from the newly outlined research area, as new theoretical lenses have proven to be fertile grounds for conceptual advancement. The introduction of consumer boosting showcases that relevant intervention constructs can be created out of exploratory, conceptual efforts. At the same time, consumer boosting may spark conceptual and empirical efforts in its own right. Finally, the discussion of the constructs’ unintended consequences confirms the notion that no universally

preferable intervention for consumer empowerment exists. Rather, intervention designers require a toolbox with several intervention mechanisms and an according framework for the evaluation of situational merits and shortcomings.

Beyond its academic contributions, this article has several implications for business practitioners. Most importantly, it shows that considering several interventions, including consumer boosting, and evaluating them from a TCI perspective yields the potential to achieve desirable consumer outcomes while avoiding unintended consequences. TCI and consumer boosting thus have the potential to substantially enhance the average impact of deployed interventions, and thereby their significance in consumer empowerment strategies.

This article is currently under review (round 3) at the Journal of Service Research. Previous versions have been presented at global marketing and consumer research conferences, including the AMA Winter Academic Conference and the Association for Consumer Research Conference.

Article 3: Empowerment Increases Engagement in Complex Services: A Multi-Method Investigation of the Effects of Empowerment on Consumer Engagement

Martin Bieler and Peter Maas

This article scrutinizes two focal consequences of consumer interventions: Perceived empowerment, a consumer-based psychological state, and its effects on customer engagement, an important marketing metric. The research is one of the first attempts to bridge the notion of empowering interventions with desirable and measurable firm outcomes, and homes in on the psychological processes underlying the constructs' interrelations. With an international survey panel, a lab experiment, and an online experiment, this work develops and validates a conceptual model of how firms' empowering activities, such as consumer interventions, result in increased customer engagement with that firm. This effect is largely mediated by consumers' psychological empowerment, reflected in their perceived control and perceived learning.

From an academic perspective, this article is a step toward the elaboration of concrete desirable consequences of empowering interventions for marketers, which to date have received little attention. It thus highlights the relevance of research into interventions and empowerment in relation to marketing constructs. While engagement is confirmed as a consequence of empowerment, future empirical research may unveil

additional outcomes and help further optimize empowerment strategies accordingly. In that vein, the research presented in Article 3 also yields important implications for practitioners. If firms to put effort into empowering activities, benefitting themselves as well as consumers. What is more, the detailed understanding of perceived control and learning as dimensions of empowerment presents opportunities to tailor empowerment initiatives to consumers' needs, as well as measure their impact better.

An early version of this manuscript has been published in the working paper series of the Institute of Insurance Economics at the University of St. Gallen (No. 248). It is currently being prepared for submission to the Journal of Service Research.

Adaptive Cognitive Interventions: Outlook

Cognitive interventions are increasingly important as technological advancements provide ever-increasing opportunities to leverage them efficiently in consumer interactions. What is more, in response to market complexities and concerns regarding consumer vulnerability, increased attention is given to cognitive interventions as tools for sustainable empowerment. However, multi-pronged, concerted efforts are required to keep up with the rapid real-world developments which alter the way various stakeholders understand, utilize, and perceive interventions.

The present dissertation consistently contributes to a growing body of research which moves beyond the empirical evaluation of interventions' direct effects. It seeks to understand the processes resulting from interventions, the situational influences on these processes, and consequences beyond immediate behavior. To that end, new context dimensions which significantly affect intervention effectiveness are introduced, a new intervention mechanism is developed, and the effect of empowering activities on firm outcomes is modeled and validated. These efforts reflect the various ways in which interdisciplinary research can meaningfully contribute to the evolution of a consumer intervention theory. At the same time, they are but initial steps toward that goal.

One of the most ambitious, yet pressing objectives of cognitive intervention research continues to be the development of holistic frameworks which guide future research endeavors and provide guidance to business practitioners (Grüne-Yanoff et al., 2018; Szaszi, Palinkas, Palfi, Szollosi, & Aczel, 2018). This endeavor can be broken down into two primary sub-goals. First, the different intervention constructs discussed herein, including consumer boosts, need to be theoretically refined and rooted in mutual

nomological networks. This can be facilitated by unified taxonomies and a broad consensus regarding the objectives of interdisciplinary interventions research (Münscher et al., 2016). Second, the impact of further context dimensions on interventions needs to be evaluated from theoretical and empirical angles (Jachimowicz et al., 2019). The target of such research is the development of a library of statement on the situational effectiveness of interventions.

Another promising research frontier is the explication of the interaction between interventions and cognitive processes. While current interventions research almost exclusively focuses on resulting behavior or downstream outcomes such as health (Landais et al., 2020), future research will benefit from a robust understanding of how, exactly, cognitive processes change subject to consumer interventions (Schulte-Mecklenbeck, Kühberger, & Ranyard, 2011). Process knowledge will facilitate the deduction of consequences, including undesirable ones (Johnson, Schulte-Mecklenbeck, & Willemsen, 2008). What is more, an awareness of the specific effects of interventions on a process level will allow for a more targeted design and implementation of interventions. To that end, interventions research can leverage data creation methods which have been extensively employed in choice research but received sparse attention in relation to interventions. The judgement and decision-making literature advocates tracking cognitive processes through verbal protocols, eye movements, or mouse cursor activity (Schulte-Mecklenbeck et al., 2017). An even more direct observation of cognitive activity is made possible by the utilization of neuroimaging. While more effortful to implement in an experimental paradigm, neuroimaging has been proposed as a promising avenue toward understanding when and why interventions are effective (Felsen & Reiner, 2015). In fact, recent works in neurophysiology model and validate adaptive cognitive processes throughout all decision-making stages, which can inform interventions theory (Kelly, Corbett, & O'Connell, 2020). Consumer research rarely resorts to neurological analyses and likely, the expertise regarding such methods is more pronounced in other research areas like cognitive psychology or medicine. Thus, an interdisciplinary research approach can also facilitate the advancement of methods utilized for the study of focal entities.

Beyond the two research angles mentioned here, several other endeavors which could advance consumer interventions theory are discussed in more detail in the respective articles. Likely the most relevant contribution of this dissertation is the

uncovering of trajectories for future interdisciplinary progress regarding consumer interventions. This dissertation elaborates where research is needed and provides initial examples which demonstrate that such research, albeit complex, is worthwhile. It thus makes the benefits of consumer interventions research more salient for the academic community. Ultimately, meaningful progress in the field will depend on the question whether implicit boundaries, whether disciplinary or otherwise, can be overcome.

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Embracing the Context of Context: Empirical Evidence on Unanticipated Effects of Psychological States on Choice Architecture Interventions

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Abstract

Consumers' individual context influences the effectiveness of choice architecture interventions. Among other factors, psychological states moderate the impact of choice architecture on consumer behavior throughout decision-making processes. However, research on psychological determinants of intervention effectiveness is sparse. Resulting from a limited attention to context effects, existing choice architecture studies show drastically varying effect sizes and frequent unintended consequences. To understand and predict the situational effectiveness of choice architecture, theory-driven empirical context research is required.

After an introduction of choice theory-based hypotheses, three online experiments show significant influences of perceived decision importance and time pressure on social norm and default interventions, confirming that psychological states are important to consider in choice architecture design. These findings help choice architects select situationally appropriate interventions when consumers' psychological states can be manipulated or anticipated. Counterintuitively, perceived decision importance increases choice architecture effects. Cataloging such unanticipated findings is essential for the development of holistic choice architecture frameworks, contributing to an improvement in average effect sizes and the avoidance of undesirable consequences. Also, they highlight areas for conceptual clarification and advancement.

Keywords: choice architecture, context, decision importance, perceived time pressure, defaults, social norms

Introduction

Choice architecture research is at a crossroads. After more than a decade of amassing empirical evidence on choice architecture interventions in various settings, researchers increasingly point out the lacking generalizability as well as the limited novelty of such findings (Münscher, Vetter, & Scheuerle, 2016; Szaszi, Palinkas, Palfi, Szollosi, & Aczel, 2018). At the same time, academic and practical interest in choice architecture is unbroken. Recent research supports the notion that the context in which choice architectures work is central to their impact on human behavior (Hummel & Maedche, 2019; Ingendahl, Hummel, Maedche, & Vogel, 2020; Jachimowicz, Duncan, Weber, & Johnson, 2019). The present research contributes to this nascent movement and is the first to experimentally analyze the impact of two psychological states on the effectiveness of two choice architecture interventions.

Choice architecture describes the way a choice is presented, which could potentially be altered by someone designing the decision environment, that is, a choice architect (Johnson et al., 2012; Thaler & Sunstein, 2008). Deliberate alterations to the choice environment can predictably elicit a change in consumer behavior, such as a specific choice being made. These changes are referred to as choice architecture interventions (Szaszi et al., 2018). In recent years, a host of choice architecture interventions has been proposed. Default settings have, for instance, received a lot of attention in the academic literature and beyond. In many instances, pre-selecting an alternative in a choice task significantly increases the likelihood of that option being chosen (Jachimowicz et al., 2019). For example, the finding that organ donation rates can be dramatically increased by changing the default option from *not a donor* to *donor* has inspired policy-makers around the world (Johnson & Goldstein, 2003). Other notable choice architecture elements which can be addressed by interventions include the salience of choice options, the presentation and framing of information, or social cues (Dolan et al., 2012; Johnson et al., 2012).

The promise of choice architecture is compelling. At a very low cost, organizations can increase the likelihood that consumers behave in desirable ways (Hertwig & Ryall, 2020; Münscher et al., 2016). Behavior patterns successfully targeted by changes to the choice architecture include consumption choices (Lamberton & Diehl, 2013), nutrition and healthy behavior (Cadario & Chandon, 2020; Landais et al., 2020),

financial decision-making (Camilleri, Cam, & Hoffmann, 2019), pro-social choices (Goswami & Urminsky, 2016), and more. However, risks of choice architecture tools increasingly become apparent. When adopting established mechanisms to new settings, effect sizes are often vastly different from what was observed in prior research. Sometimes, effects of interventions are directionally opposite to the hypothesized ones (Jachimowicz et al., 2019). What is more, deliberate changes to the choice architecture may result in unintended consequences such as psychological reactance. As long as the drivers for such side effects are not known, choice architects are at risk of detracting from their own goals while potentially hurting consumers.

Although research increasingly acknowledges that the larger context of choice architecture interventions greatly influences their effectiveness, little is known about the interactions of the immediate choice environment with factors that go beyond it (Münscher et al., 2016; Szaszi et al., 2018). This is surprising as theories of choice have long acknowledged the relevance of myriad contextual factors on choice strategy selection, processes, and outcomes (Bettman, Luce, & Payne, 1998; Klein & Yadav, 1989; Payne, Bettman, & Johnson, 1988). To date, knowledge of psychological factors influencing the outcomes of choice architecture interventions, or in other words, of the intrapersonal context of choice context, is sparse (Ingendahl et al., 2020). The present research singles out two psychological context factors and assesses whether and in what way they influence the outcomes of choice architecture research. The choice architecture literature as well as behavioral decision theory are drawn upon to develop hypotheses on how perceived decision importance and perceived time pressure will impact the effectiveness of two popular choice architecture interventions: Default settings and social references. Extant research shows that decision strategy selection in a choice task depends on whether people are motivated and able to leverage effortful decision routines (Dhar, Nowlis, & Sherman, 2000; Sweeney, Danaher, & McColl-Kennedy, 2015). In that vein, perceived decision importance and perceived time pressure are expected to influence whether consumers select heuristic or more systematic decision strategies (Krishnan, Dutta, & Jha, 2013; R. Suri & Monroe, 2003). This, in turn, will impact choice architecture effectiveness and ultimate decision outcomes.

The studies presented here consider the effectiveness of choice architecture interventions on donation choices. Charitable activity has a large economic impact, as

annual donation amounts in 2018 in the U.S. alone exceeded \$420 billion, funding more than 1.5 million charitable organizations (NCCS, 2020). Charitable giving has been of interest to consumer researchers as a behavior driven by different motivators, yet closely interlinked with, self-focused consumption (Ariely & Norton, 2009; Khodakarami, Petersen, & Venkatesan, 2015). Knowledge on when and why consumers are donating to charitable causes is rapidly developing. For instance, research has found that consumers are more likely to give when donation requests are framed as a roundup suggestion during a purchase (Kelting, Robinson, & Lutz, 2019), that political ideology is a predictor of donation behavior (Farmer, Kidwell, & Hardesty, 2020), and that linking firm donations with consumers' hedonic product purchases relieves their consumption guilt (Zemack-Rugar, Rabino, Cavanaugh, & Fitzsimons, 2016). What is more, empirical studies have assessed choice architecture interventions in donation settings, finding mixed results (Goswami & Urminsky, 2016). The present work contributes to this research in that it is the first to analyze contextual dimensions influencing the effectiveness of choice architecture interventions in charitable giving. In three online experiments, significant effects of psychological contexts on intervention effectiveness in a donation choice task are found.

While first works on the impact of psychological traits as determinants of intervention effectiveness have been published (Ingendahl et al., 2020), the present research is the first to link choice architecture and psychological states. This has several implications for choice architecture research and practice. For one, this research provides some of the first empirical evidence on intrapersonal states' impact on choice architecture interventions. Crucially for practitioners, it demonstrates that perceived decision importance and time pressure influence the effectiveness of such interventions. Choice architects can make use of this by only implementing the interventions when it can be anticipated that consumers are in an appropriate mindset, or, if possible, by altering that mindset preemptively. At the same time, such insights are necessary for the progress toward the conceptualization of context-sensitive intervention frameworks, which have increasingly been called for in recent research (Grüne-Yanoff, Marchionni, & Feufel, 2018). Specifically, such frameworks may seek to explain the differences previously observed among seemingly similar intervention mechanisms and allow the more accurate prediction of choice architecture effects in the future (Szasz et al., 2018). More broadly, the findings herein do not fully align with the hypotheses that were

developed after an analysis of extant theory. Such research is essential to eliminate commonly held, but inconsistent assumptions as well as give rise to new theories (Johnson, 2013). To date, there is a lot we do not know about when and why choice architecture interventions work. A focus on the context of choice context is an intriguing, if not necessary avenue for research. Some of the first concrete evidence on that journey is presented here.

The remainder of this article is organized as follows. The next chapter introduces the theoretical background on default and social norm interventions as well as the role of context in behavioral decision theory. Based on this, a set of hypotheses is developed. Then, three studies are presented which test the hypothesized context-dependent effects of defaults and social references in charitable giving choice tasks. This is followed by the development of a logistic regression model leaning on the data from the context manipulation studies. The general discussion summarizes the key findings, implications for research and practice, and introduces avenues for future research.

Theoretical Background

Choice Architecture

Choice architecture research discusses how choice presentation influences consumers' decision-making processes, and thus their ultimate choices (Johnson et al., 2012). The term was coined by Thaler and Sunstein in 2008, who suggest that choice architectures can be manipulated to predictably alter decision outcomes without imposing bans or offering economic incentives. Choice architecture tools include the provision of social reference points, the structuring of alternatives in a choice set, or the proactive and salient disclosure of information pertaining to a decision (Dolan et al., 2012; Münscher et al., 2016; Sunstein, 2014). Notably, while Thaler and Sunstein's seminal work helped consolidate previously divergent research streams by introducing a common terminology, consumer researchers have discussed mechanisms which fit the definition of a choice architecture intervention for more than half a century. One early effort demonstrated that merely providing price-per-unit information for comparable products in close proximity to the respective product selection significantly increased the likelihood that the relatively cheaper options were chosen (Russo, Krieser, & Miyashita, 1975). Later, it was shown that altering organ donation policy so that by

default, citizens were considered organ donors unless they had actively opted out drastically increased donor rates (Johnson & Goldstein, 2003).

Choice architecture interventions are attractive to policy-makers and organizations desiring to influence consumer behavior due to their low development and implementation cost as well as their mostly successful track record (Jachimowicz et al., 2019; Szaszi et al., 2018). At the same time, the conceptual state of choice architecture-based interventions research has been questioned. One particular concern motivated the present research. While the amount of potential influences on consumer choice is increasing (Johnson, 2013), context plays a negligible role in interventions research. As stated before, this hinders the development of frameworks which account for varying decision-making contexts (Münscher et al., 2016). Accordingly, many empirical findings cannot be replicated beyond the specific setting in which they were generated. This is intriguing as choice theories have for a long time emphasized context-dependency of decision processes, and in that vein discussed context attributes such as time (Simon, 1956), decision effort (Johnson & Payne, 1985), or the amount of alternatives in a choice set (Dhar et al., 2000).

The following paragraphs introduce the foundational hypotheses on the effects of default settings and social norms in a donation setting. Thereafter, hypotheses on how these effects are affected by alterations of the choice context will be introduced.

Defaults

A default setting, which is a pre-selected choice that comes into effect whenever no other active choice is being made, increases the likelihood of that option being chosen (Johnson & Goldstein, 2003; Johnson et al., 2012). A review of empirical choice architecture articles published between 2008 and 2016 found that defaults were by far the most tested choice architecture intervention (Szaszi et al., 2018).

Common explanations as to how and why such choice architecture tools work suggest that in many situations, consumers want to reduce the cognitive load associated with making decisions. To construct preferences, they often rely on heuristic-based rather than normatively rational decision routines (Bettman et al., 1998; Gigerenzer & Brighton, 2009; Kahneman, 2011; Münscher et al., 2016). Like other choice architectural cues, defaults can predictably trigger the selection of a heuristic decision-making routine (Johnson & Goldstein, 2003). For instance, consumers may see a choice

default as an implicit recommendation, assuming that the choice architect has a valid reason for pre-selecting this option (McKenzie, Liersch, & Finkelstein, 2006). An alternative, but related explanation is that defaults cater to consumers' status quo bias and result in decision inertia. This suggests that the default will be selected by people who prefer that option as well as those choosing not to choose (G. Suri, Sheppes, Schwartz, & Gross, 2013). Third, it has been proposed that default effects can be partially explained by the effort required to move away from a pre-selected choice – however, default effects have also been observed where changing did not require more effort than keeping the default option (Johnson & Goldstein, 2003). Finally, setting a default option usually leads to higher salience of that option, which by being declared the standard becomes the logical and visual “odd one out” in an otherwise homogeneous choice set (Dhar et al., 2000). More salient options are more likely to attract attention, thus increasing the likelihood of those options being chosen (Dolan et al., 2012; Milosavljevic, Navalpakkam, Koch, & Rangel, 2012).

Beyond the previously mentioned areas, the effectiveness of default settings has been established in fields like healthy nutrition and other health-related settings (van Kleef, Seijdel, Vingerhoeds, de Wijk, & van Trijp, 2018; Venema, Kroese, & De Ridder, 2018), retirement savings (Benartzi et al., 2017; Madrian & Shea, 2001) or purchasing behavior (Goldstein, Johnson, Herrmann, & Heitmann, 2008; Park, Jun, & MacInnis, 2000), to name but a few. What is more, there is initial evidence that default settings are effective at increasing donation amounts toward a specific cause (Everett, Caviola, Kahane, Savulescu, & Faber, 2015). Nevertheless, as introduced before, default effect sizes vary with the substantial area, specific task content, and environmental factors (Goswami & Urminsky, 2016; Jachimowicz et al., 2019). It is therefore necessary to initially establish the baseline effectiveness of default settings in our study setting.

H₁: Specifying a default option in a donation choice task increases the likelihood of that option being chosen.

Social Norms

Consumers use information about the behavior of a peer group (e.g., neighbors) as reference points for their own behavior (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). When social norms are embedded within a choice architecture,

consumers will often consider and gravitate toward that benchmark (Cialdini & Goldstein, 2004; van Bavel et al., 2020). Appeals to social norms are widely applied by businesses and policymakers alike. They have been empirically tested in fields such as water or energy consumption, where informing people about their usage in comparison to a peer group results in alterations of consumption patterns which more closely approximate the norm (Allcott & Rogers, 2014; Bernedo, Ferraro, & Price, 2014). Notably, the gravitation toward the middle can be observed for those performing worse than the benchmark, as well as those performing better – with the latter leading to a decline in performance. This potential backfiring can become an issue if it cannot be ensured that only those performing below average are targeted by the social cue (Schultz et al., 2007).

Recently, social norms have received much attention as a potentially strong lever in combatting the Covid-19 pandemic (van Bavel et al., 2020). Prior research suggests that social cues are also effective in donation settings, where the provision of social information increases the average amount donated to a focal cause (e.g., Shang & Croson, 2009). It is expected that this effect will also be observed for choices from a set of several charitable organizations, where the option endorsed by the social norm has a higher likelihood of being chosen.

H₂: Indicating that most other participants have chosen a specific option in a donation choice task, thus implying a social norm, increases the likelihood of that option being chosen.

Choice Theories and Context

Much of modern behavioral decision research leans on Simon's paradigm of bounded rationality: As humans command a limited set of resources (including competencies), they often use efficient choice strategies or heuristics rather than normatively rational decision routines (Simon, 1955; Weber & Johnson, 2009). A stream within behavioral decision theory proposes that consumers adaptively select cognitive strategies that improve the decision efficiency in a given setting, subject to available resources. The selection of these strategies depends on a variety of context factors (Payne et al., 1988; Payne, Bettman, & Johnson, 1993).

The notion of adaptive strategy selection is only plausible when acknowledging that consumers do not always have fixed or well-defined preferences. Rather,

preferences are often constructed during judgment and decision-making processes (Bettman et al., 1998; Zwebner & Schrift, 2020). Beyond task-inherent traits and the choice architecture, the preference construction process is influenced by prior experiences, cues of the external environment, and personal characteristics of the decision-maker (Bettman & Park, 1980; Payne et al., 1988). As the ultimate choice outcome is affected by these contextual characteristics, they are of interest to choice architects. This conclusion echoes the common call of choice theorists to put a larger emphasis on the role of context in the modelling of choice processes as well as intervention design (Arkes, 2013; Jachimowicz et al., 2019). For example, regarding the prediction of choice outcomes, it has been stated that “even the simple goal of prediction requires the incorporation of context” (Johnson, 2013).

Notably, although choice architecture and choice contexts are often used synonymously, an important distinction needs to be made. The term choice architecture implies that some task characteristics can be controlled. However, choice outcomes not only vary with task design, but also depend on previous experiences, on (conflicting) goals, or on attitudes and beliefs (Weber & Johnson, 2009). In any interaction with consumers, these aspects can only be affected to a limited extent, if at all. In the present work, every aspect of the decision environment that can be immediately altered by choice designers is called choice architecture, all other potential influences are collectively denoted as context. Among the context attributes that are challenging, albeit not impossible, to control are consumers’ psychological states when they face a choice task (Steyer, Schmitt, & Michael, 1999). We will explore two such states in the present research: Perceived decision importance and perceived time pressure. Fostering understanding on how these contexts interact with choice architecture effects is a worthwhile endeavor: If a contextual aspect impacts the effect of choice architecture on decision outcomes, this should be considered in choice architecture design. For instance, even when psychological states cannot be manipulated by choice architects, they might be anticipated and should inform intervention design.

Importance-Dependent Effectiveness of Choice Architecture Interventions

In a recent article, Jachimowicz and colleagues (2019) present a meta-analysis of empirical studies on default effectiveness. They find that even in seemingly comparable settings, effect sizes of default nudges vary. This may be the consequence of contextual changes, which are neither exhaustively reported by, nor necessarily

apparent to, those conducting the research (Hummel & Maedche, 2019; Meder, Fleischhut, & Osman, 2018). In that vein, they propose that the impact of perceived decision importance on default effectiveness warrants further inquiry (Jachimowicz et al., 2019). The present research addresses this gap. What is more, similar claims have been made on the context-dependency of other choice architecture interventions, including social norms (Dolan et al., 2012; Münscher et al., 2016; Szaszi et al., 2018). Accordingly, the effect of decision importance on social norm effectiveness is also tested.

Within the present study, decision importance is conceived as a dynamic, context-dependent psychological state (Steyer et al., 1999) which reflects consumers' perceived relevance of the substantive area of a choice, as well as the anticipated impact of the choice itself. For example, consumers will perceive a donation decision as important when they believe that the cause it supports is meaningful and that their donation actually helps the organization. As such, perceived decision importance is closely related to the concept of self-relevance, which suggests that consumers are more likely to have stronger psychological and motivational ties to brands that are closely related to their self-concept (Bhattacharya & Sen, 2003; Houston & Walker, 1996). This can result in higher engagement and more intense interactions with that brand (Park, Eisingerich, & Park, 2013). Albeit in a much more narrow scope, transferring the concept of self-relevance to single choices implies that consumers' engagement with a choice task depends on how important that decision is perceived by those making the choice (Jin, Ji, & Peng, 2019).

Perceived decision importance is expected to be negatively correlated to intervention effectiveness for two reasons. First, people are likely to deem a choice as more important when they have thought about the issue and formulated according preferences (Jachimowicz et al., 2019). Previously established preferences will however guide choice to a large extent and thereby reduce the impact of environmental alterations (Bettman et al., 1998). Second, consumers who perceive a decision as more important are more likely to be willing to exert more cognitive effort to make a choice (Crano & Prislin, 2006; Houston & Walker, 1996). Some of the effectiveness of choice architecture interventions is explained by the fact that people leverage them in pursuit of the goal to minimize choice effort (Dhar et al., 2000; Goswami & Urmitsky, 2016). If, however, consumers care about the subject matter of a choice, the goal of maximizing

the choice outcome is expected to gain importance. This will reduce the likelihood that heuristic decision strategies are triggered, and accordingly the likelihood that interventions have an impact on consumer choice.

H_{3a, b}: An increase in consumers' perceived decision importance in a donation choice task (a) decreases the effectiveness of a default intervention and (b) decreases the effectiveness of a social norm intervention.

Time-Dependent Effectiveness of Choice Architecture Interventions

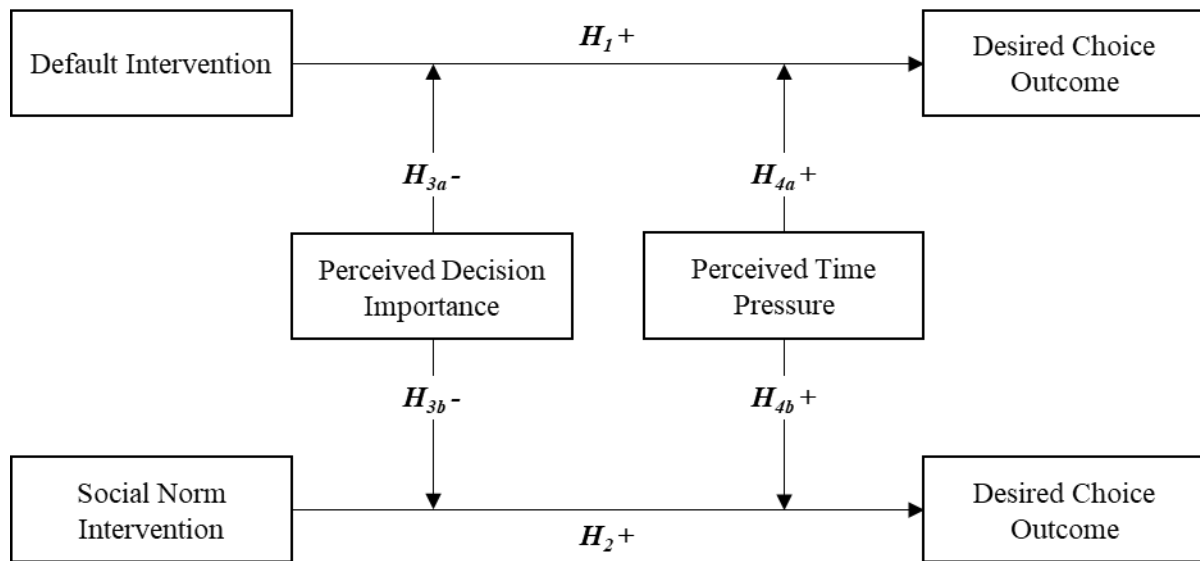
When facing a choice, consumers' time is often limited (Simon, 1956). Such time constraints influence the selection of decision strategies, making the utilization of heuristic routines more likely (Lieder & Griffiths, 2017; Payne et al., 1988). To understand decision efficiency considerations when time is constricted, behavioral decision theory offers the following explanation. Choice processes can be deconstructed into constituent elements like reading, comparing, choosing and more. These "elementary information processes" serve as a measure for the overall effort associated with a choice process, as well as a proxy for the overall time requirement (Johnson & Payne, 1985; Payne et al., 1993). When time is limited, people tend to select decision strategies with the least elementary information processes involved: Time pressure promotes adaptive decision behaviors resulting in higher decision speeds (Maule, Hockey, & Bdzola, 2000). Both defaults and social norms provide opportunities for mental shortcuts that would reduce the amount of elementary information processes required to reach a satisfactory choice. Under time constraints, some will consider the social information or default as a sufficient cue to make their decision. As a consequence, they may not read the other choice options, or avoid a thorough comparison of attributes (Oh et al., 2016). Therefore, it is expected that time pressure will increase the effectiveness of these choice architecture interventions.

Comparable to decision importance, perceived time pressure is conceived and measured as a psychological state. Maule, Hockey, and Bdzola (2000) argue that time pressure is not a mere limitation of a resource, but implies the alteration of an affective state. It stands to reason that only those who feel that their time is constrained are likely to trigger heuristic decision routines in response (R. Suri & Monroe, 2003). Therefore, rather than actual limitations of time available for a choice, the construct measures consumers' perception of how pressured they felt.

$H_{4a, b}$: *An increase in consumers' perceived time pressure during a donation choice task (a) increases the effectiveness of a default intervention and (b) increases the effectiveness of a social norm intervention.*

Figure 2 summarizes all hypotheses in a conceptual model, which reflects that the effects of default and social norm interventions on choice outcomes are expected to be moderated by both decision importance and time pressure as perceived by consumers.

Figure 2: Conceptual Model and Hypotheses Overview

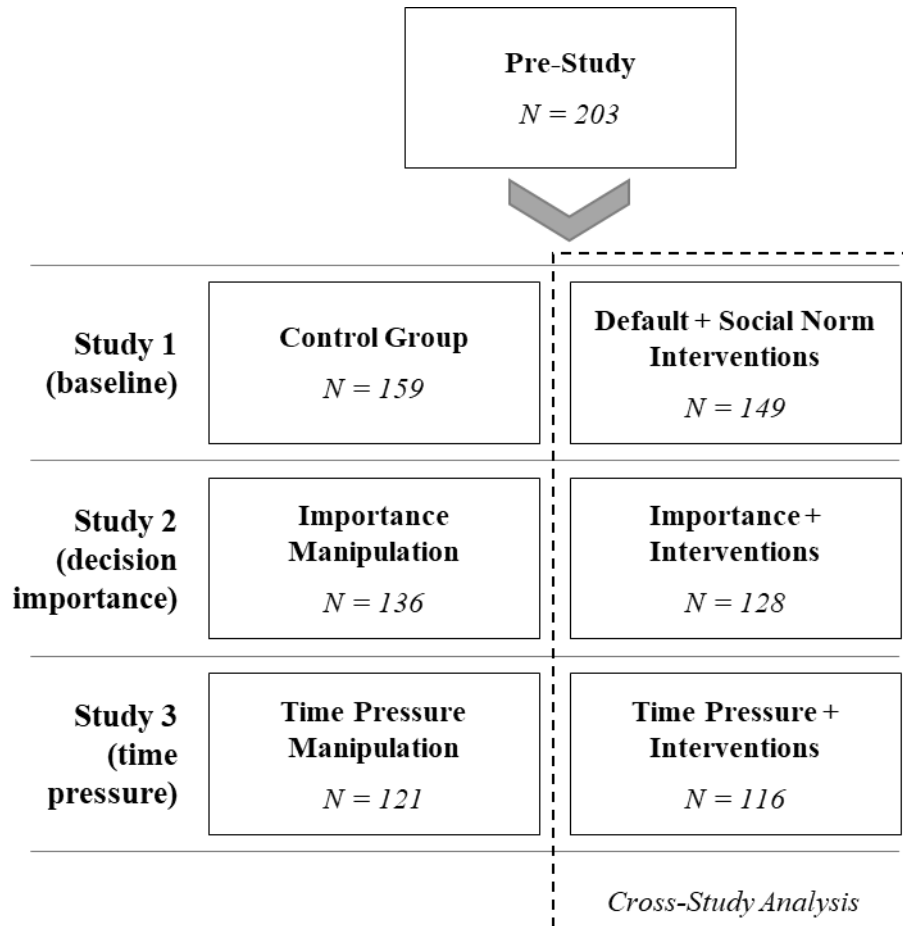


Method

A pre-study and three online experiments were conducted to test the context-dependent effectiveness of default and social cue interventions. In all studies, participants recruited from an online panel were asked to make two choices. Both tasks asked them to choose a charitable organization to donate to, out of a given list of three organizations. Participants were randomly assigned to a control or an intervention treatment condition. In the control condition, participants could select from the randomized list of charities without any deliberate guidance. Participants in the treatment condition were subject to a default and a social cue intervention, both of which aimed at increasing the likelihood of a specific choice being made. Whereas the first study was conducted to assess the interventions' effect sizes without a deliberate manipulation of contextual conditions, study 2 manipulated participants' perceived

decision importance and study 3 manipulated their perceived time pressure. An overview of all studies is provided in Figure 3.

Figure 3: Overview of Studies and Treatment Groups



The pre-study was conducted for all groups that were not subject to both the intervention and the context manipulation (i.e., no context / no intervention; no context / interventions; time pressure / no intervention; decision importance / no intervention).

Pre-Study

The pre-study set out to test whether both the interventions and context manipulations achieved the desired results. As effect sizes for nudge interventions can vary substantially (Franklin, Folke, & Ruggeri, 2019; Jachimowicz et al., 2019; Schultz et al., 2007), pre-testing was required to assess whether their anticipated effect could be large enough to detect potential influences of context attributes on that effect. Similarly, pre-testing the context manipulations was deemed necessary. To our knowledge, there are no published choice architecture experiments which have manipulated perceived

time pressure or perceived decision importance. Generating initial findings as to their effectiveness allows for the potential adjustment of manipulations and measures before the main studies. Furthermore, the pre-study tested the decision importance and the time pressure scales, which were transferred from extant research to the present context (time pressure: Dhar et al., 2000; Maule et al., 2000, decision importance: Akpınar et al., 2018; Houston & Walker, 1996). What is more, two studies (2 and 3) manipulate and measure psychological states and were therefore vulnerable to common method bias (Curran, 2016). Among several other methodological approaches, conducting pre-studies has been recommended as a pre-emptive remedy to this potential issue (Krosnick, 1999; Podsakoff, MacKenzie, & Podsakoff, 2012).

Study Setup

For all studies, we developed a set of survey forms and recruited respondents from an online survey panel who were based in the USA and paid for their participation. A between-subjects randomized experimental design was employed. After a short introduction, participants were consecutively presented with two unrelated sets of organizations committed to combatting hunger (choice 1) and cancer (choice 2). Organizations' names on the list were accompanied with a short text describing what the donation would supposedly contribute to, e.g., "Feeding America – Your donation will provide 50 meals for American families in need". In both tasks, respondents could freely choose one out of three organizations they wanted to donate to. Afterwards, they answered questions that contributed to a perceived time pressure scale as well as a decision importance scale. Organization choice options as well as answer items on the decision importance and the time pressure scale were randomized. Finally, participants answered demographic questions (gender, age, education, occupation, US residency, political preference), which was followed by a short debriefing.

To test the respective effectiveness of psychological context manipulations as well as default and social norms interventions, participants were randomly assigned to one of four groups: 1) control, 2) interventions without context manipulation, 3) decision importance manipulation, 4) time pressure manipulation. The treatments are described in more detail in Methodological Details Appendix 1. None of the pre-study groups was subjected to both interventions and context manipulations.

Results

203 participants ($M_{\text{age}} = 36.9$, $SD = 9.75$, female = 38.9%) completed the survey and were considered in the analysis. Participants were approximately evenly distributed across treatment groups ($N_{\text{control}} = 50$, $N_{\text{interventions}} = 50$, $N_{\text{importance}} = 50$, $N_{\text{time}} = 53$).

Intervention Effectiveness. It was first analyzed whether the choice architecture interventions were successful. To that end, the frequencies with which the target choices of task 1 and task 2 were selected in the control and in the intervention group were compared. In the first task, 20% of the participants in the control group chose the target option, whereas 34% of the participants who saw it as the default option did. While this directionally indicates a potential effect of the default intervention, a chi-squared test revealed that this effect was not significant [$\chi^2(2, N = 100) = 2.828$, $p = .243$]. The same analysis was conducted for task 2. 42% of the participants in the treatment group followed the social cue and selected the target option, versus 26% of the participants in the control group. The effect of the social cue intervention was as directionally predicted and significant [$\chi^2(2, N = 100) = 6.789$, $p = .034$].

Decision Importance. We computed the perceived decision importance scale for all participants that were either in the control or the decision importance group ($N = 100$). A good internal consistency was detected ($\alpha = .825$) (Bagozzi & Yi, 1988; Peterson, 1994). Comparing the scale means of the two groups revealed that participants in the decision importance group did consider the task more important, albeit not by a large margin ($M_{\text{control}} = 3.96$, $SD = .716$, $N = 50$; $M_{\text{importance}} = 4.26$, $SD = .644$, $N = 50$). A one-way ANOVA confirmed that this difference was significant at a 95% confidence level [$F(1, 98) = 4.85$, $p = .030$].

Time Pressure. We computed the perceived time pressure scale for all participants that were in the control or the time pressure group ($N = 103$). A satisfactory internal consistency was detected ($\alpha = .799$). Comparing the scale means of the two groups revealed that participants in the timed group felt moderately higher time pressure ($M_{\text{control}} = 2.21$, $SD = .761$, $N = 50$; $M_{\text{time}} = 2.89$, $SD = 1.05$, $N = 53$). A one-way ANOVA confirmed that this difference was significant [$F(1, 101) = 13.80$, $p < .001$].

Discussion

The pre-study detected relatively small effects of the choice architecture interventions, which was addressed in the design of the following studies. Mainly, these

changes were related to how the choices and interventions were presented. Furthermore, minor inconsistencies in the task presentation were remedied. What is more, the marginal decision importance treatment effect size was considered problematic. As the mean decision importance rating in the control group was unexpectedly high, completely new donation choice settings which were expected to appear substantially less important to participants were created for the control groups in subsequent studies. Last, there were indications that a high proportion of respondents were satisficing or clicked randomly. The pre-study allowed thus the definition of low-quality criteria for exclusion of response sets in the main studies (Curran, 2016). For instance, several respondents rated all items on the time pressure scale as “absolutely agree”, even though they were reverse coded. To be able to detect inattention better, we included an attention check in subsequent studies which was placed after the measurement of the context constructs. (Oppenheimer, Meyvis, & Davidenko, 2009). Additionally, we included a reverse coded item on the decision importance scale. The Methodological Details Appendix 2 describes the quality check procedure in more detail.

Study 1: Baseline Effects of Interventions in Donation Choices

An online experiment was conducted to determine the baseline effectiveness of the default and the social cue interventions without any deliberate manipulation of context.

Method

Participants were randomly assigned to either the control group (no interventions) or the interventions treatment. After a short introduction, respondents were presented with two tasks in which they had to choose one organization each to donate to. The task descriptions, which were altered after the pre-study, were expected to appeal substantially less to participants’ self-relevance: (1) The description emphasized that the decision was purely hypothetical and had no real life consequences, (2) these hypothetical organizations were based in Switzerland, presumably reducing personal relevance for U.S. residents, (3) the choices addressed a Swiss roadbuilding project and flower protection initiatives, and (4) it was emphasized that the merits of these projects were debated. Participants in the control group were not deliberately nudged toward any organization. In the choice architecture treatment, a default option was implemented in the first choice task and a social cue in the second choice task. An

overview of the choice screens in the different treatment groups across studies is presented in Appendices 1 to 3. After choosing organizations to donate to, participants in all main studies answered randomized items (5-point Likert scales, 1: do not agree at all, 5: absolutely agree) which contributed to the perceived time pressure and perceived decision importance scales. The questions contributing to the measured constructs, along with item and scale statistics, are shown in Table 1. The questionnaire ended with a set of demographic questions and a short debriefing.

Table 1: Overview of Scales for Construct Measurement

Scale and Items	Factor Loading	α	CR	AVE
<i>All Studies (n = 809): Time Pressure Scale</i>				
		.91	.91	.66
When selecting the organizations, I felt anxious.	0.748			
I was relaxed when I made my decisions. [R]	0.785			
I would have liked more time to make my decisions.	0.828			
I had sufficient time to think about the issue. [R]	0.802			
When making the decisions, I felt rushed.	0.905			
<i>All Studies (n = 809): Decision Importance Scale</i>				
		.85	.85	.48
Choosing organizations to donate to mattered to me.	0.752			
I believe that my decisions matter.	0.752			
I believe [<i>the presented causes</i>] are two of the most important issues of our times.	0.675			
The topics are important.	0.709			
The topics have a high personal relevance for me.	0.677			
The presented choices do not matter to me. [R]	0.581			

[R] = reverse coded item

Results

A total of 308 respondents ($M_{\text{age}} = 39.1$, $SD = 11.95$, 44.8% female) completed the survey and passed the quality checks. About half of the participants each were assigned to the control and the choice architecture conditions ($N_{\text{control}} = 159$, $N_{\text{interventions}} = 149$). Figure 4 shows the proportion of participants choosing the target

option in choice task 1 and 2 with and without choice architecture intervention. In the first choice task, the proportion of participants choosing the target option was higher when a default setting was present (54.3% vs. 40.3% in the control condition). A chi-squared test confirmed that this likelihood ratio change was significant [$\chi^2(1, N = 308) = 5.581, p = .018$]. In the second choice task, the proportion of participants choosing the target option was higher when a social cue was present (35.8% vs. 21.4%). This change, too, was significant [$\chi^2(1, N = 308) = 7.638, p = .006$]. The mean score for the 5-item time pressure scale ($M = 1.87, \alpha = .845$) indicated that participants did not feel rushed. For decision importance, respondents on average indicated that they considered the decision somewhat important ($M = 3.51, \alpha = .793$). Figure 5 depicts the average rating of perceived time pressure and perceived decision importance for the control and the context treatment studies.

Figure 4: Effects of Choice Architecture Interventions on Choice Outcome

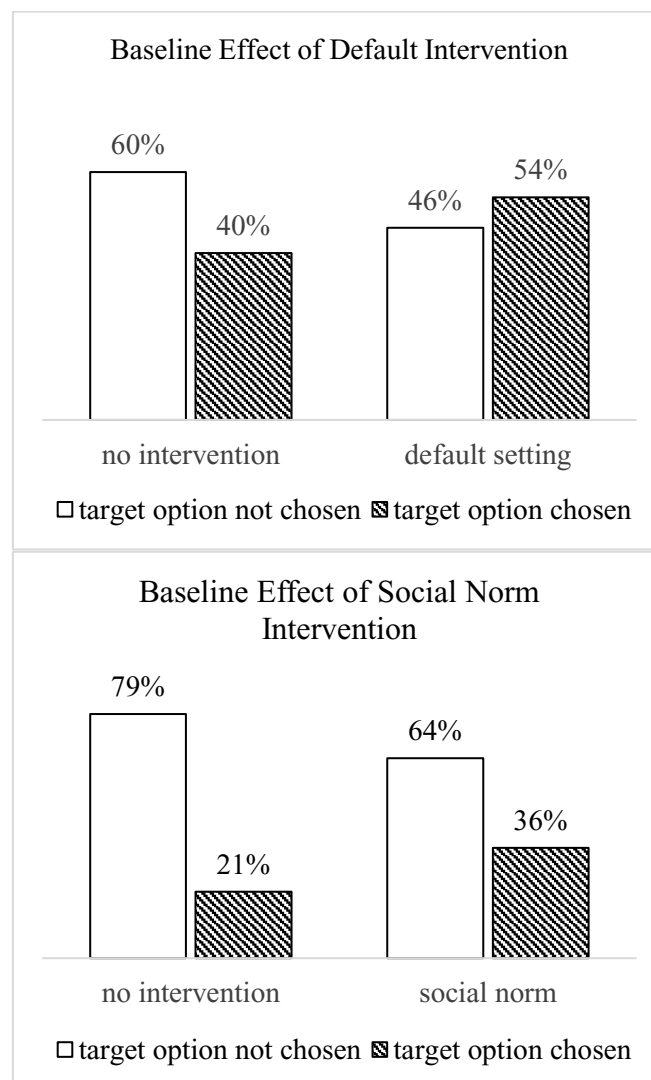
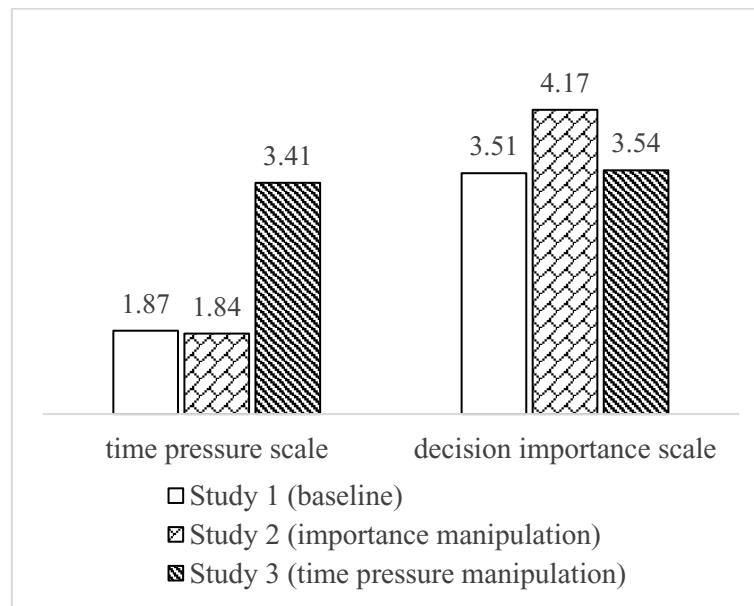


Figure 5: Effects of Importance and Time Manipulation per Group

Discussion

Study 1 set out to confirm previous studies' findings regarding the effects of default and social norm interventions on choice outcomes in the present setting as well as establish a baseline effect size of the tested interventions. The results demonstrate that a default setting increases the likelihood of an organization being chosen in a donation choice experiment, as does providing a social reference point to participants. H_1 and H_2 are thus supported.

Study 2: Decision Importance as an Intervention Context

Method

Participants were randomly assigned to either the control group (no interventions) or the interventions treatment. The general setup was the same as in study 1, however, the following decision importance manipulation was implemented: The introductory text as well as the choice descriptions were adapted from the pre-study, in which participants had on average reported high perceived importance levels. These texts stressed the importance of the present research and the discussed causes, while focusing less on the hypothetical nature of the questions. Participants were asked to select one organization to donate to from a set of charities committed to fighting global hunger, as well as one addressing the ongoing Covid-19 pandemic [Appendix 2]. They

then answered the same scale items, IMC question, and demographics as participants in the other studies.

Results and Discussion

A total of 264 respondents ($M_{\text{age}} = 40.6$, $SD = 13.23$, 57.2% female) completed the survey and passed the quality checks. About half of the participants each were assigned to the control and the choice architecture conditions ($N_{\text{control}} = 136$, $N_{\text{interventions}} = 128$).

Decision Importance Manipulation. ANOVA analyses compared the mean scores of the time pressure scale ($\alpha = .822$) and the decision importance scale ($\alpha = .842$) with the means obtained in the first study, which did not deliberately manipulate the context. As expected, the mean score on the time pressure scale was similar to the ones obtained in the baseline study ($M_{\text{TP importance study}} = 1.84$ vs. $M_{\text{TP baseline study}} = 1.87$, $p > .05$). The mean score on the decision importance scale was significantly higher ($M_{\text{DI importance study}} = 4.17$ vs. $M_{\text{DI baseline study}} = 3.51$, $p < .001$), confirming that the desired manipulation of perceived decision importance was successful.

Chi-Squared Tests. In the first choice task, the proportion of participants choosing the target option was higher when the default setting was present (57.0% vs. 51.1% in the control condition). However, this effect size, i.e., the increase in participants who chose the target option, was lower than in the baseline study (5.9% vs. 14.0%). Furthermore, a chi-squared test revealed that the likelihood ratio change was not significant [$\chi^2(1, N = 264) = .821$, $p > .05$]. The same holds true for the social cue treatment in choice 2. With 34.4% of the people choosing the target option, the effect size of the intervention was only 3.5% (vs. 14.4% in study 1). This increase in the target option being chosen was insignificant [$\chi^2(1, N = 264) = .366$, $p > .05$]. The diminishing effect size and significance observed in both instances indicates an effect of perceived decision importance in the direction suggested by $H_{3a,b}$.

Logistic Regression. We conducted binary logistic regressions to test whether decision importance influenced choice architecture effectiveness. The dependent variable was whether participants chose the target option intended by the default or social norm intervention (yes = 1 or no = 2). Beyond the decision importance rating as the independent variable, we also tested gender and age as potentially relevant covariates. With age included into the model, we detected a marginal main effect of

decision importance on default effectiveness. However, unlike hypothesized in H_{3a}, this effect was positive: Higher decision importance increased the likelihood of a successful default intervention ($B = .187$, $\chi^2(2) = 5.944$, $p = 0.051$). For the second choice task, with age included into the model, we detected a marginal main effect of decision importance on the effectiveness of the social cue. Again, unlike hypothesized in H_{3b}, that effect was positive ($B = .297$, $\chi^2(2) = 5.362$, $p = .068$). Albeit not significant, these results indicate that the more important a decision seemed to participants, the more likely they were to follow the choice architecture interventions. We further test the validity of these results in the cross-study analysis section. Before doing so, the following section introduces the findings of the time pressure study.

Study 3: Time Pressure as an Intervention Context

Method

Participants were randomly assigned to either the control group (no interventions) or the interventions treatment. The general setup as well as the organizations to donate to were the same as in study 1 (roadbuilding and flower protection in Switzerland). As the time pressure manipulation, participants were informed that they would only have 25 seconds per choice, and that it was essential that they finished in time. During each choice task, they saw a large red timer ticking down from 25 seconds to zero [Appendix 3]. Respondents could make their selection and proceed with the questionnaire even if the timer reached zero. After making their choices, they answered the same scale items, IMC question, and demographics as participants in the other studies.

Results and Discussion

A total of 237 respondents ($M_{\text{age}} = 38.6$, $SD = 12.86$, 48.5% female) completed the survey and passed the quality checks. About half of the participants each were assigned to the control and the choice architecture conditions ($N_{\text{control}} = 121$, $N_{\text{interventions}} = 116$).

Time Pressure Manipulation. ANOVA analyses compared the mean scores of the time pressure scale ($\alpha = .875$) and the decision importance scale ($\alpha = .845$) with the means obtained in the first study. As expected, the mean score on the decision importance scale was similar to the ones obtained in study 1 ($M_{\text{DI time study}} = 3.54$ vs. $M_{\text{DI baseline study}} = 3.51$, $p > .05$). The mean score on the time pressure scale was significantly

higher ($M_{TP \text{ time study}} = 3.41$ vs. $M_{TP \text{ baseline study}} = 1.87$, $p < .001$), confirming that the desired manipulation of perceived time pressure was successful.

Chi-Squared Tests. In the first task, the proportion of participants choosing the target option was higher when the default setting was present (44.8% vs. 40.5% in the control condition). However, this default effect size was lower than the one observed in the baseline study (4.3% vs. 13.1%). Additionally, a chi-squared test revealed that this likelihood ratio change was not significant [$\chi^2(1, N = 237) = .454$, $p > .05$]. This indicates a negative impact of time pressure on the effectiveness of default interventions, and thus an effect opposite to the one suggested in H_{4a} . Similarly, the effect size of the social norm intervention in a time pressure context was slightly smaller than without time pressure (11.8% vs. 14.4%), as insignificantly more people (45.7% vs. 33.9%) chose the target option [$\chi^2(1, N = 237) = 3.449$, $p > .05$].

Logistic Regressions. Analogous to study 2, logistic regressions were conducted with gender and age as potential covariates. With age included into the model, we detected a significant main effect of time pressure on default effectiveness. However, unlike hypothesized in H_{4a} , this effect was negative ($B = -.212$, $\chi^2(2) = 7.959$, $p = 0.019$). This suggests that the more time pressure participants felt, the less likely they were to follow the default intervention. For the second choice task, with age included into the model, we detected a significant main effect of time pressure on social norm effectiveness. In this case, the direction of the effect was positive as hypothesized in H_{4b} ($B = .248$, $\chi^2(2) = 9.480$, $p = 0.009$). This confirms that the more time pressure participants felt, the more likely they were to follow the social norm.

Modelling the Impact of Contextual Changes on Choice Architecture

To test whether the effects observed in studies 2 and 3 were consistent across studies, binary logistic regression modelling was conducted using data from all three studies. The analysis tested the effects of time pressure, decision importance, and their interaction term as independent variables on intervention success (i.e., chose as desired by the intervention yes (1) or no (0)) as the independent variable. The analysis was conducted for both choice 1 (default) and choice 2 (social norm), age and gender were considered as potentially relevant covariates.

Regression Model: Default

Significant main effects of both decision importance ($B = .040$, $\chi^2(2) = 6.542$, $p = .038$) and time pressure ($B = -.218$, $\chi^2(2) = 12.114$, $p = 0.002$) on default effectiveness were detected. These findings further confirm the effects observed in Study 2 and 3. Furthermore, there was a significant interaction effect of decision importance and time pressure on default effectiveness ($B = -.057$, $\chi^2(2) = 12.054$, $p = 0.002$). All models included age as a significant covariate, whereas gender consistently did not alter the model results.

Regression Model: Social Norm

A significant positive main effect of time pressure on the success of social norms was detected ($B = .281$, $\chi^2(2) = 10.984$, $p = .002$), but no significant effect of perceived importance ($p > .1$). There was a significant interaction effect of decision importance and time pressure on social norm effectiveness ($B = .072$, $\chi^2(2) = 10.647$, $p = 0.005$). Both significant models included age as a covariate, whereas gender consistently did not alter the model results.

Discussion

The logistic modelling largely confirmed the findings of studies 2 and 3. An overview of all hypotheses and the respective empirical results is presented in Table 2. Only one of 4 context hypotheses is confirmed. Nevertheless, in all but one constellation, context significantly alters the effect of choice architecture interventions. The highest predictive accuracy can be achieved when including the interaction term of both context conditions into the model. This shows that different contexts influence decision outcomes and that they, in turn, are also influenced by other context attributes.

Table 2: Overview of Hypotheses, Observed Effects, and Overall Results

#	Hypothesis	Study	Impact on target choice (H_1 , H_2) or on intervention effectiveness			Result
			Anticipated	Observed: Individual Studies	Observed: Cross-Study Analysis	
H_1	Specifying a default option in a donation choice task increases the likelihood of that option being chosen.	1			---	confirmed
H_2	Indicating that most other participants have chosen a specific option in a donation choice task, thus implying a social norm, increases the likelihood of that option being chosen.	1			---	confirmed
H_{3a}	An increase in consumers' perceived decision importance in a donation choice task decreases the effectiveness of a default intervention.	2				rejected: opposite effect
H_{3b}	An increase in consumers' perceived decision importance in a donation choice task decreases the effectiveness of a social norm intervention.	2				rejected: inconclusive
H_{4a}	An increase in consumers' perceived time pressure during a donation choice task increases the effectiveness of a default intervention.	3				rejected: opposite effect
H_{4b}	An increase in consumers' perceived time pressure during a donation choice task increases the effectiveness of a social norm intervention.	3				confirmed

General Discussion

The present research confirms the theorizing of various authors that even within the same choice task, choice architecture interventions are sensitive to alterations of contextual attributes (Jachimowicz et al., 2019; Münscher et al., 2016; Szaszi et al., 2018). Study 1 reaffirms the effectiveness of default settings and a social norm intervention, which has been observed in various other settings, on donation choices. Study 2 presents marginal evidence that a higher perceived decision importance increases both interventions' likelihood of success. Study 3 shows that perceived time pressure reduces the effectiveness of default interventions but increases the effectiveness of social norm interventions. The cross-study logistic regression modelling solidifies these findings, with the exception of the effect of importance on social norm interventions. What is more, the logistic model demonstrates that the interaction of the two contextual attributes time pressure and decision importance has a significant effect on the choice outcome.

While the studies present compelling evidence as to the existence of contextual influences, it also becomes apparent that even with robust theorizing, these effects are challenging to predict. This is evidenced by only one out of four hypotheses being validated. Embracing such uncertainties and gradually reconciling theory and empirical evidence is likely to reinvigorate choice architecture research with high practical relevance. In fact, our observations give rise to further theorizing and warrant further empirical assessment. The next section shortly discusses potential explanations for our surprising empirical findings. Thereafter, a research agenda and implications of the present research will be discussed.

Key Findings

Study 1 established the baseline effectiveness of default settings and social references in the present donation choice tasks, thus confirming H_1 and H_2 . Beyond that, one hypothesis regarding the impact of context on intervention effectiveness was confirmed: Increased time pressure increases the effectiveness of social norm interventions (H_{4b}). Interestingly, this effect cannot be observed in the case of default interventions (H_{4a}). What is more, somewhat counter-intuitively, increased perceived decision importance does not diminish the effectiveness of either intervention (H_{3a} and H_{3b}), but further enhances it. For each unexpected finding, possible explanations are

fathomable. Notably, the ex-post theorizing presented in the following paragraphs is speculative but does provide meaningful avenues for further empirical assessment.

Time Pressure and Choice Architecture Effectiveness

The theoretical background section introduced the notion that when time is restricted, people tend to choose decision strategies which require less processing effort (Johnson & Payne, 1985; Payne et al., 1993). It was argued that including social norms and a default setting presents to consumers the opportunity to include salient choice architecture elements into their heuristic decision-making. In light of perceived time constraints, these cues are more likely to trigger heuristic decision-making strategies which reduce choice effort, for instance by taking the most salient option (Milosavljevic et al., 2012). However, there is evidence that individual choice architecture interventions can trigger several psychological processes which may offset each other. For instance, defaults can serve as reference points and trigger inertia (Goswami & Urminsky, 2016), but may also elicit additional contemplations of why the option is present: Is the choice architect benevolent? Why do they want me to click the default option? Only after such effortful considerations have been conducted, the other options can be evaluated. Relatedly, selecting another option can often require more effort than sticking with the default (Goswami & Urminsky, 2016; Johnson & Goldstein, 2003). In such situations, rather than being an indication for the best option in the choice set, the default leads to an increase in the required elementary information processes. The intervention would conflict with consumers' goal to conserve cognitive resources and be less effective. This differs from a social norm intervention in one notable way, potentially explaining the different impact on the effect size: As social reference points are a strong motivator for choices, the information that the majority of other respondents has answered in a certain way may be more believable and trust-inspiring than suggestion of a choice architect with specific, not necessarily benevolent, objectives in mind (Thaler, 2018).

These alternative explanations can be explored by including process tracing elements into experimental paradigms. For quite some time, it has been suggested that the observation of processes leading to choices can enrich our understanding of why those choices are being made (Johnson, Schulte-Mecklenbeck, & Willemsen, 2008). Examples for process tracing techniques which may provide helpful for understanding the context-dependent differences of decision-making processes include verbal

protocols, eye tracking, or the tracing of computer interaction via mouse movements (Schulte-Mecklenbeck, Kühberger, & Ranyard, 2011).

Decision Importance and Choice Architecture Effectiveness

Choice architecture interventions often appeal to heuristic processes which reduce cognitive effort. One key assumption underlying the hypotheses that perceived decision importance will reduce the likelihood of intervention success is that when a decision is important to them, individuals exert more cognitive effort to achieve an approximately optimal choice. While the experiment results are surprising given these considerations, they could be explained by other cognitive processes concealing the hypothesized effect. For instance, it has been suggested that consumers perceive default settings as a form of advice by the choice architect (McKenzie et al., 2006). In that vein, consumers may be more inclined to follow expert advice when a decision is important to them and they have few other cues to go by. If they do not care about the choice itself, they will also likely not care about this advice. Again, the validation or falsification of such explanations could be achieved by the tracking of process data during a choice experiment (Johnson et al., 2008).

Implications and Research Agenda

The present work advances choice architecture research by providing some of the first empirical evidence on the relevance of consumers' individual-level choice context. The findings presented here will help charitable organizations understand when and why appeals to charitable giving are likely to be successful and allow them to create choice architectures that lead to higher donation amounts. Furthermore, the presentation of the impact of perceived time pressure and decision importance on choice architecture effectiveness advances research in several meaningful ways. Most importantly, it demonstrates that psychological states are context factors which alter the effectiveness of defaults and social norm interventions. The present work is one of the first empirical efforts on psychological determinants of intervention effectiveness (see Ingendahl et al., 2020 for a notable exception). Nevertheless, it adds to a growing body of literature which acknowledges and seeks to elaborate the context-dependency of choice architecture (Hummel & Maedche, 2019; Meder et al., 2018; Szaszi et al., 2018). A strong motivator for such research is the recurring finding that intervention effectiveness situationally fluctuates, and that interventions can incur unintended

consequences (Dolan & Galizzi, 2015; Jachimowicz et al., 2019). Following the notion that consumers' preference construction and decision-making processes are context-dependent (Bettman et al., 1998), the possibility to predict intervention effectiveness remains limited as long as contextual attributes are neglected. Albeit inherently complex, context research allows the exploration of mechanisms situational merits and potential unintended consequences, thus reducing the influence of (bad) luck in choice architecture design.

The present studies contribute to a library of effects which consider three main dimensions: The intervention category (defaults and social norms), the substantial area (pro-social choice / donations), and individual context dimensions (perceived time pressure and decision importance). Ultimately, such efforts are required for the development of context-dependent choice architecture frameworks, which have been repeatedly called for in recent research (Grüne-Yanoff et al., 2018; Münscher et al., 2016; Szaszi et al., 2018). Choice architects need to know under what conditions intervention effectiveness within a certain range can be expected. To that end, a research program that consecutively assesses and catalogs context effects on choice architecture interventions will enhance practitioners' ability to select a situationally appropriate mechanism. The present research adds to this nascent research area and shows that decision importance strengthens the effect of default and, marginally, social norm interventions. The use of these interventions is therefore advisable when consumers are expected to deem a choice as important. This is notable as extant research can be interpreted to point toward reduced choice architecture effectiveness when perceived importance is high. Furthermore, as hypothesized, social norm effectiveness is accentuated by perceived time pressure in the present setting. This effect strengthens the case for the utilization of social norm interventions when consumers can reasonably be expected to be short on time.

The inconclusive findings regarding time pressure-dependent default effectiveness warrant further research. What is more, in pursuit of holistic frameworks, choice architecture research has yet to elaborate the effects of various other psychological determinants of consumer behavior (Ingendahl et al., 2020). Various context dimensions have been theorized about but remain empirically underexplored. For instance, perceived choice effort affects decision processes and by extension choice architecture effectiveness (Bettman, Johnson, & Payne, 1990) and may therefore

moderate intervention effectiveness. When exploring new context dimensions, it is important to emphasize that empirical answers to the questions presented here may at first seem inconclusive, unanticipated, or unaligned with theory. Still, making these findings available to the scientific and business community is even more important in those cases, reflecting the assessment that “models that fail, and fail spectacularly will best serve the enterprise of understanding choice” (Johnson, 2013, p. 155). It has been observed that current choice architecture research may have a bias towards the publication of results which are in line with existing theory or individually constructed hypotheses (Hummel & Maedche, 2019). If that is the case, opportunities for theory advancement are missed. Unexpected evidence can inform hypothesis development beyond commonly held assumptions and be essential for the conceptualization of construct interdependencies which may be generalizable to other settings, contexts, or interventions.

A final avenue for future research revolves around the conceptual state of choice architecture mechanisms. The field of consumer psychology needs to contribute to the theoretical clarification and advancement of choice architecture constructs. While individual empirical findings abound, the present work showcases the challenges of transferring choice architecture interventions from one context to another and inferring specific effects from theory. This may emerge from the fact that much of current choice architecture concepts are originally based in (behavioral) economics. Economics researchers are largely focused on social welfare as a focal outcome and descriptively analyze situations where consumer behavior deviates from normative models of decision-making (Thaler & Sunstein, 2008; Tversky & Kahneman, 1974). Behavioral economics largely neglect the question why people behave in certain ways, resulting in a lack of explanations of context effects and other individual-level determinants of consumer behavior. Consumer psychology, however, provides a host of theories that incorporate these influences (Fischhoff & Broomell, 2020). Much like the hypotheses in the present research lean on behavioral decision theory, that theory can inform the conceptualization of choice architecture constructs. An intervention mechanism based in behavioral decision theory would acknowledge that efficiency is a key consideration in choice strategy selection and that individual differences and further choice context substantially influence decision outcomes. Rather than observing such influences after the fact, consumer theory-based constructs would proactively include suggestions as to

how they are managed in intervention design and selection. To that end, psychological theories that focus on individual-level determinants of behavior, such as the theory of planned behavior (Ajzen & Kruglanski, 2019) or self-regulation theory (Inzlicht, Werner, Briskin, & Roberts, 2021), could therefore provide invaluable insights as to the circumstances under which interventions work.

Conclusion

In the last two decades, choice architecture research has provided invaluable insights for academics, organizations, and policymakers alike. Remarkable conceptual progress has been made and vast empirical evidence on the main effects of choice architecture interventions has been compiled. Recently, however, the novelty of newly reported research findings has declined. For future substantial advancement in this important area, context research is one of the most promising frontiers.

Unanticipated changes in effect sizes, including the occasional effect reversal, consistently highlight the fact that there is a host of contextual moderators we do not know enough about. Based on the present unexpected findings, we emphatically echo the calls of other choice architecture researchers to further explore the impact of psychological and environmental context attributes on intervention effectiveness. The present research shows how psychological states can significantly alter the impact of choice architecture on behavioral outcomes. While this general notion is intuitively appealing, much empirical and conceptual work is needed to map out the impact of relevant context dimensions on popular intervention mechanisms. Ultimately, such efforts will allow choice architects to leverage the increasing amount of personal-level data and develop meaningful consumer interactions with a much-reduced likelihood of unintended consequences.

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Appendix A.

Intro and Choice Screens Presented to Study Participants, Study 1 (Baseline)

Intro to baseline groups (note: second screen after general welcome)

We want to learn when and why people donate money to certain organizations.

In this study, we will present a set of fictitious projects to you.
These are **based in Switzerland**, where they address two different topics.

In this survey, you will be asked to make two hypothetical choices: If we gave you money to donate to one of these projects, which ones would you choose?

For transparency reasons, we have to inform you that your choice does not have immediate real world impact, as no donations will result from this study.

>

Choice 1, no treatment, no intervention

Currently, driving the route from Berne to Lausanne in Switzerland takes about 1.5 hours. This duration could be reduced by about 10 minutes if a new highway segment was developed.
Some Swiss people favor the project, others reject it: Many people travel the road, but the infrastructure investment would be massive.

Imagine that all of the organizations below contribute directly to the development of the highway segment. If you could donate to any of them, which one would you choose?

Which fund would you want to contribute to?

☐ Helvetic Highway Fund
money for road and highway projects in Switzerland

☐ European Road Development Initiative
trans-European infrastructure projects

☐ City of Lausanne Street Fund
street development in the Lausanne Municipality

Choice 2, no treatment, no intervention

There are several organizations dedicated to protecting domestic plant life in Switzerland.

In the past, the effectiveness of these initiatives has been questioned.

Please select one of the three organizations below.

Which organization committed to flower protection in Switzerland would you choose?

- ☐ Green Alps Initiative · *create and maintain protected areas for domestic plants to grow*
- ☐ One Petal at a Time · *collects endangered plants for controlled reproduction*
- ☐ The Plant Project · *financial assistance for local flower protection projects*

Choice 1, no treatment, default intervention

Currently, driving the route from Berne to Lausanne in Switzerland takes about 1.5 hours. This duration could be reduced by about 10 minutes if a new highway segment was developed.

Some Swiss people favor the project, others reject it: Many people travel the road, but the infrastructure investment would be massive.

Imagine that all of the organizations below contribute directly to the development of the highway segment. If you could donate to any of them, which one would you choose?

Which fund would you want to contribute to?

- ☒ Helvetic Highway Fund (default) · *money for road and highway projects in Switzerland*
- ☐ City of Lausanne Street Fund · *street development in the Lausanne Municipality*
- ☐ European Road Development Initiative · *trans-European infrastructure projects*

Choice 2, no treatment, social norm intervention

There are several organizations dedicated to protecting domestic plant life in Switzerland.

In the past, the effectiveness of these initiatives has been questioned.

Please select one of the three organizations below.

Which organization committed to flower protection in Switzerland would you choose?

- ☐ Green Alps Initiative · *create and maintain protected areas for domestic plants to grow*
- ☐ The Plant Project · *financial assistance for local flower protection projects* · **84% have chosen this option**
- ☐ One Petal at a Time · *collects endangered plants for controlled reproduction*

Appendix B.

Intro and Choice Screens Presented to Study Participants, Importance Treatment

With different crises affecting the lives of millions around the globe, more and more people rely on donations.
The Covid-19 pandemic has a devastating impact of countless families. At the same time, longstanding issues like global hunger have not been resolved yet.

We want to learn when and why people donate to certain charitable organizations. In this study, **you get a budget of 40\$**, which you can assign to two charitable organizations of your choice (20\$ each).
You can select these organizations on the next screens.

Please note that your selection really matters: Understanding when and why people choose causes to donate to will help charities operate more efficiently in the future - and more money will end up where it is really needed.

>

Hunger is still a ubiquitous challenge in today's world, both domestically and abroad.

Which organization do you want to donate 20\$ to?

☒ Feeding America - *default* -
(your donation will provide 50 meals for American families in need)

☐ The Water Project
(reduce child mortality by contributing to clean water projects in developing countries)

☐ United Nations World Food Programme
(your donation will provide enough food for one child in Africa for two weeks)

Covid-19 has had a devastating impact on the economy, families, and communities.

Which organization do you want to donate 20\$ to?

☐ John Hopkins research fund
support promising research on vaccines and treatments

☐ WHO Covid-19 response fund · **84% of respondents have chosen this option** ·
providing essential equipment to frontline workers

☐ United Way Covid-19 relief fund
donate to U.S. communities most affected by the pandemic

Appendix C.

Intro and Choice Screens Presented to Study Participants, Time Treatment

We want to learn when and why people donate to certain charitable organizations.

In this study, we will present a set of organizations to you.
These organizations are **based in Switzerland**, where they address two different issues.

In this survey, you will be asked to make two hypothetical choices: If we gave you money to donate to one of these organizations, which ones would you choose?

For transparency reasons, we have to inform you that your choice does not have immediate real world impact, as no donations will result from this study.

Once you proceed to the next page, **you will see a 25 second timer.**

It is very important that you make your decisions quickly: We can only make use of your data for research purposes if you choose in time, pass the attention checks, and completing the survey.



Currently, driving the route from Berne to Lausanne in Switzerland takes about 1.5 hours. This duration could be reduced by about 10 minutes if a new highway segment was developed.
Some Swiss people favor the project, others reject it: Many people travel the road, but the infrastructure investment would be massive.

Imagine that all of the organizations below contribute directly to the development of the highway segment. If you could donate to any of them, which one would you choose?

Which fund would you want to contribute to?

☒

Helvetic Highway Fund (default)
money for road and highway projects in Switzerland

☐

European Road Development Initiative
trans-European infrastructure projects

☐

City of Lausanne Street Fund
street development in the Lausanne Municipality

00:20

There are several organizations dedicated to protecting domestic plant life in Switzerland.
In the past, the effectiveness of these initiatives has been questioned.

Please select one of the three organizations below.

Which organization committed to flower protection in Switzerland would you choose?

- ☐ The Plant Project · *financial assistance for local flower protection projects*
84% have chosen this option
- ☐ Green Alps Initiative
create and maintain protected areas for domestic plants to grow
- ☐ One Petal at a Time
collects endangered plants for controlled reproduction

00:17

Methodological Details Appendix A

Control group participants in the pre-study were asked to select from one randomized set of hunger-related organizations to donate to. Then, they were asked to make a similar choice from another set of Covid-19-related organizations. No deliberate attempts were made to influence the choice.

Participants in the no context / interventions condition received the same questions as the control group. The only difference was that for both charitable organization selections, choice architecture interventions were present that attempted to increase the likelihood of a specific organization being chosen. The first choice task included a small text indicating that an organization was pre-chosen, without explanations as to why that was the case. That option was pre-selected in the list and the word “default” was added after the organization name. In the second task, no option was pre-selected, but a text after the name of the target organization indicated that “84% of respondents have chosen this option”.

Participants in the decision importance / no intervention condition received largely the same questionnaire as control group participants. However, we implemented some manipulations which aimed at heightening respondent’s impression that their choice mattered. First, stronger wording emphasizing the relevance of the decision as well as the dependency on millions of people on donations were utilized. The donation amount was also increased from 5\$ to 20\$ per choice. Furthermore, in accordance with self-relevance theory (Bhattacharya & Sen, 2003), it was expected that decisions would be perceived as more important if participants first chose the cause that mattered most to them. Accordingly, participants could choose whether they wanted to donate to an organization that addressed global hunger, U.S. forest fires, Covid-19, or cancer, and were then asked to select a charity committed to the focal cause. Afterwards, respondents were asked to answer the questions on the decision importance scale, followed by demographic questions and the debriefing.

In the final pre-study condition, the time pressure manipulation was tested. Participants saw the same information as in the control condition. Additionally, they were informed that they would see a timer when making their choices, and that it was essential that they finished in time. A test among colleagues and students had revealed that about 25 seconds were barely enough to read the question and make an intuitive

choice. Thus, when making their choices, participants saw a large red timer ticking down from 25 to 0 seconds. Notably, the intent of this treatment was to manipulate the psychological state of perceived time pressure, not actual time constraints. Therefore, nothing happened when the timer reached 0 and participants could proceed normally through the rest of the questionnaire. After choosing two organizations, respondents were asked to answer the questions on the perceived time pressure scale, followed by demographic questions and the debriefing.

Methodological Details Appendix B

In all main studies, a two-step quality check procedure was implemented. It has been shown that especially when recruiting participants via online worker panels, a substantial proportion of respondents answer carelessly (Curran, 2016; Meade & Craig, 2012). When the expected effect sizes are relatively small, this can become an issue as a resulting tendency toward the mean can obscure otherwise significant and relevant effects (Kung, Kwok, & Brown, 2018; Maniaci & Rogge, 2014). First, a long-string analysis was utilized to detect whether participants answered the construct scale questions indiscriminately. For two items in the time pressure scale and one in the decision importance scale, we included logically opposing options (e.g., “I had sufficient time to think about the issue”, “I would have liked more time to make my decision”) (Curran, 2016). If one or several pairs of reverse coded options were assigned the same value other than 3, response sets were flagged for a second quality check to determine whether the response set would be kept in the final analysis. Response sets were only immediately excluded if all scale items (11 in total) were assigned the same rating or if all reverse coded pairs were assigned the same value other than three. Secondly, an instructional manipulation check (IMC) proposed by Oppenheimer, Meyvis, and Davidenko (2009) was utilized. As manipulation checks may alter peoples’ attentiveness and their response patterns in subsequent questions (Hauser & Schwarz, 2016), this IMC was placed after the scale items and before the demographic section, so as to not confound the central empirical results. When presented with the salient question of how they wanted to distribute a certain donation amount to several charities, the instruction asked participants to select “other” and enter the digits 23, rather than select any of the other options. All participants who did not enter 23 and also failed the long-string check were excluded from consideration in the final analysis. Notably, some respondents who failed the IMC remained in the final sample. This two-factor quality check allowed for the detection of random or careless response behavior with reasonable accuracy, while biasing the sample toward participants who consistently paid high attention was avoided (Oppenheimer et al., 2009).

Enabling Cocreation with Transformative Interventions: An Interdisciplinary Conceptualization of Consumer Boosting

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Abstract

Service research emphasizes the relevance of consumers' participation in the cocreation of transformative outcomes like health and well-being. However, in complex services, consumers' limited operant resources and lacking resource integration efficiency hinder transformative value cocreation. Service research on mechanisms that facilitate well-being through efficient resource integration is sparse, but several disciplines elaborate cognitive interventions with that target. These interventions have been validated in various contexts. Nevertheless, concerns persist that they can hurt, rather than help, individual consumers. Overcoming such limitations requires an interdisciplinary effort. The present article outlines the new research area "transformative consumer interventions" (TCI) by integrating interventions theory, consumer psychology, and transformative service research in a health context. TCI provide theory-driven principles for the selection and design of interventions that facilitate operant resource integration in complex services. Additionally, we conceptualize consumer boosting, the first TCI-based intervention construct. Consumer boosts are efficient, context-specific, and personalized interventions that enhance individuals' operant resources. Consumer boosting provides a pathway to transformative cocreation and alleviates the risk of unintended consequences and value co-destruction. This research illustrates that the transformative service domain stands to benefit substantially from getting involved in the discussion on consumer interventions and offers a unique perspective for further conceptual elaboration.

Keywords: interventions, operant resource integration, transformative value, unintended consequences, behavioral decision theory

Introduction

Firms, consumers, and other actors often collaborate to enhance consumer well-being in co-creative processes (Anderson et al., 2016; Vargo & Lusch, 2016). To achieve transformative outcomes in health services, consumers' active participation is essential (McColl-Kennedy, Hogan, Witell, & Snyder, 2017; Ng, Sweeney, & Plewa, 2019). In fact, many co-creative processes are consumer-directed and take place outside of providers' immediate reach (McColl-Kennedy et al., 2017; Mende & van Doorn, 2015). At the same time, consumer-directed co-creation is effortful (Sweeney, Danaher, & McColl-Kennedy, 2015) and consumers may experience stress if they are responsible for the co-creation of their well-being outcomes (Anderson et al., 2016). One pathway for service providers to positively impact consumer-led co-creation of transformative value both during and beyond service interactions is the development of consumer resources (Blocker & Barrios, 2015). For instance, firms can facilitate consumers' co-creation efforts with subtle interventions into their cognitive processes. However, to date, service research on cognitive interventions is sparse.

Service research stands to benefit from embedding the vast body of knowledge on cognitive interventions and could in turn provide a unique perspective and relevant fields of application for the further development of interventions theory. The present research addresses this opportunity and outlines transformative consumer interventions (TCI), a new middle-range theory for all cognitive interventions that seek to enable the co-creation of transformative value. TCI theory allows for the conceptual evaluation of existing mechanisms, establishes a foundation for the development of new constructs, and provides a new perspective for the design and selection of situationally appropriate interventions. On that basis, we conceptualize consumer boosting, the first intervention construct that aims at facilitating transformative value through the efficient development of consumers' operant resources.

Concepts that discuss the consumer-directed co-creation of sustainable health and well-being are central to transformative service research (TSR) (Blocker & Barrios, 2015). The Covid-19 pandemic showcases the extent to which risks to peoples' health can affect individuals, societies, and the economy. In efforts to mitigate the impact of the disease, human behavior takes center stage (Betsch, Wieler, & Habersaat, 2020). Behavioral science suggests that slight alterations of the environment in which

consumers make choices can substantially affect their choice outcome. For instance, the effectiveness of an advertisement for self-quarantine is higher when it highlights social norms or is framed in a positive way (van Bavel et al., 2020). Such choice architecture interventions or “nudges” are often effective at altering behavior patterns in a target population (Johnson et al., 2012; Szaszi, Palinkas, Palfi, Szollosi, & Aczel, 2018; Thaler & Sunstein, 2008). Service providers can implement nudges into consumer interactions to increase well-being outcomes with relative ease (Wunderlich, Kranz, Totzek, Veit, & Picot, 2013). At the same time, these interventions can have unintended consequences. Some are desirable, for instance, Covid-19 interventions help mitigate the spread of other infectious diseases such as the seasonal influenza (Cowling et al., 2020). Other side effects hurt individuals: After they have been successfully targeted by a healthy eating intervention, consumers may permit themselves to indulge more in unhealthy food later, leading to a negative overall effect (Dolan & Galizzi, 2015).

Interventions which seek to alter peoples’ behavior by interacting with their cognitive processes have been discussed in various disciplines, including consumer psychology (Milosavljevic, Navalpakkam, Koch, & Rangel, 2012), behavioral medicine (Nahum-Shani et al., 2018), and public policy (Sunstein, 2014). To date, these developments have not been systematically incorporated into service research. At the time of writing, a search for the terms “choice architecture”, “cognitive interventions”, and “behavioral interventions” in this journal yields no results. Only one article peripherally discusses the concept of nudges as an intervention (Wunderlich et al., 2013). This is surprising for several reasons. First, TSR acknowledges peoples’ behavior as a key determinant for future well-being and explicitly seeks for mechanisms that foster sustainable consumer well-being through service encounters (Blocker & Barrios, 2015; McColl-Kennedy et al., 2017). This aim overlaps with the goals of interventions research, which often portrays cognitive and behavioral interventions as tools to increase well-being (Hertwig & Grüne-Yanoff, 2017; Thaler & Sunstein, 2008). Second, service theories such as co-creation provide a valuable perspective for the conceptualization and discussion of interventions as joint efforts of providers and consumers are required for interventions to be effective. Third, service providers are in a prime position to utilize consumer interventions. Many firms have access to personal-level data and various, often digital, interactions with consumers (Aksoy, Alkire (née Nasr), Choi, Kim, & Zhang, 2019; Huang & Rust, 2017). This gives them a unique

understanding of where consumers would benefit from assistance and the means to dynamically implement helpful interventions. Last, service firms stand to benefit substantially from transformative interventions, as enabling consumers' ability to co-create raises the perceived service quality, efficiency, and ultimately well-being (Ouschan, Sweeney, & Johnson, 2006).

We develop TCI through an integration of TSR, interventions research, and behavioral decision theory (MacInnis, 2011). These research streams are important for the following reasons: TSR, which is outcome-oriented and aims at affecting well-being through services (Anderson et al., 2013; Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015), motivates the present research and constitutes a field of application. Furthermore, the concept of co-creation allows for a systematic analysis of the resource integration processes that lead to transformative value in service networks. Interventions research complements TSR by elaborating various mechanisms which foster well-being. TCI leans on existing research on choice architecture interventions, which facilitate the integration of operant resources (Dolan et al., 2012; Johnson et al., 2012), and heuristic boosting, which has recently been suggested as a method to develop peoples' cognitive resource repertoire (Grüne-Yanoff & Hertwig, 2016; Hertwig & Ryall, 2020). Last, behavioral decision theory provides psychological insights into consumers' context-dependent development and integration of cognitive resources (e.g., Bettman, Luce, & Payne, 1998), which has important implications for the design of transformative consumer interventions.

Discussing interventions from a TCI perspective yields several novel insights. First, distinctive interventions can facilitate transformative value co-creation in different situations. While some support efficient resource integration, others can foster knowledge and competencies (cf. Hibbert, Winklhofer, & Temerak, 2012). To unfold their full potential in a service exchange, TCI need to be context-specific, individualized, and efficient. Furthermore, a new perspective on consumer interventions helps overcome some challenges related to existing intervention mechanisms, such as a limited understanding of the underlying cognitive processes, unintended consequences, and challenging to predict effect sizes (Jachimowicz, Duncan, Weber, & Johnson, 2019; Münscher, Vetter, & Scheuerle, 2016; Szaszi et al., 2018).

This research has substantial interdisciplinary implications (Gustafsson et al., 2016). By outlining TCI as a middle-range theory in service research (Brodie, Saren, &

Pels, 2011) and developing consumer boosting as an exemplary TCI-based concept, the present work highlights the relevance of research into interventions that facilitate transformative value. Furthermore, it aligns relevant academic efforts on a unified trajectory which advances theory. Practitioners will be able to leverage our findings to develop context-sensitive and consumer-focused intervention strategies. This will be of special relevance for firms which seek to elicit transformative value, such as health app providers, financial advisors, or educative bodies. However, all firms using interventions in consumer interactions will benefit from this research, as will policymakers seeking to improve well-being.

The remainder of this paper is structured as follows. The following section highlights the necessity of interdisciplinary research into transformative interventions. We introduce existing research on nudging, heuristic boosting, and behavioral decision theory, to then integrate that theoretical backbone and outline TCI. Next, we conceptualize consumer boosting, the first TCI-based intervention. An analysis of the merits and potential unintended consequences of the interventions discussed herein follows. We close with a discussion of theoretical and managerial implications and an outlook on future research.

Theoretical Foundations of Transformative Consumer Interventions

In service, an interdisciplinary perspective is required: Both the domain of service research as well as TSR as one of its sub-fields have been characterized as interdisciplinary areas that share a common interest in discussing service-related phenomena and contexts (Anderson & Ostrom, 2015; Ostrom et al., 2015). The present work integrates extant knowledge from various disciplines, which is essential to advance subsequent research (MacInnis, 2011; Palmatier, Houston, & Hulland, 2018). Conceptual works in service research need to be open to the incorporation of theories, paradigms, and methods from various disciplines (Gustafsson et al., 2016). The overlap of disciplines affected by, and contributing to, TSR and interventions research is substantial. TSR encompasses any research that addresses sustainable improvements to consumers' well-being through service encounters (Anderson & Ostrom, 2015; Anderson et al., 2013). The domain focuses on the co-creation of transformative value, which signifies a sustainable change toward increased well-being (Blocker & Barrios,

2015). For instance, overcoming (operant) resource constraints to increase access to health services and making their co-creation more efficient can have a lasting impact on the quality of life of many people, especially those who possess the least resources (McColl-Kennedy et al., 2017; Ostrom et al., 2015).

While relevant to all service settings, the present study selects health services as its field of application for several reasons. First, health services are complex and the co-creation of well-being through health services requires substantial resource commitments from providers and consumers alike (Anderson et al., 2016; Frow, McColl-Kennedy, Payne, & Govind, 2019). Health services would benefit from the development of concepts and tools that facilitate the integration of such resources. Second, health services are transformative in that their central goal is the elicitation of sustainable well-being. Nevertheless, it is critical that undesirable consequences, which lead to the co-destruction of value, are avoided (Anderson & Ostrom, 2015). Third, resulting from technological change, health services are rapidly developing (Danaher & Gallan, 2016; Huang & Rust, 2017). To manage and utilize that technological change appropriately, value creation dynamics in health services need to be scrutinized and innovated (Čaić, Odekerken-Schröder, & Mahr, 2018).

Co-creation recognizes that several stakeholders integrate operand and operant resources in a service exchange (Vargo & Lusch, 2004, 2008). However, “the precise routes by which well-being is co-created among actors [...] remain unclear” (Chen et al., 2020, p. 2) and “there has been a lack of theoretical development to explain the processes by which customers learn to be effective resource integrators” (Hibbert et al., 2012, p. 247). Addressing these shortcomings, TSR-informed consumer interventions acknowledge that service providers can leverage their resources in two ways: They can either contribute them to the co-creation process directly or apply them to the development of consumer resources (Figure 6). This mechanistic distinction emphasizes that co-creation happens over time and often outside of providers’ immediate control (Mende & van Doorn, 2015). What is more, in line with the notion that learning determines how consumers engage in future co-creation encounters (A. F. Payne, Storbacka, & Frow, 2008), actors can influence other actors’ resources, which they contribute to the service exchange immediately or at a future point in time (Anderson et al., 2016; Hibbert et al., 2012). For instance, firms can provide suggestions based on their expertise (integrating their operant resources),

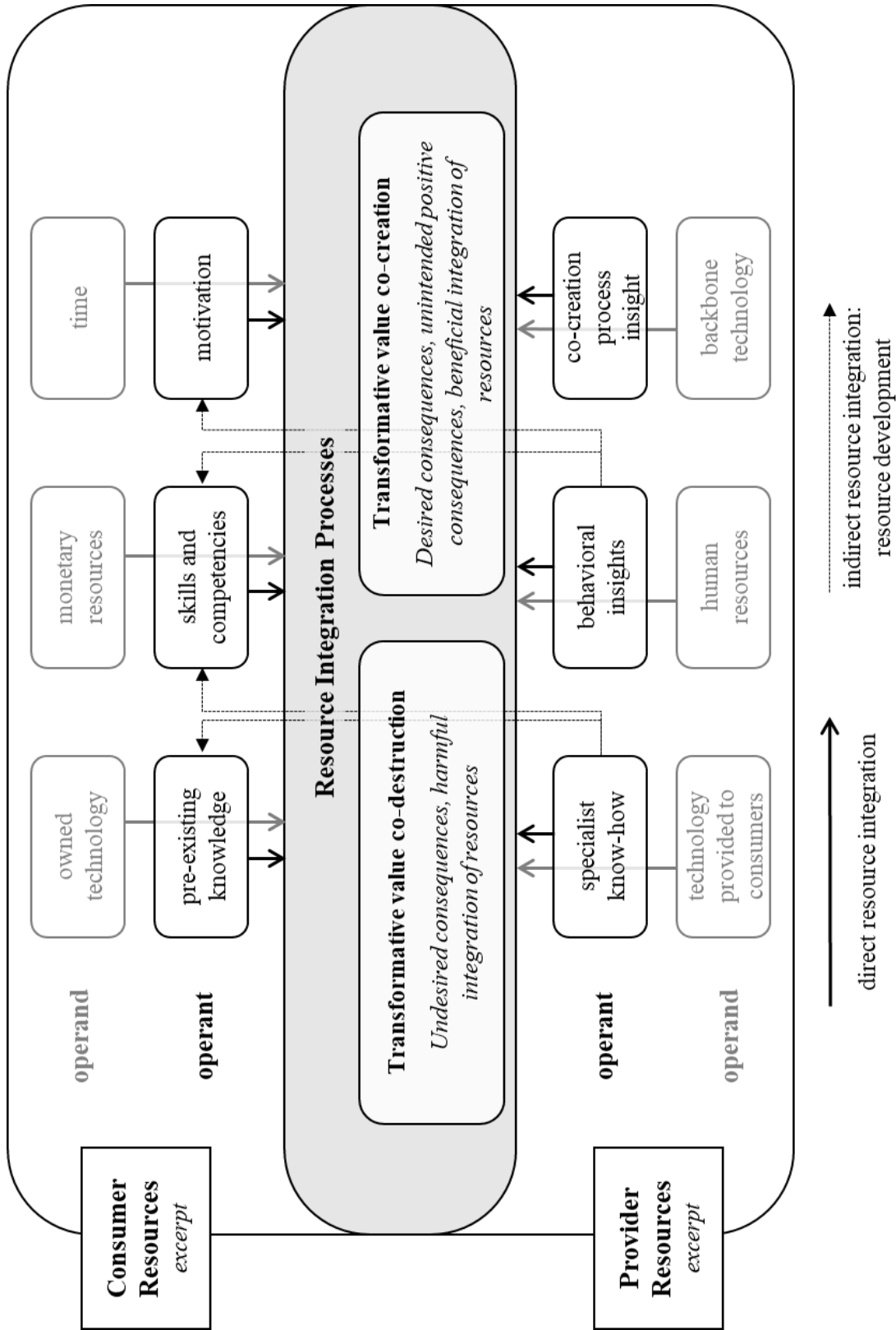


Figure 6: Exemplary Pathways of Operant Resource Development and Integration in Co-Creative Service Exchange

or they can enhance consumers' relevant knowledge and competencies (developing operant resources). Indirect resource integration through consumers' resource development may lead to more efficient co-creation (Hibbert et al., 2012).

An elaboration of co-creative concepts also needs to address their co-destruction potential. While service providers can leverage cognitive interventions to facilitate transformative value creation, value is phenomenologically determined by the beneficiary (Vargo & Lusch, 2008). Co-creation will be perceived as successful by the consumer if the desired outcomes are achieved. Positive side effects may further enhance this perception. However, there is also a risk that providers' value propositions, resource contributions, and process enablers are not optimally integrated, which can result in the co-destruction of value (Anderson & Ostrom, 2015; Spanjol et al., 2015). In some situations, no existing intervention reliably empowers consumers. This results from several issues, including interventions' potential to be used malevolently (Rebonato, 2012; Thaler, 2018) as well as their vague definitions (Kosters & van der Heijden, 2015; Sims & Müller, 2019). Consequently, interventions can incur undesirable results for providers and consumers (Dolan & Galizzi, 2015; Grüne-Yanoff, Marchionni, & Feufel, 2018; Jachimowicz et al., 2019).

As a first step toward the development of TCI, the conceptual hold on intervention constructs and their merits and shortcomings needs to be improved (Grüne-Yanoff et al., 2018). To foster understanding of when and how interventions can facilitate co-creation, and where co-destruction risks emerge, the following sections briefly review the mechanisms nudging and heuristic boosting. As new intervention constructs should be backed by consumer-based theory (Michie, van Stralen, & West, 2011), we then discuss how behavioral decision theory can contribute to TCI.

Heuristic Boosting

If the effort to co-create desirable outcomes is reduced, the released resources can be allocated to the pursuit of other well-being goals. Co-creation effort has therefore been of interest to transformative service researchers in health settings (Sweeney et al., 2015). Heuristic boost interventions can advance that discussion. The term "boosting" was first used to describe an intervention mechanism by Grüne-Yanoff and Hertwig (2016). We dub their original iteration of the mechanism *heuristic* boosting to highlight the key conceptual element (heuristics) and allow a differentiation from *consumer*

boosting as developed in this paper. Like most modern decision-making research and behavioral sciences, heuristic boosting rests on the paradigm of bounded rationality (Grüne-Yanoff & Hertwig, 2016). Bounded rationality suggests that peoples' resources, including capabilities and time, are limited. It is therefore impossible to consistently behave optimally (Simon, 1956). To overcome resource limitations in the pursuit of well-being, consumers utilize various decision strategies. They can either rely on normative decision rules suggested by economic theory, or use simpler routines such as heuristics (Simon, 1990). Heuristics describe mental shortcuts which ensure satisfactory outcomes while reducing the resource requirement for the decision process (Gigerenzer & Brighton, 2009).

Heuristic boosting seeks to improve heuristic decision-making capabilities and thus targets consumers' operant resource repertoire. Hertwig and Grüne-Yanoff (2017, p. 977) define heuristic boosts as "interventions that target competencies rather than immediate behavior. [...] By fostering existing competencies or developing new ones, boosts are designed to enable specific behaviors." Heuristic boosts target the efficient build-up of competencies and expertise in the long run (Hertwig, 2017). Heuristic boosts therefore differ from other interventions in that the intervention designer does not seek to influence the co-creation process directly, but rather influences the operant resources of other actors. Heuristic boosts can increase competencies in health and other service areas (Hertwig, 2017; Hertwig & Grüne-Yanoff, 2017) and there is some evidence that systematic heuristic education positively impacts consumer decision-making and well-being (Drexler, Fischer, & Schoar, 2014). It has also been argued that in some situations, heuristic boosts are more likely to have a positive impact on well-being outcomes than other intervention mechanisms (Hertwig & Ryall, 2020).

However, the nascent literature on heuristic boosting has yet to deal with a variety of challenges: (1) Heuristic boosting is still vaguely defined and therefore both hard to delineate from other constructs and hard to integrate in a larger theoretical framework (Grüne-Yanoff et al., 2018; Sims & Müller, 2019). (2) With some notable exceptions (Bradt, 2019; Franklin, Folke, & Ruggeri, 2019), there is still a paucity of empirical research on the effectiveness of heuristic boosts. (3) There are no conceptual models or empirical observations of the side effects of boosts (Grüne-Yanoff et al., 2018). Accordingly, the means to prevent unintended value co-destruction are missing. (4) Boosting's focus on heuristic decision-making competencies is problematic for the

generalizability of the construct. Including further classes of operant resources which efficiently assist peoples' pursuit of well-being goals would increase the practical viability of the concept. Overall, heuristic boosting is promising for some co-creation settings. In situations where the risk of unintended consequences is high, other mechanisms should be considered. One potential alternative are choice architecture interventions, also labeled nudges.

Nudging

Nudging is one of the most discussed intervention mechanisms in public policy and consumer research, including in health settings (Benartzi et al., 2017; Marteau, Ogilvie, Roland, Suhrcke, & Kelly, 2011). The term was coined by Thaler and Sunstein who outline a nudge as “any aspect of the choice architecture that alters peoples' behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler & Sunstein, 2008, p. 6). Choice architecture, in turn, is understood as the way in which a choice is presented. Without changing the contents of a choice, the design of its environment may influence choice outcomes (Johnson et al., 2012). For instance, a default option, whether in an online menu or a governmental form, is considered an aspect of the choice architecture. Its deliberate change in hopes of enticing a behavioral outcome thus constitutes a nudge (Goldstein, Johnson, Herrmann, & Heitmann, 2008). Other nudges include the provision of social reference points or the structuring of alternatives in a choice set (Dolan et al., 2012; Sunstein, 2014). These interventions predictably appeal to a range of automated cognitive processes or biases in a large part of the target population (Johnson & Goldstein, 2003; Tversky & Kahneman, 1974).

By structuring the environment in which consumers co-create value, nudges can lead to reduced decision effort and thereby facilitate access to well-being (Johnson & Goldstein, 2003). Nudges have been repeatedly and successfully applied to support healthy behavior patterns (Baskin et al., 2016; West, Michie, Rubin, & Amlôt, 2020). However, the construct also has limitations. For instance, nudges have been criticized as coercive, manipulating individuals into behaving as desired by the choice architect (Rebonato, 2012), which leaves intervention targets vulnerable to malevolent intervention designers (Thaler, 2018). Another recurring line of criticism has focused on the conceptual state of nudging. Its definition has been characterized as vague and

deliberately broad, applying to most non-coercive interventions (Hertwig & Grüne-Yanoff, 2017; Kusters & van der Heijden, 2015). Echoing the issues of heuristic boosting, this hinders theoretical elaboration and may pave the way for unintended consequences (Handel, 2013).

To summarize, both nudges and heuristic boosts have advantages and can contribute to the co-creation of transformative value. At the same time, they do not fit all settings optimally. To understand the situations in which either intervention might be preferable, conceptual research is required (Grüne-Yanoff et al., 2018; Reijula, Kuorikoski, Ehrig, Katsikopoulos, & Sunder, 2018). Neglecting the constructs' limitations results in a substantial risk of unintended consequences and value co-destruction (Jachimowicz et al., 2019; Szaszi et al., 2018). The research area TCI embraces these challenges and seeks to answer how known limitations of heuristic boosting and nudging can be overcome, and how the likelihood of unintended consequences can be decreased. Behavioral decision theory provides some potential answers.

Behavioral Decision Theory: Implications for Interventions Research

The present work is the first in TSR to leverage behavioral decision theory, which elaborates the psychological processes affecting individual decision-making routines and behavioral outcomes (Einhorn & Hogarth, 1981; Fischhoff & Broomell, 2020; Weber & Johnson, 2009). The incorporation of well-established theories has positive effects for concept and framework development (Anderson & Ostrom, 2015; Michie et al., 2011). As TSR focuses on consumer outcomes, psychological theories promise intriguing insights. Accordingly, previous studies in TSR have drawn upon theories such as self-determination and self-regulation theory (Mende & van Doorn, 2015), construal level theory (McColl-Kennedy et al., 2017), or psychological ownership theory (Chen et al., 2020).

When scrutinizing the implications of behavioral decision theory for TCI, three important findings emerge. First, when consumers' context-dependent strategy selection can be anticipated, TCI provide an opportunity for intervention designers to alter the perceived context, trigger desirable decision routines, and thus contribute to transformative outcomes. As noted earlier, decision processes and outcomes are context dependent (J. W. Payne, Bettman, & Johnson, 1988). Besides available resources,

strategy selection in a co-creation task is contingent on environmental attributes such as the selection and quantity of choice alternatives (Klein & Yadav, 1989), the timing of a decision (Simonson, 1990) or the time pressure associated with it (Dhar, 1997). Furthermore, the built environment, technological enablers, and other actors in a service network play important roles in service co-creation (Keating, McColl-Kennedy, & Solnet, 2018). When presented with the same choice task in a different context, consumers are likely to adaptively select different decision-making routines that increase their choice efficiency (Bettman et al., 1998). Behavioral decision research thus provides theoretical insights into the role of context in consumers' co-creation efforts, which valuably enriches both service and interventions research: Transformative services have been described as context-dependent (Frow et al., 2019; Ng et al., 2019) and interventions research provides various tools for the alteration of the choice context (Johnson et al., 2012).

Second, behavioral decision theory emphasizes the role of efficiency in decision-making. In that vein, task complexity and decision effort are central themes. Technological advancements and the skyrocketing access to information and market offerings have increased complexity in all areas of life (Broniarczyk & Griffin, 2014). *Ceteris paribus*, complexity leads to increased decision effort. Accordingly, the service literature argues that co-creation in complex services requires effortful behavioral and cognitive participation (McColl-Kennedy, Vargo, Dagger, Sweeney, & van Kasteren, 2012). Consumers' perceived effort will rise with an increase in perceived complexity, and less people perform tasks that are perceived as effortful (Ng et al., 2019; Sweeney et al., 2015). Consumers' adaptive strategy selection has been conceived as a means to optimize the cost-benefit function of decision tasks (Lieder & Griffiths, 2017; J. W. Payne, Bettman, & Johnson, 1993). Reducing the resources to co-create transformative value while holding the outcome stable translates into increased efficiency. Likewise, increased value as perceived by the consumer equates to higher efficiency when no additional effort is expended. We propose that TCI need to increase choice efficiency by facilitating consumers' resource integration or improving their resource repertoire, whichever is likely to lead to more efficient co-creation in the long run.

A final important notion of behavioral decision research that informs the conceptualization of TCI is that people often do not have stable preferences. Rather than retrieving the optimal response to a choice task from memory, people construct their

preferences throughout the process (Bettman et al., 1998). This constructive perspective on decision-making is a logical consequence of bounded rationality, as stable preferences would require an unlimited inventory of all preferences to be stored in memory (J. W. Payne, Bettman, & Johnson, 1992). At the same time, preference construction is a prerequisite for cognitive interventions, which interact with the constructive processes leading to a choice, to be effective (cf. Zwebner & Schrifft, 2020). The dynamic construction of preferences throughout the decision-making process has important implications for interventions theory. Most importantly, if preference configurations are individually determined, other actors in a co-creation network cannot assume to know consumers' preference before a choice has been made. An intervention that enables people to make the best choice, "as judged by themselves" (Thaler & Sunstein, 2008, p. 5), needs to rely on mechanisms which facilitate efficient preference construction while leaving the ultimate choice to the intervention target. If possible, interventions should therefore be tailored to individuals.

Integrating TSR, Interventions Research, and Behavioral Decision Theory

The integration of TSR, extant interventions research, and behavioral decision theory allows the outlining of a new class of interventions which seek to facilitate the co-creation of transformative value. Table 3 provides a summary of the theoretical background of the newly outlined research area. TCI are all interventions into peoples' cognitive processes that are designed to enable the co-creation of transformative value. TCI can contribute to efficient resource integration either directly via an optimization of the co-creation environment or indirectly via an increase of beneficiaries' operant resources. Existing examples for these differing mechanisms are nudge and heuristic boost interventions, which in some cases fit the description of TCI. The new TCI perspective provides principles for the selection of the optimal intervention mechanism when the co-creation of transformative value is the target. What is more, its theoretically rooted principles allow for the conceptualization of completely new intervention mechanisms. To date, an intervention which explicitly seeks to elicit a transformative change and leverages consumer-based theory to mitigate unintended consequences is missing from intervention architects' toolbox. To change this, we propose the new TCI mechanism "consumer boosting".

Table 3: Literature-Based Overview of TCI-Relevant Findings on Established Intervention Mechanisms.

Nudging				Heuristic Boosting			
Theme	Notable Studies	Type	Relevant finding(s)	Theme	Notable Studies	Type	Relevant finding(s)
Theoretical predecessors	Bounded rationality	Simon (1956, 1990)	People have limited operant resources and therefore leverage efficient decision strategies. Humans adapt behavioral strategies to their environment.	Bounded rationality	Simon (1956, 1990)	conceptual	People have limited operant resources and therefore leverage efficient decision strategies. Humans adapt behavioral strategies to their environment.
	Heuristics and biases	Tversky and Kahneman (1974)	Heuristics lead to systematic and predictable errors in human decision-making	Simple heuristics	Gigerenzer and Brighton (2009)	review	Heuristics improve decision resource efficiency, and some heuristics can improve decision accuracy as compared to normative decision models.
Benefactor(s)	Individuals, society	Thaler and Sunstein (2008) / review	Nudges can improve consumers' choices, as judged by themselves. Altering choice architectures can also contribute to socially desirable options being chosen, thus increasing societal welfare.	Individuals, society	Grüne-Yanoff and Hertwig (2016); Hertwig and Grüne-Yanoff (2017)	conceptual	Heuristic boosts instill competencies for people to exercise choice agency in alignment with their personal goals; this can be aligned with policy goals to foster societal objectives
Outcome	Behavior change	Sunstein (2014) / commentary	Nudges steer toward a certain behavior, but their targets are free to behave otherwise	Heuristic competencies	Hertwig and Grüne-Yanoff (2017)	conceptual	Only interventions that affect (heuristic) competencies, rather than behavior, can preserve agency.
Prerequisite knowledge for design	Targets' expected behavior	Thaler and Sunstein (2008) / review	Choice architects predictably alter behavior in a certain direction. Intervention designers need to know where and in what way the expected behavior of a target population deviates from the desired outcome.	Heuristic applicability	Hertwig and Grüne-Yanoff (2017)	conceptual	Heuristic boosts enhance capabilities to deal with future decision problems. Designers need to know how likely consumers are to encounter such tasks, and how big the impact of the new heuristic competency will be.
	Expected effect size	Jachimowicz et al. (2019) / meta analysis	Knowledge of the effect size and of how contextual attributes influence the effect are required for the selection of an intervention. If such information is missing, unexpected negative consequences may result.	Individual conditions	Grüne-Yanoff, Marchionni, and Feufel (2018)	conceptual	For the design of effective heuristic boosts, personal conditions such as preferences and available resources need to be assessed.

Table 3: (continued)

Nudging				Heuristic Boosting			
Theme	Notable Studies	Type	Relevant finding(s)	Theme	Notable Studies	Type	Relevant finding(s)
Organ donation	Johnson and Goldstein (2003)	empirical	Altering the default setting for organ donation after death from opt-in to opt-out drastically increases donation rates.	Financial decision-making	Franklin, Folke, and Ruggeri (2019)	empirical	Both nudges and boosts can improve consumers' average decisions. To select the right interventions, a consideration of their respective merits and of the choice context is vital.
Various	Sunstein (2014)	commentary	automatic retirement scheme enrolment increases savings; precommitment can reduce unhealthy habits; eliciting intentions makes active behavior (e.g., voting) more likely				
Healthy nutrition and others	Szaszi et al. (2018)	meta analysis	Most empirical nudge studies are conducted in a health setting, many are unclear as to when and why nudges work. This can be overcome by clear taxonomies and a focus on conceptual mechanisms.	Insurance	Bradt (2019)	empirical	Nudges are more effective at increasing willingness to pay for flood insurance than a statistical numeracy boost. Contextual determinants of relative effectiveness need to be assessed further.
Application examples							
Perceived manipulation				commercial nudges can manipulate consumers towards behaving in ways that hurt them			
Boomerang effects	Thaler (2018)	conceptual		Same categories as nudging	<i>this study</i>	conceptual	As of today, no empirical studies of heuristic boosts' unintended consequences exist. We propose that heuristic boosts may incur the same negative consequences as nudges, but that likelihoods and effect sizes of unintended consequences differ.
	(1) Schultz et al. (2007); (2) Jachimowicz et al. (2019)	(1) empirical; (2) meta analysis	(1) social norms to reduce energy consumption have resulted in the opposite effect for those who perform above average; (2) the effectiveness of defaults is domain-dependent				
Moral self-licensing	Dolan and Galizzi (2015)	review	moral behavior now reduces the likelihood of moral behavior later; making social norms explicit may reduce effort to pursue societal goals				
Annoyance effects	Dangaard and Gravert (2018)	empirical	recurring exposure to a nudge (e.g., reminder) can annoy consumers				
Potential undesired consequences (consumer side)							

Conceptualizing Consumer Boosting

The present section conceptualizes consumer boosting, the first transformative consumer intervention. To pave the way for further conceptual efforts, we propose a construct definition which uses consistent and accurate nomenclature and is delineable from extant intervention mechanisms (Gilliam & Voss, 2013; Teas & Palan, 1997):

A consumer boost is a context-specific and individualized intervention into consumers' cognitive processes that aims at developing their operant resources to facilitate the efficient co-creation of transformative value.

Key Aspects of Consumer Boosting

This definition of consumer boosting reflects the integration of extant interventions conceptualizations, fundamental notions of behavioral decision research, and TSR. We now detail the theoretical roots of discrete definition elements and how they contribute to a meaningful definition, beginning with the terms adopted from extant interventions research: *boost*, *intervention*, and *cognitive processes*.

Boost. The term “boost” is adopted from Grüne-Yanoff and Hertwig’s (2016; 2017) inception of heuristic boosting. The term embodies a novel category of intervention mechanisms which do not directly affect choice, but rather empower – or boost – consumers’ capabilities to make that choice. This holds true for consumer boosting. Furthermore, the dictionary definition of the word equates boosting and “to assist over obstacles, to advance the progress of; to support, encourage; to increase” (OED, n.d.). This reflects the central intention behind the mechanism of consumer boosting, which is to enable consumers to pursue transformative value in alignment with TSR (Anderson & Ostrom, 2015; Blocker & Barrios, 2015). We adopt the label “boost” for our new intervention mechanism.

Intervention. In the disciplines considered herein, “intervention” is a well-established denotation for a mechanism that interacts with consumers’ cognitive processes to change a focal outcome in a desired direction (Fischhoff & Broomell, 2020; Nahum-Shani et al., 2018; Szaszi et al., 2018). Both nudging and heuristic boosting have been labeled as interventions (Hertwig & Ryall, 2020). As opposed to other categories of interventions, such as economic incentives or governmental regulation (Michie et al., 2011), nudging has been considered a behavioral intervention which has “the potential to encourage desirable behavior without restricting choice” (Benartzi et

al., 2017, p. 1041). However, we argue that categorizing boost interventions as behavioral would be misleading. On an individual level, no behavioral outcome of consumer boosts can be predicted. Rather, they interact with cognitive processes and result in increased cognitive resources. Consumer boosting is therefore better classified as a cognitive intervention. To avoid redundancies with other definition elements (cognitive processes, operant resources) we omit the word “cognitive” before “intervention”.

Cognitive processes. Service research clearly distinguishes between operand (i.e., material) and operant (i.e., cognitive) resources (Vargo & Lusch, 2016). Extant interventions research largely focuses on peoples’ cognitive processes, neglecting other dimensions of human decision-making such as emotional processes (Weber & Johnson, 2009). Even the popular model of two modes of reasoning, which attempts to provide an explanation as to why human decisions are systematically biased, exclusively describes an intuitive (faster) and deliberate (slower) cognitive process (Kahneman, 2011). As this commitment to one category of psychological processes is beneficial for a focused conceptualization, we follow such examples and conceive consumer boosting as strictly cognitive, bracketing other processes affecting decision-making.

Originating from TSR, two definition elements reflect the intended outcome of TCI and a potential antecedent to transformative value: *Operant resources* and *transformative value*.

Operant resources. Knowledge, decision strategies, and skills are operant resources which can be integrated in pursuit of a focal outcome (Hibbert et al., 2012; Vargo & Lusch, 2016). The provision of context-relevant information can increase consumers’ well-being (Wittkowski et al., 2020) and improving decision-making competencies is one possible means to assist consumers in overcoming vulnerabilities caused by information imbalances (Anderson et al., 2016; Ouschan et al., 2006). The conceptualization of an intervention that fosters operant resource development is therefore a worthwhile endeavor. Thus far, the emphasis on operant resources is unique to heuristic boosting. However, the mechanism only focuses on one specific type of decision strategy. Interventions that target other operant resources can be conceived. Competencies consist of five distinct domains, namely “domain knowledge, psychological traits, cognitive skills, decision strategies, and task characteristics” (Shanteau, 1992, p. 256). Relatedly, it has been proposed that product- or service-related

knowledge may contribute to several dimensions of improved consumer welfare (Bell, Auh, & Eisingerich, 2017) as much as numeracy or health literacy can influence relevant decisions (Hertwig, 2017). Consumer boosts can affect such competencies by providing pieces of domain-specific information or conveying simple rules to compute the relative values of choices. In our conceptualization of consumer boosting, we consider all classes of operant resources as potentially relevant.

Transformative value. As introduced before, enhancing beneficiaries' transformative value is a central target of TSR and accordingly the goal of consumer boosts. Transformative value arises when sustainable consumer well-being is co-created through resource integration (Blocker & Barrios, 2015; McColl-Kennedy et al., 2012; Parkinson, Mulcahy, Schuster, & Taiminen, 2019). As limited capabilities may hinder successful resource integration (Anderson et al., 2016), transformative value can be elicited through increased competencies and skills (Taiminen, Taiminen, & Munnukka, 2020). Notably, TSR also deals with the potential of transformative value co-destruction through resource integration (Anderson et al., 2016; Ng et al., 2019). This potential needs to be considered in the design of TCI.

The integration of fundamental considerations of the interventions literature and TSR allows for an initial approximation of the above-mentioned definition of consumer boosting. As extant research indicates that specificity is essential to avoid conceptual overlap between intervention constructs (Sims & Müller, 2019), we further enhance definitional accuracy. TCI are interactions with consumers' cognitive processes and, to successfully foster transformative value co-creation while avoiding unintended consequences, need to incorporate findings on how these processes unfold. We specify in what way consumer boosts achieve their target outcome by including the core notions of behavioral decision theory: Consumer boosts need to be *context-specific*, *individualized*, and *efficient*.

Context-specific. Consumer decisions depend on myriad contextual factors (Handel, 2013; Sweeney et al., 2015). In complex services, acknowledging the decision context in intervention design is essential as it has the potential to change strategy selection and preference construction processes (Bettman et al., 1998; Zwebner & Schrift, 2020). Considering contextual elements in intervention design can enhance well-being (Nahum-Shani et al., 2018). This is even more the case as consumer vulnerability emerges in certain contextual constellations (Baker, Hunt, & Rittenburg,

2007), which may be avoided with context-sensitive interventions. Current technology provides the means to develop and implement such interventions (Aksoy et al., 2019; Danaher & Gallan, 2016). For instance, an intervention that seeks to encourage increased physical activity (e.g., walking) can account for the current weather and the built environment around a target's location (Klasnja et al., 2019). The success of consumer boosts critically depends on the successful implementation of such context data.

Individualized. Decision processes are highly individual. Individual-level co-creation determinants may include cultural background (McColl-Kennedy et al., 2012), locus of control (Sweeney et al., 2015), pre-existing expertise (Hibbert et al., 2012) or individual biometric markers (Wittkowski et al., 2020). As is the case with context data, modern technological means allow service firms to use personal-level data to make interventions more interesting and meaningful (Danaher & Gallan, 2016; Nahum-Shani et al., 2018). For instance, where relevant behavioral and biometric data are available, a fitness boost can consider the calories burnt on a specific day and the expected personal energy requirement during exercise. On that basis, a specific workout regime that allows a person to achieve their daily goal could be suggested. Another important aspect of individualized intervention design are personal goals. Both conscious and non-conscious goals have been shown to considerably influence strategy selection and effort allocated to a task (van Osselaer & Janiszewski, 2012). If goals have been specified, interventions can be designed to aid in their achievement (Ajzen & Kruglanski, 2019). If the same person as above had the goal of sleeping better in addition to burning calories, they would require a different boost. The intervention could highlight that while their workout duration contributes to better sleep, their habit of working out late in the evening prevents their body from entering a resting state for some hours after the activity (Chennaoui, Arnal, Sauvet, & Léger, 2015). To summarize, consumer boosts are most likely to be effective if they consider individual-level data and account for personal goals, which is encompassed in the term “individualized”.

Efficient. Co-creation requires consumers' effortful cognitive and behavioral participation in a service network (Sweeney et al., 2015). People attempt to reduce decision effort by leveraging efficient decision mechanisms (Gigerenzer & Brighton, 2009). If one decision task is executed more efficiently, resources for the further optimization of that or other decisions becomes available. As such, decision efficiency

may contribute to well-being. Consumer boosts are deployed when there is a high likelihood that consumers can benefit from the conveyed capabilities. Through the incorporation of context and individual-level data, the likelihood of presenting consumers with irrelevant information, which would result in wasted resources, is reduced. What is more, as capabilities obtained through consumer boosts can be applied to later decision problems, they can contribute to short- and long-term choice process efficiency. This can be achieved by conveying frugal decision strategies, providing the right bits of information in the right context, which alleviates search effort, or interpreting individual-level data which reduces consumers' computation effort.

Table 4 summarizes the theoretical roots of consumer boosting, central considerations for the design of the intervention, potential unintended consequences and opportunities for future academic exploration. In the following section, we provide an example.

Table 4: Overview of Consumer Boosting's Theoretical Roots, Design Considerations, and Future Research

Consumer Boosting	
Theme	Relevant finding(s) / propositions
Theoretical Predecessors	Bounded rationality; interventions research Consumer Boosting is paradigmatically rooted in bounded rationality. It considers attributes of other intervention mechanisms (Table 3) as well as their theoretical predecessors.
	Behavioral Decision Theory People adaptively use different decision strategies, depending on personal goals, perceived effort, and contextual factors. Strategy selection is individual, and preferences are constructed during the choice process.
	Transformative Service Research Service providers can support consumers in the co-creation of well-being. Mechanisms for efficient resource integration are required. To avoid harming consumers, unintended consequences of interventions need to be considered.
Bene- ficiaries	Consumers Consumer boosting enables consumers' co-creation of transformative value. It is focused on consumer outcomes and indirectly affects other actors in a service co-creation network.
	Increased operant resources Consumer boosts improve competencies by affecting one of the following areas: domain knowledge, psychological traits, cognitive skills, decision strategies, and task characteristics (Shanteau 1992).
Out- come examples	Health The present study presents examples of consumer boosts in a health context, including physical fitness and disease prevention.
	<i>Opportunities for future studies</i> The concept of consumer boosting can be transferred to other areas where limited resources and complex decision problems hinder the pursuit of well-being. These include financial decision-making, education, sustainability, charitable giving, and other areas.
Prerequisite knowledge for design	Various personal-level data Context-specific, personalized intervention design requires data such as consumers' goals, pre-existing knowledge, resource availability, and others (e.g., in health, biometric data). Means for data tracking, frequent consumer interactions, and consumers' willingness to share data are essential.
	Expected effort allocation Consumer boosts are efficient but require some resource investment. Resource requirements vary depending on the category of consumer boosts. Knowledge of consumers' ability and willingness to expend effort toward the pursuit of a goal can inform boost design.
Potential undesired consumer effects	<i>Opportunities for future studies</i> Future research needs to elaborate the determinants for the effectiveness of consumer boosts, which can be considered in intervention design and selection processes.
	Data vulnerability As a result of consumer boosts' unique data requirements, consumers are vulnerable to the misappropriation of their data. Service providers need to address this with secure and transparent data management policies.
	Annoyance effects / diminishing motivation When individual consumer boosts are perceived as too effortful or too many boosts are sent, this may result in consumers not wanting to consider further boosts. This limits the potential of long-term competency accumulation.
	<i>Opportunities for future studies</i> Rigorous empirical and conceptual research needs to establish whether unintended consequences that have been proposed for other interventions carry over to consumer boosts. We also suggest that any consumer boosting studies should consider further potential side effects, positive and negative.

A Health Consumer Boost

Consider the following consumer boost: To sustain her physical fitness, Mary has been using an activity tracker along with an app that leverages consumer boosts. Mary usually goes out for a run several times a week. Currently, she is not allowed to do so due to governmental regulations which are intended to reduce the spread of Covid-19. During a home workout, the app sends her a notification: “Mary, throughout the last weeks you have only gotten about one third of the intense exercise minutes you normally do. And this shows: Your resting heart rate has increased by 4 beats per minute and you might be feeling less fit than usual. We know that during a lockdown, you might not be able to go for a run as you normally do. But did you know that you can achieve the same results at home with high intensity training (HIIT) – and even in 40% less time? Interested? Click [here] for a list of HIIT workouts that you can do at home with no need for equipment.” Adhering to the key design principles of TCI, this exemplary consumer boost enables to Mary’s resource integration. The intervention leverages scientific insights (e.g., Klasnja et al., 2019), utilizes individual data (heart rate and further biometric data, movement patterns), is implemented just-in-time in a specific context, and efficiently improves operant resources that align with an explicit higher-order goal. If targeted well, it reduces information search load and computational effort required to digest substantial amounts of information.

Thus far, this article has developed the research area TCI through an integration of TSR and research on heuristic boosting, nudging, and behavioral decision research and conceptualized consumer boosting on that interdisciplinary basis. To solidify those findings, the next section proposes a generic conceptual model for transformative consumer interventions and discusses consequences of the different mechanisms discussed herein.

Consequences of Transformative Consumer Interventions

Like any other theoretical construct, TCI unfold their meaning in connection to other relevant entities, particularly their consequences. TCI immediately affect operant resources, but their ultimate goal is to enhance well-being. Transformative co-creation happens when service provider, consumer, and other actors integrate their respective resources to achieve a mutually beneficial goal (Davey & Grönroos, 2019). However, resource integration activities may lead to the co-destruction of value (Chen et al.,

2020). Interventions carry a risk of detracting from well-being, as interventions research has detected a host of unintended consequences (e.g., Dolan & Galizzi, 2015; Johnson et al., 2012). Those may be desirable, thus making an intervention more appropriate in a situation, or undesirable and harmful to consumers. Either way, intervention designers need to be aware of potential indirect effects to optimally empower consumers. Figure 7 shows a proposed conceptual model of interventions' immediate effects, intended indirect consequences, and common unintended outcomes.

We first consider the positive side effects of interventions. Nudging and heuristic boosting can have an impact on both individual and societal welfare (Reijula et al., 2018). This holds true for TCI, which focus on consumer outcomes, but may have societal effects. Service research also seeks to increase societal welfare (Ostrom et al., 2010), which is therefore a desirable, albeit unintended consequence. As another side effect, Hertwig (2017) suggests that in the long run, targets of heuristic boosts will accumulate decision-making competencies that they can apply to later tasks. He further argues that with rare exceptions, nudges do not have a lasting impact. For consumer boosts, the potential for later application of the obtained capabilities is not only a side effect, but a core consideration: The integration of these operant resources in later co-creation processes both elicits the longitudinal effect of transformative interventions and increases the lifetime intervention efficiency. Finally, enabling consumers to co-create may result in positive experiential states toward the service provider (Ouschan et al., 2006). Such positive spillover effects are important to consider when evaluating the effectiveness of different intervention mechanisms.

Among the empirical research related to nudging, some works have considered undesirable consequences (Table 3). These may arise even when the intervention designer is benevolent and does not intend to manipulate consumers (Goldstein et al., 2008; Thaler, 2018). For instance, it has been shown that nudges can result in effect reversals or boomerang effects (Dolan et al., 2012; Ringold, 2002). Invoking social norms, such as telling someone that most people are physically active for a certain amount of time per day, will increase the average activity of those who are under that level. For above-average performers, the opposite has been observed: After being informed of peer group behavior, their performance tends to deteriorate (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Likewise, it has been observed that well-established default nudges sometimes result in effects that oppose the predicted one

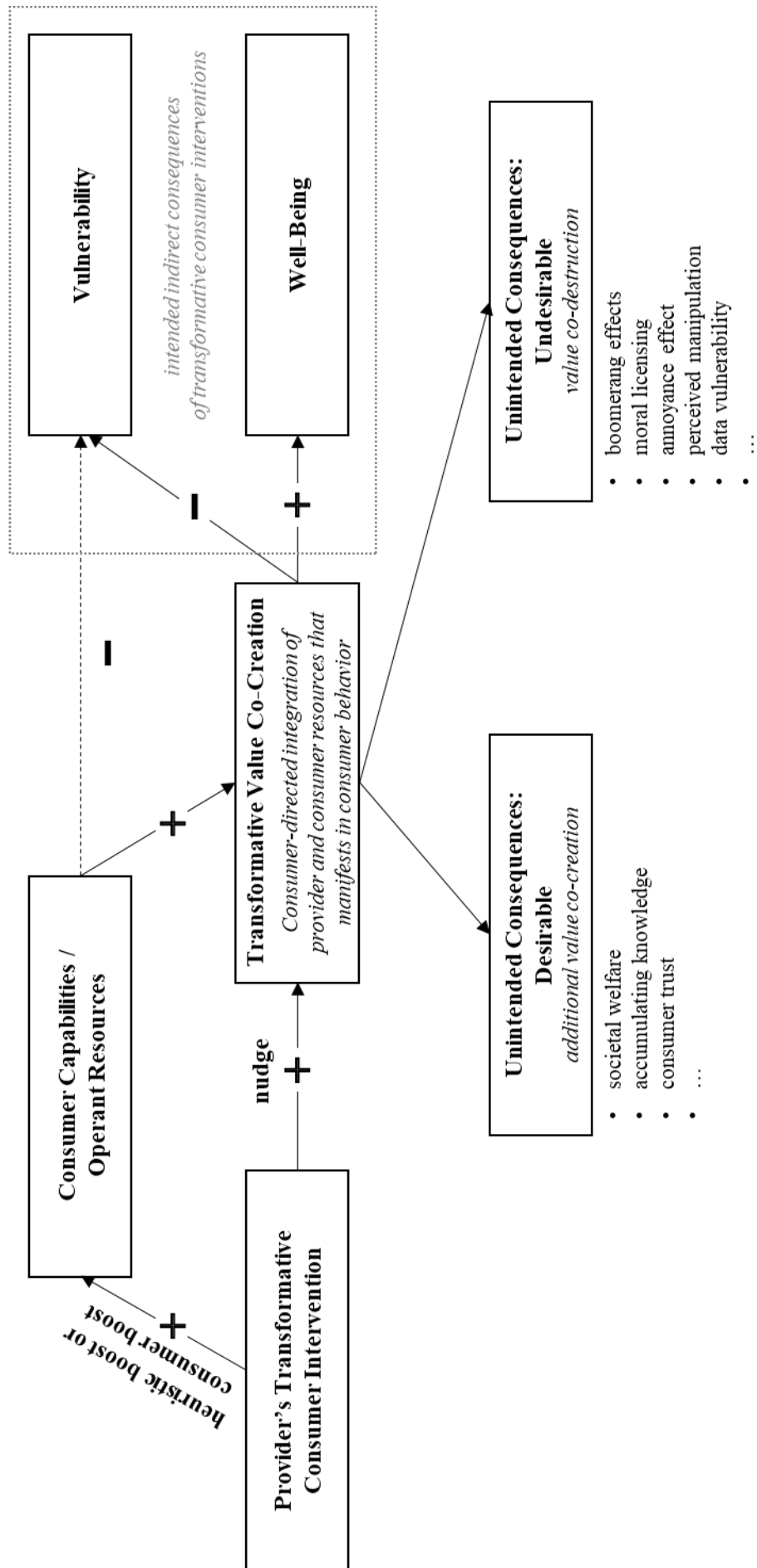


Figure 7: Conceptual Model of Transformative Consumer Interventions' Main and Side Effects

(Jachimowicz et al., 2019). In those cases, the integration of provider resources leads to value co-destruction. The next example of a negative spillover effect is moral self-licensing: After expending effort to behave in a socially desirable way, people tend to muster less effort for a subsequent, equally positive action (Hertwig, 2017). Someone who believes they have recently acted pro-socially is less likely to donate to a social cause later. Similarly, a person who has been nudged to wash hands more regularly may feel licensed to observe other hygiene rules less. This may lead to a negative overall effect (Dolan & Galizzi, 2015). Another unintended consequence of nudges, the annoyance effect, emerges when repeated nudges lead consumers to avoid further exposure to the intervention. It has been shown that recurring reminders to donate to a cause, embedded in a newsletter, can increase the initial donation amount, but also lead people to unsubscribe and thus reduce donation payments in the long run (Damgaard & Gravert, 2018; Goldstein et al., 2008). While choice architecture interventions can facilitate the efficient integration of resources in a co-creation process, these examples showcase situations where at least to some extent, negative side effects detract from the overall value increase.

Compared to nudging, the nascent heuristic boosting research has yielded limited empirical evidence on the construct's effectiveness, and to date, no empirical evaluation of the indirect consequences of boosts exists (Hertwig, 2017; Sims & Müller, 2019). Absent existing evidence, we hypothesize that the unintended consequences of nudges also persist for heuristic boost interventions, albeit potentially to a different extent. Boomerang effects may result for consumers with developed capabilities in a specific area when they learn a heuristic that seems useful but leads to worse decisions than they would otherwise have made. Additionally, when a heuristic boost is processed but does not increase resources, effort is wasted. Next, moral licensing may be an issue as the effect seems to persist irrespectively of how the initial, socially desirable behavior was brought about (Monin & Miller, 2001). Likewise, heuristic boosts may result in annoyance effects. While usually only conveyed once, that heuristic training requires some effort (Hertwig, 2017), which can lead consumers to circumvent future boosts.

Unintended consequences of interventions are ubiquitous and establishing an exhaustive list of all undesirable outcomes before the design of an intervention may be impossible. An efficient approach to the amelioration of unintended consequences is

the adherence to the TCI design principles. We exemplify this point with context-specific, individualized, and efficient consumer boosts.

Jachimowicz and colleagues (2019) propose that boomerang effects can occur when interventions are deployed without tailoring them to a specific context. Their meta-analysis of default nudges shows them to be more effective in consumption settings, as compared to their effect on pro-environmental behavior. This is in line with studies which have shown that the effect of interventions may vary, or even reverse, in different contexts (Andor & Fels, 2018). Accounting for the consumers' context will therefore reduce the risk of harming them.

Boomerang and annoyance effects may also be addressed by the individualization of consumer boosts. Some interventions have been shown to be misaligned with peoples' goals (Hertwig, 2017; Thaler, 2018), which may lead to psychological reactance. That reactance occurs when a person perceives a goal to be forced upon them (Ringold, 2002) and is therefore likely to decrease when an intervention is explicitly tailored to personal objectives. Likewise, it is less likely for consumers to be annoyed at a recurring intervention (nudges) or one that requires some cognitive effort (boosts) if it aligns with their personal goals.

Reactance to interventions may also be reduced by increasing their efficiency. As people perform more tasks that are perceived as less effortful (Sweeney et al., 2015), consumer boosts strive to improve consumers' ability to co-create transformative value with the same or even less resources. They therefore contribute to empowerment rather than to negative states associated with high decision effort.

This shows that consumer boosts mitigate some downsides that other interventions have. At the same time, TCI increase the risk of one negative side effect: Data vulnerability. To be effective, consumer boosts depend on personal and contextual data. For instance, reducing peoples' risk of cardiovascular disease can be facilitated by service firms' understanding of their relevant competencies, behavioral habits (e.g., activity, nutrition), biometric markers, preferences or knowledge of conflicting goals. With the current means to collect, store, and analyze those data (Huang & Rust, 2017), some co-creative service offerings such as wearable-based health apps only function when customers are willing to share their personal data (Klasnja et al., 2019; Wittkowski et al., 2020). While it seems reasonable to assume that an individuals'

context and preferences can never be fully grasped by an intervention designer, the amount of data consumers share will improve firms' ability to optimize consumer boosts. Data sharing will reduce uncertainty regarding the optimal intervention in each situation and thus moderate interventions' effect on transformative outcomes.

Consumers are more willing to share data when this leads to a perceived benefit (Martin, Borah, & Palmatier, 2017). However, data privacy is a ubiquitous concern and reputable companies can be victims to severe data breaches (Janakiraman, Lim, & Rishika, 2018). Service firms can address perceived vulnerability to privacy violations with transparent data management policies (Martin et al., 2017). This includes having appropriate data security measures in place and informing consumers that their data are being collected, what they are being used for, and how consumers can opt out. To avoid undesirable consequences, firms setting out to develop TCI need to adhere to such transparent practices.

In summary, direct and indirect outcomes of all interventions must be carefully considered before their implementation. Consumer boosting is central to any TCI strategy as it inherently addresses context, individualization, and efficiency. Nevertheless, nudging and heuristic boosting are equally important in a TCI toolbox. TCI principles can inform their design and in certain situations, both have the potential to facilitate resource integration. If consumers' goals are explicitly known, nudges can reduce the resource requirement of co-creation tasks. Heuristic boosts can alter the cognitive resources to deal with co-creative tasks, whenever a consumer is willing to allocate resources to extending their heuristic toolbox. Nevertheless, all interventions benefit from contextualization and personalization. Adopting a TCI mindset in the design of intervention strategies improves their effectiveness while preventing consumer harm: Interventions have situational merits which must be understood, optimized, and weighed. Put differently, peoples' strategy selection is adaptive, and this needs to be mirrored by interventions (Nahum-Shani et al., 2018; J. W. Payne et al., 1988).

Discussion

The present work integrates the interdisciplinary research area transformative consumer interventions and anchors it in TSR. TCI are interventions into consumers' cognitive processes that facilitate efficient operant resource integration or development and thereby enable the co-creation of transformative value. TCI theory enables the evaluation and design of existing interventions like nudging and heuristic boosting. These can situationally contribute to the targets of TCI, while in other settings, they are more likely to lead to the co-destruction of value and should be avoided. Additionally, TCI research provides a robust basis for the development of new intervention constructs. This article leverages TCI principles to conceptualize the new intervention consumer boosting. Consumer boosts are personalized and context-specific interventions that enhance consumers' operant resource repertoire and thereby enable them to efficiently co-create transformative value. As such, consumer boosts are promising when sufficient personal-level and context data can inform the intervention design. Our two central contributions have various implications for (transformative) service research and practice.

Theoretical Implications

Introducing interventions research to the service area and conceptualizing an intervention that seeks to foster transformative outcomes advances TSR in several ways. First, ten years ago, the improvement of well-being through transformative service was proclaimed a priority for service research (Ostrom et al., 2010). Recent publications show that a lot of work remains to achieve that goal (Anderson et al., 2016). Such progress in the interdisciplinary service domain requires the incorporation of established theories from other fields (Alkire et al., 2020; Anderson & Ostrom, 2015). TSR focuses on consumer outcomes, therefore psychological theories are well suited to inform the field. Integrating these facilitates the development of TSR concepts and frameworks (Chen et al., 2020; McColl-Kennedy et al., 2017; Mende & van Doorn, 2015). The present study is the first in TSR to include key concepts of behavioral decision theory, which helps understand how and under what circumstances consumers integrate resources in complex settings. We thereby generate theory-driven insights that are highly pertinent to the design and selection of transformative interventions. What is more, the consolidation and integration of extant interventions theory shows how

intervention concepts can contribute to transformative value co-creation. While no previous study has systematically scrutinized the link between cognitive interventions and TSR, we demonstrate the natural fit between the areas. Interdisciplinary intervention concepts yield extraordinary potential to facilitate transformative value co-creation and service research would benefit substantially from the further exploration of TCI theory.

With consumer boosting, we propose the first intervention construct that is deliberately tailored to achieve the focal outcome of TSR, transformative value (Blocker & Barrios, 2015). To be valuable to its stakeholders, service research relies on the development of applicable mechanisms and constructs. To date, however, a dearth of such concepts has been observed (Aksoy et al., 2019; Alkire et al., 2020). A reason for this scarcity may be a lack of relevant middle-range theory, which is conducive to construct development (Brodie et al., 2011). In that vein, outlining the middle-range TCI theory enables us to develop a mechanism therein. Consumer boosting differs from extant interventions in that it acknowledges the hurdles of achieving well-being in complex services and addresses those with a focus on context, personalization, and efficiency. As these aspects align well with TSR, they may also be considered in the development of other transformative service concepts. At the same time, consumer boosting reflects how new transformative intervention concepts can be developed through integration of different theories into TSR.

Our research explores the observation that resource integration can result in co-destruction (Chen et al., 2020) by showing how interventions can detract from well-being, even if they are designed with good intentions. Due to consumers' high personal stakes associated with services such as health, the unintended destruction of value has been subject to much research (Anderson & Ostrom, 2015; Spanjol et al., 2015). For example, it has been shown that self-tracking technology in health care can unexpectedly undermine advice compliance in some situations (Wittkowski et al., 2020). Similarly, assistive robots in health care can positively impact well-being, but at the same time contribute to reduced privacy or human interaction (Čaić et al., 2018). Any transformative service theory and concept needs to limit the potential of introducing new unintended consequences to service interactions and strive to ameliorate existing ones. The present research does so in two distinct ways. First, the introduction of TCI elucidates that several mechanisms may be valuable levers in the

co-creation of well-being. The TCI principles allow the assessment of interventions' situational merits and serve as signposts for the further theoretical development of existing intervention constructs that addresses their likelihood of unintended effects. Second, consumer boosts are interventions that are by design less likely to result in value co-destruction. We thus demonstrate that the deliberate development of mechanisms which reduce the potential of unintended consequences is possible and worthwhile. In doing so, the present research provides signposts for future research endeavors with a similar target.

Finally, this work has far-reaching interdisciplinary implications. Both public policy and behavioral decision research have called for the development of frameworks that consider various intervention mechanisms as equally relevant and focus on respective situational merits and shortcomings (Grüne-Yanoff et al., 2018; Münscher et al., 2016; Szaszi et al., 2018). TCI is a steppingstone toward such frameworks in that it introduces principles for the design and implementation of well-being-focused interventions. What is more, consumer boosting can easily transcend the boundaries of the service field and be applied in public contexts or product consumption settings.

Managerial Implications

This conceptual work has important implications for service practitioners. Businesses can leverage the TCI principles to select suitable interventions for specific purposes. Many different mechanisms have been suggested, and a TCI perspective allows the evaluation of their situational merits. Intervention architects' design and selection processes can be guided by TCI based questions: Which intervention is the most efficient in a situation? How can context and personal data be incorporated in the intervention design? Is it possible to reduce resource integration efforts directly through changes to the co-creation environment or is it more beneficial to increase consumer resources? Such guiding questions will increase the likelihood that appropriate interventions are selected. What is more, a structured evaluation can highlight situational shortcomings of interventions even before they have been tried in the field. While interventions are often selected and improved upon in try-and-error processes, a systematic and logical approach may shorten these processes, alert intervention designers to potential unintended consequences and thus reduce time and resource requirements while increasing the likelihood that the desired outcomes are achieved.

Furthermore, service providers will benefit from consumer boosting as an important addition to their intervention toolbox. As an intervention conceived for digital environments, consumer boosting is especially interesting for businesses that can make use of personal-level data and dynamically interact with consumers to support them in their goal pursuit. Consumer boosts convey important capabilities which foster transformative value. Unlike nudges, which are mostly effective when they are embedded in a choice process, consumer boosts can elicit a sustainable change in behavior. At the same time, they are more efficient than heuristic boosts and not restricted to one class of operant resources. Therefore, consumer boosts will often be the preferable alternative for a service provider who wants to improve well-being.

Limitations & Research Agenda

While the present research substantially advances theory and answers several calls for research, some limitations are inherent to this kind of explorative work. We suggest that these limitations are signposts for future transformative interventions research.

A psychological theory that sheds light onto how consumers use their resources, how their decision processes unfold, and how these processes can be interacted with yields important insights for the co-creation of transformative value. Accordingly, the present work benefits substantially from the incorporation of behavioral decision theory. At the same time, it is likely that other theoretical lenses will yield similarly relevant insights. Several theories that have been applied in TSR to other ends might allow the further elaboration of TCI. For instance, understanding under what conditions consumers take psychological ownership might illustrate when they are more receptive to specific interventions (Chen et al., 2020), while the theory of planned behavior may yield further indications of how consumer interventions can support goal-directed behavior (Ajzen & Kruglanski, 2019).

Empirical research is required to advance TCI beyond its conceptual state. First, TCI provides a basis for analyzing benefits and negative implications of interventions in a transformative service context. The TCI principles can guide rigorous experimental research which detects and catalogues the situational merits of intervention effectiveness. Such efforts are required for the development of consumer intervention frameworks that, rather than proposing one-size-fits-all approaches, consider various

intervention mechanisms as equally relevant levers to foster consumer well-being. Second, the new intervention construct consumer boosting needs to be substantiated with empirical evidence. While we describe consumer boost examples that lean on different elements which have been observed in real-world interactions, no explicit evidence on the effects of consumer boosts exist yet. Experimental research is required to establish the effect of different consumer boosts on well-being (either as perceived by consumers or measured by objective scales, such as the frequency of health incidents), to what extent the effects carry over to future decisions, and what potential unintended effects consumer boosts incur.

As a final limitation, health is the only field of application in the present research. Health is of central importance to (transformative) service research, but TCI are conceivable in other complex areas which substantially influence individual well-being, for instance financial services (Guo, Arnould, Gruen, & Tang, 2013). Another field where decision interventions have been discussed before is charitable giving (e.g., Damgaard & Gravert, 2018). From a TSR perspective, that area is intriguing as increasing consumers' ability to make satisfying and efficient decisions not only affects their well-being, but also that of charity recipients.

Conclusion

In closing, we acknowledge that creating and consistently selecting interventions that sustainably enhance consumer well-being is a tall order for academics and practitioners alike. The present research is an important first step toward that ambitious goal. It showcases that much valuable research which can contribute to this journey is readily available, as are the technological means to implement context-specific and personalized interventions. Service research will benefit from embracing consumer interventions as a driver of transformative value and can at the same time contribute substantially to this developing field.

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Empowerment Increases Engagement in Complex Services: A Multi-Method Investigation of the Effects of Empowerment on Consumer Engagement

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Abstract

Empowering consumers benefits firms. While intuitive and supported, albeit not unequivocally, by conceptual work, there is no generally accepted definition of empowerment among marketers. Consequences are conceptual vagueness and a paucity of empirical efforts.

This research shows evidence that empowerment is an important driver of consumer engagement in health and financial contexts. We differentiate between firms' empowering activities and consumers' perceived empowerment, where the latter is a psychological state that consists of perceived learning and perceived control. Across three studies, we show that empowering activities increase consumer engagement with the firm. This effect is mediated by perceived empowerment.

This work highlights the importance of empowerment for the marketing discipline and shows that and how the concept can be leveraged in marketing-based nomological networks. Marketing practitioners can use the improved understanding of the empowerment process to tailor their empowerment strategies to learning and control, thereby eliciting engagement.

Keywords: engagement, empowerment, perceived control, learning, health, finance

Introduction

In complex relational services such as health and finance, consumers often face hurdles when it comes to making the right decisions. Setting appropriate health and financial goals, devising plans to reach those goals, and sticking to the execution of the plans requires operant resources; competencies, cognitive effort, and the allocation of time. At the same time, the impact of operant resource deployment can be substantial. For instance, a lacking grasp of the long-term consequences of obesity can drastically increase the likelihood of preventable diseases and mortality (OECD, 2019). Failure to comprehend what is covered under an insurance policy can substantially impede future financial well-being. In light of such stakes, consumers' perceived vulnerability when making decisions related to their financial situation or health can be high. Specifically, it has been shown that a limitation of perceived competencies and perceived control in service contexts have important psychological, behavioral and physiological consequences on the individual level (Jayanti & Burns, 1998; Moeini et al., 2008; Moulding & Kyrios, 2007). For instance, vulnerability can manifest in an increased openness to manipulation by other market actors, or an increased risk of making worse than desirable decisions (Hill & Sharma, 2020).

Empowering activities can reduce individuals' vulnerability. Prior research suggests that vulnerability emerges in specific contexts, is temporally limited and can be decreased or overcome with cognitive and behavioral effort (Baker, Gentry, & Rittenburg, 2005; Baker, Hunt, & Rittenburg, 2007). Empowerment, on the other hand, is a process which increases consumers' control in a given situation, which positively affects subsequent well-being (Zimmerman, 1995). As well-being outcomes are often co-created (Vargo & Lusch, 2008), firm activities play a pivotal role in the empowerment process. While consumers' operant resources are finite, firms and other actors contribute and coordinate resources in value co-creation networks (Ng, Sweeney, & Plewa, 2019). Thus, shifting some of the onus of resource endowment away from consumers yields the potential to improve co-creation efficiency and outcomes in complex services (Keeling, Keeling, de Ruyter, & Laing, 2020). We suggest that the target of empowering activities is to improve the efficiency of value co-creation processes from the consumers' perspective, strengthens peoples' control in the pursuit of their explicit goals, and thereby contributes to their perceived well-being. Companies can facilitate consumer empowerment by reducing required resources to achieve a

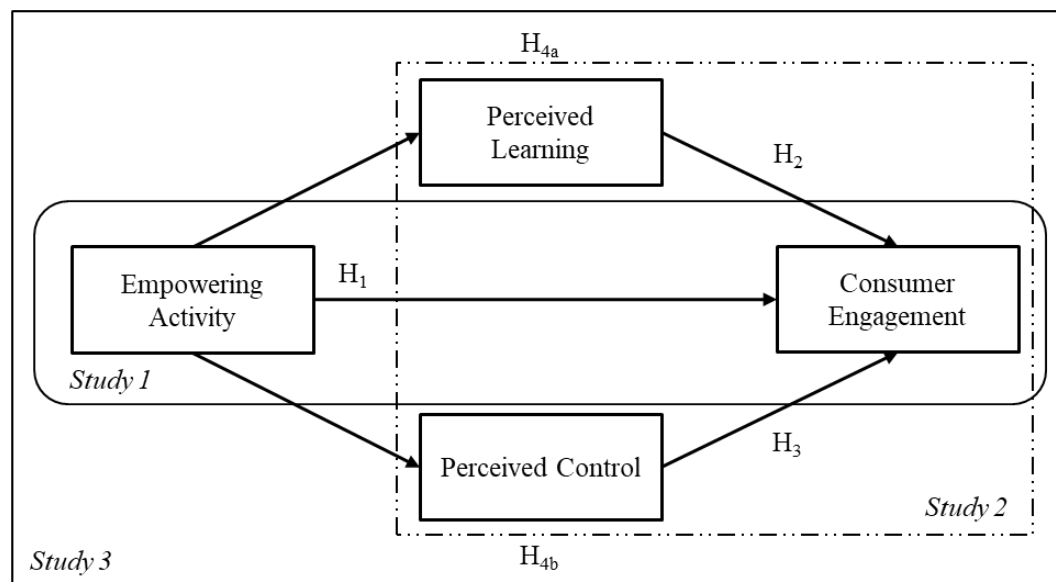
stable outcome, or by increasing consumer operant resources. For instance, a firm may facilitate consumers' evaluation and purchase processes by simplifying the language of their terms and conditions, or they may convey basic competencies which allow for an improved judgement of an offer's merits. Both approaches reduce the perceived effort of consumer to execute the focal tasks, which can lead to more such tasks being tackled and, ultimately, to increased well-being (Sweeney, Danaher, & McColl-Kennedy, 2015).

The empowerment of consumers has been a recurring theme in marketing and consumer research literature. Recent research suggests that increasing consumers' perception of power in a given context induces improved choices and contributes to well-being goals (Tanner, Vann, & Kizilova, 2020; Wang, Minton, & Zhang, 2020). In complex services where knowledge is a key resource in value co-creation, overcoming information asymmetries can lead to empowerment (Keeling et al., 2020). To date, however, the empowerment literature is fragmented as a result of diverse disciplinary influences and even within marketing, several different conceptualizations remain (Bachouche & Sabri, 2019). Consequently, there is a paucity of empirical evidence on how firms can benefit from empowering consumers (see Ouschan, Sweeney, & Johnson, 2006 for a notable exception). The present research contributes to closing that gap and shows that consumer empowerment has a significant and substantial impact on consumer engagement. This finding replicates across different service contexts.

Throughout the last decade, consumer engagement research has gained traction in the field of marketing. Consumer engagement (CE) is a psychological state that reflects peoples' motivation to interact with a firm (Hollebeek, Srivastava, & Chen, 2019; Jaakkola & Alexander, 2014). In that vein, engagement marketing has been characterized as firms' activities that motivate and empower consumers to contribute resources in a service exchange (Harmeling, Moffett, Arnold, & Carlson, 2017). Engagement is a multidimensional construct that can lead to increased customer satisfaction (Hollebeek, 2011), trust (Brodie, Hollebeek, Jurić, & Ilić, 2011), and loyalty (Brodie, Ilic, Juric, & Hollebeek, 2013), among others. What is more, engagement is an antecedent of organizational performance (Kumar & Pansari, 2016; Verhoef, Reinartz, & Krafft, 2010). Therefore, advancing understanding of when and on which conceptual pathways engagement can be increased is a worthwhile endeavor.

We suggest a conceptual model of the effects of empowerment on consumer engagement. Across three studies, we demonstrate that empowering activities increase consumer engagement with a focal service offering. This increase is mediated by the perceived empowerment of consumers, which in our model consists of both perceived learning and the perceived increase in control over a well-being outcome. Figure 8 outlines the complete conceptual model and provides an overview of the studies conducted for the present work. We find that the model holds in two areas with substantial impact on consumer well-being, that is, health and financial services (Anderson & Ostrom, 2015; Anderson et al., 2013).

Figure 8: Conceptual Model and Overview of Hypotheses and Studies



The present research contributes to academic progress in four important ways. First, we introduce consumer empowerment as a two-step process that begins with a firm's empowering activities (EA) which, if successful, result in an increase of consumers' perceived control and learning. The explicit distinction between EA and perceived empowerment enables a more focused discussion of how consumer empowerment can be facilitated as well as an understanding of what may result from empowerment initiatives, and why. The model thus consolidates extant research and makes the somewhat fuzzy concept of empowerment more tangible. Second, we provide the first two-part measure of perceived consumer empowerment. Reflecting the current state of research, this scale considers both consumers' perceived learning as well as their perceived control in a service environment. Making empowerment measurable

in that way is another crucial step in the further development and empirical validation of the construct. Third, this work contributes to the consumer engagement literature by proposing and validating consumer empowerment as an antecedent. Finally, demonstrating the effects of empowerment on engagement showcases the relevance of the construct in a marketing context.

Making the empowerment construct tangible is also an important contribution to marketing practice. Firms who have included empowering elements in their business strategy, or have contemplated doing so, will be able to provide evidence as to their effectiveness. That way, managers may perceive empowerment initiatives as strategic imperatives rather than niche projects. What is more, the present research provides an improved understanding of the relevant empowerment dimensions and of how (not) to drive consumers' empowerment perceptions. A key realization in that vein is that EA are only likely to lead to positive downstream consequences when they improve perceived empowerment, i.e., when they lead to perceived learning and / or control. This allows the development of well-targeted consumer empowerment initiatives that are more likely to be effective than before. Last, this research outlines a new mechanism to foster consumer engagement. This can motivate firms which have previously not focused on consumer empowerment initiatives to do so in the future. This will also benefit consumers, who with the right support will be able to overcome vulnerabilities as well as perceived and actual power asymmetries in the markets.

The remainder of this paper is structured as follows. First, we give an overview of the relevant theories and develop a set of hypotheses as well as the conceptual model. These are empirically validated in three studies. After a general discussion of the results, we outline the present study's limitations as well as its implications for business practice and further research.

Theoretical Background and Hypotheses

This section introduces the literature that served as the foundation for the development of the hypotheses and conceptual model. Specifically, we assess current research on the different dimensions of consumer empowerment and CE.

Consumer Engagement

CE research emerged just above a decade ago in an attempt to move beyond the popular, yet simplistic customer satisfaction concept (Bowden, 2009). Since then,

engagement has developed into one of the central research objects in marketing (e.g., MSI, 2020).

Consumer engagement is a psychological state that reflects a person's potential to interact cognitively, emotionally, or behaviorally with a firm (Brodie et al., 2011). It is motivational in nature and unfolds its relevance through the elicitation of desired consequences (Hollebeek et al., 2019). Engagement research has been conducted in a variety of contexts. Due to the interactive nature of CE, significant attention has been given to inherently interactive, digital settings. For instance, recent research explores situational influences of online brand communities (Hanson, Jiang, & Dahl, 2019), social media (de Oliveira Santini et al., 2020), and mobile applications (Vishwanathan et al., 2017) in relation to CE. These efforts have largely confirmed the generalizability of CE's foundational principles, but also demonstrated that effect sizes are dependent on contextual aspects such as the type of the firm or their mode of interaction with consumers (de Oliveira Santini et al., 2020). Therefore, in order to establish robust theoretical and managerial implications, it is essential to be aware of potential situational contingencies. We address this with the different settings our studies are conducted in.

The relation of engagement to a host of consumer and firm-based antecedents and consequences has been assessed. For instance, it has been shown that CE is brought about by consumers' trust, and may at the same time result in more trust for established customers (Brodie et al., 2011). What is more, CE levels are increased by consumers' satisfaction with a service offering as well as their positive emotions towards it (de Oliveira Santini et al., 2020). As for the outcomes, CE positively affects loyalty, satisfaction, and can drive purchase intentions (Brodie et al., 2013; Hollebeek et al., 2019). Given these consumer-side effects, it comes as no surprise that engagement also positively influences firm performance (Kumar & Pansari, 2016; Kumar, Rajan, Gupta, & dalla Pozza, 2019).

Another proposed, albeit difficult to measure, effect of CE is the elicitation of co-creation in service encounters. There is a strong conceptual link between CE and co-creation, in that they both focus on interactive experiences in a value co-creation network (Hollebeek et al., 2019; Jaakkola & Alexander, 2014). The key distinction is that CE denotes a motivational state (Hollebeek, 2011), whereas co-creation implies activity (cognitive or behavioral) of the involved parties. We thus argue that CE in a

service network is latent co-creation potential, which when altered accordingly affects the likelihood of co-creation. In other words, CE is a psychological antecedent to co-creative activities.

Empowerment

The empowerment construct has been of interest to various disciplines, such as organizational research (Spreitzer, 1995), health care (Ouschan et al., 2006), psychology (Zimmerman, 1995), and marketing and its sub-disciplines (Wathieu et al., 2002; Wittkowski et al., 2020; Wright, Newman, & Dennis, 2006). While this showcases the relevance of the notion of empowerment, these diverse perspectives have contributed to conceptual vagueness. This issue is further aggravated by the ambiguity of the term: “empowerment” can describe the act of empowering someone, the process leading to increased power, or that state of higher power itself (Bachouche & Sabri, 2019). Within the marketing discipline, empowerment has been used to denote the act of giving consumers more choice options (Shankar, Cherrier, & Canniford, 2006; Wathieu et al., 2002), increasing their competencies and autonomy to make choices (Prigge, Dietz, Homburg, Hoyer, & Burton, 2015), or facilitating consumption enjoyment (Wright et al., 2006). This has led to lacking consensus on fundamental questions such as whether or not empowerment is desirable (Broniarczyk & Griffin, 2014).

There is, however, some agreement on the concept of psychological or perceived empowerment (PE). PE focuses on an individuals’ state of perceived power and the alteration of that state. It depends on the context and is individually determined (Prigge et al., 2015; Zimmerman, 1995). Consequences of PE include increased satisfaction (Wathieu et al., 2002) and a higher propensity to comply with expert advice (Camacho, De Jong, & Stremersch, 2014). What is more, the service literature suggests that empowerment is an antecedent to consumer’ ability to co-create (Ouschan et al., 2006; Wittkowski et al., 2020).

We extend this notion and suggest that EA foster consumers’ potential to co-create value. In that vein, effort plays a central role. Recent advances based in the service dominant logic show that the integration of resources to achieve well-being outcomes requires consumer effort, and that tasks which are considered to be more effortful are attempted less than easier tasks (Sweeney et al., 2015). The success of

value co-creation activities is therefore dependent on service provider's ability to facilitate consumers' resource integration (Keeling et al., 2020). We propose that firms can tailor their communication and actions toward consumers in a way that strengthens consumers' position in a service co-creation network, thus empowering them. EA as conceived herein can contribute in two distinctive ways. First, they can alter the extent to which consumers need to allocate resources to a co-creation process in order to achieve the same outcome, or they can alter that process in a way that elicits improved outcomes for consumers despite the same allocation of time, competencies or other resources. Various means to that end are available to firms. To mention but two, firms can anticipate what data is relevant and meaningful to consumers in a given context and communicate that information proactively and transparently, all of which reduces consumers' information seeking effort. A timely example is the measurement and visualization of health data via wearable devices (Wittkowski et al., 2020). Alternatively, they can support consumers' understanding of the subject matter, and thus their capability to evaluate given information efficiently and successfully, for instance by leveraging educational or behavioral interventions (Alba & Hutchinson, 1987; Fischhoff & Broomell, 2020; Grüne-Yanoff & Hertwig, 2016).

The second mechanism through which EA may affect co-creation potential is through an alteration of consumers' psychological state. Psychological states have a signaling function; negative affections encourage a more considerate, that is, effortful processing of the available information (Luce, Bettman, & Payne, 1997; Schwarz, 2010). As higher effort does not necessarily increase decision-making accuracy (Gigerenzer & Brighton, 2009), negative emotional states can lead to wasteful decision making, increase actual and perceived effort, and detract from overall value. Successful EA, on the other hand, result in a state of perceived empowerment, which evokes positive emotions within the service exchange. This reflects evidence from a management context, which shows that empowering leadership increases psychological empowerment, which in turn raises employee engagement and motivation (Zhang, 2010). Similarly, we suggest that empowerment elicits the motivation to further interact with the firm that was the source of that empowerment, that is, consumer engagement. We propose this initial hypothesis:

H₁: Firms' empowering activities increase consumer engagement with the firm.

In the following paragraphs, we elucidate the conceptual pathways on which EA lead to CE, focusing on two dimensions of psychological empowerment: Perceived learning and perceived control.

Perceived learning. Within studies on consumer empowerment, perceived learning and perceived control are recurring, distinct themes (Wittkowski et al., 2020). The learning dimension is central to Zimmerman's conception of PE as "a process by which people, organizations and communities gain mastery over issues of concern to them" (1995, p. 581). From that perspective, PE is not static but varies over time, subject among other factors to altered cognitive resources, i.e., consumer learning. An empowered state can be pursued by the development of competencies and skills (Bachouche & Sabri, 2019). While firms may sometimes be reluctant to assist consumers in the acquisition of relevant expertise (Bell, Auh, & Eisingerich, 2017), various desirable outcomes of consumer learning have been established. For instance, learning increases task enjoyment (van Beuningen, de Ruyter, & Wetzels, 2011), loyalty (Xu, Benbasat, & Cenfetelli, 2011), and trust (Eisingerich & Bell, 2008). What is more, recent research suggests that knowledge development and learning facilitate the development of CE as consumers must acquire the cognitive capabilities to integrate resources in a service exchange (Hibbert, Winklhofer, & Temerak, 2012; Hollebeek et al., 2019). Similarly, Lemon and Verhoef (2016) state that empowerment, which they conceive as consumers' increased potential to co-create or destroy value, leads to increased engagement with relevant firms.

H₂: In a value co-creation process, higher perceived learning leads to higher consumer engagement with a relevant service provider.

Perceived control. As for the second dimension of perceived empowerment, EA can increase a consumer's sense of control in a given context (Camacho et al., 2014). As is the case with learning, the motivational state of CE is most affected by consumers perceived, as opposed to their actual control (Bachouche & Sabri, 2019). There is a long history of research outlining the consequences of consumers' perceived control on behavioral, cognitive and emotional outcomes, including their well-being (Hui & Bateson, 1991; Jayanti & Burns, 1998). Wallston and colleagues suggest that perceived control is the "belief that one can determine one's own internal states and behavior, influence one's environment, and bring about the desired outcomes" (1987, p. 5). We

hypothesize that this belief leads to a higher willingness to engage cognitively, behaviorally, and emotionally throughout a co-creation process.

H₃: Higher perceived control over a focal outcome leads to higher consumer engagement with a relevant service provider.

We have suggested that CE can be increased by altering the required resource allocation in a service exchange, or by increasing the efficiency of allocated resources. As empowerment unfolds its effects primarily through an alteration of consumers' psychological state (Zhang, 2010), the effectiveness of such activities can be gauged via the measurement of perceived control and learning. Irrespective of how empowerment is caused, it is a two-step process where empowering activities are only effective in achieving their ultimate goal when they succeed in eliciting a perception of increased control and learning. In that vein, we propose that perceived empowerment mediates the effect of empowering activities on CE.

H₄: The relationship between firms' empowering activities and resulting consumer engagement is mediated by (a) consumers' perceived learning and (b) their perceived control over a focal service outcome.

Overview of Studies

Service research is characterized by its consideration of several fields of application and contextual conditions (Ostrom et al., 2010; Ostrom, Parasuraman, Bowen, Patrício, & Voss, 2015). For instance, health services include consultations in hospitals as well as mobile fitness applications. Likewise, an insurance broker evaluating appropriate policies with a customer constitutes a financial service as much as an online investment platform. Generalizable service-related research needs to cover different substantive areas as well as modes of interaction. To that end, our studies are conducted in both a health and a financial service context, as well as a generic and a mobile application setting. What is more, recent research suggests that there may be regional differences in the effects on CE creation processes (Kumar et al., 2019). We account for this by conducting our first study in several countries.

Study 1 assesses the proposed direct effect of EA on CE in a financial services context. To establish the international generalizability of the findings, the study was conducted with representative samples in five regions. Study 2, which was conducted in a health app setting, teases out the effects of perceived learning and perceived control

on CE. Finally, study 3 assesses the whole model, in which the two PE dimensions mediate the direct effect of EA on CE. With about half of the participants each considering either a health app or a financial app experience, the study allows the comparison of effect sizes in these scenarios.

Study 1: Direct Effect of Empowerment on Engagement

This study tests the foundational assumption of the conceptual model, that is, that firms' empowering activities increase CE with that firm. This study is conducted in a financial services setting. Specifically, an international panel of respondents was asked to answer questions about a salient experience with an insurance firm. This field was chosen as insurance is one of the key industries in the financial services sector, and insurance-related decisions can profoundly affect individual well-being (Netemeyer, Warmath, Fernandes, & Lynch Jr, 2018). What is more, there is robust evidence that classic means of information, which firms often try to leverage, are ineffective at improving financial literacy (Fernandes, Lynch, & Netemeyer, 2014; Willis, 2011). Such studies call for different, more targeted means of education, but notably ignore the relevance of perceived learning or control. Consequently, alternative drivers of perceived empowerment in a service exchange have not been sufficiently explored (Bachouche & Sabri, 2019). The present survey addresses this gap and proposes a new scale to measure firms' empowering activities beyond mere educative initiatives. Empowering consumers by proactively and transparently communicating individually relevant information in a way that fosters understanding is expected to have a positive impact on how consumers perceive their role in the value co-creation process, which will lead to positive consumer-based consequences such as engagement.

Method and Scales

We developed an online questionnaire and conducted a pre-test to assess the survey flow and average time requirement. Then, a professional panel service distributed an online survey to representative samples in five countries (Australia, Canada, Singapore, UK, US). Participants received a monetary compensation. Obtained responses were checked for previously determined low-quality indicators: Faster than reasonable completion, giving the same answer to all questions, and failing an attention check were reasons for flagging participants. In total, two thousand and thirty-four

participants ($N = 2,034$; 53.0% female; $M_{\text{age}} = 42.5$, $SD = 12.8$) passed the quality check procedure and were included in the final analysis.

The survey asked people to recall the last interaction with an insurance company, if they ever had any. They were then asked to think of their experiences with that company for the rest of the survey. In the main section of the survey, participants answered a set of questions regarding the company which included the empowering activities scale. As to date, no such scale exists, it had to be developed for the present study (an overview of the utilized scales per study is provided in Table 5. In line with the theoretical background outlined above, the scale measures firms' empowerment of consumers as those activities that convey relevant information, do so transparently and proactively, and thereby foster understanding. Such activities alleviate issues arising out of consumers' limited resources and thereby enable more successful co-creation processes (McColl-Kennedy, Vargo, Dagger, Sweeney, & van Kasteren, 2012). By facilitating cognitive processes, these firm activities should contribute to consumers' feeling of control, while the conveyed information can elicit a sense of learning. The EA scale was influenced by a previous study in a health services setting, which was adapted to the present context (Ouschan et al., 2006). Toward the end of the survey, participants answered items on an engagement scale. This scale was based on two existing measures (Kumar & Pansari, 2016; Vivek, Beatty, Dalela, & Morgan, 2014) and one on engagement behavior in an insurance context (Chen, Weng, & Huang, 2018). These scales were substantially consolidated, reworded where necessary to fit the study setting, and limited to four items in order to keep the survey reasonably short.

In preparing the surveys for studies 1-3, common method variance was a concern. Following recommendations of MacKenzie & Podsakoff (2012), the likelihood of severe common method bias was addressed through the implementation of the following procedural remedies: When developing the surveys, they were kept reasonably short to reduce cognitive exhaustion and repetitive questions were avoided as well as singular items with more than one meaning. What is more, the wording was consistently chosen to emphasize the high personal relevance of the questions, which was further facilitated by the study contexts (health and / or insurance).

Like the other studies, study 1 ended on a set of demographic questions and short debriefing. The study was in cooperation with a digital health provider as part of a joint research project.

Table 5: Overview of Scales for Construct Measurement Across Studies

Source(s) / Influences	Scale and Items	Factor Loading	α	CR	AVE
Ouschan et al. (2006; patient empowerment context); conceptual literature	Study 1: Empowering Activity		.93	.93	.73
	My provider informs me immediately of any problems or new developments.	.82			
	My provider helps me understand the best solution/policy required for me individually.	.87			
	My provider presents unbiased, meaningful information to me.	.84			
	My provider communicates with me transparently in a way I can understand.	.87			
	My provider responds to my changing needs/circumstances.	.87			
Pansari & Kumar (2016); Vivek et al. (2014); Chen et al. (2018)	Study 1: Consumer Engagement		.85	.85	.58
	I ask my provider for information proactively.	.77			
	I discuss the policies of other insurance companies with my provider.	.80			
	I suggest modifications to my policies when conducting a purchase.	.79			
Eisingerich & Bell (2008); van Beuningen et al. (2011)	I refer potential other customers to my provider.	.69			
	Study 2: Perceived Learning		.74	.75	.44
	Using the app was educating.	.53			
	Using the app was meaningful.	.84			
	Using the app was interesting.	.61			
own item	How much has using the app increased your health knowledge?	.62			
	Study 2: Perceived Control		n.a.	n.a.	n.a.
Hollebeek et al. (2014); Vivek et al. (2014)	I believe the app could help me improve my health.				
	Study 2: Consumer Engagement		.86	.86	.52
	If this app was available, I would like to use it again.	.86			
	I would recommend this app to my friends.	.82			
	I would be interested to see a live version of this app.	.65			
	I could not imagine using an app like this at all. [reverse coded]	.66			
	I am passionate about this app.	.76			
Study 1; conceptual literature	Using the app got me thinking.	.52			
	Study 3: Empowering Activity		.72	.73	.36
	The app helps me understand the best solution for me.	.70			
	The app presents unbiased information to me.	.43			
	The app communicates with me transparently in a way I can understand.	.67			
	The app actually wants to help me, not only to sell me something.	.56			
	The app deliberately includes features that have the target of increasing my knowledge.	.61			

Table 5: (continued)

Source(s) / Influences	Scale and Items	Factor Loading	α	CR	AVE
Ouschan et al. (2006; patient empowerment context)	Study 3: Perceived Control		.78	.79	.49
	When interacting with the app, I feel like I am in control.	.55			
	Using the app has made it more likely that I achieve my health goals.	.80			
	Using the app empowers me.	.77			
	Using the app helps me overcome my weaknesses.	.66			
Eisingerich and Bell (2008); Prigge et al. (2015)	Study 3: Perceived Learning		.88	.89	.56
	Using the app is educating.	.71			
	Since using the app, I believe I have learned more about health than other people who do not use the app.	.75			
	I know more about health since I have started using the app.	.82			
	Using the app is meaningful.	.70			
	Using the app is interesting.	.65			
	The app has taught me valuable things.	.85			
Hollebeek et al. (2014); Vivek et al. (2014)	Study 3: Consumer Engagement		.86	.86	.52
	Using the app makes me think. <i>[cognitive]</i>	.57			
	I want to use the app more in order to learn something. <i>[cognitive]</i>	.69			
	I am passionate about this app. <i>[emotional]</i>	.81			
	I feel good when I use the app. <i>[emotional]</i>	.75			
	I'm proud to use the app. <i>[emotional]</i>	.82			
	The app reflects who I am. <i>[emotional]</i>	.76			
	I spend a lot of time using the app, compared to other health apps I am using. <i>[behavioral]</i>	.71			
	The app is one I usually use when using health apps. <i>[behavioral]</i>	.57			
	If additional features were offered in the future, I would use the app more. <i>[behavioral]</i>	.60			

Note: all items measured on 5 point Likert scales from 1 (strongly disagree) to 5 (strongly agree)

CR = Composite Reliability; AVE = Average Variance Extracted

Results and Discussion

We assessed the validity and reliability of the EA scale and the consolidated CE scale. An overview of confirmatory factor analyses and reliability values for all scales is provided in Table 5, descriptive statistics per study are listed in Table 6. The scales measuring EA ($M_{EA} = 3.64$, $SD = .83$, $\alpha = .93$) and CE ($M_{CE} = 3.15$, $SD = .87$, $\alpha = .85$) showed a high internal reliability, with the different scale items loading relevantly on the respective construct (factor loading $> .7$ for all indicators) (Bagozzi & Yi, 2012).

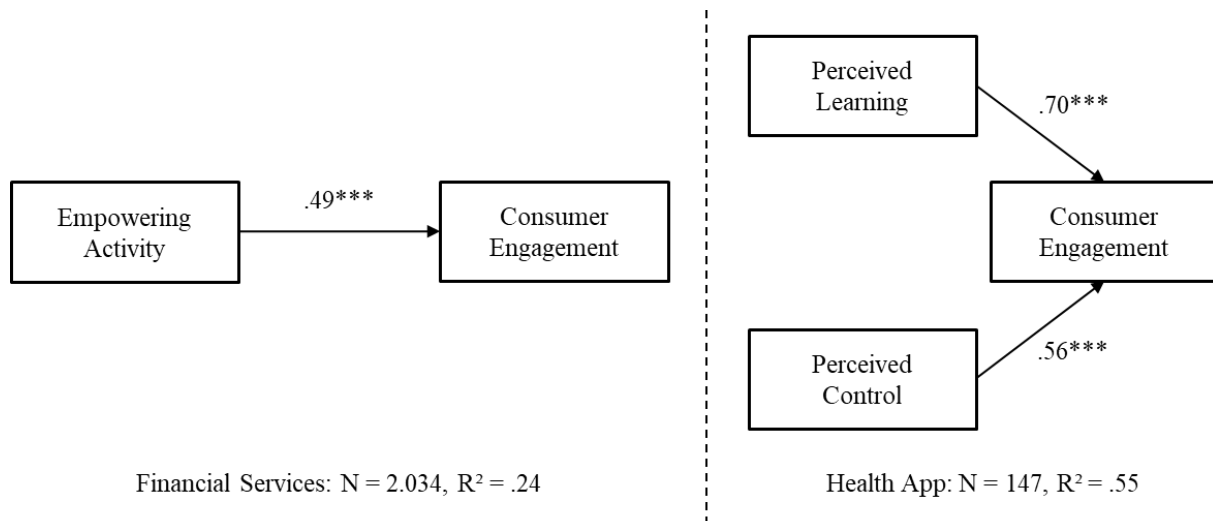
Table 6: Overview of Scale Descriptive Statistics and Correlations per Study

Study	Construct	Mean	SD	(1)	(2)	(3)	(4)
1 n = 2,034	Empowering activities	3.64	.83	-			
	Consumer engagement	3.15	.87	.49**	-		
2 n = 147	Perceived learning	3.60	.62	-			
	Perceived control	3.89	.82	.51**	-		
	Consumer engagement	3.63	.75	.70**	.56**	-	
3 n = 508	Empowering activities	4.01	.59	-			
	Perceived learning	3.96	.74	.65**	-		
	Perceived control	3.93	.72	.67**	.72**	-	
	Consumer engagement	3.75	.74	.64**	.80**	.70**	-

** $p < 0.01$ (two-tailed)

The results of study 1 and 2, which are elements of the complete conceptual model, are shown in Figure 9. Testing the direct effect proposed in H_1 , a bivariate linear regression found that firms' EA have a substantial impact on CE. Consumers who reported that their provider communicated in an empowering manner ranked significantly higher on the engagement scale ($\beta = .49$, $p < .001$). We controlled for age and gender, which had no significant impact on the result. H_1 is therefore confirmed.

To our knowledge, this is the first study that showcases the impact of EA which go beyond educative measures on CE. The effect was robust across the five assessed countries. The country samples yielded similar standardized effect sizes ($N_{AUS} = 393$, $\beta_{AUS} = .52$, $N_{CA} = 417$, $\beta_{CA} = .49$, $N_{SG} = 402$, $\beta_{SG} = .51$, $N_{UK} = 421$, $\beta_{UK} = .47$, $N_{US} = 401$, $\beta_{US} = .42$; significance level for all results $p < .001$). This shows that neither cultural differences nor the respective insurance systems have a relevant impact on the relationship between EA and CE in that area. The results are a first indication toward a generalizability of the findings.

Figure 9: Direct Effects on Consumer Engagement (study 1 and study 2)

Study 2: Effects of Perceived Empowerment on Engagement

Study 2 set out to assess whether and to what extent consumers' perceived empowerment increases their engagement with a focal service provider. The setting for this study was a health app experience. Like finance, health is another service area where the results of co-creation processes have a substantial impact on individual well-being. At the same time, mobile apps that support consumers in the pursuit of their health goals are on the rise. Health apps allow for frequent, individualized, and context-specific interactions with users as well as the collection and rapid analysis of vast amounts of data (Witkowski et al., 2020). Such technological advancements increasingly provide rich new opportunities for the co-creation of value (Huang & Rust, 2017). Whether in health or other areas, they allow consumers to take control of their own well-being outcomes and behave in alignment with their goals more efficiently. In other words, health apps can empower users. Therefore, health apps are a relevant and timely field of analysis.

Method and Scales

One hundred and forty-seven students of a university in Switzerland (44.2% female, $M_{\text{age}} = 23.1$, $SD = 3.4$) participated for monetary compensation. The study was conducted in that institution's behavioral lab. The study consisted of two parts: First, the participants had fifteen minutes to experience a mock-up version of an app that

conveyed personalized, context-specific health competencies. In the scenario presented to participants, it was suggested that they had been feeding data from various sources (e.g. fitness wearable, regular mental health surveys) into the app with the goal of improving their health. All participants saw an overview of their health in five categories (mind, heart, sleep, weight, and activity). It was indicated that some of these categories required improvement. The users could then freely explore the individual categories, which shed light on how a rating was calculated and what it meant for the overall health of the users. Participants received information on their individual health state which were triggered at different points of the app. For instance, in the mock-up presented to participants they could see that their alter ego's sleep needed improvement. As an empowering intervention, popups shortly introducing desirable levels of sleep-related indicators and ways to reach them were shown. The design of the health overview in the female condition, more detailed information within the category "sleep", and a context-specific, personalized intervention with the intent of empowering users' sleep-related behavior is depicted in Figure 10. In total, participants could explore up to 65 different screens.

In stage two of the study, after having explored the app for the assigned time, participants were asked to report their experiences with and feelings towards the app in a survey. First, the survey tested perceived learning in a scale that was influenced by extant empirical research on learning in a service context (Eisingerich & Bell, 2008; van Beuningen et al., 2011). The scale was adapted to fit the app context and framed to specifically address participants' perception of learning, rather than an actual difference in literacy or skills.

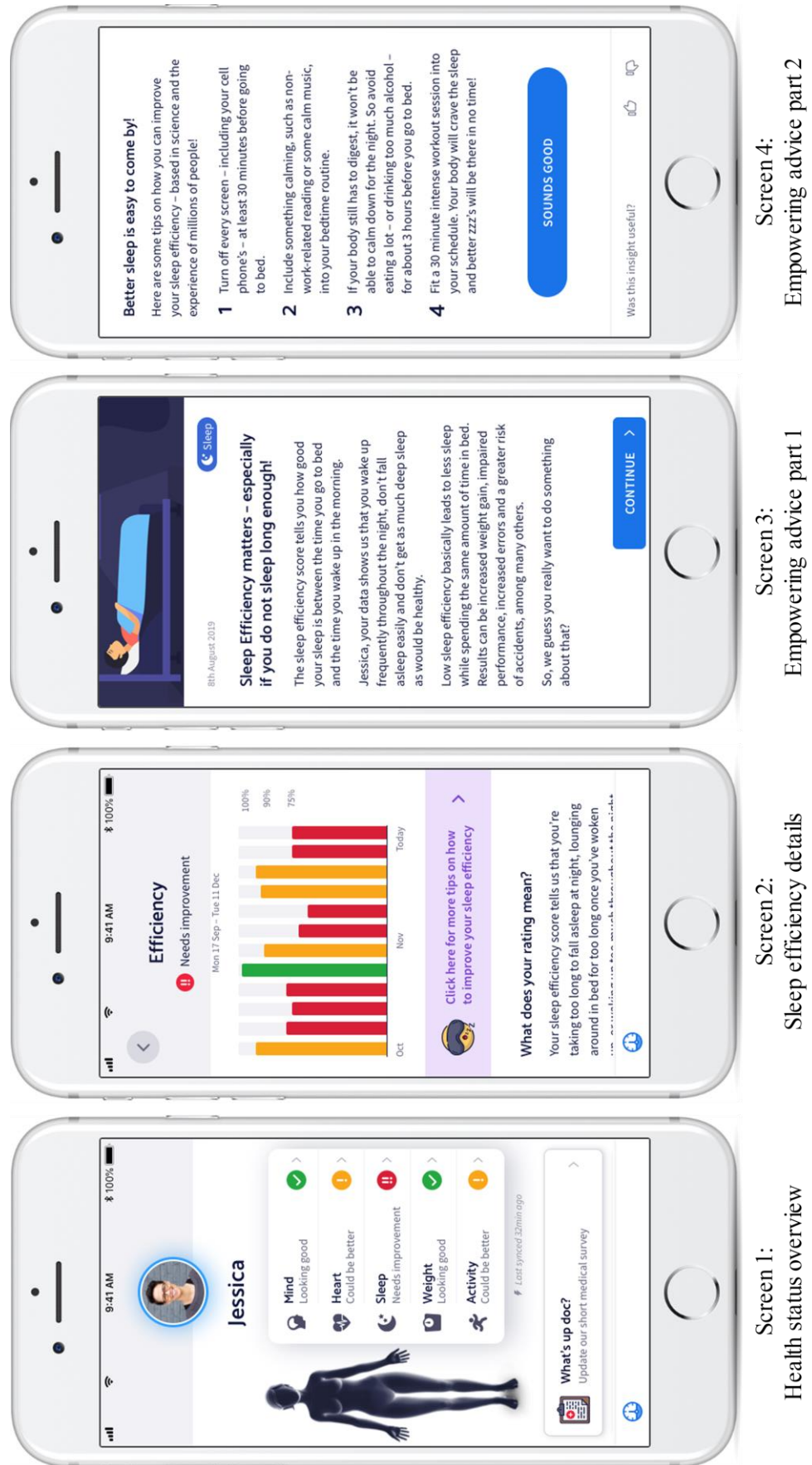
As for perceived control, users were asked to assess whether they believed they would be more successful in achieving their health goals after using the app. The merits and risks of using single item measures have been discussed in the past, and they have been employed when the former outweigh the latter (Homburg, Schwemmler, & Kuehn, 2015). It has been suggested that the predictive validity of different measures does not depend on whether they contain a singular or several items, making single-item measures the preferable option in some contexts (Bergkvist & Rossiter, 2007). Study 2 served as an initial indication for perceived control as a predictor of engagement. We included a singular item to keep the complete questionnaire reasonably short.

Last, measuring the dependent variable, the CE scale was altered from study 1 to account for the mobile health context. Again, the scale leaned on extant research (Hollebeek, Glynn, & Brodie, 2014; Vivek et al., 2014) and included items that gauged the emotional, cognitive, and behavioral dimensions of CE.

We assessed the validity and reliability of the scales used in the study: Perceived learning and CE. A commonly accepted threshold for internal consistency as measured by Cronbach's α as well as for the composite reliability to be considered satisfactory is 0.7 (Peterson 1994, Bagozzi and Yi 1988). Both scales show a sufficient to high composite and internal validity ($M_{PL} = 3.60$, $SD = .62$, $\alpha = 0.74$; $M_{CE} = 3.63$, $SD = .75$, $\alpha = .86$). However, the factor loadings of some items were relatively low (i.e., $< .7$), which contributes to a lower average variance extracted. There are no universally applicable cut-off thresholds for indicator loadings. It can be useful to include an indicator with a factor loading below 0.5, if this item is of theoretical importance and other reliability indicators do not suffer from their inclusion (Bagozzi and Yi 2012).

One example to that end is the item "Using the app was educating", which has a relatively low factor loading (.53), but is conceptually important in that it is the only item in the scale which has participants evaluate the overall helpfulness of the app in relation to their learning outcomes. From a statistical perspective, it has been suggested that factors with loadings between 0.4 and 0.7 should only be eliminated if that contributes to an increase in the composite reliability (Hair, Ringle, & Sarstedt, 2011). For all indicators which fell in that range, this was not the case and they remained in the scales.

Figure 10: Exemplary Screens Health App Mock-Up, Operationalization of Sleep-Specific Insights in the Health Empowerment Treatment Group (Female)



Results and Discussion

On average, participants reported that they had perceived the app as rather empowering ($M = 3.66$, $SD = .60$). We conducted a multiple regression analysis (controlling for age and gender) to evaluate the effects of perceived learning and perceived control on CE. Perceived learning has a significant positive effect on engagement ($\beta_{PL} = .56$, $SE = .08$, $p < .001$), which is also the case for perceived control ($\beta_{PC} = .28$, $SE = .06$, $p < .001$). These results demonstrate that as suggested in H_2 and H_3 , the two dimensions of perceived empowerment are relevant predictors of CE. To our knowledge, this is the first empirical evidence of the impact of perceived empowerment on a consumer-based marketing metric. What is more, the relatively high regression coefficients suggest a substantial effect size of the observed independent variables.

Study 3: Mediated Process Model of Empowerment

With the respective direct effects of active and perceived empowerment on engagement established, it was the objective of study 3 to assess on what conceptual pathways these dimensions of empowerment lead to an alteration of CE. Specifically, it was proposed that the effect of empowering activities on CE can to a substantial extent be explained by consumers' altered psychological state of empowerment resulting from these activities. Awareness of the role of psychological empowerment between service firms' EA and subsequent CE allows for a nuanced analysis of why an empowerment initiative is (or is not) successful. Further, the delineation of different dimensions of empowerment can inform frameworks for multi-dimensional marketing strategies. If, for instance, a firm has no realistic way of affecting peoples' perceived learning, they might still be able to increase their perceived control in a situation.

Method and Scales

A total of five hundred and eight participants ($M_{age} = 35.67$, $SD = 11.1$, 35.8% female) who were recruited from an online panel completed a survey in exchange for monetary compensation. The higher average age constitutes a notable contextual difference to study 2, as does the origin of respondents. While the survey was globally accessible, 69,7% ($N = 354$) of the responses were obtained from U.S. residents.

In a first step, participants were asked to think of a salient health- or finance-related app they had made very positive or negative experiences with. They were asked

to type the name of that app and indicate whether it was in the area of health or finance ($N_{\text{health}} = 252$; $N_{\text{finance}} = 256$). To check whether participants paid attention and consistently considered the same app, which is an essential requirement for the study, respondents were asked to once more state its name at a later stage of the questionnaire. Respondents who stated the same name as before (aside from slight differences like typos) were included in the final sample. No further attention checks were conducted.

After the introductory question, participants answered a set of questions which measured the four constructs. First, the EA scale ($M_{\text{EA}} = 4.01$, $SD = .59$, $\alpha = .72$) was based on the instrument that was developed for study 1, but adapted to the app context. The high mean rating on that scale indicates that on average, people had the perception that the apps they thought about actively contributed to their empowerment (Table 6). Interestingly, the scale and item reliability indicators were significantly lower than for the similar empowering activities scale in study 1 (Table 5). Nevertheless, the composite consistency values can be considered satisfactory, and none of the individual indicators has a loading below the critical 0.4 threshold (Bagozzi & Yi, 2012; Hair et al., 2011).

The perceived control scale ($M_{\text{PC}} = 3.93$, $SD = .72$, $\alpha = .72$) was further developed from the single item used in study 2. With two differently framed items each, we included the respondent's immediate feeling of control in the given setting, and to what extent the app contributed to a successful pursuit of health goals. All scale and item reliability analyses yielded satisfactory results. The same holds true for the perceived learning scale ($M_{\text{PL}} = 3.96$, $SD = .74$, $\alpha = .78$), which was based on the scale used in study 2 and included two further items. The final instrument measured participant's engagement with the app ($M_{\text{CE}} = 3.75$, $SD = .74$, $\alpha = .88$). It was adapted and extended from the prior studies in order to ensure that the motivational, cognitive, and behavioral dimensions of the constructs were all sufficiently addressed (Hollebeek et al., 2014; Vivek et al., 2014). The relatively high reliability values can be attributed to the fact that the scale was based in substantial empirical work.

Results and Discussion

A set of bivariate regression analyses confirmed the direct effects of the empowerment dimensions EA ($\beta_{\text{EA}} = .64$, $SE = .04$, $p < .001$), perceived control ($\beta_{\text{PC}} = .70$, $SE = .03$, $p < .001$), and perceived learning ($\beta_{\text{PL}} = .80$, $SE = .03$, $p < .001$) on CE.

This shows that the previous studies' findings replicate in the present study, which serves as the basis for the following model analysis.

We conducted a parallel mediation analysis with 10,000 bootstrapped samples in PROCESS v3.4 using model 4 (Hayes, 2018) to assess indirect effects on CE. We controlled for age and gender, which did not significantly affect the results. The analysis was done for the total sample as well as the health and finance sub-samples to detect context-specific differences. The results of the analyses are summarized in Figure 11. For the combined sample, there were strong indirect effects of empowering activities on CE through perceived empowerment. Both perceived learning and perceived control are significant and, in relation to the total effect, relevant mediators ($\beta_{PL \text{ combined}} = .37$ [95% CI: .30 , .43], SE = .03; $\beta_{PC \text{ combined}} = .14$ [95% CI: .08 , .20], SE = .03). This confirms a complementary mediation: A significant effect exists alongside the indirect effects, albeit with a relatively small effect size (Zhao, Lynch, & Chen, 2010).

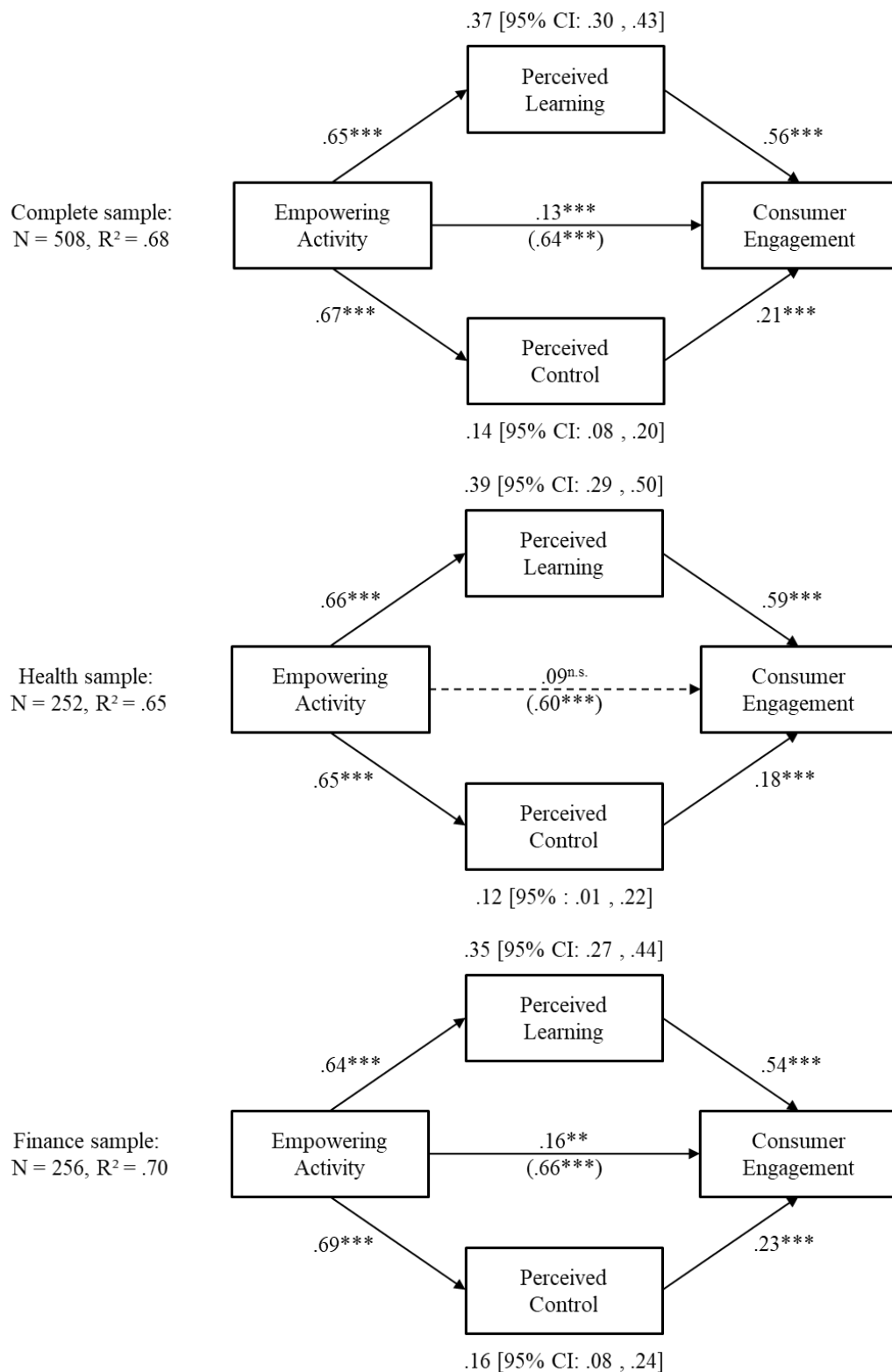
The mediation held when only considering the finance ($\beta_{PL \text{ finance}} = .35$ [95% CI: .27 , .44], SE = .04; $\beta_{PC \text{ finance}} = .16$ [95% CI: .08 , .24], SE = .04) and the health sample ($\beta_{PL \text{ health}} = .39$ [95% CI: .29 , .50], SE = .05; $\beta_{PC \text{ health}} = .12$ [95% CI: .01 , .22], SE = .05). Interestingly, whereas a significant direct effect remained after accounting for the mediation in the finance sample ($\beta_{EA \text{ finance}} = .16$, SE = .06, $p < 0.01$), this was not the case for health. After including perceived empowerment in the model, the direct effect became insignificant ($\beta_{EA \text{ health}} = .09$, SE = .06, $p > 0.1$). This indirect-only mediation suggests that the mediating factors capture most of the mechanism through which empowering activities influence CE in a health context (Zhao et al., 2010).

Overall, the findings provide evidence for perceived empowerment's mediating role between EA and CE. This goes to show that to a large extent, the effect of EA can be attributed to the alteration of psychological states which precede CE. Absent an increase in consumers' perceived empowerment, there will only be a slight increase in CE, or none at all. This has important academic and practical implications, which we discuss in the next segment.

What is more, study 3 confirms that contextual contingencies influence how empowering activities unfold their effectiveness. While direct and indirect effect sizes were similar, the mediation in the health sample accounts for a higher proportion of the total effect as compared to the finance sample. In fact, in the health setting, the

remaining direct effect of empowering activities is insignificant. Further explanatory or mediating variables can exist in the case of both a complementary as well as an indirect only mediation (Zhao et al., 2010). However, our findings indicate that in a finance setting, these additional explanations may be more relevant. One suggestion in that vein is that consumers' affective states such as trust may play a larger role in the model, as trust has been suggested as an antecedent to CE (Brodie et al., 2011; Pansari & Kumar, 2017).

Figure 11: Direct and Indirect Effects of Empowerment on Consumer Engagement in Health and Finance



*** p < 0.001

** p < 0.01

n.s. not significant

General Discussion

This research highlights that in financial services and health, empowerment is an important driver of consumer engagement. The three studies presented herein provide consistent evidence for the hypothesized model: There is a direct effect of empowering activities on CE, which is mediated by consumers' state of perceived empowerment.

Consumer empowerment has been of recurring interest to marketing academics, but to date has not been anchored in the discipline's nomological networks. We argue that this is primarily due to (1) the lacking definition and frequent oversimplification of the empowerment concept (Bachouche & Sabri, 2019) and (2) a paucity of empirical efforts discussing the relation of empowerment to other key marketing constructs. We address these gaps by introducing a conceptual distinction between empowering activities and perceived empowerment, suggesting perceived learning and control as two dimensions of the latter. Then, we show how different dimensions of empowerment interrelate and that EA and perceived empowerment are important predictors of CE.

Study 1 provides evidence for the direct effect of EA on CE. To our knowledge the study is the first empirical effort to that end. EA are those activities which target consumers' perceived value co-creation potential: They are interesting, educative, foster understanding of the subject matter and are meaningful in a given context. These attributes, if successfully conveyed, shift the resource requirements in a co-creation process in a consumer's favor, thus increasing their perceived power over a focal outcome, which elicits their engagement.

Study 2 explores the link between consumers' perceived empowerment and CE. It establishes that both perceived learning and perceived control are relevant predictors of CE. These effects, too, have not been evaluated in prior research. The study therefore yields two novel findings: First, there is a psychological state of empowerment which precedes CE. Second, that state consists of two dimensions which have received attention in empowerment research, that is, learning and control. Thus, we provide empirical evidence that both dimensions are relevant for the discussion of empowerment in marketing.

In our last study, we demonstrate how EA, perceived empowerment, and CE interrelate. Firms' EA affect consumer' perceived learning and control, which in turn contribute to CE. The mediating effect of perceived empowerment accounts for most of

the total effect size. A small direct effect remains, which suggests that there may be further dimensions of perceived empowerment, or other psychological processes resulting out of empowerment and preceding CE, to be considered in the future. Overall, the model shows that and in what way empowerment substantially influences a marketing metric. Several important implications for academics and practitioners follow.

Theoretical Implications

The present work contributes to the development of an empowerment theory in marketing. Prior empowerment research has suffered from ambiguities and limited measurability of the discussed constructs, and we agree with Bachouche and Sabri (2019) that substantial further research is required in the area. The conceptual model and empirical evidence presented herein strive to make empowerment as a marketing construct more tangible and measurable. This also contributes to the elucidation of further research avenues that can benefit consumers as well as firms.

By breaking down the empowerment process into its constituent parts, the conceptual model facilitates the integration of consumer empowerment in nomological networks. For instance, EA as described herein are a multidimensional construct that is related to various other constructs, such as education. Furthermore, the perceived empowerment construct provides a useful basis for the further theorizing and quantitative assessment of empowering activities as discussed herein. Future research may address one specific dimension of perceived empowerment in order to facilitate focused discussions. For instance, an inquiry into the drivers of perceived control would advance empowerment research while reducing noise from the equally important, but in that case not central perceived learning dimension. Likewise, if empirical research yielded the finding that one of the dimensions is significantly affected by an EA, while the other is not, such a finding would enable the further quantitative and theoretical analysis of that phenomenon.

Another important implication relates to the empowerment measures used herein. Along with the conceptualization of the constructs in our model (except for CE), we developed a set of scales leaning on extant work on constructs that have been connected to empowerment (e.g. learning, Eisingerich & Bell, 2008). As we will discuss in the limitations section, this approach is not without its risks. Nevertheless, the

developed scales proved internally consistent and reliable. Academics can adopt these scales for their own empirical endeavors or future scale refinement efforts. What is more, we provide indications as to how different contexts affect the wording of these scales.

Last, the present work contributes to the engagement literature. CE has emerged in the last decade as an important research stream in marketing and vast empirical evidence as to its connections with other marketing constructs has been generated. That body of research shows CE as an important marketing outcome which elicits cognitive, behavioral, and emotional processes and furthermore contributes to firm performance (Kumar et al., 2019; Vivek et al., 2014). Establishing empowerment as an antecedent to CE contributes to the development of CE frameworks and can inform related strategies. Further research may set out to refine this conceptual link and elaborate further potential marketing outcomes of empowerment.

Managerial Implications

Many service firms have begun empowering people due to an intuition, supported by extant theoretical efforts, that this will foster co-creation potential and drive consumer well-being as well as firm performance. The present research is the first to undergird this intuition with empirical data, showing that empowering activities substantially drive a key marketing outcome. What is more, we provide first evidence of the findings' generalizability beyond a specific field or application, interaction context, or region. Thus, we contribute to an increased motivation to explore means for consumer empowerment as a business management and marketing strategy.

Our finding that empowerment causes engagement is a strong argument to that end. However, rather than targeting CE directly, marketing managers who want to enhance their customers' ability to co-create value should attempt to improve the learning and control dimensions of perceived empowerment. Doing so will facilitate the design of empowerment strategies in several ways. First, initiatives to raise perceived control may differ from those that elicit perceived learning. Second, perceived empowerment is a direct consequence of EA and thus allows the measurement of their immediate impact. As the studies presented herein consistently show, fostering perceived learning and perceived control will ultimately lead to increased CE.

To date, whether conceived as the act of giving consumers more choice or the attempt to educate them, empowerment initiatives often fail (Broniarczyk & Griffin, 2014). However, absent rigorous definitions of both the independent variables and their success measures, it would be premature to neglect such mechanisms altogether. It may be a worthwhile endeavor to revisit previously discarded constructs that could lead to an increase in perceived empowerment. For instance, while it has been shown that financial education has a very limited effect on consumers' financial literacy (Fernandes et al., 2014), it has not been established whether such interventions could still increase consumers' perception of competency in that context. Recent evidence suggests that consumers' sense of empowerment drives their behavior and well-being outcomes irrespectively of other measures of "actual" empowerment (Tanner et al., 2020; Wang et al., 2020). Until generalizable evidence on such issues is established, firms should focus on how empowerment initiatives are received by consumers, not on the activities themselves.

Limitations and Research Agenda

The present research is exploratory in nature but moves beyond conceptual theorizing in order to provide evidence for the effects suggested herein. With this approach, we contribute to overcoming the observed dearth of quantitative research on consumer empowerment, thus providing tangible evidence for the necessity of such effort. Nevertheless, one potential area of concern relates to the measurement of the empowerment constructs discussed herein. No established instruments for the measurement of EA or perceived empowerment in the discussed settings were available, which therefore needed to be developed based on conceptual literature or scales which had been used in different contexts. While consistently acceptable, the reliability of some indicators used in our measures was relatively low. Lower reliability thresholds are being considered sufficient for research in the early stages of theoretical development. In the course of the subsequent theoretical advancement of the constructs and the refinement of related measuring instruments, the values will usually increase (Peterson, 1994). We expect this will be the case for future research on consumer empowerment. Another interesting observation in relation to the construct measurement was a significant variation of the scale reliability for constructs that were measured in more than one context (e.g., empowering activities). These findings indicate the need

for rigorous scale development efforts, including further scrutiny of situational contingencies of the constructs and their measurement.

To date, no consensus exists within marketing on the empowerment concept and its definition. To enable a concerted academic effort in this vast and timely research field, an integration of extant research streams and a clear delineation of what is and what is not empowerment is required (MacInnis, 2011). Thus generated conceptual clarity would facilitate an understanding of how empowerment differs from related constructs – or to what extent it is similar and can therefore incorporate existing findings. Pertinent constructs are self-efficacy and motivation (e.g., Bandura, 1993), locus of control (Wallston et al., 1987), agency (Bachouche & Sabri, 2019), or the relationship between consumer expertise and perceived learning (Alba & Hutchinson, 2000). Furthermore, future empowerment inquiry can contribute to developing areas such as transformative consumer or service research by discussing whether empowerment is necessarily a process that alleviates vulnerability in the markets (Anderson & Ostrom, 2015; Baker et al., 2005). A clear definition of the construct would also enable the development of a comprehensive nomological network through a discussion of other potential consequences of empowerment. Extant research on consumer learning, for instance, gives rise to the notion that trust and loyalty may be further desirable effects of empowerment (Bell et al., 2017).

What is more, a discussion of the drivers of empowerment including their situational contingencies is in order. If psychological empowerment is individually determined and depends on the context (Zimmerman, 1995), there is no universally applicable way for firms to increase empowerment. Rather, various approaches have to be personally tailored and dynamically leveraged. Several mechanisms with the target of empowering consumer decision-making have been suggested, including education, cognitive, and behavioral interventions (Fischhoff & Broomell, 2020; Grüne-Yanoff & Hertwig, 2016). Through the rise of mobile technologies, ubiquitous personal data, and further technological developments, interventions that dynamically adapt to a consumers' context have become possible (Nahum-Shani et al., 2018). Further research needs to assess what mechanisms of empowering consumers are most effective under which contextual conditions, and how they can be successfully implemented in service interactions.

Another intriguing research trajectory for a comprehensive understanding of empowerment is the assessment of the unintended consequences of empowering activities. Empowerment as conceived herein has an educative component. More educated consumers, however, may have lower psychological barrier of switching to a competitor, thus representing a risk to firms (Bell et al., 2017). Empowerment may also lead to overconfidence which negatively affects decision quality (Camacho et al., 2014). Rigorous research needs to establish a robust understanding of these and further potential undesirable effects to be able to consider them in the development of empowerment strategies.

In summary, as of today there is substantial potential to explore empowerment and its dimensions through a marketing lens. Particularly, conceptual and empirical efforts are required to firmly anchor the construct in nomological networks which can inform marketing strategies. By establishing EA and perceived empowerment as antecedents to CE, the present research demonstrates why such endeavors are timely and of interest to marketing academics and practitioners alike.

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