Contextual Effects on Perceived and Actual Product Efficacy

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CONTEXTUAL EFFECTS ON PERCEIVED AND ACTUAL PRODUCT EFFICACY

By
Noah Thomas Van Bergen

A DISSERTATION

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CONTEXTUAL EFFECTS ON PERCEIVED AND ACTUAL
PRODUCT EFFICACY

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This dissertation examines how the context in which consumers encounter products shapes perceptions of product efficacy and product efficacy experiences. Contextual influences are recognized as relating to both the product and the consumer. While extant research on product efficacy perceptions has examined a range of factors inherent to products that influence perceived efficacy, less research has examined how the context in which a product appears influences product efficacy judgments, and even scarcer is research on the influence of a consumer’s decision context. The present research advances knowledge in both arenas by studying two practically important and theoretically-driven contextual influences on product efficacy—one relating to the product, and one relating to the consumer. The first essay (Chapter 2) examines the context in which a product appears, focusing on the presence or absence of product replicates in product presentations. Although products appear both in isolation and as groups of replicates in a range of marketplace settings, previous research has not examined how this impacts product evaluations. The present research fills this gap, demonstrating that a product is perceived to be more effective when presented as part of a cohesive group of product replicates (vs. in isolation) because such groups highlight the underlying essence of the products and thereby increase attention to product efficacy. The second essay (Chapter 3) studies a
common contextual influence on consumers: experiences involving low (vs. high) personal control. Two studies demonstrate that individuals feeling low (vs. high) personal control perceive greater product efficacy. This effect is driven by the motivation to use external sources of control that can help reestablish a control-deprived consumer’s own (internal) sense of control; as such, low control increases the perceived efficacy of products that can help a user reach a desired outcome, but does not impact the perceived efficacy of products that are personally irrelevant for restoring control at the time of judgment. The dissertation concludes with a discussion of the theoretical and practical implications of the present research, as well as limitations and directions for future research.
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CHAPTER 1: INTRODUCTION

Every day, consumers purchase, consume, and use products on the basis of the function or benefit they expect products to deliver. The perception of how well a product is able to perform its function or provide its benefit—its perceived efficacy—is therefore an important antecedent of purchase and repurchase decisions (Bei and Chiao 2001; Rust, Lemon, and Zeithaml 2004). Moreover, for some types of products—which I refer to as “efficacious products” (Ilyuk and Block 2016)—the ability of the product to deliver a specific functional benefit is a necessary (and sometimes sufficient) condition for consideration. For example, an energy drink is defined by its ability to increase the user’s energy; a detergent is defined by its ability to clean items; and pharmaceuticals (e.g., pain relievers; cough syrups) are defined by their ability to provide relief from ailments. As these types of products are defined by the functional benefit they claim to provide, judgments of product effectiveness and product efficacy experiences are critical variables for marketers and consumers alike (Selnes 1993).

In this dissertation, I add to the growing body of research on product efficacy judgments by examining how the context in which a consumer perceives an efficacious product impacts perceptions of the product’s efficacy. I consider contextual effects as factors that are unrelated to a focal product (in the sense that changes to the context do not change properties or attributes of the product), but which may nevertheless impact product perceptions. This definition is consistent with research showing that the context in which consumers consider and consume products influences how they make consumption decisions (e.g., Huber, Payne, and Puto 1982), pursue goals (e.g., Laran, Janiszewski, and Cunha 2008), and perceive products and product attributes (e.g., Nam
and Sternthal 2008; Noseworthy, Wang, and Islam 2012). Furthermore, my
categorization recognizes that contextual effects manifest both in terms of a product’s
contextual environment (holding the consumer context constant) and the consumer’s
contextual environment (holding the product context constant). My dissertation is
organized around this framework (see Figure 1): In my first essay, I examine how the
product’s context—in particular, whether a product is viewed among product replicates
or in isolation—impacts perceptions of product efficacy and product efficacy
experiences. In my second essay, I examine how a contextual factor related to the
consumer—the extent to which consumers feel they lack (vs. possess) personal control—
impacts product efficacy judgments.

The rest of this dissertation is organized as follows: I first provide a general
overview of research in product efficacy, reviewing previous findings and setting the
stage for how the contextual effects documented in my research will fit with and
contribute to extant research. I then introduce my research questions by briefly reviewing
extant literature in the domains of product quantity and personal control, which are the
respective product-context and consumer-context effects I study. I close Chapter 1 with a
discussion of why the specific questions I study in my two essays are practically and
theoretically important. Chapter 2 then demonstrates that the presence of product
replicates in the context of a focal product can improve product efficacy perceptions and
experiences, because a cohesive group of homogenous products highlights the products’
core essence, which manifests in greater attention to product efficacy. Chapter 3 shows
that contextual experiences that reduce a consumer’s feelings of personal control
motivate consumers to utilize external sources of control that can help them achieve
desired outcomes, leading to greater product efficacy perceptions. I offer concluding remarks in Chapter 4 by summarizing my findings, reviewing the theoretical and practical implications of my results, and discussing the limitations of my studies and directions for future research.

PRODUCT EFFICACY PERCEPTIONS IN MARKETING

While marketing researchers have long been interested in how consumers make inferences about general product quality (Curry and Faulds 1986; Hjorth-Andersen 1984; Kirmani and Rao 2000; Mitra and Golder 2006), a burgeoning stream of research has more recently focused specifically on product efficacy judgments and experiences. This work has its roots in research on the placebo effect (Kirsch 1985; Stewart-Williams and Podd 2004), reflected in Shiv, Carmon, and Ariely’s (2005) seminal research on placebo effects of marketer actions. These authors demonstrated that consumers form expectations for product efficacy (e.g., the effectiveness of an energy-enhancing beverage) based on marketing strategy decisions, such as whether or not a product is priced at a discount; as a result of these expectations, the efficacy that consumers actually derive from products also changes.

Following the lead of Shiv, Carmon, and Ariely (2005), subsequent research on product efficacy perceptions and experiences has demonstrated that a range of other factors influence consumers’ perceptions of product efficacy. These factors can be categorized as (a) properties inherent to the product and/or its attributes, (b) contextual properties relating to the product, or (c) contextual properties relating to the consumer. For example, representing the first category, Shiv, Carmon, and Ariely (2005; see also
Waber et al. 2008) focus on an inherent property of the product—its price—as the factor that impacts product efficacy perceptions and experiences. Other drivers of product efficacy in this category include negative product attributes (e.g., taste and side effects; Kramer et al. 2012), the aesthetic attractiveness of product packaging (Sundar, Noseworthy, and Machleit 2013), eco-friendly cues on packages (Pancer, McShane, and Noseworthy 2015), the color, size, format, and origin of medication (Buckalew and Coffield 1982; Buckalew and Ross 1991; Wang, Keh, and Bolton 2010), and the number of active ingredients listed on a package (Wright et al. 2013).

While several properties that are inherent to the product under consideration thus impact product efficacy perceptions, less research has focused on the latter two categories of contextual drivers of product efficacy. For example, work on contextual impacts relating to product perception demonstrates that perceived efficacy increases when advertisements depict less (vs. more) distance between cause and effect (Chae, Li, and Zhu 2013), when products appear to be scarcely (vs. widely) available (which signals consumer demand; Wright et al. 2013), and when a product is packaged in a single-serving (vs. multi-serving) format (Ilyuk and Block 2016). Even less research has focused on contextual effects relating to the consumer: To my knowledge, the only research suggesting that the context may impact consumers and thereby affect product efficacy is work showing that consumers’ nonconscious goals (Geers et al. 2005) and motivation to derive product efficacy (Irmak, Block, and Fitzsimons 2005) impact the strength of the placebo effect.

My research thus advances the literature on product efficacy by demonstrating the importance of examining the influence of properties that are separate from the product
and its attributes on perceptions of product efficacy. To do so, I study the impact of practically relevant yet unexamined contextual influences on product efficacy perceptions. First, I examine a contextual feature of the product under consideration—the presence or absence of product replicates appearing with the focal product—that is a ubiquitous variable in marketing contexts but which has not yet been studied in the marketing literature. Second, I turn my attention to a contextual influence on the consumer—the degree of personal control they feel when making product judgments—that is also widely applicable in the marketplace. I next briefly review relevant research relating to each contextual factor I study.

**PRODUCT QUANTITY**

An important stream of research in marketing studies how differences in product quantity impact judgments, evaluations, and consumption of products. In this line of research, product quantity has taken different forms. For example, some research studies how the size or format of a package influences product perceptions (Ilyuk and Block 2016; Yan, Sengupta, and Wyer 2014) and consumption behavior (Zlatevska, Dubelaar, and Holden 2014). Other work focuses on the extent to which products appear to be limited in availability (vs. abundant), finding that the scarcity of products tends to improve valuation and quality perceptions (Castro, Morales, and Nowlis 2013; Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009, 2014). While my research focuses on contexts in which differences in quantity are unlikely to signal more or less availability, it is related to prior work demonstrating that differences in product quantity impact product perceptions.
Although several articles have demonstrated the benefits of scarcity (vs. abundance), the question of whether perceptions of a product differ on the basis of the presence or absence of product replicates has not been examined (however, see Castro, Morales, and Nowlis (2013) for a related study of disorganization and availability, which includes conditions featuring one product vs. multiple products). This gap in the product quantity literature is surprising, given the myriad contexts in which products may appear in the presence or absence of product replicates. Moreover, these contexts need not signal availability or consumer demand, which is a primary driver of scarcity effects (Parker and Lehmann 2011). For example, online retailers, advertisements, and in-store special displays regularly depict products in the presence or absence of product replicates without indicating product popularity or limited availability. Moreover, because presenting a product in the presence of product replicates introduces perceptual characteristics that cannot apply to a single product (particularly homogeneity and cohesiveness of the set), studying perceptions of a single product depending on whether or not it appears among replicates is both a theoretically and practically relevant question.

As I argue in Chapter 2, the homogeneous and cohesive grouping of product replicates is likely to impact perceptions of product efficacy because these characteristics relate to the perception of a shared essence (Mishra 2009; Yzerbyt, Corneille, and Estrada 2001). In addition, because the essence of an object or entity manifests in the consequences of its usage (Morales and Fitzsimons 2007; Rozin, Millman, and Nemeroff 1986), perceiving a product as part of a cohesive group defined by a shared essence is predicted to increase the salience of product efficacy and thus increase product efficacy
perceptions. I report five studies in Chapter 2 that test these predictions and find consistent support.

PERSONAL CONTROL

Research on personal control studies how contexts and experiences that threaten individuals’ beliefs that they are in control of the outcomes they experience influence subsequent behavior. While the application of personal control to research in marketing is relatively nascent (Chen, Lee, and Yap 2016; Cutright 2012; Cutright and Samper 2014; Cutright, Bettman, and Fitzsimons 2013; VanBergen and Laran 2016), work in compensatory control theory (CCT; Kay and Eibach 2013) is based on a stream of research in psychology demonstrating the importance of maintaining beliefs that individuals possess control over their environments. Because perceptions of control can be threatened by both positive and negative experiences that are relatively inconsequential in nature (Cutright 2012; Kay et al. 2008), the degree of personal control consumers feel in the marketplace often varies. In addition, researchers have documented a range of divergent strategies consumers can use to compensate for reduced personal control (Landau, Kay, and Whitson 2015).

My research builds on the extant personal control literature by recognizing that efficacious products can be seen as external sources of control that act on a user’s behalf to bring about desired outcomes (Landau, Kay, and Whitson 2015). However, extant research on external sources of control has focused on entities that possess autonomy and do not require user intervention (e.g., religions and governments; Kay et al. 2008; Kay and Eibach 2013) as ways to compensate for reduced personal control. Because
efficacious products are not autonomous agents and rather require action on the part of
the user, documenting the influence of personal control on product efficacy perceptions
requires a new explanation describing how external sources of control can compensate
for deficits in personal control. Thus, in Chapter 3 I propose and test a theory describing
how consumers experiencing low personal control can reaffirm their own (internal) sense
of agency by perceiving that external sources of control—such as efficacious products—
are more effective at assisting in the experience of desired outcomes. This research is
therefore both practically relevant, given the ubiquity of experiences that threaten
personal control, and theoretically important, given the gap in compensatory control
research on the possibility of using external sources of control as a way to reaffirm one’s
own internal agency.

PRODUCT EFFICACY, PRODUCT QUANTITY, AND PERSONAL CONTROL

In summary, this dissertation introduces two novel antecedents of product
efficacy perceptions. By studying these antecedents, my research advances our
knowledge of the drivers of perceived and actual product efficacy by documenting that
contextual effects relating to either the environment in which a product appears or the
experiences leading up to a consumer’s product efficacy judgment shape perceptions of
product efficacy. A theme I have worked to incorporate across the research reported in
this dissertation is widespread practical importance combined with theoretical rigor.

To this end, Chapter 2 focuses on two common ways in which a product may be
presented (i.e., in the presence vs. absence of product replicates) that have nevertheless
been neglected by the marketing literature. I account for the practically important finding
that a product is perceived to be more efficacious when appearing in a group of product replicates (vs. in isolation) by relating the characteristics of a cohesive group of homogenous objects to the likelihood of perceiving a defining essence shared by the objects. In doing so, I contribute to research in psychological essentialism and product displays by showing that a cohesive group of product replicates can highlight an inherent essence of the products and thereby influence product perceptions in important ways.

Chapter 3 maintains my focus on practical importance and theoretical rigor by studying the common experience of feeling low (vs. high) personal control and relating this to perceptions of objects that can act as external sources that help regain control. As I discuss, accounting for the influence of personal control on product efficacy perceptions requires a novel explanation for the strategies consumers can use to compensate for personal control. I thus build a theory explaining why low personal control increases perceptions of product efficacy, and I derive and test hypotheses for the moderators and mediators of this effect.

Together, the essays comprising this dissertation represent a new way to conceptualize product efficacy judgments and experiences (Figure 1). While the contextual antecedents I study provide initial support for the utility of this framework, they are only two contextual effects out of many that may influence perceptions of product efficacy. Thus, my dissertation is a useful starting point that I hope will promote the continuation of research on contextual drivers of product efficacy, a topic of discussion to which I return in my concluding remarks (Chapter 4).
FIGURE 1
CONCEPTUALIZATION OF CONTEXTUAL EFFECTS ON PRODUCT EFFICACY
CHAPTER 2: THE MERE PRESENCE OF PRODUCT REPLICATES ENHANCES PERCEIVED AND ACTUAL PRODUCT Efficacy

Marketers present products either in the presence or absence of product replicates in various contexts. As examples, online retailers depict offerings by showing a single unit or a group of replicates, advertisers present a single item or several identical items in their promotional materials, and in-store special displays and sampling booths feature one package or many packages of promoted products. Such variations apply to many fast-moving consumer goods such as foods, beverages, household cleaners, and pharmaceutical products. While extant research has studied variation in product quantity in many ways (e.g., Argo and White 2012; Castro, Morales, and Nowlis 2013; Haws and Winterich 2013; Ilyuk and Block 2016; Parker and Lehmann 2011; Scott et al. 2008; Sevilla and Townsend 2016; van Herpen, Pieters, and Zeelenberg 2009; Wansink 2004; Wansink and Kim 2005; Wansink and Chandon 2014; Yan, Sengupta, and Wyer 2014), we know little about how merely presenting a product among product replicates, as opposed to viewing a single product in isolation, affects product perceptions. Given that marketers promote, display, and package their products in various ways, such that product replicates may or may not be visible to consumers, research on the effects of displaying a product among product replicates versus in isolation is important to both marketers and consumers.

Prior work in packaging and shelf-based scarcity suggests that product evaluations are more favorable when less (vs. more) quantity is present (e.g., Castro, Morales, and Nowlis 2013; Ilyuk and Block 2016; Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009; Yan, Sengupta, and Wyer 2014). In the present research, I build on this literature by investigating the conditions in which a larger (vs.}
smaller) number of products positively influences consumers’ perceptions of product efficacy and product experiences. Specifically, I show that presenting multiple replicates of a product (vs. a single unit of a product) leads consumers to perceive the product as more effective. In doing so, my work contributes to prior research in several important ways. First, in contrast to prior work on the effect of packaging and shelf-based scarcity showing that less (vs. more) quantity leads to greater perceptions of product efficacy (Ilyuk and Block 2016; Wright et al. 2013) and product quality (Castro, Morales, and Nowlis 2013; Yan, Sengupta, and Wyer 2014), I show that one unit of a product is perceived as more efficacious when it is presented as part of a group of identical products as opposed to being presented as an individual item.

Second, I draw from and build on research on psychological essentialism (Newman and Dhar 2014; Smith, Newman, and Dhar 2015), essence transfer (Morales and Fitzsimons 2007; Argo, Dahl, and Morales 2006, 2008; Kramer and Block 2014; Newman, Diesendruck, and Bloom 2011) and group perception (Mishra 2009; Yzerbyt, Judd, and Corneille 2004) to propose that organizing product replicates as a cohesive group increases the salience of a shared underlying essence, which manifests as increased attention to the products’ primary functional benefit. This occurs because a cohesive group of efficacious product replicates is characterized by both perceptual and functional homogeneity, which suggests that there is a unifying feature, or shared essence, that is responsible for the perceived cohesiveness (Haslam, Rothschild, and Ernst 2000; Ip, Chiu, and Wan 2006; McGarty et al. 1995; Mishra 2009; Yzerbyt, Corneille, and Estrada 2001). As a result, a product is expected to be more effective when presented as a member of a cohesive group of product replicates (vs. as an isolated product).
Finally, as I focus not only on package size or shelf facings, but more generally on the number of product replicates consumers are exposed to in advertisements, retail settings, and at the time of consumption, the marketing implications of the quantity effects I investigate in this research extend from packaging to retailing and advertising strategy. As such, my findings carry important implications to marketers, retailers, advertisers, and consumers.

**CONCEPTUAL DEVELOPMENT**

**Presence vs. Absence of Product Replicates**

In the marketplace, product quantity varies in different ways. Packages come in different sizes (Yan, Sengupta, and Wyer 2014; Zlatevska, Dubelaar, and Holden 2014), products are sold in packages containing different numbers of units (Ilyuk and Block 2016), and the number of products available on a shelf varies (Castro, Morales, and Nowlis 2013; Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009). In addition, the number of products displayed in ads, special displays, and on retailing websites varies. It is in these contexts, when consumers view and form impressions about products, that I am particularly interested. Although I am aware of no research examining how the mere presentation of more (vs. fewer) products in these latter domains affects product perceptions, research on shelf-based scarcity and packaging is relevant to my research. In particular, research in this area shows that small quantities of products tend to lead to more favorable consumer perceptions and experiences (e.g., in terms of product quality and effectiveness) than large quantities (Ilyuk and Block 2016; Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009).
Two reasons for why low (vs. high) quantity tends to improve evaluations are related to my question of how product perceptions may differ depending on the presence or absence of product replicates. The first relates to perceptions of availability and the inferences people form about product popularity and quality as a result of perceived availability. Research on shelf-based scarcity shows that consumers infer that products in limited supply have been purchased by other consumers; thus, the products are perceived as more popular and higher in quality than items on fully-stocked shelves, leading to greater purchase likelihood and choice of the scarce option (Castro, Morales, and Nowlis 2013; Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009; 2014).

A second reason for the benefit of low (vs. high) quantity relates to consumers’ reliance on proportional (vs. absolute) information (Slovic et al. 2002). Recent work has applied this reliance to product packaging, showing that the number of servings inside a package (i.e., single-serving vs. multi-serving package formats) impacts how consumers perceive efficacious products such as energy-enhancers and pain relievers (Ilyuk and Block 2016). These authors showed that, when consumers’ processing resources are constrained, finishing the entire contents of a single-serving package (vs. consuming the same quantity as a proportion of a multi-serving package) leads the functional resources consumed to be perceived as more adequate, resulting in greater product efficacy.

Consistent with the heuristic nature of proportion dominance, packaging format does not affect product efficacy when consumers’ processing resources are unencumbered (see also Silvera, Josephs, and Giesler 2001).

My research differs from the work described above in two important ways. First, I am interested in the impact of product replicate presence versus absence when variation
in product quantity does not provide meaningful information about a product’s availability, popularity, or quality. Thus, rather than presenting products on a retail shelf (in which case variance in quantity does signal availability and popularity), I examine how the presence or absence of product replicates impacts perceptions in contexts such as advertising and special displays. Further, as proportion-based effects of product quantity are more likely when the context makes the completion (or lack thereof) of a consumption episode salient (Ilyuk and Block 2016), the contexts in which I primarily focus my examination make the proportion heuristic less likely to impact product perceptions.

Second, previous research on shelf-based scarcity tends to examine the differences between perceptions of a product when many versus few products are available (e.g., Parker and Lehmann 2011; van Herpen, Pieters, and Zeelenberg 2009; 2014; for an exception, see Castro, Morales, and Nowlis 2013). In contrast, I am interested in how consumers’ product perceptions differ when products are presented as multiple product replicates versus as a single product. This difference is important because groups of multiple replicates have perceptual characteristics that single items cannot possess—such as homogeneity and cohesiveness—even if only a few replicates form the group. Based on research showing the importance of such characteristics for perceptions of a group’s underlying essence, I propose that a cohesive group of efficacious product replicates (vs. a single product) makes the products’ efficacy more salient. To develop my theory, I next review relevant research on psychological essentialism and how the grouping of objects influences perceptions of groups and group members.
**Essence and Psychological Essentialism**

Work on psychological essentialism (Medin and Ortony 1989) studies the pervasive tendency to view members of a group or category as possessing an underlying essence that accounts for membership in the group or category. For example, research on stereotyping suggests that people often conceptualize social (e.g., racial or ethnic) groups as being defined by an underlying essence that is shared by each group member and accounts for the distinctive characteristics of the group (e.g., Yzerbyt, Rocher, and Schadron 1997). However, psychological essentialism is not restricted to social groups: A stream of research in marketing, for example, suggests that brands and collections are perceived to possess a defining essence (Newman and Dhar 2014; Smith, Newman, and Dhar 2015), different types of products can transfer their essence to one another (Morales and Fitzsimons 2007), and essence can also be passed from people to products and vice versa (Argo, Dahl, and Morales 2006, 2008; Kramer and Block 2014; Newman, Diesendruck, and Bloom 2011).

As I discuss below, extant research suggests that specific properties of groups make the perception of a shared essence more likely (Mishra 2009; Yzerbyt, Corneille, and Estrada 2001). I build on this research by proposing that a cohesive group of product replicates (vs. a single product) increases attention to the inherent underlying essence of products. However, a theme of the psychological essentialism literature is that a particular essence is often hard to articulate. For example, Nemeroff and Rozin (1994) find considerable variability in participants’ conceptualizations of contagion (i.e., essence transfer), and verbal descriptions of reactions to contagion by participants illustrate the difficulty of explaining what exactly the essence being transferred is. For example, one
participant described their aversion to a sweater worn by someone they consider evil:

“Somehow the object would pick up some negativeness. I’m not saying it would smell or have dandruff on it, but it would be creepy because he’s a creepy person” (p. 178).

Reflecting this ambiguity, authors in the academic literature have used terms such as “offensive properties” (Morales and Fitzsimons 2007, p. 272), “some as yet undefined contagious entity” (Nemeroff and Rozin 1994, p. 159), “heritage” or “pedigree and history” of a brand (Newman and Dhar 2014, p. 375), and simply “an inhering essence” (Yzerbyt, Corneille, and Estrada 2001, p. 143) to describe a particular essence. Most often, the essence is not explicitly defined, and its presence or transfer is inferred based on perceptions of groups, individuals, and objects (e.g., Argo, Dahl, and Morales 2006, 2008; Rogier and Yzerbyt 1999; Yzerbyt, Rogier, and Fiske 1998).

While a particular essence may be difficult to articulate, the essence of a given entity can be understood as a summary of defining features (Nemeroff and Rozin 1994) that describes the implications, or consequences, of an interaction with the entity (Morales and Fitzsimons 2007; Rozin, Millman, and Nemeroff 1986). A review of the essence transfer and psychological essentialism literatures supports this interpretation of an essence.¹ For example, disgusting stimuli are often used as the source of contagion because disgusting stimuli are associated with important and widely understood consequences (Rozin, Millman, and Nemeroff 1986). Morales and Fitzsimons (2007) also show that disgusting stimuli lead to essence transfer, while objects characterized by other negative (but nonconsequential) associations, such as the frustration associated with tax

¹ A passage from Nemeroff and Rozin (1994, p. 159, quoting Mauss 1972 [1902], p. 137) describing the Melanesian concept of “mana” perhaps best describes essence as the consequences associated with an object: “[It is] the genuine effectiveness of things...what causes the net to bring in a good catch...and keeps the canoe sailing smoothly. In the farms it is fertility; on an arrow it is the substance which kills.”
software, do not contaminate other objects. Other instances of essence transfer also manifest in the consequential implications associated with the source. Kramer and Block (2014), for example, demonstrate that task performance of a previous user transfers to subsequent users: When participants used materials that had previously been used by a good (vs. poor) performer, the essence of the previous user (i.e., their good or bad performance) was transferred to subsequent users, evidenced by subsequent good (vs. poor) performance.

As the relative salience of an object or product’s essence manifests in perceptions of the outcomes associated with usage, some types of products are more impacted by essence salience than others (Morales and Fitzsimons 2007). In particular, products that are associated with singular, specific functions or benefits should be more susceptible to essence-driven effects than more complex products that are associated with multiple benefits and consequences. For instance, products such as energy enhancers, household cleaners, and pharmaceuticals are defined according to the respective outcomes of increased energy, clean surfaces, and relief from ailments; this suggests that a manipulation increasing the salience of these products’ essences will manifest in the relative salience of the products’ effectiveness at delivering their primary benefit. On the other hand, perceptions of complex products such as smartphones or sport utility vehicles are unlikely to be affected by a manipulation aiming to increase the salience of the product’s essence, since such products are unlikely to have a clear essence because of their association with multiple important consequences and benefits. For these reasons, I use products associated with a specific functional benefit (i.e., “efficacious products,” Ilyuk and Block 2016) across my studies, and operationalize essence salience as the
salience of the product’s effectiveness at delivering its key functional benefit. Next, I develop my theory for why the cohesive grouping of products is hypothesized to increase the salience of the products’ essence and thus efficacy perceptions.

**Cohesiveness and Essence Salience**

An important finding from the essence transfer literature relates perceptions of an essence to the physical grouping or arrangement of products, demonstrating that the way multiple products are arranged (e.g., close together vs. far apart; perceptually homogeneous vs. heterogeneous) impacts the tendency to perceive the transfer of essence between products (Mishra 2009; Mishra, Mishra, and Nayakankuppam 2009). In particular, when products appear similar (e.g., products in the same vs. different packages) and are arranged in close proximity, product perceptions are influenced by contagion. For example, Mishra (2009, study 1) presented participants with two sets of identical products, differing only according to the spacing between items. Within each set, one of the products either possessed a positive consequence (e.g., a gift certificate) or a negative consequence (e.g., a packaging defect), and participants were asked to choose one of the sets from which to select a product, not knowing which product in either set possessed the positive or negative attribute. Mishra (2009) found that when the unidentified product was associated with a positive (negative) consequence, participants were significantly more likely to choose to draw from the set in which products were close together (far apart), suggesting that the “essence” of the unidentified product—the positive or negative consequence of choice—was more readily transferred to other products in the set when the items were close together than when they were far apart.
Mishra’s (2009) results thus suggest that characteristics increasing the perceived cohesiveness of a group of products (i.e., the similarity, proximity, and symmetry of items in the group) makes their shared essence more accessible. Why might this be the case? Mishra (2009) drew from the relationship between psychological essentialism and perceived entitativity (Campbell 1958; Hamilton and Sherman 1996) to explain her results. Entitativity refers to the extent to which a set of individuals is perceived to be a real and coherent group, which often accompanies the belief in an inherent underlying essence that defines the entitative group (Crawford, Sherman, and Hamilton 2002; Yzerbyt, Corneille, and Estrada 2001; Yzerbyt, Rocher, and Schadron 1997; Yzerbyt, Rogier, and Fiske 1998). Thus, when a set of products is characterized by features that make it appear as a cohesive group, consumers are also likely to believe that the products are unified by an underlying essence. This is reflected in the definition of cohesiveness, which is the “forming of a united whole” (Oxford University Press, 2017), as the concept of unity suggests there is some defining quality shared by the individuals that leads to this status. In line with this notion, an implication of perceiving that groups are unified by an underlying essence is the belief that a characteristic possessed by one member of the group is representative of the group as a whole, and that a characteristic of the group as a whole is possessed by each group member (Crawford, Sherman, and Hamilton 2002; Yzerbyt, Rogier, and Fiske 1998).

However, an aspect of Mishra’s (2009) paradigm bears emphasizing: Essence transfer occurred when products were similar, proximal, and symmetrically arranged, but the particular essence being transferred was externally cued (i.e., a gift certificate or product defect noted by the experimenter) rather than an inherent quality of the products.
In my research, I aim to build on these findings by studying whether a cohesive group of product replicates will make the inherent core essence of products (rather than an externally cued essence) more accessible and influence product perceptions as a result.

Following extant research demonstrating that the processes governing perceptions and beliefs about psychological essentialism and social groups extend to the product domain (Argo, Dahl, and Morales 2006, 2008; Kramer and Block 2014; Newman and Dhar 2014; Newman, Diesendruck, and Bloom 2011; Mishra 2009; Morales and Fitzsimons 2007; Smith, Newman, and Dhar 2015), I integrate the research introduced above on the relationship between group characteristics and observers’ beliefs about groups to inform my theory and hypotheses. First, groups that appear cohesive—that is, groups in which members are similar, proximal, and unified by a shared goal or purpose—are likely to be perceived as possessing a unifying underlying essence that defines the group and describes its members (Haslam, Rothschild, and Ernst 2000; Lickel et al. 2000; Ip, Chiu, and Wan 2006; Yzerbyt, Corneille, and Estrada 2001). Moreover, in order for a group of products to cue an underlying essence, the products must be perceptually homogeneous and arranged cohesively (Mishra 2009; Mishra, Mishra, and Nayakankuppam 2009)—that is, they should look like a unified group, rather than a mere assortment of dispersed individual units (Ip, Chiu, and Wan 2006).

Second, when a group is perceived as possessing a core essence, perceptions of the group and its members change in important ways. In particular, observers attend more to the group as a whole than to the individual members making up the group, and they use the properties of the group to make inferences about individuals (Dasgupta, Banaji, and Abelson 1999; Yzerbyt, Rogier, and Fiske 1998). In other words, group members are
seen less as unique individuals, and more as interchangeable manifestations of the
group’s underlying essence (Crawford, Sherman, and Hamilton 2002; Dasgupta, Banaji,
and Abelson 1999; Yzerbyt, Rogier, and Fiske 1998). In contrast, when individuals
appear outside the context of their group, they are characterized by and perceived
according to features that may or may not relate to the essence of their respective groups
(Hamilton and Sherman 1996).

The discussion above leads to the following predictions. First, presenting a
cohesive group of efficacious product replicates will make the products’ essence more
salient than an isolated product. Moreover, because product essence manifests in the
central consequences or benefits associated with using a product, I operationalize the
salience of product essence as the salience of product effectiveness. Second, since
attribute salience influences perceptions of objects (Fiske, Kenny, and Taylor 1982;
Shavitt and Fazio 1991), and I predict that a cohesive group of product replicates makes
their defining essence of effectiveness more salient, I propose that a product will be
perceived as more effective when presented among a cohesive group of product replicates
than when presented in isolation. This also implies that efficacy salience should mediate
the effect of displaying multiple product replicates (vs. a single product) on product
efficacy perceptions. Third, because the homogeneity and cohesiveness of groups
influence the salience and transfer of an underlying essence (Ip, Chiu, and Wan 2006;
Mishra 2009; Yzerbyt, Corneille, and Estrada 2001; Yzerbyt, Judd, and Corneille 2004),
product efficacy perceptions should only increase for multiple (vs. single) products if the
product replicates form a cohesive group (i.e., when the individual units appear to form a
unified whole). In contrast, if multiple units appear as distinct individual items, efficacy
salience (and thus efficacy perceptions) should not differ according to the presence or absence of product replicates. Fourth, external information independently increasing perceived product cohesiveness (i.e., increasing the perception of a product as a unified whole) should increase product efficacy perceptions regardless of whether a single product or multiple product replicates are viewed, because cohesiveness suggests the presence of a unifying essence. Finally, following research demonstrating the effect of efficacy expectations on actual product efficacy (e.g., Shiv, Carmon, and Ariely 2005), I predict that the increase in perceived efficacy will also translate to actual efficacy experiences.

I test these predictions in five studies using a range of product categories and dependent measures. First, in study 1a, I show that an advertisement displaying multiple product replicates (vs. a single unit) of a household cleaner leads to greater perceived efficacy, and I replicate this effect in study 1b using a different product and presentation context. Study 2 demonstrates that multiple product replicates must be arranged cohesively in order for perceived efficacy to increase—if these conditions are not met, multiple replicates are only as efficacious as a single product—and shows that attention to product efficacy mediates the increase in perceived efficacy. In study 3, I manipulate the (conceptual) cohesiveness of a product through the description of a cognition-boosting supplement, leading a single product to convey its efficacy just as well as a group of product replicates, which results in equally high efficacy perceptions. Study 3 also measures purchase likelihood, demonstrating that the salience of product effectiveness drives perceived efficacy, thereby increasing purchase likelihood. Finally, in study 4, I show that these effects on perceptions of product efficacy translate to actual
product efficacy experiences, and demonstrate that individual differences in holistic processing (Choi, Koo, and Choi 2007) moderate this effect, as holistic processing relates to the tendency to perceive objects as a unified whole (Zhu and Meyers-Levy 2009).

**STUDY 1A**

Study 1a aims to provide initial evidence for the effect of presenting a single product versus multiple product replicates (a factor I refer to as “displayed quantity” throughout my studies) on perceived efficacy. To do so, I presented participants with an advertising evaluation task involving a cleaning product that was represented either by a single unit of the product or five side-by-side product replicates and asked how effective the product was perceived to be. I hypothesized that the product would be perceived as more efficacious when represented by multiple product replicates (vs. a single product).

**Method**

**Participants and design.** Eighty-seven individuals ($M_{age} = 34.7$ years; 36.8% female) recruited from Amazon’s Mechanical Turk (Mturk) participated in study 1a for nominal payment. The design was a single factor (displayed quantity: single vs. multiple) between-subjects design.

**Procedure.** I informed participants that the purpose of the study was to investigate responses to print advertisements. I showed participants an ad I created for “Dettol Surface Cleanser” that included minimal text (“Dettol Surface Cleanser – the smarter anti-bacterial solution” and “Look for it in a store near you!”) along with a picture of the product(s). To manipulate displayed quantity, this ad depicted either a single bottle of Dettol or a group of five identical bottles of Dettol (see Appendix).
After viewing the advertisement, participants responded to the dependent measure of perceived efficacy of Dettol, measured by four items: “In general, how effective do you think the Dettol you considered would be?” (1 = Not at all effective; 9 = Extremely effective); “How much do you think Dettol would help you clean your home?” (1 = Not at all; 9 = A great deal); “How effective do you think Dettol is in cleaning dirt and bacteria?” (1 = Not at all; 9 = Extremely); and “How potent do you think the active ingredients in Dettol are?” (1 = Not at all potent; 9 = Extremely potent). The average of these four items comprises my dependent measure (α = .93).

Next, I administered questions to rule out alternative explanations relating to inferences participants may have made about the product or brand based on the displayed quantity. Specifically, I asked how much Dettol participants thought the manufacturer produces (1 = Extremely low quantity; 9 = Extremely high quantity), how widely available (1 = Not at all; 9 = Extremely), and how popular the product was perceived to be (1 = Not at all; 9 = Extremely). I also asked how realistic the advertisement seemed (1 = Not at all; 9 = Extremely). Finally, I collected demographic measures, debriefed participants, and thanked them for their time.

Results

Perceived efficacy. An independent samples t-test on the efficacy composite revealed that participants believed Dettol would be significantly more effective when the ad featured multiple products ($M = 7.02, SD = 1.55$) than a single unit ($M = 6.36, SD = 1.50$; $t(85) = 2.00, p = .048$).

Alternative explanations. No significant effects of displayed quantity were found on perceptions of how much Dettol the manufacturer produces ($p > .10$), how widely
available the product was perceived to be \( p > .22 \), how popular the product was perceived to be \( p > .23 \), or how realistic the ad seemed \( p > .28 \).

**Discussion**

Study 1a provides initial evidence for my hypothesis that presenting a product among multiple product replicates (vs. in isolation) increases the perceived efficacy of the product. This finding carries important practical implications, as marketers can easily (and cheaply) design ads that include multiple product replicates to increase perceptions of product efficacy. In study 1b, I seek to replicate this effect using a different product category (energy-enhancers) and a different presentation context (a special display).

**STUDY 1B**

**Method**

*Participants and design.* Seventy-one participants \( M_{age} = 37.8 \) years, 54.9% female) recruited from Mturk participated in study 1b for nominal compensation. I randomly assigned participants to one of two conditions in a single factor (displayed quantity: single vs. multiple) between-subjects design.

*Procedure.* Similar to study 1a, I informed participants that the purpose of study 1b was to understand consumer responses to marketing promotions such as special displays and advertising. I asked participants to imagine they were grocery shopping when they saw a special display for an energy-enhancing product called “Enerji.” I showed participants an image of the display that included a table featuring one unit of Enerji (in the single displayed quantity condition) or a cohesive group of Enerji including three rows of five units (in the multiple displayed quantity condition) and a sign
promoting the product (“Now selling ENERJI energy shots!”; see Appendix). I also used a slightly smaller table in the single displayed quantity condition to minimize the influence of space-to-product-ratio on product perceptions (Sevilla and Townsend 2016). Note that space-to-product-ratio predicts that the single displayed quantity condition should be perceived more favorably than the multiple displayed quantity condition, suggesting that operationalizing displayed quantity in this way provides a conservative test of my hypotheses.

After viewing the product, I measured efficacy perceptions with a single item: “How energizing do you think drinking a bottle of Enerji would be?” (1 = Not at all energizing; 9 = Extremely energizing). Participants then responded to a few questions relating to alternative explanations: I first measured the perceived popularity of Enerji, as in study 1a (“How popular do you think Enerji is with consumers?” 1 = Not at all; 9 = Extremely). I also asked participants how small or large they thought the Enerji company was (1 = Very small; 9 = Very large). Finally, since it may be possible that the effect of multiple products on efficacy perceptions is due to participants considering how much efficacy in total is displayed in the multiple product condition (rather than how much efficacy a single unit from the group has), I asked the following: “When you were answering the questions about the effectiveness of Enerji, were you thinking about how effective one single product would be or how effective multiple products would be?” (response options: one product; multiple products). Finally, I collected demographic measures, debriefed participants, and thanked them for their time.
Results

Perceived efficacy. Replicating the results of study 1a, participants reported significantly higher efficacy perceptions of Enerji when multiple units of the product were displayed ($M = 6.20$, $SD = 1.45$) than when a single product was featured ($M = 5.25$, $SD = 1.57$; $t(69) = 2.64$, $p = .01$).

Alternative explanations. Perceptions of popularity ($t < 1$) and company size ($p > .31$) did not differ based on displayed quantity. Moreover, the majority of participants in both the single (33 out of 36; 91.7%) and multiple (30 out of 35; 85.7%) displayed quantity conditions reported that they were thinking about one single unit of the product when reporting the perceived efficacy of Enerji. The effect of displayed quantity on efficacy perceptions therefore does not appear to be influenced by inferences about the brand or considering a different quantity of products when responding to questions about perceived efficacy.

Discussion

Study 1b replicates the effect of displayed quantity on efficacy perceptions shown in study 1a using a different product category and presentation context. I also ruled out alternative explanations relating to perceived popularity of the product, inferences about the company’s size, and reporting efficacy perceptions for one vs. multiple products. In study 2, I aim to provide evidence for my proposed theory by measuring the effect of displayed quantity on the salience of the product’s underlying essence, operationalized as the extent to which a cohesive group of products focuses attention on product effectiveness, and testing whether this mediates results on perceived product efficacy. I also test a boundary condition implied by my proposed theory by manipulating the
perceived cohesiveness of the display. When multiple products are presented as a cohesive group, I expect to replicate the results of my first two studies. However, when multiple units are arranged as a dispersed collection of individual items, the salience of product efficacy and therefore product efficacy perceptions should mirror the single displayed quantity condition.

**STUDY 2**

According to my conceptualization, a critical characteristic leading a product presented among replicates to be perceived as more effective than a product presented in isolation is the perception of the product as belonging to a homogeneous and cohesive group, since observers believe such groups share a defining underlying essence. Thus, if multiple product replicates fail to be perceived as a cohesive group, product efficacy perceptions should not differ depending on the presence or absence of multiple replicates. I therefore manipulate the arrangement of multiple product replicates in study 2, in addition to manipulating displayed quantity, such that multiple products appear as a cohesive group in one condition but as separate individual items in another. In addition, study 2 measures attention to product efficacy, aiming to demonstrate that the salience of product efficacy mediates the effect of displayed quantity on efficacy perceptions.

**Method**

*Participants and design.* Sixty-seven undergraduate business students ($M_{age} = 19.5$ years; 55.2% female) participated in study 2 for partial fulfillment of a course requirement. I used a single-factor between-subject design with three levels (product...
Procedure. Study 2 used a special display context to test the effect of displayed quantity on perceived efficacy of an energy shot using similar stimuli to those used in study 1b (see Appendix). I asked participants to imagine that they were shopping at a local sporting goods store that was featuring a new type of energy shot called “Enerji,” and showed participants an image of a table displaying the product along with a sign advertising the energy shot (“Now selling ENERJI energy shots!”) and other products that might be found on display in the personal fitness section of a sporting goods store (i.e., water bottles; towels). I included these other products to manipulate the cohesiveness of the products in the display: In the multiple product–high cohesiveness condition, I arranged five bottles of Enerji in close proximity to one another in the center of the table, forming a perceptually homogeneous group. In the multiple product–low cohesiveness condition, I displayed the same five bottles of Enerji, but I reduced the proximity of the items and placed the other objects on the table between the Enerji bottles to perceptually break up the cohesive grouping of Enerji (Mishra 2009). In the single product condition, I used the same display as the high cohesiveness condition, except that only a single bottle of Enerji was displayed, and the size of the table was again reduced to minimize the influence of space-to-product-ratio on product perceptions (Sevilla and Townsend 2016).

After evaluating the display, I measured the salience of Enerji’s essence—its effectiveness—by asking, “How much did the display focus your attention on the overall effectiveness of Enerji?” (1 = Not at all; 9 = A great deal). As a manipulation check for
my manipulation of cohesiveness, I defined cohesion for participants as “the forming of a unified whole” and asked, “To what extent did you view Enerji as a cohesive group?” (1 = Not at all; 9 = A great deal).

Participants then responded to four questions asking about the perceived effectiveness of Enerji: “How energizing do you think drinking a bottle of Enerji would be?” (1 = Not at all energizing; 9 = Extremely energizing); “How effective do you think Enerji would be at increasing your physical performance?” (1 = Not at all effective; 9 = Extremely effective); “Imagine you decided to have a bottle of Enerji before your next workout. How much do you think it would improve your energy while you exercise?” (1 = Not at all; 9 = A great deal); and “How much longer do you think you would be able to exercise due to drinking a bottle of Enerji?” (1 = Not at all longer; 9 = Much longer). I took the average of these four items to form an efficacy composite (α = .97).

Next, participants responded to a few additional items asking about the display. To ensure that my manipulation did not confound cohesiveness with how organized or realistic the display appeared, I asked “How organized vs. disorganized did the display look?” (1 = Extremely disorganized; 9 = Extremely organized) and “How realistic (in terms of resembling a display you might see in real life) did this display look?” (1 = Not at all realistic; 9 = Extremely realistic). In addition, to further rule out the explanation that participants who view multiple replicates report higher efficacy perceptions because they recognize that more total efficacy is available from multiple product replicates than a single product, I asked, “When you were answering the questions about the effectiveness of Enerji earlier in the study, were you thinking more about how much energy one single bottle would give you, or how much total energy you could get from
multiple bottles?” (1 = Definitely one bottle; 9 = Definitely multiple bottles). Finally, I collected demographic information and thanked participants for their time.

Results

Manipulation check. A one-way ANOVA on the perceived cohesiveness of the display showed that the manipulation was successful ($F(2, 64) = 3.75, p = .029$): Multiple products arranged in close proximity ($M = 4.12, SD = 1.88$) were rated as significantly more cohesive than both the multiple product–low cohesiveness condition ($M = 2.81, SD = 1.86; F(1, 64) = 6.45, p = .014$) and the single-product condition ($M = 3.05, SD = 1.43; F(1, 64) = 4.16, p = .045$). The latter two conditions did not differ from one another ($p > .65$).

Perceived efficacy. A one-way ANOVA on the efficacy composite revealed a significant effect of product display ($F(2, 64) = 4.16, p = .02$). Planned contrasts revealed that the multiple product–high cohesiveness condition ($M = 4.93, SD = 1.80$) was perceived to be significantly more effective than both the single product ($M = 3.69, SD = 2.03; F(1, 64) = 5.15, p = .027$) and multiple product–low cohesiveness displays ($M = 3.52, SD = 1.71; F(1, 64) = 6.76, p = .012$). The latter two conditions did not significantly differ from one another ($p > .77$).

Efficacy salience. A similar one-way ANOVA on efficacy salience ratings showed that the product display significantly affected attention to the overall effectiveness of Enerji ($F(2, 64) = 5.43, p = .007$). The pattern of means mirrored that of efficacy perceptions: The multiple product–high cohesiveness display ($M = 3.77, SD = 2.14$) led to significantly greater attention to product efficacy than the single product ($M = 2.40, SD = 1.35; F(1, 64) = 6.81, p = .011$) and multiple product–low cohesiveness
conditions \((M = 2.24, SD = 1.58; F(1, 64) = 8.76, p = .004)\). The latter two conditions did not significantly differ from one another \((p > .76)\).

Mediation. I tested whether salience of product efficacy mediated the level of perceived efficacy of Enerji by running Model 4 in Hayes’ (2013) PROCESS macro (version 2.16, which allows for categorical independent variables with more than two levels) with 5,000 bootstrap resamples. I used indicator (i.e., dummy) coding such that the single product and multiple product–low cohesiveness conditions were compared to the multiple product–high cohesiveness condition, which served as the reference group. Results revealed that the previously significant effect of product display on perceived efficacy became nonsignificant when accounting for efficacy salience (omnibus \(p > .44\); dummy \(ps > .24\)), and the indirect effect of product display on efficacy perceptions through the salience of product efficacy was significant (omnibus: \(b = .06, SE = .05, 95\% CI [0.0003, 0.187]\)). Moreover, the indirect effects of both dummy coded indicators did not cross zero (D1: \(b = -0.82, SE = .35, 95\% CI [-1.557, -0.204]\); D2: \(b = -0.73, SE = .32, 95\% CI [-1.400, -0.178]\)).

Alternative explanations. Product display did not significantly affect how organized the display was perceived to be \((p > .62)\), how realistic the display appeared \((p > .11)\), or whether participants responded to the perceived efficacy of one bottle versus multiple bottles \((p > .50)\). Moreover, when these measures, along with efficacy salience, were entered as mediators of perceived efficacy, only the indirect effect of display format through efficacy salience was significant; all other confidence intervals crossed zero.
**Discussion**

The results of study 2 provide further evidence that presenting a product among multiple product replicates (vs. in isolation) increases efficacy perceptions, and that this effect is driven by the effect of perceiving a cohesive and homogenous group of products on attention to the products’ shared underlying essence, which manifests as attention to overall effectiveness. When multiple product replicates were displayed as spread-out individual items, I found that both efficacy salience and efficacy expectations were equivalent to a condition featuring a single unit of the product. The results of study 2 are thus important for ruling out alternative explanations based on the mere quantity (vs. cohesiveness) of products displayed. For example, if perceptions of popularity were driving the effect of displayed quantity on efficacy perceptions, the perceived cohesiveness of the displayed products should not matter. However, since the same quantity of products was perceived as less efficacious when the items were low (vs. high) in cohesiveness, popularity cannot account for these results. In addition, one may still argue that the increase in perceived efficacy when multiple products (vs. a single product) are viewed is due to anchoring on a greater total quantity of functional resources in the multiple-quantity condition, despite null results on the questions in study 1b and study 2 relating to this explanation. However, this account would also predict that multiple-product displays would be perceived as equally efficacious regardless of the arrangement of the items, while the results of study 2 showed that presenting replicates as part of a less cohesive group attenuated efficacy perceptions (and attention to overall effectiveness). Next, in study 3 I build on the results of studies 1 and 2 by manipulating conceptual,
rather than perceptual, cohesiveness, aiming to show that both conceptual and perceptual cohesiveness increase the salience of product effectiveness and thus perceived efficacy.

**STUDY 3**

In study 2, I demonstrated that a homogeneous set of cohesively grouped product replicates highlights the shared possession of the products’ most important functional benefit, leading to greater efficacy perceptions. In study 3, I build on these results by manipulating product cohesiveness orthogonally to the manipulation of displayed quantity. My theory states that product efficacy increases as a result of the cohesiveness of a group of product replicates signaling the possession of a shared underlying essence. However, presenting multiple replicates may not be the only way to signal product cohesiveness—marketers may be able to convey this directly by describing a cohesive unifying essence of their products. In study 3 I test this possibility by describing the essence (i.e., primary benefit) of a cognition-boosting supplement and manipulating the cohesiveness of the essence described. My goals for study 3 are thus to show that (a) attention to a product’s underlying essence can be increased by both perceptual cohesiveness (i.e., displaying a group of product replicates) and conceptual cohesiveness (i.e., describing a unifying underlying essence); (b) when essence salience is increased through conceptual cohesiveness, a single product is perceived to be just as efficacious as multiple product replicates; and (c) attention to the products’ essence (i.e., the product’s effectiveness) drives perceived efficacy regardless of whether salience is increased through perceptual or conceptual means. As an additional goal, I also measure purchase
likelihood in study 3, aiming to demonstrate that efficacy salience increases perceptions of efficacy, which translates to greater purchase likelihood.

**Method**

*Participants and design.* Participants were 130 individuals (54.6% female; $M_{age} = 37$ years) recruited from Mturk for nominal compensation. The design of study 3 was a 2 (displayed quantity: single vs. multiple) x 2 (product cohesiveness: neutral vs. high) between-subjects design.

*Procedure.* Similar to study 1a, I used an advertising evaluation cover story in study 3. Participants were shown an ad for a supplement claiming to enhance cognitive functioning called Cognition Plus. The ad disclosed five active ingredients at the top of the page (e.g., B-Vitamins, Omega-3 fatty acids), followed by information about the product and an image of either one bottle of the product or six bottles arranged in close proximity to one another (see Appendix).

I manipulated cohesiveness through the information provided about the product’s primary benefit in the ad. In the neutral cohesiveness condition, the ad read, “Cognition Plus includes these ingredients to provide benefits to mental functioning.” In the high cohesiveness condition, I described how these ingredients unite to form a unified whole: “Every capsule of Cognition Plus combines these ingredients in a harmonious way, such that the benefits to mental functioning they provide together are distinct from the benefits provided by the individual ingredients. This cohesive formulation is the defining feature of Cognition Plus.” Note that this manipulation does not provide additional information about the level of product efficacy; it merely describes the cohesive combination of
ingredients as distinct from the individual items and defines the product according to this cohesive combination.

After viewing the ad, I measured efficacy perceptions and purchase likelihood. Perceived efficacy was measured with two items: “How effective do you think taking a dose of Cognition Plus would be at boosting your cognitive functioning?” (1 = Not at all effective; 9 = Extremely effective), and “Imagine you buy a bottle of Cognition Plus (a month’s supply) to try and see how it works. How likely do you think consuming one bottle of Cognition Plus would be to increase your mental performance by the end of the month?” (1 = Not at all likely; 9 = Extremely likely). These items were averaged to form an efficacy composite ($r = .850, p < .001$). After rating the perceived efficacy of the product, participants provided their purchase likelihood ratings on a separate page: “How likely would you be to purchase a bottle of Cognition Plus?” (1 = Not at all likely; 9 = Extremely likely).

Participants then indicated their attention to the overall efficacy of the product. This was measured with a single item, as in study 2: “How much did the ad focus your attention on the overall effectiveness of Cognition Plus?” (1 = Not at all; 9 = A great deal). I anticipated that responses to this question would mediate the interactive effects of displayed quantity and product cohesiveness on efficacy perceptions. As a manipulation check for cohesiveness, I defined cohesion as in study 2 (“the forming of a unified whole”) and asked participants, “Considering this definition, how cohesive do you think Cognition Plus is?” (1 = Not at all; 9 = Extremely).

Participants also responded to a few measures tapping potential inferences based on product quantity and the perceived realism of the ad, similar to previous studies.
Specifically, I asked how much quantity participants believed the manufacturer produced (1 = Very small quantity; 9 = Very large quantity), perceived popularity of the product (1 = Not at all popular; 9 = Extremely popular), and how realistic the ad looked (1 = Not at all realistic; 9 = Extremely realistic). Finally, participants were debriefed and thanked for their time.

Results

Manipulation check. An ANOVA on perceived cohesiveness showed that my manipulation successfully increased perceptions of Cognition Plus as a unified whole: I observed only a main effect of the cohesiveness manipulation ($F(1, 126) = 5.36, p = .022$), such that perceptions of cohesion were higher in the high cohesiveness condition ($M = 6.49, SD = 1.87$) than the neutral cohesiveness condition ($M = 5.69, SD = 1.93$; other $ps > .17$).

Perceived efficacy. An ANOVA on the efficacy composite revealed only a significant two-way interaction ($F(1, 126) = 5.30, p = .023$; see Figure 2.1). The pattern of this interaction supported my predictions: In the neutral cohesiveness condition, product efficacy was significantly higher when multiple product replicates were shown ($M = 5.47, SD = 1.94$) than when a single product was shown ($M = 4.47, SD = 2.21$; $F(1, 126) = 3.81, p = .05$), replicating the results from previous studies. In contrast, displayed quantity had no effect on perceived efficacy in the high cohesiveness condition ($M_{\text{single}} = 5.56, SD_{\text{single}} = 1.98$; $M_{\text{multiple}} = 4.86, SD_{\text{multiple}} = 2.26$; $p > .19$). Looked at differently, the manipulation of cohesiveness significantly increased perceived efficacy when the ad featured one bottle of the product ($F(1, 126) = 4.59, p = .034$) but had no effect when the ad depicted multiple bottles ($p > .25$).
*Purchase likelihood.* An ANOVA on purchase likelihood responses matched the results found on perceived efficacy: I found only a significant 2-way interaction ($F(1, 126) = 4.61, p = .034$), such that participants were significantly more likely to purchase the product in the neutral cohesiveness condition when the ad featured multiple products ($M = 4.21, SD = 2.40$) than when the ad featured a single product ($M = 2.94, SD = 2.37$; $F(1, 126) = 4.27, p = .041$). In contrast, displayed quantity did not impact purchase likelihood in the high cohesiveness condition ($M_{single} = 4.56, SD_{single} = 2.58$; $M_{multiple} = 3.93, SD_{multiple} = 2.73$; $F < 1$). Looked at differently, when the ad depicted a single product, participants were significantly more likely to purchase Cognition Plus in the high cohesiveness condition than the neutral cohesiveness condition ($F(1, 126) = 7.03, p = .009$), while cohesiveness did not affect purchase likelihood in the multiple-product condition ($F < 1$).

*Efficacy salience.* A similar ANOVA on attention to overall effectiveness of Cognition Plus revealed a significant main effect of the cohesiveness manipulation ($F(1, 126) = 10.24, p = .002$), showing that increasing perceived cohesiveness drew attention to the product’s overall effectiveness ($M_{cohesive} = 6.17, SD_{cohesive} = 1.99$; $M_{neutral} = 4.94, SD_{neutral} = 2.32$). Moreover, this main effect was qualified by a significant 2-way interaction with displayed quantity ($F(1, 126) = 4.83, p = .03$; see Figure 2.2). The pattern of this interaction was similar to the results found on efficacy perceptions and purchase likelihood: In the neutral cohesiveness condition, presenting a product among replicates significantly increased attention to overall efficacy ($M = 5.48, SD = 2.25$) relative to the single-unit condition ($M = 4.41, SD = 2.30$; $F(1, 126) = 4.22, p = .042$), replicating the results of study 2. In contrast, in the high cohesiveness condition, the perceptual cue of
displayed quantity had no impact on attention to overall efficacy ($M_{\text{single}} = 6.44$, $SD_{\text{single}} = 1.99$; $M_{\text{multiple}} = 5.86$, $SD_{\text{multiple}} = 1.98$; $p > .28$). Looked at differently, in the single-unit condition, conceptual information relating to product cohesiveness increased the salience of product efficacy ($F(1, 126) = 15.31$, $p < .001$), while this information had no effect on efficacy salience when multiple product replicates were displayed ($F < 1$).

*Mediation.* My conceptualization proposes that the increase in perceived efficacy is driven by the perception that products are united by an essential functional benefit, and that this can be achieved either by presenting a product among a cohesive and homogeneous group of product replicates or by directly describing the product as more (vs. less) cohesive. This implies that the two significant simple effects reported above (i.e., the simple effect of displayed quantity in the neutral cohesiveness condition and the simple effect of cohesiveness in the single-product condition) should both be mediated by efficacy salience. I tested this prediction for product efficacy perceptions by running Model 8 in Hayes’ (2013) PROCESS macro for SPSS with 5,000 bootstrap resamples. Results revealed that the previously-significant two-way interaction of displayed quantity and cohesiveness on efficacy perceptions became nonsignificant when accounting for efficacy salience ($p > .14$), and the indirect effect of the two-way interaction on efficacy perceptions through salience was significant ($b = -0.72$, $SE = .35$, 95% CI [-1.499, -0.100]). Moreover, and as predicted, the indirect simple effect of displayed quantity on perceived efficacy through efficacy salience was significant in the neutral cohesiveness condition ($b = 0.47$, $SE = .26$, 95% CI [0.013, 1.010]) but not the high cohesiveness condition (95% CI [-0.733, 0.165]). This replicates the findings of study 2, demonstrating that, in the absence of conceptual information about a product’s cohesive underlying
essence, the presence of product replicates increases the salience of a product’s underlying essence and therefore increases perceptions of product efficacy. In addition, the indirect effect of the cohesiveness manipulation was significant in the single-product condition ($b = 0.88$, SE = .28, 95% CI [0.415, 1.511]) but not the multiple-product condition (95% CI [-0.300, 0.637]), demonstrating that providing conceptual information about a cohesive underlying essence when no product replicates are present leads to the same increase in attention to the product’s primary benefit—and thus perceived efficacy—that the presence of product replicates provided in the neutral cohesiveness condition.

I also tested for serial mediation of purchase likelihood by attention to product efficacy and efficacy perceptions (i.e., Model 6 in PROCESS) to understand the structure of relationships among my constructs of interest. Specifically, my conceptualization predicts that the interaction of displayed quantity and cohesiveness first affects attention to the product’s underlying essence, and that efficacy perceptions increase as a result of this change in perception and attention; purchase likelihood is then expected to increase because of the heightened expectations for product efficacy. I therefore tested this structure against alternative structures by entering the two-way interaction of displayed quantity and cohesiveness as the independent variable (and entering the main effects of displayed quantity and cohesiveness as covariates), and entering efficacy salience, perceived efficacy, and purchase likelihood as the mediators and dependent variables. I first tested the structure predicted by my theory: two-way interaction $\rightarrow$ efficacy salience $\rightarrow$ perceived efficacy $\rightarrow$ purchase likelihood. Results revealed that this full indirect effect was significant ($b = -0.70$, SE = .34, 95% CI [-1.449, -0.099]), supporting my
conceptualization. My second model reversed the order of efficacy salience and perceived efficacy in the model; this time, the full indirect effect through both mediators was not significant (95% CI [-0.205, 0.037]), while the indirect effect of the two-way interaction on purchase likelihood through efficacy perceptions (but not salience) was significant ($b = -1.66$, SE = .72, 95% CI [-3.046, -0.271]). There are two important implications of these results: First, displayed quantity and cohesiveness affect the salience of a product’s essential benefit, which drives efficacy perceptions, and this causal sequence fits my data better than one in which efficacy perceptions drive efficacy salience. Second, efficacy perceptions drive purchase likelihood.

*Alternative explanations.* A series of ANOVAs on the follow-up measures revealed no significant effects of displayed quantity, essence salience, or their interaction ($ps > .24$).

**Discussion**

Study 3 replicates and extends the results from my previous studies by showing that both the presentation of a cohesive group of product replicates and the description of a product as possessing a more (vs. less) cohesive essence increase attention to product effectiveness, leading to greater perceived efficacy and purchase likelihood. Study 3 thus builds on study 2, which demonstrated the conditions under which *multiple* replicates will *not* lead to greater salience of the primary benefit, by demonstrating the conditions under which a *single* product will be perceived according to its underlying essence. These findings carry important managerial implications that I discuss in the general discussion.

Having demonstrated the impact of perceiving a group of product replicates on both efficacy perceptions and purchase likelihood, and providing evidence for the
underlying process through both mediation and moderation analyses, in study 4 I aim to extend the effect of displayed quantity beyond hypothetical product evaluations to the actual consumption of an efficacious product. I test whether the effect of perceiving multiple product replicates (vs. a single product) on efficacy perceptions leads a product to actually become more effective, consistent with research on marketing placebo effects (e.g., Irmak, Block, and Fitzsimons 2005; Shiv, Carmon, and Ariely 2005). An additional goal of study 4 is to investigate the conditions under which a single product will be more effective than multiple product replicates, a boundary condition to the effects demonstrated in my previous studies in which a single product was perceived as less efficacious than, or equally efficacious to, multiple product replicates.

To accomplish both these goals, I extend my findings to the context of packaging by asking participants to consume a product taken from a package including either multiple units or a single unit of the product. This context aligns with my primary goal by providing a medium through which to operationalize the presence versus absence of actual product replicates. In addition, the packaging context lends itself to my second goal given recent findings indicating that single-serving (vs. multi-serving) packages lead to greater product efficacy when individuals’ processing capacity is limited (Ilyuk and Block 2016). I build on these findings by proposing that, when processing capacity is not constrained, individual differences in holistic processing (Choi, Koo, and Choi 2007) determine whether a package including several product replicates (vs. a single product) leads to more (vs. less) product efficacy.
STUDY 4

To test whether the effect of displayed quantity on perceived efficacy translates to actual product efficacy, in study 4 I provided participants with a performance-enhancing product that was inside a package containing either a single unit or multiple units of the product, asked all participants to consume one unit of the product, and subsequently measured actual performance. By extending my study of displayed quantity to the packaging context, I also build on recent findings demonstrating that consumers with limited processing capacity derive more efficacy from products taken from single-serving (vs. multi-serving) packages (Ilyuk and Block 2016). I extend these findings by proposing that, when consumers have sufficient processing capacity, two competing processes determine whether a product taken from a package including multiple units or a single unit will be more or less effective: First, as shown in the present research, consumers should derive more efficacy from multi-serving (vs. single-serving) packages when the products in the multi-serving package are perceived to form a cohesive and unified group that shares an underlying essence. However, because the packaging context introduces proportional information regarding what is versus is not consumed, a second possibility, as identified by Ilyuk and Block (2016), is that consumers may derive more efficacy from single-serving (vs. multi-serving) packages due to perceiving that they have consumed all of (vs. part of) the available resources in the single-serving (vs. multi-serving) package condition.

I propose that individual differences in consumers’ tendency to process information holistically (Choi, Koo, and Choi 2007) determine which of these two effects are observed: Individuals who process information more holistically integrate contextual
information with focal information and focus more on the whole context than the parts comprising the whole, while individuals who process less holistically separate focal information from contextual information and focus more on the parts comprising the whole than the whole itself. In other words, more holistic processors are likely to create a unified (i.e., cohesive) whole defined by the features of its constituent elements, while less holistic processors are unlikely to do so (Zhu and Meyers-Levy 2009). Thus, I predict that more holistic processors’ performance will primarily be driven by perceiving products inside a multi-serving package as a cohesive group that shares a core essence, leading to greater product efficacy in the multi-serving (vs. single-serving) package and replicating the findings from studies 1 – 3. On the other hand, less holistic processors are unlikely to view individual objects as a unified whole, and instead should keep the individual units perceptually separate. As a result, they will likely be primarily affected by the act of consuming the complete contents of the single-serving package, in which case no parts are left unconsumed (vs. consuming a proportion of the contents in the multi-serving package, in which case several parts are left unconsumed), given the relative focus of less holistic processors on the parts that comprise the whole. Therefore, products taken from single-serving packages may lead to greater derived efficacy than products from a multi-serving package for less (vs. more) holistic processors.

**Method**

*Participants and design.* Two hundred and seven ($M_{age} = 19.4$ years; 50.2% female) undergraduate students participated in study 4 for partial completion of a course requirement or extra credit. The design was a 2 (displayed quantity: single vs. multiple) x continuous (holistic processing) between-subjects design, where displayed quantity was
manipulated between-subjects and holistic processing was a measured continuous variable.

Procedure. Participants were first informed that the study would involve consuming a performance enhancing product called Gatorade Energy Chews. At the time of running study 4, Gatorade Energy Chews were only available for purchase online or at Walgreens. While they had been on the market for some time, interviews with undergraduate students from the same subject population indicated that the product was not very well-known, suggesting that I could tailor information about the product to suit the purposes of the study without raising suspicion. After confirming their willingness to consume this product, participants were given a small baggie containing either a single Gatorade Energy Chew (in the single displayed quantity condition) or six Gatorade Energy Chews (in the multiple displayed quantity condition). Participants had been randomly assigned to a condition at the beginning of the lab session when the lab administrators on duty assigned participants to cubicles. The behavioral lab where this study was conducted is divided into two halves; all participants seated on one side of the lab for a given session were in one condition, and all participants on the other side of the lab for that session were in the other condition (condition assignments were rotated each session to avoid potential confounds).

After being handed the baggie containing the product, I provided participants with more information about Gatorade Energy Chews through the computer-based survey: Participants were told that this product contained ingredients that had been shown to improve reflexes, concentration, and memory, that each chew had enough of these ingredients to boost performance for one hour, and that the recommended dose was one
chew per hour (in reality, a single serving includes all six chews included in a package). After receiving this information, participants in the single displayed quantity (multiple displayed quantity) condition were asked to eat the chew (one of the chews) they had been given and to hand the empty baggie (uneaten chews) back to the lab administrator. Note that this procedure is similar to studies by Ilyuk and Block (2016), in which participants consumed either the entire contents of a package or a proportion of the available contents.

Once participants had consumed the chew and completed a short filler task to ostensibly allow the product to be absorbed into the bloodstream, they were directed to the performance task. This task, called “Word Prospector,” presented participants with a 10-letter word and asked them to come up with as many words of four or more letters using only the letters from the 10-letter word. I informed participants that each letter from the original word could be used only once per new word, and only words that were spelled correctly and could be found in the Oxford English Dictionary would be counted. Participants completed one unscored practice task, followed by two scored trials. Each trial lasted 60 seconds, during which participants could enter as many words as possible. Thus, this task requires both physical performance (typing quickly without making errors) and mental performance (thinking of acceptable words).

Following the completion of the performance task, I measured participants’ knowledge of and experience with Gatorade Energy Chews to ensure that prior experience with this product would not influence the effectiveness of my manipulation. I asked how familiar participants were with Gatorade Energy Chews (1 = Not at all familiar; 9 = Extremely familiar), whether they had ever consumed the product before
(yes vs. no), whether participants knew how many Gatorade Energy Chews came in a pack (yes vs. no), and whether participants knew how many chews are recommended for one serving (yes vs. no). In the event that participants responded in the affirmative to either of the latter two questions, they were presented with free-response questions asking how many chews come in one pack and how many chews are in a recommended serving size.

Finally, I administered the measure of holistic processing, using the 6-item locus of attention subscale from Choi, Koo, and Choi’s (2007) Analysis-Holism scale. Example items include “It is more important to pay attention to the whole than its parts” and “The whole, rather than its parts, should be considered in order to understand a phenomenon” (1 = Strongly disagree; 7 = Strongly agree; \( \alpha = .75 \)). Finally, I collected demographic information, debriefed participants, and thanked them for their time.

**Results**

*Familiarity.* Participants were relatively low in familiarity with Gatorade Energy Chews (\( M = 3.52, SD = 2.84 \); this is significantly below the midpoint of the scale; \( t(206) = -7.50, p < .001 \)). Fifty-two participants (25.1%) reported that they had tried the product; 38 (18.4%) reported that they knew how many chews came in a pack; and 58 (28%) reported that they knew how many chews were in a recommended serving. However, when participants were asked how many chews came in a package, only 15 (7.2%) provided the correct answer of six, and only five participants (2.4%) knew how many chews were in a recommended serving. Results are unaffected by removing participants based on any of these criteria.
**Performance.** Participants came up with between zero and 32 acceptable words across the two scored tasks (\(M = 13.30, SD = 5.13\)). I regressed the number of acceptable words on the displayed quantity condition to which participants were assigned, participants’ mean-centered holistic processing score (\(M = 4.42, SD = 1.05\)), and the interaction of these two variables. Results revealed only a significant two-way interaction (\(b = 1.63, t(203) = 2.41, p = .017\); see Figure 2.3). I probed this interaction with floodlight analysis to identify the regions of holistic processing for which the effect of displayed quantity was significant (Spiller et al. 2013). Results revealed that participants in the multiple (vs. single) displayed quantity condition performed significantly better when holistic processing was greater than or equal to 5.44 (i.e., .97 SD above the mean; \(b = 1.96, t(203) = 1.97, p = .05\)), while participants in the single (vs. multiple) displayed quantity condition performed significantly better when holistic processing was less than or equal to 2.33 (i.e., 1.99 SDs below the mean; \(b = -3.12, t(203) = -1.97, p = .05\)).

**Discussion**

Study 4 shows that the presence (vs. absence) of product replicates does not only impact perceptions of product efficacy, but also influences actual experiences with products: Participants who process information more (vs. less) holistically performed significantly better on a task requiring a combination of mental and physical performance when consuming a product in the presence (vs. absence) of multiple product replicates. This study thus extends the practical implications of cohesive product groupings beyond the advertising and special display contexts to product packaging and consumption contexts. In addition, I build on recent finding by Ilyuk and Block (2016) by demonstrating that both single-serving and multi-serving package formats can lead to
increased product efficacy, depending on consumers’ processing style: When consumers process information more (vs. less) holistically, the underlying essence shared by a group of homogeneous products is more important than the experience of consumption closure (or lack thereof), leading a product taken from a multi-serving (vs. single-serving) package to be more effective. However, when consumers process information less (vs. more) holistically, consumption closure overpowers product essence perceptions, leading products in single-serving packages to be more effective than products in multi-serving packages.

**GENERAL DISCUSSION**

This research explores how presenting a product as part of a cohesive group of product replicates (vs. as an individual product) impacts consumers’ perceptions of product efficacy. Building on the psychological essentialism and product grouping literatures, I demonstrate that a cohesive and homogeneous group of product replicates (vs. a single product) makes the shared underlying essence of products more salient, leading to greater product efficacy perceptions (studies 1 – 3) and experiences (study 4). I demonstrate the importance of perceiving products as part of a cohesive group (vs. as a single item, or as part of a mere aggregation of individual products) by showing that the increase in efficacy perceptions due to displayed quantity is only observed when products are arranged more (vs. less) proximally in a cohesive, perceptually homogeneous group (study 2), and that the salience of the product’s primary benefit—its effectiveness—mediates this effect (studies 2 and 3). I also demonstrate that either perceptual or conceptual information increasing perceived cohesiveness can increase the salience of a
product’s underlying essence, and that both methods result in heightened efficacy perceptions and greater purchase likelihood (study 3). Finally, these effects also impact actual product efficacy, such that a product taken from a package in which product replicates are present (vs. absent) is more effective for individuals who process information more (vs. less) holistically.

**Theoretical Contributions**

My findings make two primary theoretical contributions. First, while much research has been devoted to studying differences in product quantity, this is the first investigation dedicated to understanding how perceptions of a product differ depending on whether a product appears in isolation or as part of a group of product replicates. Importantly, I find that products are perceived to be more effective when presented as part of a cohesive group of product replicates (vs. in isolation), and that this effect is driven by a cohesive group of products focusing attention on the products’ primary functional benefit more so than an individual product. Thus, I contribute to the literature on product quantity by revealing that, under certain conditions, a large quantity of products is perceived more favorably than a small quantity. Given the myriad contexts in which consumers observe products presented either in isolation or among replicates, these results have important and tractable implications for practitioners by suggesting that the presentation of multiple product replicates (vs. a single product) in these contexts will lead consumers to expect greater product efficacy and thereby increase purchase likelihood.

Second, I contribute to the literature on psychological essentialism by showing that a cohesive group of product replicates highlights the underlying essence of a product,
which manifests in greater attention to the product’s primary benefit. Thus, for efficacious products, a cohesive group of product replicates increases attention to the products’ efficacy, increasing product efficacy perceptions. These findings build on work in marketing studying how the essence of products and brands influences perceptions of products (e.g., Mishra 2009; Newman and Dhar 2014; Smith, Newman, and Dhar 2015). My studies build most directly on Mishra’s (2009) work, showing that grouping homogeneous products in close proximity facilitates the transfer of an externally-cued essence, by demonstrating that cohesive presentations can also make an inherent essence of the products more salient, thereby influencing product perceptions with regards to the essential benefit of the products. Thus, I demonstrate that product groupings not only impact contagion, but also affect the salience of particular product qualities: A cohesive group of product replicates makes a product’s key functional benefit salient, increasing perceptions of the strength of this benefit as a result. On the other hand, when an individual product is considered, consumers may focus on the product’s essential benefit, but they may also consider less important features (e.g., a consumer evaluating an energy drink may consider the product’s taste, packaging, and brand personality, in addition to considering its efficacy). Moreover, consistent with Mishra’s (2009) work, I find that the particular arrangement of products is important (i.e., dispersed and heterogeneous displays are less effective at cuing a product’s essence than cohesive and homogeneous displays), but I also demonstrate that a product’s essence can be made salient through verbal descriptions of product cohesiveness, leading to the same increase in efficacy salience and product efficacy perceptions.
Managerial Implications and Future Directions

My work also has important practical implications. First, as mentioned above, my studies suggest that cohesively presenting multiple product replicates in contexts such as advertising and online retailing has beneficial effects for how consumers perceive products and the expectations they form for product efficacy. Moreover, as demonstrated in study 3, the salience of a product’s essence can be increased through both perceptual and conceptual cohesiveness cues, suggesting the managerial implications of cuing a product’s core essence are general and important: Marketers can increase essence salience both through displays that depict products as a cohesive and homogeneous group, and by describing products in promotional materials in ways that highlight a cohesively-possessed defining functional attribute. In addition, I show that these strategies not only increase perceptions of product efficacy, but also increase purchase likelihood. Given that these strategies are relatively inexpensive to implement (i.e., no changes to product packaging or ingredient formulation must be made), my findings should be of great interest to practitioners.

Furthermore, the present findings suggest a novel, easy, and inexpensive method for marketers to improve perceptions of products evaluated on the basis of perceived efficacy (Zhu, Billeter, and Inman 2012). While past research has shown that consumers react more favorably to shelf-based scarcity when judging a product (e.g. Castro, Morales and Nowlis 2013; Parker and Lehmann 2011), the present findings suggest that a greater quantity of items in the retail place may actually lead to improved perceptions of product benefits via salience of a product’s underlying essence.
My work also demonstrates that both single-serving and multi-serving packaging formats can increase the efficacy consumers derive from products. This suggests that marketers should consider (a) the extent to which a target market is likely to perceive information holistically (e.g., Eastern and Western cultures differ according to holistic processing; Choi, Koo, and Choi 2007), (b) the likelihood of consumers processing information more or less heuristically (Ilyuk and Block 2016), and (c) how salient the perceptual homogeneity and cohesiveness of the units in a multi-serving package are likely to be (vs. how salient the experience of consumption closure is likely to be), in their product packaging strategies. As each of these factors influences the efficacy consumers expect and experience, basing packaging strategies on these considerations can help marketers give consumers the most effective products possible.

These findings also have implications for future research. For example, an important future direction is to examine how the effect of cohesive product groupings extends to other product categories. While my studies provided evidence for generalizability by using a range of categories (i.e., detergents, energy-enhancers, and pharmaceuticals), all of these categories can be defined according to a single primary benefit. I chose to study efficacious products for this very reason, yet the effects shown in my studies may either generalize or change in meaningful ways when extended to other types of categories. For example, if consumers have different preconceived notions about the primacy of various benefits in other product categories, cohesively presenting multiple replicates from these categories may signal different essences for different consumers. This suggests it would be important for marketers to segment consumers according to the primary reason for purchasing a given type of product. It may also be
possible for marketing communications to position products according to a single primary benefit, even if those products would normally be evaluated according to multiple benefits. For example, complex products such as vehicles provide multiple critical benefits. If a marketer can prime consumers to view a particular benefit as most important (e.g., safety) and subsequently depict offerings as a cohesive group, this may communicate strength on this attribute and improve product perceptions.

Another interesting future direction is to examine whether cohesive groups of products may also backfire in some contexts. For example, if a product or brand’s essence relates to a benefit that negatively correlates with quantity (e.g., environmental friendliness, exclusivity, or uniqueness), a cohesive presentation of multiple products may make this essence more salient, but nevertheless negatively impact product evaluations because the salient essence conflicts with the product display (e.g., a greater quantity of products is less environmentally friendly, exclusive, and unique than a smaller quantity of products). Generally speaking, an important future direction is thus to study the various boundary conditions and moderators of the effect of cohesive product groups on the manifestation of a salient essence.

Finally, an additional future direction is to further explore the factors determining whether presenting a small or large quantity of products leads to more favorable product perceptions. My results demonstrate that, when inferences based on availability are unlikely, products are evaluated more favorably when among replicates (vs. in isolation). Note, however, that most of the research on scarcity uses displays featuring multiple products in both the scarce and abundant conditions (for an exception, see Castro, Morales, and Nowlis 2013), while my studies explicitly focused on presenting a single
product versus multiple product replicates. It is therefore also possible that the advantage of low quantity shown in scarcity research would be weakened if the limited availability shelf included only a single remaining product. A useful direction for future research would thus tease apart the influence of limited availability from that of cohesive product groupings in determining evaluations of a small vs. large quantity of products. By studying these questions, future research can build on the present work by advancing our understanding of how differences in quantity impact product evaluations under different conditions and help marketers leverage the influence of these processes.
FIGURE 2.1

STUDY 3 RESULTS: PERCEIVED PRODUCT EFFICACY

Note: Error bars represent ± 1 standard error of the mean.
FIGURE 2.2

STUDY 3 RESULTS: SALIENCE OF PRODUCT EFFICACY

Note: Error bars represent ± 1 standard error of the mean.
FIGURE 2.3

STUDY 4 RESULTS: PERFORMANCE

Note: Vertical gray lines represent Johnson-Neyman points of statistical significance; the simple effect of displayed quantity is significant when holistic processing is less than or equal to 2.33 and greater than or equal to 5.44.
CHAPTER 3: PERSONAL CONTROL AND PERCEIVED PRODUCT EFFICACY

Consumers typically feel they have control over what happens to them in life (Alloy and Abramson 1979; Langer 1975). However, common everyday circumstances threaten this belief: Commuters get stuck in unexpected traffic, shoppers go to the store to purchase an item only to find that it is out of stock, and service recipients are forced to wait in long lines and crowded waiting rooms. Researchers in social and consumer psychology have recently begun to examine how individuals cope with such threats to perceived control. For example, individuals feeling low personal control may respond by supporting external sources of control such as religions and the government (Kay et al. 2008), seeking predictability through patterns and structure (Cutright 2012; Cutright, Bettman, and Fitzsimons 2013; Whitson and Galinsky 2008), or affirming other important life lessons, such as those learned through childhood socialization (VanBergen and Laran 2016).

Research in marketing has also demonstrated that a loss of control increases the desirability of products that are associated with behaviors indicative of personal control. In particular, products that require more (vs. less) effort to use, and utilitarian (vs. hedonic) products (which are associated with problem-solving), are more attractive under low (vs. high) control (Chen, Lee, and Yap 2016; Cutright and Samper 2014). However, it is unclear from this literature whether product preferences change because a loss of control motivates consumers to engage in behaviors that demonstrate their own possession of control (e.g., through exerting effort or solving problems), or because consumers want to leverage products as external sources of control that secure the ability to obtain desired outcomes. While subtle, this distinction has important theoretical and
practical implications for the consequences of low (vs. high) personal control. Although both Cutright and Samper (2014) and Chen, Lee, and Yap (2016) interpret their findings in terms of the former process, I argue that the latter process is actually a more important driver of behavior following a loss of control. By recognizing that low personal control leads consumers to seek products that increase the likelihood of attaining desired outcomes (even if this implies relying less on internal agency to bring about desired outcomes), I derive novel predictions for the consequences of a loss of control, the process underlying these consequences, and boundary conditions characterizing these effects.

Specifically, the present research is the first to demonstrate that low (vs. high) personal control leads consumers to rely on products as external sources of control. I show this by investigating the effect of personal control on perceptions of product efficacy (e.g., how effective an energy-enhancing product is perceived to be). By examining efficacy perceptions (rather than product evaluations), I disentangle the motivation to improve chances for attaining desired outcomes from the motivation to engage in control-restoring behavior alongside a product, since higher product efficacy perceptions are indicative of the former process but inconsistent with the latter. This insight also suggests an important boundary condition for the effect of personal control on efficacy perceptions: the relevance of a product for helping its user attain a personally relevant desired outcome. While previous research suggests that evaluations for products associated with control-restoring behavior are impacted by personal control even when products are hypothetically considered, my work shows that the process driving consumers’ reliance on products as external sources of control is more nuanced: Products
serve as external sources of control when products can directly assist in achieving desired outcomes, but personal control has no influence on product perceptions when product efficacy does not relate to the experience of desired outcomes. Thus, my work demonstrates the contexts in which control deprived consumers don’t simply like certain products more than other products, but are motivated to actually perceive the products differently—as more powerful sources of external control.

My research thus makes two primary contributions to the compensatory control literature: First, I build on work in marketing suggesting that the desire to affirm internal agency drives the relationships between personal control and product evaluations (Chen, Lee, and Yap 2016; Cutright and Samper 2014) by demonstrating that consumers are also motivated to use external resources in the environment to secure desired outcomes, even if this implies less affirmation of internal agency. This conceptualization has practical implications for the marketing of products that can help restore control, and theoretical implications in terms of types of products (and, more generally, the types of strategies) that control-deprived individuals are likely to turn to under a loss of control.

Second, my work also contributes more generally to compensatory control theory, which suggests that consumers draw from four (independent) strategies when responding to a loss of control (Landau, Kay, and Whitson 2015). My research demonstrates that control-deprived individuals may also combine the compensatory strategies that are activated by a loss of control. In particular, by showing that the motivation to use external sources of control (i.e., efficacious products) in order to attain personally relevant outcomes increases perceived product efficacy, I demonstrate that external sources of control can be internalized. That is, the resources possessed by an efficacious product are
hypothesized to restore a control-deprived user’s own feelings of personal control. Thus, while extant research shows that consumers can compensate for a loss of control either by affirming internal agency or external agency, I show that they can also affirm internal agency through affirmation of external sources of control. With rare exception (Sullivan, Landau, and Rothschild 2010), the strategies that are employed to compensate for low personal control have been studied in isolation, and previous research has not examined the possibility that individuals may simultaneously employ different strategies to restore control (Landau, Kay, and Whitson 2015). My research therefore makes a step towards filling this gap through the study of complementary compensatory processes.

In the sections that follow, I first review the relevant literature, focusing on research in marketing and compensatory control theory that examines the use of external versus internal strategies to restore control and pointing out the gaps in this literature. Building on the extant literature, I then describe my theory for the effect of low personal control on product efficacy perceptions, and I derive testable hypotheses regarding moderation and mediation based on my theory. Third, I describe two experiments I conducted that provide evidence for the effect of low personal control on perceived product efficacy and the mechanism underlying this effect. Fourth, I propose two additional studies that aim to provide further support for my theory. Finally, I close this essay by discussing the theoretical and practical implications of my work, and directions for future researchers to build on the findings presented here.
CONCEPTUAL DEVELOPMENT

Compensatory Control Theory

While the topic of personal control has a long history in psychological research (e.g., Alloy and Abramson 1979; Kelly 1955; Langer 1975; Lefcourt 1973), a recent wave of research has identified several intriguing consequences of low personal control, from supporting religious institutions and governments (Kay et al. 2008; Kay et al. 2009) to impacting product and brand preferences (Cutright 2012; Cutright, Bettman, and Fitzsimons 2013). Such a diverse array of findings across seemingly unrelated domains prompted the development of a unifying model that can account for this range of findings. Compensatory Control Theory (CCT) is the result of this integration (Kay and Eibach 2013; Landau, Kay, and Whitson 2015).

CCT is based on the simple idea that when individuals have experiences that reveal they are not in control of the outcomes they experience, they become motivated to bolster the belief (a) that outcomes are under control, or (b) that the world is orderly and predictable (vs. random and chaotic). In turn, these two motivations can be served by four strategies that individuals utilize when experiencing low (vs. high) personal control (Landau, Kay, and Whitson 2015).

First, the motivation to affirm that outcomes are under control leads people to bolster beliefs in (1) internal agency or (2) external agency. For example, because exerting effort empowers individuals and reminds them that they can work to bring about desired outcomes, products that require more (vs. less) effort to use become more

\footnote{To facilitate discussion throughout this essay, I refer to the strategies by number in the order in which Landau, Kay, and Whitson (2015) present them: (1) bolster personal agency, and (2) bolster external agency.}
attractive under a loss of control (Cutright and Samper 2014), an effect that is driven by the general motivation to affirm internal agency. Alternatively, individuals can affirm the controllability of outcomes by believing that external entities, such as religious figures or the government, have the power to influence personally relevant outcomes on one’s behalf (Kay and Eibach 2013). Reliance on this strategy has been shown to lead to greater support for governments and increased religiosity (Kay et al. 2008; Kay et al. 2009; Kay, Moscovitch, and Laurin 2010).

Second, the motivation to affirm the belief that the world is orderly and predictable can be served by affirming structure in the domain in which personal control was threatened, or by affirming structure in domains unassociated with the loss of personal control (see Landau, Kay, and Whitson 2015 for a review). Since my research builds on the first motivational process of affirming that outcomes are controllable through (1) internal agency or (2) external agency, I focus my conceptualization on literature pertaining to these strategies.

A review of the literature on compensatory affirmation of external sources of control reveals a conspicuous gap: Only entities that possess agency (such as religious figures or governmental institutions) have been considered as external sources of control (Kay and Eibach 2013; Landau, Kay, and Whitson 2015). However, reliance on external sources of control has been defined as “relying on a system outside of the self as a locus of resources that can influence personally relevant outcomes and improve one’s chances for achieving certain ends” (Landau, Kay, and Whitson 2015, p. 3), suggesting that a broader range of external sources should be considered. In particular, I argue that efficacious products fit the definition of external control quoted above, as efficacious
products represent an external locus of resources that can help achieve desired outcomes. However, while scholars have suggested that possessing products can provide a sense of control (Beggan 1991), theories accounting for the effect of personal control on product evaluations are based on the motivation to affirm internal control, not the motivation to use products as external sources of control (Chen, Lee, and Yap 2016; Cutright and Samper 2014). Thus, the existing body of literature in marketing on the influence of personal control insufficiently describes the extent to which consumers may turn to products facing a loss of control, and may even lead to inaccurate conclusions regarding the primary motivation driving compensatory behavior following low (vs. high) personal control. To reconcile these limitations, I next review the relevant research in marketing to build my theory describing when and how products serve as external sources of control.

**Products and Compensatory Control**

A nascent but growing body of research in marketing examines how personal control impacts consumers’ product preferences and behavior. Relating this work to the compensatory strategies described above, the motivation to affirm agency has been shown to increase the attractiveness of products that require more (vs. less) effort to use (Cutright and Samper 2014) and utilitarian (vs. hedonic) products (Chen, Lee, and Yap 2016). In both cases, the authors draw from the motivation to affirm *internal* agency in accounting for the effects of personal control on product evaluations.

Cutright and Samper (2014) first demonstrated that the desire to affirm internal agency influences product evaluations in their study of personal control and consumers’ preferences for products that require more versus less effort to use. They demonstrate that consumers experiencing a loss of control are attracted to the opportunity to affirm
internal agency by exerting effort alongside a product, because putting forth effort is empowering and attractive to control-deprived individuals. As a result, low (vs. high) personal control leads to greater preferences for products that require more (vs. less) effort to use.

Research by Chen, Lee, and Yap (2016) also studies the impact of low (vs. high) personal control on product evaluations. Also like Cutright and Samper (2014), these authors base their theory on the behaviors implied by using different types of products and the behavioral motivations that control deprivation induces. Specifically, Chen, Lee, and Yap (2016) show that consumers feeling low (vs. high) personal control report higher evaluations for utilitarian products than hedonic products. This is because lacking personal control increases the general motivation to engage in problem solving, and utilitarian products are more associated with problem solving than hedonic products. It is this general problem solving tendency (not the desire to use utilitarian products in order to achieve desired outcomes) that mediates the relationship between personal control and product preferences.

Thus, extant research has shown that when using a product implies engaging in behavior that affirms one’s sense of agency, product evaluations increase as a result of low (vs. high) personal control. A very different potential consequence of reduced personal control, for which extant research remains silent, is whether products that substitute for user behavior would also be affected by a loss of personal control. In other words, extant research shows that a loss of control increases the favorability of products that provide a medium for engaging in behavior that restores control. On the other hand, I am interested in whether a loss of control will also motivate consumers to draw from the
resources offered by efficacious products. In this case, the product is not a medium between behavior and outcomes, but rather an antecedent that (artificially) increases the ability to engage in control-restoring behavior.

While this is a subtle distinction, it carries important implications for theory and practice. Theoretically, understanding whether and when consumers prioritize their own ability to achieve desired outcomes over the resources offered by products suggests what strategies will primarily be used to restore control and how these strategies will impact consumer behavior. While extant research in marketing leads to the conclusion that affirming internal agency is primary, I suggest that affirmation of internal agency is only a viable strategy if the ability to attain desired outcomes is given. This is based on CCT, which describes how the motivation to affirm (internal or external) agency serves the more basic drive to bolster beliefs that outcomes are under control (Landau, Kay, and Whitson 2015). To test this distinction, I examine an unexplored consequence of low (vs. high) personal control: product efficacy perceptions. If threatened personal control leads to the prioritization of exercising internal agency, efficacy perceptions should either be unaffected (or reduced) under a loss of control because consumers’ motivation would relate to their own behavior alongside the product, not the resources of the product itself. However, if threatened personal control leads to the prioritization of securing desired outcomes, efficacy perceptions should increase under a loss of control (to the extent that greater product efficacy implies greater ability to experience desired outcomes) as a result of consumers’ motivation to perceive that products will improve their ability to experience desired outcomes (Rutjens et al. 2013).
Importantly, extant compensatory control research does not lend insight to this distinction: Previous work examines only the effect of reduced personal control on product evaluations, and evaluations may be impacted both by the desire to affirm internal agency alongside the product, as well as the motivation to utilize the product as an external source of control. I therefore contribute to work in marketing on compensatory control by showing that a novel consequence—increased product efficacy perceptions—results from a loss of personal control, and that a novel process—the motivation to use external sources of control to increase the ability to achieve personally relevant outcomes—drives this effect. Moreover, by demonstrating that efficacy perceptions increase in order to improve one’s ability to experience desired outcomes, I contribute to CCT by showing that the strategies to regain control can be combined (Landau, Kay, and Whitson 2015). Specifically, my results show that control-deprived individuals affirm external sources of control in order to affirm their own internal agency. While previous work in CCT has demonstrated that a loss of control leads consumers to rely on external sources of control, the present research is the first demonstration that an external locus of resources can be used by consumers to bolster internal agency. The implications of this finding are important, as it suggests additional consequences that may follow a loss of control (e.g., biased perception of other product dimensions that relate to restoring personal control).

Whether a loss of control primarily leads to the desire to affirm internal agency versus secure desired outcomes also has important practical implications for the marketing of products in the myriad contexts in which consumers’ personal control is often threatened (e.g., busy highways, crowded shopping centers, public transportation,
waiting rooms). In particular, understanding how consumers respond to a loss of control has implications for both the way that products should be advertised (i.e., emphasizing the user’s behavior vs. the product’s efficacy) and the types of products that should be marketed (i.e., products like exercise equipment that require exercising internal agency vs. products like diet pills that do not require exercising internal agency) in such contexts. By demonstrating that consumers are driven to shore up their ability to experience desired outcomes under a loss of control—even if this means affirming their own internal control less—my results help inform these kinds of marketing strategy decisions.

I test the predictions derived above in two studies and find consistent support. In study 1, I provide initial support for my basic prediction that low (vs. high) personal control increases perceived product efficacy by demonstrating that individuals asked to recall an instance in which they lacked (vs. possessed) personal control believed that listening to a song by Mozart would have a greater positive impact on their performance. I also provide support for my proposal that perceiving greater product efficacy compensates for low personal control by demonstrating that an alternative means to restore control (i.e., a self-affirmation task; Whitson and Galinsky 2008) moderates the effect of low personal control on efficacy perceptions. In study 2, I test my full theoretical model by manipulating the personal relevance of the product under consideration and measuring expectations for both the perceived efficacy and taste of an energy-enhancing product. Since the taste of a product does not impact its ability to help a user achieve desired outcomes, my conceptualization predicts that personal control will impact perceived efficacy but not taste. My results support this prediction, showing that perceptions of efficacy (but not taste) are impacted by personal control, and that this
effect only occurs when products are relevant for achieving desired outcomes. I also measure participants’ motivation to derive product efficacy in order to experience desired end states, which mediates the effect of personal control on perceived efficacy.

**PRETEST FOR PERSONAL CONTROL**

In both my studies I used an autobiographical recall task to manipulate personal control. While this measure was taken from previous research (VanBergen and Laran 2016) and based on widely-used manipulations of personal control (Cutright 2012; Kay et al. 2008), I ensured that the manipulation was successful with the populations used in the present research. I therefore ran a pretest using each population sampled from in the main studies. Sixty individuals (\(M_{\text{age}} = 33.3\) years; 40% female) recruited from Amazon’s Mechanical Turk (Mturk; the population sampled in study 1), and seventy-two undergraduate business students (\(M_{\text{age}} = 19\) years; 45.8% female; the population sampled in study 2) first completed the manipulation of personal control, asking for a detailed memory involving low versus high personal control. Specifically, participants in the low personal control condition were asked to think of something that happened to them that was completely out of their control, and to write about the ways their behavior and choices were unable to influence what happened. In the high control condition, participants wrote about something that was completely under their control, focusing on the ways their behavior and choices played a role in what happened to them. After participants completed this task I administered the manipulation check, asking how much control participants felt they had over the experience they wrote about (1 = *Very little control*; 9 = *A great deal of control*).
Results revealed that the control manipulation was successful: Participants assigned to the low personal control condition reported feeling significantly less control (Mturk population: $M = 2.39$, $SD = 2.01$; student population: $M = 3.22$, $SD = 2.55$) than participants assigned to the high personal control condition (Mturk population: $M = 8.17$, $SD = 1.10$; $t(58) = 13.68$, $p < .001$; student population: $M = 6.92$, $SD = 2.30$; $t(70) = 6.45$, $p < .001$).

**STUDY 1**

The primary goal of study 1 is to provide initial evidence for my main prediction, that low (vs. high) personal control increases perceptions of product efficacy. As a secondary goal, I also aim to provide support for my proposal that increased perceptions of product efficacy compensate for low personal control by demonstrating that this effect is moderated by the availability of an alternative means of recovering from the aversive state of low personal control. Based on studies showing that providing individuals with an opportunity to affirm personally important values reduces the desire to exert control over one’s environment (Hamerman and Johar 2013) and ameliorates negative psychological experiences (Chatterjee, Irmak, and Rose 2013; Koole et al. 1999), including low personal control (Whitson and Galinsky 2008), I also manipulated self-affirmation in study 1. I predicted that individuals experiencing low (vs. high) personal control would perceive an efficacious product to be more effective, but that this effect would be attenuated if individuals affirmed their values between the experience of low personal control and the measurement of perceived efficacy.
Method

Participants and design. Ninety-eight participants ($M_{age} = 35.6$ years; 42.9% female) were recruited from Amazon’s Mechanical Turk and took part in study 1 for nominal compensation. Participants were randomly assigned to one of four conditions in a 2 (personal control: low vs. high) x 2 (self-affirmation: absent vs. present) between-subjects design.

Procedure. Participants were informed they would be taking part in a study comprising a few ostensibly unrelated tasks, the first of which was the manipulation of personal control (described in the pretest). After completing the personal control manipulation, participants completed the self-affirmation manipulation (taken from Chatterjee, Irmak, and Rose 2013). Participants in the self-affirmation present condition were given the following instructions: “Please write down the most important value to you (e.g., ‘professional achievement,’ ‘making money,’ ‘helping others,’ ‘being friendly,’ etc.). Please describe a few personal experiences in which you have acted consistently with this value.” Participants in the self-affirmation absent condition were asked to “please list, in as much detail as you can, everything that you ate or drank in the past 48 hours.”

Participants were then directed to the portion of the study that would measure efficacy perceptions, disguised as a study of “Performance-Enhancing Treatments and Task Performance.” Since my theory proposes that low (vs. high) personal control increases efficacy perceptions because control-deprived consumers are motivated to reaffirm their ability to experience desired end-states, which can be aided by efficacious products, it was important that participants believed that they would be using the product
under consideration to reach a goal. Also, due to limitations of my online research setting, I could not use a traditional efficacious product, such as an energy-enhancing food or drink. Instead, I used the “Mozart Effect” as my efficacious treatment, based on research showing that listening to classical music by the composer Mozart has the ability to increase certain types of cognitive performance (Rauscher, Shaw, and Ky 1993).

With these considerations in mind, I informed participants that they would be taking part in a study aimed at finding out what predicts performance on tasks requiring focused attention and quick reflexes. To encourage them to view good task performance as a goal, the instructions informed participants that these skills “are needed for many things we do in everyday life and work,” and asked them to try to perform as well as possible. I also explained that, to help participants perform, they would be given a performance-enhancing treatment before completing the tasks. I then introduced the Mozart Effect by informing participants that research has shown that listening to music by Mozart increases performance on tasks requiring attention, mental clarity, and focus. Participants were then given more information about the specific song they would ostensibly hear (“Sonata for Two Pianos in D Major, K488” which was the song used in Rauscher, Shaw, and Ky’s 1993 article) and told that they would respond to some questions about their beliefs about the Mozart Effect before listening to the song and completing the tasks.

Participants then responded to the dependent variable, comprising two measures of perceived efficacy: “How effective do you think the Mozart song you will hear is at improving mental focus and attention?” (1 = Not at all; 9 = Extremely) and “How much do you think the Mozart song can improve performance on tasks requiring focused
attention and quick reflexes?” (1 = Not at all; 9 = A great deal). These measures were highly correlated \((r = .898, p < .001)\) and were therefore averaged to form an efficacy composite.

Next, participants responded to measures relating to potential alternative explanations for the effect of low personal control on efficacy perceptions. First, one might argue that the effect of low (vs. high) control on the desire to regain control leads to motivated reasoning and increases perceptions of one’s own abilities, which then spills over to efficacy perceptions (e.g., “I’m going to perform well anyway, so this product is going to be effective”). I therefore asked how well participants thought they would be able to perform on a task requiring focused attention and quick reflexes without the help of the Mozart Effect (1 = Very poorly; 9 = Very well). Second, as discussed above, low control also leads to a desire for empowerment, increasing preferences for products that require effort to use (Cutright and Samper 2014). While greater efficacy perceptions should actually imply requiring less effort on the part of the user, making this an unlikely alternative explanation, it could be argued that low control makes individuals believe they will exert more effort while using the product, increasing product efficacy perceptions as a result. I therefore asked, “How much effort do you think it takes to experience the benefits of the Mozart song?” (1 = No effort at all; 9 = A great deal of effort). Finally, I debriefed participants, collected demographic measures, and thanked participants for their time.

**Results**

_Efficacy perceptions_. An ANOVA on the perceived efficacy composite showed only a significant 2-way interaction of personal control and self-affirmation \((F(1, 94) =\)
4.60, \( p = .035 \); other \( ps > .26 \); see Figure 3.1). The pattern of results was as predicted: Participants in the self-affirmation absent condition reported significantly higher perceptions of the effectiveness of the Mozart song in the low control condition (\( M = 6.61, SD = 1.79 \)) than the high control condition (\( M = 5.41, SD = 2.15; F(1, 94) = 4.38, p = .039 \)). On the other hand, participants who were given a chance to compensate for the experience of low personal control via the self-affirmation task did not significantly differ from participants in the high personal control condition (\( M_{\text{low}} = 5.27, SD_{\text{low}} = 2.07; M_{\text{high}} = 5.83, SD_{\text{high}} = 2.00; F < 1 \)). Looked at differently, self-affirmation significantly impacted perceptions of efficacy in the low personal control condition (\( F(1, 94) = 4.86, p = .03 \)) but did not affect efficacy perceptions in the high personal control condition (\( F < 1 \)).

Alternative explanations. An ANOVA on responses to the question asking how well participants thought they would be able to perform without the help of the Mozart Effect revealed a significant main effect of self-affirmation (\( F(1, 94) = 11.79, p = .001 \)) such that participants in the affirmation absent condition (\( M = 6.92, SD = 1.50 \)) reported greater ability to perform well than participants in the self-affirmation present condition (\( M = 6.00, SD = 1.17 \)). No other effects were significant (\( Fs < 1 \)). While the effect of self-affirmation was not anticipated, this main effect cannot explain results on efficacy perceptions. One possible explanation for this main effect is that affirming personally important values reduces the tendency to engage in motivated reasoning, attenuating exaggerated perceptions of one’s own abilities. No significant main effects or interactions were found on perceptions of the amount of effort required to derive efficacy from the Mozart song (\( Fs < 1 \)).
Discussion

Study 1 provides initial evidence in support of my prediction that low (vs. high) personal control increases perceived product efficacy by demonstrating that participants experiencing low personal control perceived that a song would be more effective at increasing their performance than participants feeling high personal control. Supporting the role of efficacy perceptions at compensating for low personal control, I found that a self-affirmation task (which has previously been used as a way to restore control-deprived individuals to baseline; Whitson and Galinsky 2008) attenuated the effect of personal control on perceived efficacy. In study 2, I aim to build on the results of study 1 by testing the moderating role of the relevance of products (and product attributes) for reaching a desired end state.

STUDY 2

Beyond replicating the basic effect of personal control on perceived efficacy, the primary purpose of study 2 was to test the underlying process for this effect. I did so by testing each of the predictions implied by my theory. First, my theory posits that efficacious products serve as external sources of control that help consumers restore their own internal sense of control. Thus, the effect of low (vs. high) control on product efficacy perceptions should be moderated by the personal relevance of product efficacy for a desired end state, since a product that will not be used to reach a desired end state cannot transfer its control-affirming efficacy to consumers. In study 2 I therefore manipulated whether or not participants were led to believe that the product under consideration would be used to aid performance in an upcoming task. In addition, my
theory proposes that the effect of personal control on product perceptions should be restricted to attributes that directly relate to accomplishing a desired end state. To test this prediction, I measured taste perceptions of the product in addition to efficacy perceptions; I hypothesized that personal control would impact efficacy perceptions but not taste perceptions. Finally, I also tested my prediction for the process underlying this effect by testing whether the effect of personal control on product efficacy perceptions would be mediated by the motivation to derive efficacy from a product that can help reach a desired outcome.

**Method**

*Participants and design.* Participants were 209 undergraduate business students ($M_{age} = 19.5$ years; 45% female) who took part in the study for partial fulfillment of a course requirement. I randomly assigned participants to one of four conditions in a 2 (personal control: low vs. high) x 2 (expectation of consumption and performance: absent vs. present) between-subjects design.

*Procedure.* As in study 1, participants were informed they would be taking part in a study comprising a few ostensibly unrelated tasks. They were first directed to the manipulation of personal control, using the same “detailed memories” task described in the pretest. After participants described an experience in which they were or were not in control of what happened, I manipulated the expectation of consumption and performance. In the expectation-absent condition, participants were directed to a study of “Performance-Enhancing Product Perception,” the ostensible objective of which was to understand more about people’s beliefs about products claiming to improve various abilities. I then introduced the product (“Neuro SONIC,” which is a commercially
available energy enhancer) and informed participants that the product claimed to improve attention, mental clarity, and focus.

In the expectation-present condition, participants were directed to a study of “Performance-Enhancing Products & Task Performance.” As in study 1, this was ostensibly aimed at understanding what predicts performance on tasks requiring focused attention and quick reflexes, and I again asked participants to try to perform as well as possible on the tasks to encourage them to view good task performance as a goal. They were also informed that they would be given a performance-enhancing product before completing the tasks to help them perform. They then received identical information about Neuro SONIC that participants in the expectation-absent condition received (i.e., that it claimed to improve attention, mental clarity, and focus). A few bottles of the product were also present in the lab to encourage participants to believe that the product would indeed be consumed later in the study.

After the task introduction, all participants saw a picture of Neuro SONIC and received additional information about its purported effects and active ingredients. Participants in the expectation-present condition were informed that they would receive a sample of the product before performing the tasks, but that they would first respond to some questions about their perceptions of the product. Thus, participants in both expectation conditions received identical information about Neuro SONIC, with the only difference being that participants in the expectation-present condition were led to believe that they would later be consuming the product to help them perform some tasks.

I next included measures of efficacy perceptions and motivation to derive efficacy from the product (order was counterbalanced). My dependent measure comprised two
items: “How effective do you think Neuro SONIC is at improving mental focus and attention?” and “How effective do you think Neuro SONIC is at increasing mental alertness?” (1 = Not at all; 9 = Extremely). These items were combined to form an efficacy composite ($r = .79$, $p < .001$). On a separate page, motivation to derive efficacy was also measured with two items: “How motivated are you to experience the benefits of Neuro SONIC?” and “How much do you currently want to find a product that can help you accomplish your goals?” (1 = Not at all; 9 = A great deal). These items were combined to form a motivation composite ($r = .47$, $p < .001$).

To test whether the effect of low control was restricted to product perceptions that are relevant to the desired end-state, I next measured taste perceptions of the product: “The flavor of Neuro SONIC is ‘Superfruit Infusion.’ How do you think this would taste?” (1 = Very bad; 9 = Very good). Following this, I included measures corresponding to alternative explanations. First, since low control has been shown to increase perceptions of order and structure (Whitson and Galinsky 2008), and an efficacious product could be seen as providing structure via predictable cause-and-effect relationships (Faro 2010), I asked how predictable participants believed the effect of Neuro SONIC is (1 = Not at all predictable; 9 = Extremely predictable). Second, as in Study 1, I also measured how much effort participants thought it would take to experience the benefits of Neuro SONIC (1 = No effort at all; 9 = A great deal of effort).

Participants were then directed to a manipulation check for the expectation of product consumption and subsequent performance. I asked participants, “How much have you been thinking about actually consuming Neuro SONIC and experiencing its benefits?” (1 = Not at all; 9 = A great deal). Finally, participants in the expectation-
present condition were debriefed about the nature of the study, and all participants provided demographic information to conclude the study.

**Results**

*Expectation manipulation check.* An ANOVA on responses to the consumption and performance expectation manipulation check revealed only the expected main effect of expectations ($F(1, 205) = 8.97, p = .003$; other $ps > .19$) such that participants in the expectation-present condition reported thinking about consuming the product and experiencing its benefits ($M = 4.36, SD = 2.44$) more than participants in the expectation-absent condition ($M = 3.40, SD = 2.27$).

*Efficacy perceptions.* An ANOVA on perceived product efficacy of Neuro SONIC revealed a main effect of the expectation manipulation ($F(1, 205) = 7.27, p = .008$; $M_{\text{absent}} = 4.30, SD_{\text{absent}} = 1.72$; $M_{\text{present}} = 4.87, SD_{\text{present}} = 1.54$) that was qualified by the predicted two-way interaction ($F(1, 205) = 6.06, p = .015$; see Figure 3.2). Contrast analysis showed that, in the expectation-present condition, participants induced to feel low personal control reported significantly higher efficacy perceptions ($M = 5.23, SD = 1.64$) than participants in the high personal control condition ($M = 4.57, SD = 1.40$; $F(1, 205) = 4.27, p = .04$). In contrast, when no consumption or performance was anticipated, personal control did not impact efficacy perceptions ($M_{\text{low}} = 4.08, SD_{\text{low}} = 1.67$; $M_{\text{high}} = 4.52, SD_{\text{high}} = 1.76$; $F(1, 205) = 1.98, p > .15$). Looked at differently, participants induced to feel low personal control reported significantly greater perceived efficacy when they expected to consume Neuro SONIC than when they did not ($F(1, 205) = 12.73, p < .001$), while efficacy perceptions did not differ according to consumption expectations in the high personal control condition ($F < 1$).
Taste perceptions. A similar ANOVA on perceptions of how Neuro SONIC would taste revealed no significant main effects or interactions ($p > .13$). Moreover, when I conducted a mixed-design ANOVA, treating efficacy perceptions and taste perceptions as two levels of a within-subjects factor, I found a significant three-way interaction between personal control, consumption expectation, and the type of measure ($F(1, 205) = 5.33, p = .022$), which qualified a main effect of the type of measure ($F(1, 205) = 38.44, p < .001$). The latter main effect revealed that, collapsing over the two manipulated factors, taste perceptions ($M = 5.51, SD = 1.91$) were higher than efficacy perceptions ($M = 4.58, SD = 1.66$). Interestingly, contrast analyses revealed that this difference was weaker for participants experiencing low personal control who expected to consume the product ($F(1, 205) = 2.95, p = .087$) than in any of the other three cells ($F$s$(1, 205) > 4.42, p < .04$). More importantly, further analyses of simple effects revealed that low personal control only significantly differed from high personal control in the expectation-present condition when efficacy perceptions was the dependent measure ($F(1, 205) = 4.27, p = .04$; other $ps > .15$), and the expectation-present condition only significantly differed from the expectation-absent condition when personal control was low and efficacy perceptions was the dependent measure ($F(1, 205) = 12.73, p < .001$; other $ps > .14$). These results support my proposal that the influence of low personal control is restricted to product attributes that relate to experiencing desired outcomes, but has no effect on other product attributes.

Motivation. An ANOVA on responses to the measure of motivation to derive product efficacy resulted in only a significant two-way interaction ($F(1, 205) = 4.83, p = .029$; other $ps > .27$; see Figure 3.3). The pattern of this interaction mirrored the pattern of
results found on efficacy perceptions: Participants who expected to consume Neuro SONIC and subsequently perform tasks were significantly more motivated to experience its efficacy in the low personal control condition ($M = 5.65, SD = 2.37$) than in the high personal control condition ($M = 4.69, SD = 2.02; F(1, 205) = 5.33, p = .022$).

Participants’ motivation in the expectation-absent condition did not differ according to personal control ($M_{\text{low}} = 4.71, SD_{\text{low}} = 1.80; M_{\text{high}} = 5.03, SD_{\text{high}} = 2.22; F < 1$). Looked at differently, expecting to consume Neuro SONIC significantly increased motivation to experience its efficacy in the low control condition ($F(1, 205) = 4.98, p = .027$) but did not affect motivation to experience efficacy in the high control condition ($F < 1$).

*Mediation.* According to my theory, perceptions of product efficacy increase as a result of low control when participants expect to consume and use a product because low control increases the motivation to derive product efficacy. I thus tested whether motivation to derive efficacy mediated the interaction of personal control and consumption expectation on efficacy perceptions by running Model 8 in Hayes’ (2013) PROCESS macro for SPSS with 5,000 bootstrapping resamples. Results revealed that motivation to derive efficacy significantly and positively predicted efficacy perceptions ($b = 0.36, t(204) = 7.49, p < .001$) and the indirect effect of the two-way interaction on efficacy perceptions through motivation was significant ($b = -0.46, SE = .22, 95\% \text{ CI } [-0.931, -0.057]$), whereas the direct effect of the two-way interaction on efficacy perceptions became nonsignificant when motivation was included as a predictor ($t(204) = -1.60, p > .11$). In addition, and in support of my theory, the simple indirect effect of personal control on efficacy perceptions through motivation was significant in the expectation-present condition ($b = -0.34, SE = .16, 95\% \text{ CI } [-0.688, -0.044]$) but not the
expectation-absent condition ($b = 0.11$, $SE = .14$, $95\% \text{ CI } [-0.153, 0.413]$). The indirect
effect of consumption expectation on efficacy perceptions through motivation was
likewise significant in the low personal control condition ($b = 0.34$, $SE = .16$, $95\% \text{ CI } [0.044, 0.668]$) but nonsignificant in the high personal control condition ($b = -.12$, $SE = .15$, $95\% \text{ CI } [-0.437, 0.159]$).

**Alternative explanations.** An ANOVA on perceptions of the predictability of
Neuro SONIC revealed only a marginally significant main effect of consumption
expectation ($F(1, 205) = 3.60$, $p = .059$), such that the product was perceived as more
predictable in the expectation-present condition ($M = 5.55$, $SD = 1.67$) than the
expectation-absent condition ($M = 5.07$, $SD = 2.15$). The effect of personal control ($p > .20$) and the two-way interaction ($F < 1$) were nonsignificant, suggesting that the
motivation to perceive structure and predictability could not explain the effect of low
control on efficacy perceptions. Likewise, no significant effects were obtained on
perceptions of the amount of effort required to experience the benefits of Neuro SONIC
($ps > .14$).

**Discussion**

Study 2 provides comprehensive support for my theory by testing each of the
predictions derived from my proposed theory. First, I replicated the finding from study 1
demonstrating that low personal control increased perceptions of product efficacy.
However, because this effect is based on using an external source of control to reaffirm
one’s own ability to reach desired outcomes, this effect was only obtained when
participants thought the product would be used for an upcoming performance task. This
pattern of moderation is thus important for demonstrating that personal control does not
impact efficacy perceptions for the sole reason that efficacious products are external sources of control (i.e., strategy (2) alone), otherwise I would have only observed a main effect of personal control. Rather, personal control impacts efficacy perceptions when greater product efficacy implies greater ability of control-deprived consumers to bring about desired outcomes (i.e., strategy (2) and strategy (1)). In addition, personal control had no effect on taste perceptions, as better or worse taste is irrelevant to restoring control. Finally, the effect of low personal control was mediated by the motivation to derive efficacy from a product that could assist in reaching one’s goals. Together, these results provide converging evidence that low personal control increases perceived product efficacy because of control-deprived consumers’ motivation to use an external source of control as a way to reaffirm their own, internal sense of control.

I next propose two additional studies aimed at providing additional support for my proposed theory.

**STUDY 3 PROPOSAL**

My proposed study 3 aims to provide direct support for my prediction that low personal control only impacts perceptions of products and product attributes that help individuals reach desired outcomes. While study 2 supported this through the null effect of personal control on taste perceptions, the within-subjects nature of the measurement of taste perceptions may have introduced demand or order-of-measurement effects. Moreover, given previous research suggesting that personal control is more likely to impact utilitarian product preferences than hedonic product preferences (Chen, Lee, and Yap 2016), it is also possible that taste perceptions were unaffected because taste is more
hedonic than efficacy. To reconcile these limitations, I aim to demonstrate that personal control only impacts perceptions of product attributes that are instrumental in assisting a consumer regain control by using two different types of efficacious utilitarian products in a between-subjects design, only one of which relates to performance.

Method

Participants and design. Participants will be approximately 120 individuals who are undergraduate business students (this study involves the expectation of consuming a product, which requires in-person participation). The design of study 3 is a 2 (personal control: low vs. high) x 2 (attribute-task relevance: low vs. high) between-subjects design.

Procedure. The procedure for study 3 is similar in most respects to the expectation-present condition in study 2. The critical difference is how I will describe the product participants expect to consume and its relation to the performance task participants believe they will complete. In the high attribute-task relevance condition, the procedure will be the same as the expectation-present condition from study 2 (with the exception of the specific product used, see below): Participants will be informed that I am interested in what impacts performance, and that they will be given a performance-enhancing product that should help them perform well on the upcoming task.

In the low attribute-task relevance condition, participants are informed that I am interested in people’s evaluations of products associated with specific uses and contexts. More specifically, participants are told that I am studying how people evaluate sports drinks, defined as products that do not directly impact performance during exercise, but rather provide hydration and replenish nutrients that help people recover from workouts
more quickly. To ostensibly test this, participants are told that they will be provided with a sports drink, and to simulate the context in which these beverages are typically consumed, they will then be asked to perform a task. For the product itself, I will use Body Armor Super Drink (or a similar product), which is an actual sports drink that can easily be described either as a performance enhancer (i.e., a beverage that increases energy and thereby improves performance) or as a beverage that hydrates and facilitates recovery from workouts (but that does not directly impact performance).

To recapitulate, all participants are led to believe that they will consume a product that is related to the task they will perform, but the attribute under consideration (performance enhancement vs. hydration) is more or less relevant to successful performance (respectively). Therefore, I predict that low (vs. high) personal control will increase perceptions of how effective the product is at improving performance but not how effective the product is at hydrating or replenishing nutrients. The reason is that perceiving higher efficacy at enhancing performance implies that control-deprived consumers have greater ability to reach their desired outcome of performing well via the product’s efficacy, whereas perceiving greater efficacy at hydration does not help control-deprived individuals regain internal agency through the use of the product in this case, as hydration is unrelated to successful task performance.

Once participants are given information about the product and upcoming task, I will measure my dependent variable. These measures will differ slightly between conditions. In the high attribute-task relevance condition, participants will respond to questions about expectations of the product’s effectiveness at improving dimensions of performance (as in prior studies). In the low attribute-task relevance condition,
participants will respond to questions about expectations of the product’s effectiveness at hydrating and facilitating post-workout recovery.

**Results**

I anticipate finding a significant two-way interaction between personal control and attribute-task relevance. The pattern of this predicted interaction is shown in Figure 3.4, depicting increased perceived efficacy under low (vs. high) personal control in the high attribute-task relevance condition but no effect of personal control in the low attribute-task relevance condition.

**Discussion**

Study 3 stands to provide support for my theory by demonstrating that low (vs. high) control only increases perceptions of product attributes that are related to the ability of the product to assist in achieving a desired end state. Thus, when participants are asked about the effectiveness of a sports drink at hydrating and promoting recovery after a workout, personal control no longer impacts perceived efficacy because, in this case, greater effectiveness does not enhance control-deprived participants’ ability to reach a desired end state. This study also stands to differentiate my proposed process from research by Chen, Lee, and Yap (2016). While these authors found that utilitarian products are evaluated more favorably than hedonic products, I aim to show that product efficacy only increases when efficacy implies greater ability of the user to reach a desired outcome. Thus, even though efficacious products are utilitarian, if the specific utilitarian product under consideration does not increase the likelihood of achieving a desired outcome, no effect of personal control on efficacy perceptions is expected. Importantly, my proposed theory explains why this is the case: Product efficacy increases because low
(vs. high) personal control motivates consumers to utilize external sources of control that increase their ability to accomplish goals and reach desired end states. On the other hand, Chen, Lee, and Yap (2016) demonstrate that utilitarian products are evaluated more favorably under low (vs. high) personal control (but no product perceptions were measured) because of the association between utilitarian products and the general problem-solving tendency induced by low personal control (Chen, Lee, and Yap 2016, study 4).

**STUDY 4 PROPOSAL**

The primary goal of my fourth proposed study is to provide direct evidence for the combination of compensatory strategies that I propose underlies the effect of personal control on perceived product efficacy. To do so, I plan to manipulate the opportunity to rely on an efficacious product as an external source of control for an upcoming task (strategy (2)), and measure the extent to which this affects the level of personal control participants feel they possess prior to the task (strategy (1)). If my theory is correct, control-deprived participants should only report greater product efficacy when the product is expected to relate to task performance (conceptually replicating the results of study 2); as a result of this increase in perceived efficacy, the level of personal control participants feel prior to task performance should not differ according to the previous manipulation of personal control. However, when the efficacious product is unrelated to task performance (and thus no external source of control is available for participants to internalize), control-deprived consumers should report less personal control prior to task performance than those whose personal control was not threatened earlier in the study.
Method

Participants and design. Participants will be approximately 120 undergraduate students. The design of the study is a 2 (personal control: low vs. high) x 2 (consumption expectation: absent vs. present) between-subjects design.

Procedure. Participants will be informed that the study will involve a number of ostensibly unrelated tasks. The first of these tasks is the manipulation of personal control, using an autobiographical recall task. Next, participants will be given an outline of the upcoming tasks. Specifically, I will tell all participants that the next task will involve providing opinions about different consumer products, and later in the study they will complete a moderately difficult task requiring mental alertness and focus. Thus, unlike study 2, all participants are led to believe they will perform a task later in the study. After providing this information, participants will report perceptions of two unrelated products (e.g., expectations for the tastiness of a brand of ice cream; liking of tee-shirt designs) as a filler task to fit the cover story. Each filler product will be introduced individually and some information about the product or brand will be provided. The third product viewed will be the efficacious product (e.g., Neuro SONIC), and it is at this point that I will manipulate consumption expectation.

In the expectation-absent condition, participants will be introduced to Neuro SONIC, provided with information about the product, and efficacy perceptions will be measured. The procedure will be designed to be as similar to the filler products as possible. Thus, participants in the expectation-absent condition should view the product as completely unrelated to the upcoming performance task. In the expectation-present condition, the same information and questions about Neuro SONIC will be administered,
but I will inform participants that they will actually be given this product before completing the upcoming performance task. Thus, participants in the expectation-present condition should view the product as an external source of control that can help them reach the desired outcome of successful performance.

Once efficacy perceptions have been collected, I will introduce participants to the performance task, describing the task and showing what it will entail (e.g., sample spatial reasoning questions from intelligence tests). Before they perform the task, however, I will measure the extent to which participants perceive they have personal control using the five-item measure of control from Cutright (2012) asking participants to rate their agreement with the following items on 7-point scales: “The events in my life are mainly determined by my own actions;” “I am not in control of most things that occur in my life” (reverse-scored); “whether or not I am able to get what I want is in my own hands;” “what happens to me in the future mostly depends on me;” and “what happens in my life is often beyond my control” (reverse-scored). As described above, I hypothesize that providing control-deprived participants with an energy drink that can serve as an external source of control will lead them to internalize this external control and thus bring these participants back to the baseline state of high personal control. Since control-deprived participants in the expectation-absent will not have been provided with the opportunity to regain control (either through their own actions or by relying on an external source of control), the level of personal control felt by participants in the expectation-absent condition should significantly differ according to the earlier manipulation of personal control.
Participants will not actually be required to perform the task after personal control perceptions are collected, as my theory focuses on the use of products (rather than one’s own actions) to restore perceived control. Thus, to conclude the study I will debrief participants, collect demographics, and thank them for their time.

Results

I predict a significant two-way interaction between personal control and consumption expectation on both product efficacy perceptions (replicating study 2) and perceptions of personal control. The patterns of these interactions are depicted in Figure 3.5 (product efficacy) and Figure 3.6 (perceived control). In addition, I expect that efficacy perceptions will mediate the simple effect of consumption expectation on feelings of personal control in the low personal control condition.

Discussion

My proposed study 4 aims to build on my prior studies by providing direct evidence that control-deprived consumers can combine the compensatory control strategies outlined by Landau, Kay, and Whitson (2015). Specifically, I predict that participants feeling low (vs. high) control will report greater perceptions of product efficacy when they believe the product under consideration can help them on an upcoming task; as a result, the level of personal control felt by participants prior to task completion should not differ according to the earlier manipulation of personal control. However, if individuals are not given an external source of control that they can use to accomplish desired outcomes, the level of personal control participants feel prior to task performance should be lower in the low (vs. high) personal control condition. This pattern of results would thus demonstrate that the external source of control is
internalized by control-deprived participants in the expectation-present condition, as they are hypothesized to perceive significantly more personal control than control-deprived participants in the expectation-absent condition.

**GENERAL DISCUSSION**

This research builds on the growing stream of literature showing how threats to personal control impact consumer behavior. Drawing from compensatory control theory (CCT; Kay and Eibach 2013; Landau, Kay, and Whitson 2015) and the marketing literature on personal control (e.g., Chen, Lee, and Yap 2016; Cutright and Samper 2014), I propose and test a theory describing why, and under what circumstances, low (vs. high) personal control improves product efficacy perceptions. My results support the proposed theory: I find that consumers experiencing low (vs. high) personal control report greater product efficacy perceptions (study 1), but that this effect is attenuated when the product being evaluated cannot help consumers bring about desired outcomes (study 2). Moreover, while efficacy perceptions are increased by low (vs. high) personal control, taste perceptions are unaffected (study 2). Finally, I demonstrate that low (vs. high) personal control impacts product efficacy perceptions because low control increases the motivation to use an external source of control (i.e., an efficacious product) to help bring about desired outcomes, which leads to increased product efficacy perceptions (study 2).

**Theoretical Contributions**

These findings primarily contribute to the compensatory control and product efficacy literatures. First, extant research in compensatory control has focused on how
personal control impacts relative preferences for products or brands with different characteristics (Chen, Lee, and Yap 2016; Cutright 2012; Cutright and Samper 2014; Cutright, Bettman, and Fitzsimons 2013), and has found that when using products implies engaging in behavior that reflects the possession of personal control, products are evaluated more favorably. In contrast, my research studies the extent to which consumers are motivated to rely on the resources offered by efficacious products to bolster their ability to attain desired outcomes, rather than use products as a medium between behavior and outcomes. My results demonstrate that lacking personal control motivates consumers to rely on efficacious products to help them achieve personally relevant outcomes—even if this implies less reliance on one’s own internal agency. I provide evidence for this by studying product efficacy perceptions (rather than product evaluations), since reporting greater product efficacy implies less reliance on one’s own internal skills and abilities to attain outcomes. Thus, my results also contribute to the marketing literature on personal control by showing that perceptions of a given product—not only evaluations—are impacted by personal control. Specifically, I demonstrate that personal control influences perceptions of product attributes that can assist a user regain control (i.e., perceived efficacy), but not unrelated attributes (e.g., taste; study 2).

Moreover, by studying the impact of low (vs. high) personal control on perceptions of product efficacy, rather than preferences for products with different characteristics, I disentangle the motivation to engage in control-restoring behavior alongside a product from the motivation to use products as an external source of control. While the desire to affirm internal agency is an undeniably strong motivator following a loss of control, it is important to recognize that affirmation of internal agency only occurs
because it serves the more basic need to believe that outcomes are under control.

Previous research that examines how personal control impacts the favorability of different types of products has emphasized affirming internal agency at the expense of affirming the ability to achieve desired outcomes, leading to the inaccurate conclusion that control-deprived consumers only use products to compensate for a loss of control when using products involves engaging in behaviors that reflect personal control (Chen, Lee, and Yap 2016; Cutright and Samper 2014). On the other hand, my results show that personal control motivates consumers to affirm their belief that outcomes are under control, even if doing so involves reliance on external (vs. internal) sources of control.

Second, I also contribute to research on compensatory control by demonstrating that product efficacy perceptions are impacted by personal control due to consumers’ motivation to use an external source of control as a way to regain their own (internal) personal control. This adds to CCT by (a) demonstrating that products—in addition to religions and governments—are a viable source of external control (Kay and Eibach 2013), and (b) showing that the strategies for regaining control do not always operate independently (Landau, Kay, and Whitson 2015). This also suggests additional consequences of low (vs. high) personal control, as consumers may perceive other product dimensions differently (e.g., perceiving that an energy drink is not only more effective, but also larger) as a result of their motivation to use products to affirm internal agency.

Finally, my research also contributes to work on perceived product efficacy by relating product efficacy perceptions to an internal state of the user, rather than an external feature of the product. Most previous research on product efficacy perceptions
relates efficacy perceptions to features of the product, such as its price (Shiv, Carmon, and Ariely 2005), taste (Kramer et al. 2012; Wright et al. 2013), serving size (Ilyuk and Block 2016), causal cues (Faro 2010; Chae, Li, and Zhu 2013), and country of origin (Lazzari and Slongo 2015). On the other hand, this research contributes to the limited work on consumer-driven factors that influence product efficacy perceptions and placebo effects (Geers et al. 2005; Irmak, Block, and Fitzsimons 2005; Plassmann and Weber 2015) by showing that low (vs. high) personal control leads consumers to perceive goal-relevant products as more effective.

Managerial Implications and Future Directions

My research also has implications for practitioners and consumers. For example, given the commonality of circumstances in the marketplace in which consumers’ perceptions of personal control may be reduced (e.g., while waiting in line or stuck in traffic), marketers can take advantage of the motivation to reach desired end states in such situations by advertising or making available efficacious products. In addition, if the marketer can remind consumers that the efficacious product can help them achieve a desired end state (e.g., an ad for an energy drink that mentions a goal to lose weight), consumers feeling low personal control should be even more attracted to the product.

This work also suggests directions for future research. One interesting future direction would be to build on these results by testing the possibility that other strategies to regain control (Landau, Kay, and Whitson 2015) may influence one another. For example, it may be possible for control-deprived consumers to use external sources of predictability and structure as a way to reaffirm their own internal agency, because predictability and structure allow consumers to take action in ways that reliably produce
anticipated outcomes. One way to test this idea could be to examine the effect of personal control on perceptions of uncertainty-reducing products or services (e.g., subscriptions to weather applications with more accurate local forecasts) that are more or less personally relevant for consumers (e.g., available vs. unavailable in the consumer’s location). If low (vs. high) control increases preference for order and structure in part because this allows individuals to take action that helps restore control, then low control should be especially likely to increase attraction to products that reduce uncertainty when the enhanced predictability is personally relevant (vs. irrelevant) to consumers. In line with the present research, low (vs. high) personal control may also lead consumers to perceive that such personally relevant products are also more effective at making accurate forecasts.

Another important future direction is to test whether there are other boundary conditions for the effect of low control on product efficacy perceptions, besides those tested above. For example, one additional boundary condition may be the timing of receiving a product’s benefit (e.g., immediate vs. long-term delivery of the benefit). In particular, low control may only increase perceptions of product efficacy when the benefit is expected to be temporally proximal (vs. distant). For example, if a consumer with low personal control is feeling tired but has an important assignment they need to finish, my results suggest they should perceive products such as energy drinks and coffee as more effective at increasing energy. However, if the consumer is considering products purporting to have long-term benefits to energy, but little effect in the short term (which is the case for things like all-natural juice cleanses and some pharmaceutical supplements), my theory suggests that perceived efficacy would not increase because the
benefit of the product cannot help the consumer regain control by helping them reach their desired end state (i.e., of finishing their assignment in this example).

Finally, one other future direction I am interested in pursuing is to examine whether product efficacy may be affected by low personal control as the result of other strategies to regain control, besides using an external source of control to reaffirm one’s own ability to experience desired outcomes. In particular, efficacious products can be seen as part of cause-effect relationships (Chae, Li, and Zhu 2013; Faro 2010). Because causal relationships are high in structure and predictability, low personal control may increase product efficacy because greater efficacy implies a more reliable cause-effect relationship. However, the nonsignificant effect of personal control on product efficacy perceptions in the expectation-absent condition from study 2 suggests that consumers do not ordinarily think of efficacious products in such a structural, cause-and-effect way. Thus, I am interested in testing whether making an efficacious product’s role in a cause-and-effect relationship more salient (e.g., by depicting the product near its intended effect, Chae, Li, and Zhu 2013; or by mentioning the time between product consumption and experience of the benefit, Faro 2010; Faro, Leclerc, and Hastie 2005) will lead low personal control to impact product efficacy perceptions, even when the product under consideration will not be used in the service of a desired end state. This investigation would complement the present research by adding to our knowledge of when and why personal control impacts product perceptions, and the strategies for regaining personal control that consumers use across different contexts.
FIGURE 3.1

STUDY 1 RESULTS: PERCEIVED EFFICACY

Note: Error bars represent ± 1 standard error of the mean.
FIGURE 3.2

STUDY 2 RESULTS: PERCEIVED EFFICACY

Note: Error bars represent ± 1 standard error of the mean.
FIGURE 3.3

STUDY 2 RESULTS: MOTIVATION

Note: Error bars represent ± 1 standard error of the mean.
FIGURE 3.4

PREDICTED RESULTS FOR STUDY 3: PERCEIVED EFFICACY
FIGURE 3.5

PREDICTED RESULTS FOR STUDY 4: PERCEIVED EFFICACY

<table>
<thead>
<tr>
<th>Expectation-Present</th>
<th>Expectation-Absent</th>
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<tr>
<td>Low Control</td>
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<tr>
<td>High Control</td>
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FIGURE 3.6

PREDICTED RESULTS FOR STUDY 4: PERCEIVED PERSONAL CONTROL

Low Control  High Control

Expectation-Present  Expectation-Absent
CHAPTER 4: CONCLUDING REMARKS

The two essays comprising this dissertation examine how contextual factors impact perceptions of product efficacy and experiences with efficacious products. I conceptualize contextual effects as relating both to the environment in which a product appears and the experiences a consumer has leading up to product judgments. Chapter 2 demonstrated that the product context influences efficacy perceptions by showing that an efficacious product is perceived to be more effective when it is part of a cohesive group of product replicates (vs. when it is presented as an individual item). Chapter 3 demonstrated that the consumer context influences efficacy perceptions by showing that an efficacious product is perceived to be more effective when consumers feel low (vs. high) personal control. In both essays, I built a theory describing why and under what circumstances these contextual antecedents of product efficacy perceptions have an effect, and I derived and tested moderators and mediators based on these theories. Together, the essays comprising my dissertation thus demonstrate the importance of considering not only inherent properties of products to understand the level of effectiveness consumers expect products to deliver, but also the context leading up to a consumer’s evaluation of product efficacy, and the context in which the product is viewed.

My research thus has important implications for both marketers and consumers. For marketers, these essays provide actionable information regarding how to portray products as highly effective, how to increase the likelihood that consumers have positive experiences with efficacious products, and the circumstances under which consumers are most likely to seek out efficacious products. First, the results from Chapter 2 suggest that
marketers can direct consumers’ attention to product efficacy by presenting products as a cohesive group of homogenous products, increasing the level of efficacy consumers believe the products will deliver as a result. This strategy is particularly well-suited for contexts such as advertising, online retailing, and in-store special displays, where differences in the quantity of products presented are unlikely to signal scarcity. My results also suggest that it is possible to increase attention to product efficacy through both visual and verbal means, and that the increased efficacy that consumers expect when products are perceived to be more (vs. less) cohesive translates to greater purchase likelihood. Second, Chapter 2 also shows that actual experiences of product efficacy are determined by the presence or absence of product replicates. Building on research by Ilyuk and Block (2016), my results demonstrate the importance of packaging decisions for the efficacy consumers derive from products: Packaging products in ways that encourage the perception of a unified whole are likely to improve product efficacy experiences, particularly when consumers are likely to process information more (vs. less) holistically. Third, Chapter 3 demonstrates that consumers who feel low (vs. high) personal control are motivated to use efficacious products as aids that help them accomplish goals and experience desired outcomes. Given the range of contexts in the marketplace that threaten consumers’ personal control, marketers can take advantage of these findings by promoting and selling efficacious products in such contexts.

The findings in this dissertation also have implications for consumers. For example, by recognizing the influence of cohesive product groupings on efficacy perceptions, consumers can consider the extent to which their judgment of product efficacy reflects inherent properties of the product as opposed to the context in which
products appear. However, given that my results show that efficacy expectations translate
to the level of efficacy derived from products (consistent with previous research; e.g.,
Irmak, Block, and Fitzsimons 2005; Shiv, Carmon, and Ariely 2005), even if marketers
use the strategies identified in my research to increase expectations of product efficacy
without consumers’ awareness, consumers are likely to benefit from such practices by
experiencing greater product efficacy. The results from Chapter 3 also suggest that
experiences threatening consumers’ level of perceived control may not be as negative as
consumers would anticipate: My results suggest that consumers feeling low (vs. high)
personal control become motivated to reach desired end states through whatever means
are available—including using efficacious products. Thus, low personal control may
actually be a beneficial tool that consumers can take advantage of in reaching their goals.
For example, following exercise regimens or dieting plans that remove consumers’ ability
to make choices (which should reduce personal control; Inesi et al. 2011) may ironically
improve the outcomes consumers experience because they will be more likely to use all
the tools at their disposal to achieve their desired outcomes.

This research also makes important theoretical contributions that advance our
knowledge of (a) the drivers of perceived product efficacy, (b) the influence of product
groupings on perceptions of a product’s core essence, and (c) the strategies consumers
can use to compensate for personal control. As discussed in the previous chapters, my
research contributes to work on product efficacy by conceptualizing contextual drivers to
product efficacy as relating to both the product context and the consumer context, and
demonstrating that the two previously unexamined (yet practically and managerially
relevant) contextual influences of product replicate presence versus absence, and the level
of personal control consumers feel when judging product efficacy, have significant effects on perceptions of product efficacy. My research also contributes to the work on product groupings and essentialism by demonstrating that increasing the cohesiveness of products (through either visual or verbal means) focuses consumers’ attention on the products’ core essence, which manifests in attention to the primary consequence or outcome of usage, and therefore increases the level of efficacy consumers expect products to deliver. Finally, I contribute to work in compensatory control theory (Landau, Kay, and Whitson 2015) by showing that consumers can use efficacious products as an external source of control; thus, when an efficacious product is personally relevant for reaching a desired end state, low (vs. high) personal control leads consumers to perceive greater product efficacy because of their motivation to use the product as an aid to accomplish their goals.

Of course, this research is not without its limitations. For example, an important limitation is the scope of the contextual effects examined in this dissertation. While I believe my conceptualization for contextual drivers of product efficacy can encourage future researchers to study variables that seem unrelated to the product under consideration, but which may nevertheless impact product efficacy perceptions, I have only studied two such contextual drivers in this dissertation. I chose these two drivers for their practical importance and theoretical backing, but the utility of my framework will ultimately be tested by its influence on future research. Related to this, a second limitation of this research is that my framework for contextual effects on product efficacy (Figure 1) does not describe what types of contextual effects may be more or less likely to impact product efficacy perceptions and experiences. However, my framework can act
as a starting point for a more refined conceptualization that delineates the drivers, moderators, and boundary conditions that characterize contextual effects on perceived product efficacy. For example, this dissertation identifies two important drivers of product efficacy that are impacted by the product and consumer context: the attention consumers pay to product efficacy, and the motivation to derive product efficacy. Thus, future research could build on my research by examining other contextual drivers that impact consumers’ attention and motivation in relation to product efficacy. Moreover, as motivation and attention may not be the only paths through which contextual variables impact efficacy perceptions, adding to and revising this conceptualization represents an exciting direction for future research.
REFERENCES


Faro, David, France Leclerc, and Reid Hastie (2005), “Perceived Causality as a Cue to Temporal Distance,” *Psychological Science*, 16 (9), 673-77.


APPENDIX: STIMULI FROM CHAPTER 2

Study 1A

Left: Multiple Displayed Quantity Condition

Right: Single Displayed Quantity Condition
Study 1B

*Multiple Displayed Quantity Condition*

*Single Displayed Quantity Condition*
Study 2

Multiple Product–High Cohesiveness Condition:

Multiple Product–Low Cohesiveness Condition:

Single Product Condition:
Study 3

Left: Multiple Displayed Quantity—Neutral Cohesiveness Condition;

Right: Multiple Displayed Quantity—High-Cohesiveness Condition

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Every capsule of Cognition Plus combines these ingredients in a harmonious way, such that the benefits to mental functioning they provide together are distinct from the benefits provided by the individual ingredients.

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