Adopt or Not: How Consumers' Implicit Beliefs Influence Evaluations of Innovative Products

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Abstract

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We utilize the concept of implicit theories, or individuals' lay beliefs about the malleability of human attributes, to illustrate how certain individuals can be dispositionally poised to resist (or seek) new and innovative products. We find that entity theorists, or those who believe in the fixedness of human traits, are relatively more likely to resist innovative new products, while incremental theorists, or those who believe in the malleability of human traits, are relatively more likely to seek out new products. We find this effect is bound by the perceived learning cost of the innovative product—such that low perceived learning costs reduce the differences in evaluations of new products between entity and incremental theorists. Several potential mechanisms for the effect are explored—most notably, the roles of fear of negative evaluation, negative effort beliefs, and need for cognition. Finally, we discuss theoretical and managerial implications and suggest avenues for future research.

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Introduction

New product development is an undeniably important source of competitive advantage for firms and a necessary driver of firm performance. It is estimated that firms in the United States spend over $400 billion a year on research and development (OECD, 2017). As such, the continuous development and introduction of new products never ceases, regardless of industry. With such an enormous amount of money being directed towards creating new and innovative products, some might find it then that the innovation literature reports that approximately half of these new product introductions fail (Castellion & Markham, 2013). If innovation is so critical to a firm's success and firms are investing substantive resources to bring these new products to market, why then do so many of them fail to gain traction in the market?

Past research has primarily focused on the factors that lead to consumer adoption of new products (Talke & Heidenreich, 2014), but despite a growing understanding of what drives consumers to purchase new products, the failure rate for innovations shows no signs of improving (Barczak, Griffin, & Kahn, 2009; Gourville, 2006). Thus, while past research has primarily looked at factors impacting the behavioral intention of consumers to adopt innovative new products, recent research has shifted its focus towards the behavioral intention to resist new products (Claudy, Garcia, & O'Driscoll, 2015; Reinders, 2010; Talke & Heidenreich, 2014). However, despite this recent shift in the direction of studying the factors of consumer innovation resistance, not much is known about the psychological factors that can act as barriers towards new product adoption (Claudy et al., 2015). Obviously, the adoption of new products requires consumers to deal with *change*—changes in spending, usage, daily habits, costs/benefits, and perhaps even brand loyalty or self-image. Evidence suggests that some consumers deal with change more readily than others. Hence, it seems prudent to examine the role of implicit theories

in innovation resistance, as these theories seem likely to influence consumers' responses to change.

Implicit theories represent an individuals' beliefs about the malleability of human attributes that are used to better understand the world around them. Implicit theories have been shown to drive individuals' goals, trait inferences, and responses to failures, among other items (Chiu, Hong, & Dweck, 1997; Elliott & Dweck, 1988; Leith et al., 2014). They can influence evaluations of brands, brand extensions, advertisements, and even product-harm failures (Mathur, Jain, & Maheswaran, 2012; Park & John, 2010; Yin, Yu, & Poon, 2016). Yet despite their wide application to other domains in both the social psychological and consumer behavior literatures, implicit theories are strangely absent from the discussion on innovation success (Murphy & Dweck, 2016). *Hence, the focus of this paper is to explore the importance of implicit theories impacting innovation adoption and resistance tendencies, along with offering managerially and theoretically important insights into how to improve innovation adoption and reduce innovation resistance.*

Innovation adoption and resistance

Due to its overall importance in the financial success of firms (Markham & Lee, 2013), the innovation literature contains a plethora of research related to why consumers do or do not adopt new products. Accordingly, this topic can be broken down into two distinct perspectives: one from the angle of innovation adoption, and the other from the angle of innovation resistance. While it may be simple to imagine innovation adoption as diametrically opposed to innovation resistance, research has shown both the reasons for and reasons against adopting an innovation are qualitatively and quantitatively distinct phenomena (Antioco & Kleijnen, 2010; Claudy et al., 2015; Kleijnen, Lee, & Wetzels, 2009). Ultimately, new product adoption and resistance are two

sides of the same coin and research on one has implications for the other. However, one cannot assume that the reasons for and against adopting a new product are the opposite of each other and research suggests that innovation adoption and innovation resistance are driven by different sets of factors (Claudy et al., 2015).

To date, the majority of innovation-decision research has focused on the factors that lead to the consumer adoption of new products (Claudy et al., 2015; Talke & Heidenreich, 2014). This line of research focuses primarily on the persuasion and decision stages of the diffusion of innovation, with the goal aimed squarely at understanding how the characteristics of an innovation, and thereto the perception of those characteristics, influence the likelihood of product adoption. Through information search and processing on the part of the consumer, innovation adoption is seen as the outcome of a cognitive process (Gregan-Paxton & John, 1997).

Conversely, the literature related to why consumers resist innovative new products is less clearly developed (Claudy et al., 2015; Talke & Heidenreich, 2014). By definition, an innovation consists of an element of change—be it through the price, design, or performance, or by the way it disrupts a consumer's established habits, norms, or traditions (Garcia, Bardhi, & Friedrich, 2007). Innovation resistance represents the specific set of barriers that drive consumers to reject adopting innovations. Contrasting itself with adoption, consumers often reject innovations before they even consciously evaluate them (Bagozzi & Lee, 1999).

Clearly, innovation adoption and resistance represent two unique and fundamentally important constructs to understanding why some innovations succeed, while others fail. In the following sections, we review the literature analyzing both the adoption and diffusion of innovations, along with the current literature that attempts to answer the question of why consumers may vitally resist innovative new products.

Drivers of adoption towards innovative new products

According to Rogers (2010), the fundamental structure of innovation-decisions follows a five-stage process: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. Beginning in the knowledge stage, consumers become aware of the innovation. This initial exposure represents a burgeoning awareness that consumers gain about the new product, which leads them to seek further information about it. Once they have been exposed to further attributes of the innovation, the persuasion stage is where consumers form positive or negative evaluations of the product. This formative evaluation is driven primarily by the perceived characteristics of the innovation, for instance its relative advantage to other offerings, compatibility with the consumer's lifestyle, complexity of the product for adoption, trialability to explore the innovation, and observability of product use. After a favorable or unfavorable attitude towards the product has been generated, consumers move into the decision stage. The decision stage is a crucial part of the innovation-decision process where consumers ultimately make a judgement about adopting or rejecting the innovation. It is important to note that this stage does not represent a concrete behavior, but rather reaching an intention to adopt or reject the product. Concrete behavior is realized in the implementation stage, where consumers act upon their intentions and adopt or reject the product by purchasing or not purchasing it. Finally, upon acting on the decision to purchase or not purchase, consumers seek to reinforce their belief that their decision was the correct one. If conflicting information about the innovation is received, they may continue, stop, or reverse their behavior (Parthasarathy & Bhattacherjee, 1998).

In addition to the steps listed above, three factors influence the course of the innovation-decision process: (1) adopter-specific factors, (2) situation-specific factors, and (3) innovation-

specific factors (Rogers, 2010; Wejnert, 2002). To elaborate, adopter-specific factors include characteristics of the individual evaluating the innovation. Situation-specific factors consist of the circumstances surrounding the adoption decision, such as monetary restrictions, previously purchased products, or aspects of the shopping environment. Finally, innovation-specific factors consist of the consumer's perception of the key attributes of the innovative new product.

Most research in this model of innovation-decision making has focused on the persuasion and decision stages (Claudy et al., 2015), with the theory of reasoned action (Fishbein & Ajzen, 1975) and the technology acceptance model (Davis, 1989) being the two most commonly used theories that have guided this line of research. While the theory of reasoned action focuses on investigation of innovation-decisions through product attributes such as the relative advantage, compatibility, complexity, trialability, and observability mentioned above, the technology acceptance model builds on these factors and adds perceived usefulness and perceived ease of use (Lu, Zhou, & Wang, 2009; Porter & Donthu, 2006; Wu & Wang, 2005). However, both models are based on the idea that consumer evaluations of product attributes lead to a final adoption or rejection decision.

Drivers of resistance towards innovative new products

The idea that innovation resistance is a distinct construct from innovation adoption is by no means a new one. Even going back more than three decades, Sudha Ram (1987) proposed that to understand the successes and failures of innovative products, it would be necessary to understand why consumers resist them, rather than just adopt them. Yet, a "pro-change" bias has persisted in the innovation literature, weakening our overall understanding of this domain (Heidenreich, Kraemer, & Handrich, 2016; Talke & Heidenreich, 2014). Specifically, the pro-change bias refers to an assumption that consumers are inherently open to change and, in turn,

universally want to evaluate and potentially adopt new products (Heidenreich et al., 2016). Recently, however, this assumption has been proven inaccurate on several occasions (Claudy et al., 2015; Heidenreich et al., 2016; Talke & Heidenreich, 2014).

Further evidence of this bias can be linked to the innovation-decision model outlined previously. Specifically, the model outlined above expects that consumers will move from the knowledge stage, where initial awareness of the product is generated, to the persuasion stage, where the attributes of the innovation are revealed, and then make a formative judgement regarding adopting the innovation or rejecting it. This model neglects the case where consumers show resistance to innovations even prior to learning about its attributes, i.e. the consumer is not open to change and has rejected the innovation before entering the persuasion stage and even considering the product's potential (Talke & Heidenreich, 2014). As a result of the pro-change bias, the innovation-decision literature, generally, has only considered resistance to be a byproduct of negative evaluations formed in the persuasion stage or later (Labay & Kinnear, 1981; Nabih & Poiesz, 1997; Rogers, 2010).

Why is this pro-change bias an issue in our overall understanding? For one, it limits our perspective on the topic of why innovations fail. Specifically, research that looks towards successful innovation adoptions helps us to understand the features that can help lead to a product's success, but conversely, lacking these successful features by no means guarantees failure—primarily because it does not consider the drivers of resistance. Instead, the drivers of resistance must be looked at concurrently if we are to understand the tension that exists in the consumer's mind. Further, the pro-change bias has led to marketing strategies that focus on attitude formation and stimulating conscious adoption decisions, rather than mitigating the drivers of resistance (Talke & Heidenreich, 2014). Investments in persuading consumers to adopt

innovative products is frivolously lost if the consumer has decidedly rejected the notion of adopting the innovation from the get-go (Kuisma, Laukkanen, & Hiltunen, 2007).

An attempt to close this gap in the literature was provided by Rogers, Medina, Rivera, and Wiley (2005) who conceptualized a zone called the "knowledge-attitude-practice gap" in-between the knowledge and persuasion stages where consumers might form favorable attitudes, but those positive attitudes are ultimately insufficient to cause adoption. Talke and Heidenreich (2014) sought to fix the problem further by building on the idea that innovation resistance may occur at any stage of the process. Specifically, they identify five scenarios in which resistance may occur, matching to each of the five stages in the general innovation-decision model described above: (1) passive innovation resistance or acceptance in the knowledge stage, (2) active innovation resistance or acceptance in the persuasion stage, (3) resistant or acceptant attitudinal formations in the decision stage, (4) realized rejection or adoption in the implementation phase, and (5) discontinuous or continuous rejection or adoption in the confirmation stage.

An important conceptualization to come from this updated model of innovation resistance is the difference between active and passive innovation resistance. *Passive innovation resistanc*e occurs specifically in the knowledge stage and represents both adopters' chronic inclination to resist changes and their situational satisfaction with the status quo (Heidenreich & Spieth, 2013), while *active innovation resistance* occurs in the persuasion stage and represents the attitudinal outcome of innovation-specific factors colliding with functional and/or psychological barriers (Talke & Heidenreich, 2014). Current research has addressed several drivers of both passive and active innovation resistance, as understanding the mechanisms at work is key to designing new products and experiences that can overcome a consumer's resistance, with the bulk of our current

understanding lying in the domain of active innovation resistance (Heidenreich & Handrich, 2015; Talke & Heidenreich, 2014).

The crux of passive innovation resistance is that it involves rejection of the new product prior to any deliberate evaluation. Individuals, innately, have a desire for psychological equilibrium (Osgood & Tannenbaum, 1955) and, further, new products, by their definition, represent change from the status quo that can disturb this delicate equilibrium, thus provoking resistance (Sheth, 1981). Specifically, past research has suggested that even new products that offer higher utility can be less preferred to existing solutions because a consumer's current satisfaction with the status quo is an important reference point (Bell, 1985; Falk, Schepers, Hammerschmidt, & Bauer, 2007). This finding aligns well with prospect theory (Kahneman & Tversky, 1979), with the potential losses from moving away from the old solution outweighing the potential gains of moving to the new solution in many consumers' minds. Further, consumers may become emotionally attached to their current products (Hetts, Boninger, Armor, Gleicher, & Nathanson, 2000), develop entrenched habits using their current product (Bagozzi & Lee, 1999; Labrecque, Wood, Neal, & Harrington, 2017), or be overwhelmed by the amount of new information associated with innovative new products (Reinders, 2010). Taken together, if consumers' contextual, situation-specific factors have led them to be content with the status quo, then they will exhibit a greater degree of passive resistance to innovative new products because the alternative of uncertainty is evaluated as less attractive than their current position.

Besides a preference for the status quo, research has suggested that many consumers may have a chronic resistance to change. Contrasting itself with the consumer's current satisfaction with the status quo, resistance to change is an intrinsic, adopter-specific factor. In other words, while status quo satisfaction is situational, resistance to change is a personal disposition

(Heidenreich & Kraemer, 2015; Talke & Heidenreich, 2014). When a consumer has high resistance to change, it is logical that innovative new products are less likely to be adopted. New products inherently involve an element of change and may break an individual's established routines, which can lead to these consumers becoming emotionally stressed and developing an inertia towards changing their mind (Heidenreich & Spieth, 2013; Nov & Ye, 2008).

Resistance to change is thought to consist of four elements: (1) routine seeking, (2) cognitive rigidity, (3) emotional reactions to imposed change, and (4) a short-term focus. This model of resistance to change builds off of Oreg (2003) and integrates work from Swilley (2010) and Talke and Heidenreich (2014). *Routine seeking*, as described by these papers, refers to the predisposition to resist change because change represents a potential loss of control over the external environment (Nov & Ye, 2008). *Cognitive rigidity* describes a behavioral inertia towards exploring or exploiting alternative ideas and perspectives (Rokeach, 1960). When an individual cannot cope with the stress of imposed change, they are suffering from an *emotional reaction to imposed change* (Swilley, 2010). Finally, when an individual is fixated on the potential short-term inconveniences that can be associated with a change, they can be said to have a *short-term focus* (Oreg et al., 2008). As one might anticipate, individuals who are focused on established routines, possess a great degree of cognitive rigidity, suffer from an emotional reaction to imposed change, or fixate on short-term inconveniences that stem from change, are likely to exhibit an overall greater degree of resistance to change. All four of these distinct constructs have been used to give a theoretical foundation to our understanding of resistance to change as applied to the innovation resistance literature.

Active innovation resistance, juxtaposed with passive innovation resistance, describes the set of functional and psychological barriers that exist in the persuasion stage of innovation-

decision making. As mentioned previously, active innovation resistance occurs in the context of a deliberate, conscious evaluation of a new product with regard to its features and their consistency with the values, goals, expectations, or beliefs of a consumer. *Psychological barriers* arise when a consumer's beliefs conflict with an aspect of the product (Kleijnen et al., 2009), while *functional barriers* occur when consumers perceive that an innovation will not meet certain expectations (Sundaresan Ram & Sheth, 1989). Joachim, Spieth, and Heidenreich (2017) provide an empirical validation of the active resistance typology developed by Talke and Heidenreich (2014), who identified nine functional and eight psychological barriers present in the literature. On the functional front, a new product may present a barrier if it does not provide a relative advantage (value barrier), is too difficult or complicated to use (complexity barrier), cannot be tested prior to adoption (trialability barrier), is perceived as incompatible with existing products (compatibility barrier), requires additional purchases for full functionality (co-dependence barrier), is poorly detailed to the consumer (communicability barrier), cannot be observed in use (visibility barrier), cannot be tailored to one's specific needs (amenability barrier), or if the benefits of the innovation take too long to manifest (realization barrier).

On the other side, psychological barriers include situations where the innovative new product conflicts with a consumer's societal, group, or familial norms (norm barrier), conjures unfavorable associations (image barrier), looks like it may disrupt established user patterns and routines (usage barrier), relates to perceived information asymmetries that make consumers uncertain of the potential for unwanted consequences (information barrier), or offers any form of potential physical, economic, or social harm, or uncertainty about its performance (four risk barriers). For psychological barriers, the most potent of these is the norm barrier, while on the functional side, the greatest concern lies in the product not offering a compelling value (Joachim

et al., 2017). In sum, any of these seventeen barriers may come into play when a consumer is making evaluations of the innovation-specific factors of the new product. When a value for one of these features passes a consumer's threshold of tolerance for the barrier, active innovation resistance will begin.

As we have seen from our review of the innovation adoption and resistance literature, research remains to be done in the context of understanding specific psychological traits, such as personality factors or, in the case of our predictions, implicit theories. One exception would be a recent study which found that consumers' desire for control greatly impacted their resistance towards new (vs. existing) products (Faraji-Rad, Melumad, & Johar, 2017). The authors of this work found evidence to support the idea that increased levels of desire for control are associated with an overall greater resistance to new products. Two theoretical mechanisms are posited to drive this effect. First, using new products entails changing prior routines or behaviors, which reduce one's sense of mastery and control over the external environment. Second, new products are often incongruent with consumers' prior cognitive categories or schemas, which are thereby harder to make sense of, which, finally, results in a lesser sense of control over one's external environment. The strength of the results observed in the Faraji-Rad et al. (2017) study suggests that personal factors can have substantial effects on innovation resistance. Given the importance of a greater understanding of innovation resistance, further research on how other personal factors may contribute to passive innovation resistance may yield a more granular understanding of why some innovations succeed, while others fail. We believe that consumers' implicit theories may have effects on adoption and resistance tendencies to new products.

Implicit Theories on the Malleability of Human Traits

Early Research on Implicit Theories

Implicit theories are beliefs about the nature of human attributes that individuals use to better understand the world around them. Emerging out of research by Carol Dweck and her colleagues in the '70s and '80s, the initial focus of this research was on the attributions children made after failure experiences (Dweck & Reppucci, 1973). In this study, one interesting observation made was that children who attributed failure to a lack of ability tended to exhibit decrements in performance when faced with setbacks, whereas children who attributed failure to lack of effort did not. This finding led Diener and Dweck (1978) to begin fleshing out two very different styles of dealing with difficulty, which they characterized as helpless vs. mastery-oriented. Helpless children attributed their problems to lack of ability, expressed negative affect, and wasted time on solution-irrelevant thoughts. In contrast, mastery-oriented children refrained from dire attributions, expressed optimism, and stayed focused on the task at hand.

In an effort to explain children's mastery-oriented and helpless responses to failure, Elliott and Dweck (1988) argued that the two patterns were driven by different goals. They distinguished between *performance goals,* which motivate people to *demonstrate* their ability and *learning goals,* which motivate people to *develop* their ability. Performance goals lead people to work to attain positive judgments of their ability and to avoid negative judgments that would discredit their ability. In contrast, learning goals lead people to work towards increasing their competence. As predicted, the study found that performance goals tended to make children more vulnerable to the helplessness syndrome in response to failure, whereas learning goals were more likely to foster a mastery-oriented response to setbacks. This insight led Dweck and her colleagues to wonder why some individuals embraced performance goals and others embraced

learning goals. Their conclusion centered on individuals' implicit theories about the malleability of human traits. In the beginning, their focus was on children's implicit theories of intelligence.

As outlined by Dweck and Leggett (1988), some children subscribe to an *entity theory* of intelligence while others favor an *incremental theory* of intelligence. Entity theorists believe that intelligence is a fixed, immutable trait that is not subject to change, while conversely, incremental theorists believe that intelligence is a malleable quality that can be modified through effort. These disparate implicit theories of intelligence are thought to determine whether individuals adopt performance or learning goals. Working under the assumption that their intelligence cannot be increased, entity theorists worry about their level of ability and focus on performance goals to verify their ability. Working under the assumption that their intelligence can be enhanced, incremental theorists have less need to fear momentary failures and therefore are free to embrace challenges that may increase their ability. Although Dweck and Leggett (1988) focused primarily on implicit theories of intelligence, they speculated that individuals may also hold implicit beliefs about the immutability of other traits, such as personality and morality.

Consistent with this speculation, subsequent research demonstrated that implicit theories about the malleability of various human attributes can have important consequences. For example, Chiu et al. (1997) linked implicit theories of personality to lay dispositionism, which is the tendency to use personal traits as the dominant unit of analysis in social perception. Their findings indicate that entity theorists draw stronger trait inferences from observations of others' behavior and use traits to make stronger predictions about others' future behavior than do incremental theorists. Other studies showed that in making judgments of others, entity theorists tend to neglect the influence of situational factors (Erdley & Dweck, 1993) while focusing on

trait-consistent information (Plaks, Stroessner, Dweck, & Sherman, 2001), and that they are reluctant to revise their trait inferences (Erdley & Dweck, 1993). In other words, entity theorists' belief in fixed traits leads them to search for information about others' fixed traits and to think about people in terms of fixed traits.

In another study of social perception, Levy, Stroessner, and Dweck (1998) found that individuals' implicit theories about the stability of personal traits influence their tendency to stereotype various groups. Specifically, in comparison to incremental theorists, entity theorists made more stereotypical trait judgments of various ethnic and occupational groups, formed stronger stereotypes of a hypothetical group, and were more likely to view stereotyped traits as innate. Thus, entity theorists' thinking in terms of fixed traits apparently leads them to think about groups in terms of stereotypes.

Much of the most widely-cited research on implicit theories has focused on how they impact students in their academic pursuits. Several early field studies in academic settings reported that efforts to encourage students to adopt a more incremental theory of intelligence led to improvements in motivation and achievement (Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003). For example, Blackwell et al. (2007) followed several hundred seventh-grade students across their transition into junior high school. Students assigned to the experimental group were exposed to an 8-session intervention workshop designed to convince them that intelligence is malleable and that learning can alter the brain. Control group subjects showed a marked decline in math grades, which was characterized as typical for the transition into junior high, whereas the experimental subjects showed a slight improvement in grades.

Recent Research on Implicit Theories

Research on implicit theories has burgeoned in recent years, as the concept has been applied to a wider range of phenomena. One interesting change has been a gradual shift in terminology, as an increasing number of articles are using the term *mindsets* instead of or interchangeably with *implicit theories* (Lüftenegger & Chen, 2017). The term mindset was introduced in a trade book titled *Mindset* by Dweck (2006), in which she summarized the research on implicit theories for the lay public. In the book, Dweck refers to entity theories as *fixed mindsets* and to incremental theories as *growth mindsets*. Presumably, the change in terminology was made to make the trade book more user-friendly for the general public. Surprisingly, however, the more intuitive nomenclature gradually gained traction in academic circles as more and more research publications are employing the mindset terminology. In this review, when discussing a specific article, the terminology of the original authors will be used. In discussing research in general, or potential research for the future, both sets of terminology will be used interchangeably.

A great deal of research has continued to explore how implicit theories influence students' academic engagement and performance. Much of this literature was examined in a meta-analysis of implicit theories and self-regulation in performance contexts. Burnette, O'boyle, VanEpps, Pollack, and Finkel (2013) meta-analyzed a set of 85 published and unpublished studies consisting of 113 independent samples and 273 effect sizes. Although the sample included studies looking at performance in non-academic areas (e.g., dieting, athletics), 68% of the studies were concerned with academic performance. The analysis looked at the relations between implicit theories and performance versus learning goals, mastery versus helpless coping strategies, negative emotions versus positive expectations, and goal achievement. Incremental

beliefs correlated negatively with the endorsement of performance goals and positively with endorsement of learning goals; a growth mindset correlated negatively with helpless coping and positively with mastery coping; and incremental theories correlated negatively with the experience of negative emotions and positively with reports of positive expectations. The effect sizes were generally small to moderate, although the effects of implicit theories on mastery versus helpless coping were moderate. Further, mastery coping and positive expectations correlated positively with goal achievement and negative emotions correlated negatively with goal achievement (effect sizes were moderate to large). For the most part, these data are consistent with the theoretical predictions of Dweck and her colleagues.

Since the publication of the Burnette et al. (2013) meta-analysis, additional studies of the link between implicit theories and academic performance have appeared. Particularly prominent among these are two large-scale intervention studies (Paunesku et al., 2015; Yeager et al., 2016). The findings of both studies suggest that training students to adopt a growth mindset can lead to enhanced academic performance among at-risk, low-performing students.

Although a rather large portion of the research on implicit theories has focused on academic performance, researchers have branched out to examine behavior in other contexts. For example, studies have explored the impact of fixed versus growth mindsets on success in weight regulation (Burnette & Finkel, 2012), leadership (Hoyt, Burnette, & Innella, 2012), athletic performance (Chen, Yang, & Zhao, 2008), and self-control. Another line of research has explored the relationship between implicit theories of intelligence and subjective well-being. For example, King (2017) found that a fixed mindset was associated with lower life satisfaction and higher levels of negative affect.

One interesting finding in recent research is that motivational considerations can strategically alter individuals' implicit beliefs about the malleability of specific traits. For example, Leith et al. (2014) hypothesized that people given failure feedback would shift to a more incremental theory to reduce the negative ramifications of their failure. Three studies supported the notion that individuals may shift their endorsement of implicit theories to avoid unpleasant inferences about themselves. Three additional studies found that people adjusted their implicit theories to protect their feelings about political candidates that they favored or opposed. Participants shifted toward an incremental view when they wanted to excuse a favored candidate for regrettable statements and they shifted toward an entity view when they wanted a candidate that they opposed to be permanently tainted for making regrettable statements. In a similar vein, Steimer and Mata (2016) conducted a series of studies that showed that when contemplating personal strengths or desirable traits, people lean toward entity theories that suggest that these strengths will remain stable. However, when contemplating personal weaknesses or undesirable traits people lean toward incremental theories that suggest that these weaknesses may be correctable. In other words, people perceive their weaknesses to be more malleable than their strengths. Leith et al. (2014) emphasize that their findings do not mean that chronic individual differences in mindsets are unreliable or unimportant. Nonetheless, the findings of Leith et al. (2014) and Steimer and Mata (2016) highlight a previously unappreciated source of fluidity in individuals' implicit theories.

In summary, thirty years of research on implicit theories within psychology has yielded a host of interesting findings that might inform research on consumer behavior. Implicit theories, or mindsets, shape the goals that people embrace, the strategies they rely on in pursuing these goals, the attributions they make in response to success and failure, and the resultant emotions

that they experience. Implicit theories help people to understand their social world. They provide a framework for perceiving, judging, and acting upon information. As such, it seems likely that they wield some influence over the decisions people make in the realm of consumer behavior. Indeed, implicit theories have been incorporated into some research on consumer behavior. This body of research will be reviewed in the next section.

Implicit Theories in Consumer Research

While the study of implicit theories in the social psychological literature has had a large focus on students and academic pursuits, due mostly to the theory's implications for motivation and goal setting, within the world of consumer behavior, the literature has largely focused on the topic of brands (see Jain and Weiten (2020) for a more thorough review). One recurring theme in the consumer-facing side of implicit theories research is that of brand personalities. Park and John (2010), for instance, sought to answer whether brand personalities may rub off on consumers, leading them to feel more intelligent or glamorous thanks to their brand use. Through a series of studies, they found that entity theorists' self-perceptions were influenced by their brand use, while incremental theorists were unaffected. For example, using an MIT-branded pen led entity theorists to view themselves as intelligent and hard-working. Entity theorists could also repair their self-esteem after a failure experience by choosing brands whose personalities aligned with the trait they were trying to repair (e.g., choosing an MIT-branded pen to signal intelligence after failing a test).

If entity theorists' perceptions of self may be enhanced by using branded products whose personalities signal positive qualities, then could that, too, impact how they form judgments of others? Indeed, Park and John (2018) suggest this may be the case. Their findings suggest that entity theorists tend to draw more inferences about others based on the brands that they use,

while in contrast, incremental theorists tend to draw fewer inferences. However, incremental theorists may still draw trait inferences about others based on brand usage when it is clear the target individual is intending to signal certain qualities. In another study on brand personalities, Park and John (2012) found that advertisements that focused on self-improvement were effective with incremental theorists, while advertising appeals that capitalize on the signaling opportunities (e.g., "show off your analysis skills using this amazing app!") were more effective with entity theorists. Another topic that research has looked at is the impact of brands on self-efficacy and performance. Findings from Park and John (2014) suggest that brand promises can bolster the self-efficacy of entity theorists, and even their overall task performance, when the brand of product they use relates to the domain they are working in (e.g. an MIT pen enhances performance on an exam). However, incremental theorists were unaffected by such brand promises, and, instead, showed increases in self-efficacy and task performance when offered training opportunities.

Brand extensions have also been of interest to consumer researchers. Key research by Yorkston, Nunes, and Matta (2010) and by Mathur et al. (2012) has focused on how implicit theories interact with brand personality to drive consumer reactions to brand extensions. Yorkston et al. (2010) analyzed whether consumers' implicit theories impact their inferences about the malleability of a brand's personality traits and whether that influences a firm's ability to extend its brand. Their work finds that incremental theories lead to greater acceptance that brand traits are malleable, which in turn leads to greater acceptance of brand extensions. Mathur et al. (2012) similarly focus on brand extensions, but instead look at whether implicit theories influence parent brand personality updating in response to brand extensions. Their main finding is that the congruence/fit between the parent brand and its extension influences the parent brand

personality updating of incremental theorists, but not that of entity theorists, whose parent brand personality impressions remain unchanged. This disparity between entity and incremental theorists was only seen when parent brand personality was highly salient.

When product-harm crises occur, how do implicit theories differentially impact brand evaluations? And in what direction should a firm's recovery strategy go? These two questions are the primary focus of Yin et al. (2016). They show that when an unknown firm in crisis goes with a support recovery strategy, entity theorists' penchant for thinking in terms of fixed traits and readily making quick trait inferences leads them to attribute more blame to the firm than incremental theorists. However, when a firm has a strong (favorable) corporate image, entity theorists attribute less blame to the firm than incremental theorists, regardless of the recovery strategy. Thus, when entity theorists have a favorable view of a firm experiencing a product harm crisis, they stick with their perceptions of the firm's fixed traits.

Additionally, implicit theories can have an impact on what products people buy and how they react to them. Individual's lay theories of self-control, the idea that self-control is limited or unlimited, but malleable, or ultimately fixed, changed the products parents bought for their children. Specifically, Mukhopadhyay and Yeung (2010) found evidence that limited-malleable theorists are more likely to make consumption choices that promote self-control in their children than those who subscribe to the other three views. Further, Sharifi and Palmeira (2017) look at how consumers react to technological products differentially based on their implicit theory of intelligence, and particularly at the moderating role of product complexity. Their findings lend support to the idea that incremental theorists of intelligence are more interested in complex technological products than entity theorists of intelligence.

Finally, implicit theories have also been used to explain the differences in consumer reactions to advertising and other persuasion-oriented messaging. Jain, Mathur, and Maheswaran (2009) sought to understand how implicit theories impact sensitivity to comparative framing manipulations. As entity theorists are outcome-minded, their evaluations of products did not vary as a function of negative (loss) or positive (gain) framing, while incremental theorists were more receptive when messages were framed in gain terms. This line of work was then extended into the domain of healthcare marketing where Mathur, Jain, Hsieh, Lindsey, and Maheswaran (2013) explored the effects of loss or gain framing on disease-detection and disease-prevention messages. Once again, entity theorists were insensitive to the type of framing presented. Incremental theorists tended to respond more favorably to the loss-framed messages in the case of disease detection advocacy, but preferred gain-framed messages in the case of disease prevention advocacy. In the domain of advertising, implicit theories have even been found to affect the perception of self with regard to ads. For example, female consumers who subscribed to entity beliefs about body size were more accurate at assessing their size in relation to a model, while female consumers who subscribed to incremental beliefs tended to see themselves as thinner in the future and thus had increased perceptions of similarity with models who were actually thinner than them (Cinelli & Yang, 2016).

Taken together, work on implicit theories in consumer research has made substantial progress over the past decade, but compared to the social psychology literature, it is still somewhat in its infancy. While social psychologists have studied this phenomenon extensively for the past three decades, Murphy and Dweck (2016) assert that research using implicit theories in consumer behavior research has been relatively scarce, an assessment that is echoed by two other articles in a recent research dialogue on mindsets (John & Park, 2016; Mathur, Chun, &

Maheswaran, 2016). This dissertation attempts to build on this burgeoning field of consumer research by combining implicit theories with research on innovation resistance.

How implicit theories drive innovation adoption/resistance

So why might implicit theories impact consumers' tendencies to adopt or resist new products? My review of the implicit theories literature would suggest that incremental theorists would likely lean towards adopting innovative new products, while entity theorists would likely learn towards resisting adoption of innovative products. This disparity is driven by multiple reasons.

First, new products often require a *learning process that gradually leads to mastery* of the product (Kleijnen, De Ruyter, & Wetzels, 2007; Suoranta, Mattila, & Munnukka, 2005). From the beginning, Dweck and her colleagues emphasized that incremental theorists tend to embrace learning goals as a means to enhance their competence, whereas entity theorists are focused on outcomes and prefer quick, easy results (Dweck & Leggett, 1988). Evidence from the Burnette et al. (2013) meta-analysis supports this overall assertion. Research has also repeatedly shown that when challenged, incremental theorists adopt mastery strategies and show resilience, whereas entity theorists are more likely to fall into maladaptive strategies reflecting feelings of helplessness (Blackwell et al., 2007; Burnette et al., 2013). Hence any challenges that arise while learning how to use and integrate a new product are more likely to frustrate entity theorists over incremental theorists. Thus, entity theorists may have a history of frustrating interactions with new products that lead them to view innovations with concern.

Second, in a similar vein, working with *new products can often encompass substantial effort* on the part of the user to learn and integrate into their routines (Hoeffler, 2003). Implicit theories research has shown that incremental theorists respect and value high effort, while entity

theorists believe that if you have high ability, you do not need to exert high effort, even going so far as to have situations that require high effort threaten their belief in their high abilities (Grant & Dweck, 2003; Miele & Molden, 2010; Murphy & Dweck, 2016). Hence, entity theorists may be wary of new products that require high effort, while incremental theorists appreciate the high effort as a learning opportunity.

Third, adapting to *new products can lead to frustrating failures and mistakes* on the part of the adoptee when attempting to learn the new product. Implicit theories research has shown that when faced with setbacks, incremental theorists tend to maintain high expectations and positive affect, whereas entity theorists tend to experience negative emotions (Burnette et al., 2013; Mueller & Dweck, 1998). Thus, entity theorists may avoid new products due to concerns about failures, while incremental theorists are more resilient to potential setbacks.

Finally, in addition to new products often being frustrating to learn to use, *they can be beset with bugs, flaws, and other unexpected shortcomings* (Talke & Heidenreich, 2014). Due to their emphasis on process rather than outcomes, incremental theorists may be more patient, understanding, and forgiving when encountering new product flaws, whereas entity theorists' focus on outcomes is likely to generate impatience and annoyance (Haselhuhn, Schweitzer, & Wood, 2010; Mathur et al., 2016). Along that line, Herzenstein, Posavac, and Brakus (2007) examined the effect of regulatory focus on reactions to new products and found that those with a *prevention focus*, who are sensitive to negative outcomes, were less likely to own new products than those with a *promotion focus*, who are sensitive to positive outcomes. Research has also shown that entity theorists tend to make quick trait inferences about other people and are reluctant to change these inferences (Butler, 2000; Chiu et al., 1997; Erdley & Dweck, 1993). These tendencies may also apply to entity theorists' trait inferences about products and

companies. If so, then entity theorists may be quick to draw negative conclusions about new products based on minor flaws and shortcomings that may be fixable in the long run. Taken together, these contrasting tendencies should fuel substantial differences between entity and incremental theorists in innovation resistance and adoption tendencies.

Thus, to summarize, incremental theorists will likely prefer new products, while entity theorists will likely prefer existing products. Formally, this is denoted as:

H1: Broadly, (a) *incremental theorists* will respond more favorably to innovative products than entity theorists, whereas (b) *entity theorists* will respond more favorably to existing products than incremental theorists.

This hypothesis forms the foundation of our initial investigations.

Study 1

This first study looks to find initial experimental evidence of implicit theories impacting innovation resistance in a tangible manner. Specifically, we manipulate exposure to either a new or existing product, while measuring participants' scores on an implicit person theory scale.

Method, design, and procedure

Two-hundred two MTurk workers (90 female, M_{age} = 35.34, SD = 11.05) participated for a small amount of money ($0.80). The survey was ostensibly split into three unrelated studies to hide our true intentions. The first part consisted of the domain general Implicit Person Theory Measure (Levy et al., 1998), along with scales measuring belief in genetic determinism (Keller, 2005) and belief in social determinism (Rangel & Keller, 2011). In the second part, participants were randomly assigned to one of two conditions, being presented with either an advertisement for a new product or an existing product. We then followed with relevant measures and checks.

Independent variables

Implicit theory. Participants responded to the domain general implicit person theory scale from Levy et al. (1998) on a 6-point Likert scale. The scale consists of a total of 8 statements (e.g. "No matter what kind of person someone is, they can always change very much," "People can change even their most basic qualities," and "People can substantially change the kind of person they are;" see the Appendix for the full scale) anchored by "strongly disagree (1)/strongly agree (6)." A total of 4 items in the scale are reverse coded, such that higher scores on the scale associate with greater incremental theory orientation, while lower scores on the scale associate with greater entity theory orientation.

New vs. existing product. We operationalized the new and existing products through an advertisement for a digital camera. Similar to Herzenstein et al. (2007), the product advertisement we exposed participants to was the same, except for the headlines, a couple of words in the copy, and the taglines. At the beginning of this portion of the study, participants were told to assume that they were in the market for a digital camera when they came across the displayed advertisement, and that purchasing the camera would be financially feasible for them. With regards to the manipulation, participants in the new product condition saw the camera headlined with "Advanced, New Generation." The copy of the new condition advertisement asserted that the camera was the "all new and ideal companion," possessed "innovative" image-enhancing technology, and that it was the "newest" camera technology. The tagline associated with the new product condition stated that the camera was "a totally new experience." In the classic product condition, the camera was headlined with "The Classic, Continued," while the copy asserted that the camera is the "ideal companion," possessed "refined" image-enhancing

technology, and was a "decade old" camera technology. The tagline stated that "the classics never go out of style."

To ensure that the two advertisements exhibited no differences in terms of ad effectiveness or brand attitudes, we pretested the advertisement on 250 MTurk participants. Differences in ad effectiveness were tested through measures of ad believability and truthfulness (i.e., "not believable at all (1)/extremely believable (9)," and "not true at all (1)/extremely true (9)") on 9-point Likert scales. Differences in product perceptions were tested through measures of reliability (i.e., "not reliable at all (1)/extremely reliable (9)"). We also wanted our product to be considered of moderate complexity (i.e. "not complicated at all (1)/extremely complicated (9)"), as product complexity has been shown to interact with implicit theories (Sharifi & Palmeira, 2017). Finally, and perhaps most importantly, the two advertisements had to be viewed differently in terms of their newness (i.e., "not new at all (1)/extremely new (9)" and "not innovative at all (1)/very innovative (9)"), but not vary in terms of their purchase intentions (i.e., "very unlikely (1)" to purchase/"very likely (7)" to purchase).

As desired, there were no discernable differences in ad effectiveness, based on the new or existing advertisement, through believability ($M_{new} = 6.62$, $M_{existing} = 6.58$, $t_{248} = -0.20$, $p = 0.84$) or truthfulness ($M_{new} = 6.52$, $M_{existing} = 6.58$, $t_{248} = 0.27$, $p = 0.79$). Nor were there discernable differences in brand effectiveness through reliability ($M_{new} = 6.69$, $M_{existing} = 6.75$, $t_{248} = 0.32$, $p = 0.75$). Additionally, the camera was viewed as moderately complicated with no statistically significant differences between the new and existing product advertisements ($M_{new} = 4.86$, $M_{existing} = 4.42$, $t_{248} = -1.48$, $p = 0.14$). Crucially, the cameras were perceived different on both newness ($M_{new} = 7.22$, $M_{existing} = 6.07$, $t_{248} = -4.56$, $p < 0.001$) and innovativeness ($M_{new} = 6.40$,

$M_{existing}$ = 5.54, t_{248} = -3.17, p = 0.002), but this did not impact participant's overall purchase intentions (M_{new} = 4.23, $M_{existing}$ = 4.39, t_{248} = 0.75, p = 0.45).

Psychological essentialism. One additional construct we wanted to explore is psychological essentialism. Psychological essentialism stems from individuals' tendency to categorize entities as having an underlying, nontrivial, and fundamental *essence* that defines them as what they are (Dar-Nimrod & Heine, 2011; Gelman, 2003; Medin, 1989). For instance, dogs have an underlying essence that causes them to bark, wag their tails, have soft fur, and so forth. When one believes that elementary essences causes entities to be what they are, that individual is exhibiting a high degree of essentialist thought. At its core then, psychological essentialism reflects how individuals categorize the world—when individuals are high in essentialist beliefs, they tend to conclude that things that look similar to one another *must* share attributes at a deeper level (Medin, 1989). Importantly, psychological essentialism has been found to correlate with measures of implicit theory orientation (Haslam, Bastian, Bain, & Kashima, 2006).

Two interesting papers by Keller (2005) and Rangel and Keller (2011) seek to break down psychological essentialism into two respective belief components, particularly in order to measure essentialist beliefs: genetic and social. That is, if we want to measure how strong one's essentialist beliefs are, we can look at how strongly that person believes that biological heritage and upbringing/social background contribute to an individual's underlying essence. To put more succinctly, looking at one's thoughts on the nature vs. nurture debate can shed light on their tendency to hold strong essentialist beliefs.

Thus, as a proxy for psychological essentialism, we included both the belief in genetic determinism (Keller, 2005) and belief in social determinism (Rangel & Keller, 2011) scales such that we could control for them in our subsequent evaluations.

Dependent variables

Manipulation and other checks. Checks for our manipulation of product newness came in the form of participants' ratings of the extent to which the advertisement conveyed a product that was both new and innovative on a 9-point Likert scale, anchored by "not new at all (1)/extremely new (9)" and "not innovative at all (1)/very innovative (9)" respectively. Like the pretest, we also remeasured ratings of ad effectiveness (i.e., ad believability and truthfulness), along with a few potential confounds relating to brand attitudes (i.e., usefulness and reliability). Finally, we also asked participants if they already owned a digital camera, their age, and their sex, to ensure we could control for potential endogeneity in our analyses.

Product evaluation. After seeing either the new or existing camera advertisement, participants reported the likelihood that they would buy the product ("very unlikely (1)/very likely (7)"), the favorability of their attitude towards the product ("completely unfavorable (1)/completely favorable (7)"), whether the product was a good choice for them ("a very bad choice (1)/a very good choice (7)"), and how much they liked the product ("greatly dislike (1)/greatly like (7)").

Results

Manipulation and other checks. Following the pretests of the advertisement, we average respondent ratings of product newness and innovativeness ($\alpha = .79$) and see that the new advertisement was viewed as significantly newer and more innovative than the existing product advertisement ($M_{new} = 6.29$, $M_{existing} = 5.42$, $t_{200} = -3.04$, $p_{one\text{-}tailed} = 0.001$). Additionally, our aggregate ratings for brand attitude ($M_{new} = 6.49$, $M_{existing} = 6.66$, $t_{200} = 0.73$, $p = 0.46$) and ad effectiveness ($M_{new} = 6.46$, $M_{existing} = 6.44$, $t_{200} = -0.08$, $p = 0.93$) do not vary as a function of our manipulation. Relating to our measure of product evaluation, neither gender ($\beta = -0.14$, $t_{200} = -0.69$, $p = 0.49$) nor current camera ownership ($\beta = 0.11$, $t_{200} = 0.58$, $p = 0.56$) appear to have an

impact on how respondents rated the camera, but there does exist a main effect for age ($M = 35.34$, $S.D. = 11.05$, $\beta = -0.023$, $t_{200} = -2.59$, $p = 0.049$) lowering respondent product evaluations. Because none of these variables appear to impact our results, we do not discuss them further, but we do control for them in our subsequent regression analysis.

Product evaluation. As outlined by Hayes (2013), we regressed the mean-centered implicit theory measure ($\alpha = .91$), the product manipulation (dummy coded), their interaction, and our control variables—gender, age, and camera ownership—on respondents' product evaluation metric ($\alpha = .91$). The results show a significant interaction between implicit theory and our product newness manipulation ($\beta = .51$, $t_{200} = 2.85$, $p_{one\text{-}tailed} = 0.003$, $R^2 = 0.079$). Since we are interested in contrasting entity and incremental theorists, we performed a spotlight analysis (Fitzsimons, 2008). To achieve this, we consider entity theorists to be one standard deviation below the mean and incremental theorists to be one standard deviation above. A simple slope analysis reveals that incremental theorists prefer the new product to the existing one ($M_{IT\text{-}New} = 4.77$, $M_{IT\text{-}Existing} = 4.13$, $\beta = 0.64$, $t_{200} = 2.30$, $p_{one\text{-}tailed} = 0.011$), while the same analysis reveals that entity theorists prefer existing products ($M_{ET\text{-}New} = 4.30$, $M_{ET\text{-}Existing} = 4.78$, $\beta = -0.48$, $t_{200} = -1.75$, $p_{one\text{-}tailed} = 0.041$). When we contrast entity and incremental theorists directly, we see that entity theorists prefer the existing solution to a greater degree than incremental theorists ($M_{IT\text{-}Existing} = 4.13$, $M_{ET\text{-}Existing} = 4.78$, $\beta = -0.30$, $t_{200} = 2.30$, $p_{one\text{-}tailed} = 0.011$), while incremental theorists prefer the new product compared to entity theorists ($M_{IT\text{-}New} = 4.77$, $M_{ET\text{-}New} = 4.30$, $\beta = 0.21$, $t_{200} = 1.71$, $p_{one\text{-}tailed} = 0.044$). These results support H1.

Psychological essentialism. Utilizing scales for both belief in genetic determinism and belief in social determinism, we substituted implicit theory in our linear regression on product evaluations with each of these constructs and reanalyzed the data. Belief in social determinism had a

marginally significant main effect on product evaluations ($\beta = .27$, $p = 0.10$), but did not exhibit a significant interaction with our product newness manipulation ($\beta = -0.01$, $p = 0.96$). Genetic determinism, on the other hand, did exhibit a significant main effect raising overall product evaluations ($\beta = 0.35$, $p = 0.01$), but also failed to show any significant signs of an interaction with our newness manipulation ($\beta = -0.09$, $p = 0.63$). Thus, it does not appear that our findings could be related to either beliefs in genetic or social determinism and are, instead, unique to beliefs in implicit theory.

[Insert Figure 1 around here.]

Discussion

In Study 1, we measured implicit theories and manipulated exposure to an advertisement for a new or existing digital camera. We observed that individuals with an incremental orientation are significantly more likely to prefer the new product to the existing product, while entity theorists significantly prefer the existing to the new. These results lend our first hypothesis credence. We also show that implicit theory, in this context, is distinct from belief in genetic and social determinism.

However, despite evidence suggesting that implicit theory impacts evaluations of innovative and non-innovative goods, thus far, we have only looked at results relating to a single product. Hence, in our second study, we seek to reaffirm the role of implicit theory in evaluations of innovative products, but with greater generalizability.

Study 2

While Study 1 showed initial evidence that entity and incremental theorists appear to evaluate innovative and non-innovative products in different manners, there are several potential limitations with the design. First, Study 1 only measured participant's implicit theories. While

measuring implicit beliefs is certainly appropriate due to its nature as an individual difference variable, showing a similar result while manipulating implicit theory would allow us to draw a firmer causal inference on implicit theories' effect on evaluations of innovative and non-innovative products. Second, participants in Study 1 only view a single advertisement for a sole product—a digital camera. Thus, we do not know whether the results of Study 1 generalize to other products or product categories yet. Study 2 seeks to address these methodological concerns by both manipulating participants' implicit beliefs and measuring innovative and non-innovative product evaluations for a wider range of consumer goods.

Method, design, and procedure

The design of this study employed a 2 (Implicit Theories: Entity vs. Incremental) cell design. One-hundred MTurk workers (52 female; M_{age} = 37.52, SD = 11.60) participated in our study for a small amount of monetary compensation ($1.15). The survey was ostensibly split into three unrelated studies to hide our true intentions. The first section of the study contained a manipulation for implicit beliefs, described below. The second section was filler. Finally, participants participated in a "market research study" where they were shown a series of 18 products, one at a time, and asked to evaluate each. The products were chosen based on seven selected product categories (i.e., air purifiers, alarm clocks, recumbent bikes, refrigerators, laptops, home thermostats, and vacuums), each with an option representing an innovative take on the product category, along with a more classical offering in the product category. Four products covering two product categories (i.e., headphones and air conditioners) that did not vary based on innovativeness were also included to aid in obfuscating our intentions. The sequence that products were evaluated in was randomized, effectively counterbalancing to remove any potential endogeneity from ordering effects. Each product contained a bolded headline indicating

the type of product (e.g., “Ambient Alarm Clock with Wake-up Light”), a one to two sentence description, and a photo of the product. All offerings were real products with identifiable branding information removed. See the Appendix for a full listing of all the stimuli used in this study. Finally, we followed up with questions on demographic information before thanking them for their participation.

To ensure that each product pair exhibited differences, we pretested all products using a similar procedure as outlined above with 50 MTurk participants on measures of innovativeness, effort, the potential for frustration, and product evaluations. Results from this pretest suggest that the innovative offering in each product pair was viewed as significantly more innovative and more effortful for all products tested. Additionally, all innovative offerings in each pair were found to have a significantly higher potential to be frustrating except for the alarm clock ($M_{classic}$ = 2.24, M_{innov} = 2.46, p = 0.18), and all innovative offerings in each pair were found to have naturally higher evaluations except for the air purifier ($M_{classic}$ = 3.44, M_{innov} = 3.64, p = 0.12) and laptop ($M_{classic}$ = 3.52, M_{innov} = 3.70, p = 0.25).

Independent variables

Implicit theory manipulation. Implicit beliefs were manipulated using the procedure outlined by Chiu et al. (1997). Participants read a compelling “scientific” article that outlines purported evidence for entity and incremental viewpoints. Those in the entity belief condition read an article that reportedly reviews research consisting of both case studies and longitudinal studies that demonstrate that people possess a finite set of largely fixed traits that are very difficult to change. Those in the incremental belief condition read an article that reportedly reviews research consisting of both case studies and longitudinal studies that demonstrate that human nature is dynamic and that human potentials can be cultivated and developed over time.

After reading the scientific article, participants were asked to thoughtfully read a list of 15 words, with participants in the incremental condition reading words that represented synonyms of malleability and participants in the entity condition reading words that represented synonyms of fixedness. After reading the words for a minimum of 15 seconds, participants were asked to recall 5-10 words from the previous exercise, along with picking one word from the list that best described the other words, and finally describing their personal life experiences that were "evolving and changeable" or "fixed and unchangeable," depending on the incremental/entity condition respectively.

Dependent variables

Manipulation and other checks. To check that our manipulation of domain general implicit theories was successful, all participants responded to the domain general implicit person theory scale from Levy et al. (1998) on a 6-point Likert scale, as in the previous study.

Finally, we also asked participants their age, gender, highest education level, and income bracket estimation to ensure we could control for potential endogeneity in our analyses.

Product evaluation. For product evaluations, participants simply reported on a 5-point Likert scale how they felt they would evaluate each product ("dislike a great deal (1)/like a great deal (5)"). Since we are not interested in any one specific product category, we create difference variables indicating the relative preference for the innovative product over the more classical option in each pairing—meaning that positive scores indicate a relative preference for the innovative option, negative scores indicate a relative preference for the classical option, and a score of zero indicates equal evaluations of both options. Finally, we aggregate these relative preferences for the innovative product across the product categories together to create a composite relative preference score.

Results

Manipulation and other checks. Participants who viewed the entity theory manipulation scored significantly lower on the Implicit Person Theory Measure, indicating greater agreement with entity beliefs than those who saw the incremental theory manipulation ($M_{entity} = 3.50$, $M_{incremental} = 4.41$, $t_{98} = -3.81$, $p_{one\text{-}tailed} < 0.001$). Additionally, we include our demographic variables in our analyses, though as none of these variables appear to impact our results, we do not discuss them further, but we do control for them in our subsequent regression analyses.

Product evaluation. We first regress the within-subject composite relative preference scores for the innovative product on our implicit theory manipulation (dummy coded), along with our control variables. Results indicated that those in the entity theory condition exhibited lower scores on our relative difference metric than those in the incremental theory condition ($\beta = -0.19$, $p_{one\text{-}tailed} = 0.047$). This suggests that all else being equal, participants in the incremental theory condition exhibited a relatively greater preference for the innovative options than the classical product options compared to those in the entity theorist condition.

Discussion

In Study 2, we manipulated domain-general implicit theories and measured relative evaluations of new and existing products across a series of different consumer home good product categories. We observed that individuals manipulated with an entity orientation were significantly less likely than those manipulated with an incremental orientation to prefer the innovative product over less innovative options. Given that our pre-test of the product stimuli revealed that the baseline for relative preferences shows greater evaluations of the innovative product across the board, this suppression of innovative product evaluations by those with a

temporarily salient entity orientation is quite interesting and backs up the central hypothesis that entity and incremental theorists evaluate innovative and non-innovative products differently.

Exploring Passive Innovation Resistance

With initial evidence that entity and incremental theorists evaluate new and existing products in unique manners, one might ask then "what is the nature of the elevated innovation resistance expected from entity theorists?" As noted earlier, past innovation resistance research has distinguished between two types of innovation resistance: active and passive innovation resistance (Heidenreich & Spieth, 2013). While much of the resistance to innovative products by entity theorists is likely to happen actively (i.e., after deliberative evaluation), it is also likely that entity beliefs will be associated with *passive innovation resistance*—which involves a trait-like predisposition to be wary of new products. This type of innovation resistance often leads people to reject new products, prior to much deliberate evaluation or information search, simply because they are new.

Passive innovation resistance consists of two second-order components: an inclination to resist change and satisfaction with the status quo. In thinking about change, entity theorists may have a propensity to focus on the effort required to deal with change and the potential for unknown setbacks and problems.

As mentioned previously, the inclination to resist change is built from four first-order components: (1) routine seeking, (2) cognitive rigidity, (3) emotional reactions to imposed change, and (4) a short-term focus. Because entity theorists inherently believe in the immutability of human traits, it is sensible to believe their proclivity to seek routines and cognitive rigidity is greater than incremental theorists, who value learning, personal development, and change. Similarly, entity theorists likely have a greater focus on the potential

problems new products might cause for them in the short-term, compared to incremental theorists who have a greater tolerance for mistakes. Finally, given entity theorists' frequent maladaptive strategies to failures or setbacks, we suspect they would be more likely to exhibit an emotional reaction to imposed change than incremental theorists.

In the case of satisfaction with the status quo, Heidenreich and Kraemer (2015) divided the concept into two first-order components: (1) satisfaction with the extent of innovations and (2) satisfaction with existing products. These two components combined represent an individual's overall situational satisfaction with the status quo. We suspect entity and incremental theorists will also vary their satisfaction with the status quo—as, by definition, existing products map onto the status quo to a greater extent than innovative products do. Fortunately, passive innovation resistance and its subcomponents can be measured reliably with a scale developed by Heidenreich and Kraemer (2015).

H2: Entity beliefs will be predictive of *passive innovation resistance*, such that entity theorists will score higher than incremental theorists on all the first-order components of passive innovation resistance, notably (a) routine seeking, (b) cognitive rigidity, (c) emotional reactions to imposed change, (d) short-term focus, (e) satisfaction with the extent of innovations, and (f) satisfaction with existing products.

The Potential for Fear of Negative Evaluation as a Driver of Resistance

As we have discussed previously, the concept of implicit theories was born from research that sought to identify why some individuals embrace performance goals, and others learning goals. Performance goals, specifically, lead people to work to attain positive judgments of their ability and, importantly, to avoid negative judgments that would potentially discredit their ability. And as we have established, innovative new products often have difficult learning curves

that can lead to product-use failures. Thus, entity theorists, who primarily focus on performance goals, should show greater degrees of innovation resistance. However, up to this point, the precise theoretical mechanism behind this elevated resistance has yet to be pinned down.

In the academic performance domain, several studies have found that entity theorists are more vulnerable to negative emotional reactions when they have to deal with challenges and setbacks (Dweck, 2012). Outside of the academic performance domain, studies have reported associations between a fixed mindset and measures of negative affect (King, 2017). When entity theorists contemplate the possible adoption of new products, they worry about possible failures and mistakes that may lie ahead, more so than incremental theorists, and these perceptions of potential failures are likely to represent a threat to the individual's self-esteem. In addition, when entity theorists are confronted by new products, they may worry that the products will require high effort and, in their eyes, needing to exert high effort suggests that they are not as competent as they should be. Thus, in two intertwined ways, new products can threaten the self-esteem of entity theorists.

Because entity theorists embrace performance goals and are known for avoiding potential negative judgements (along with seeking positive judgements) from others, it is likely that entity theorists also exhibit a stronger fear of negative evaluation. Fear of negative evaluation is a dispositional trait defined as the "apprehension and distress arising from concerns about being judged disparagingly or hostilely by others" (Carleton, McCreary, Norton, & Asmundson, 2006, p. 297). Since negative evaluations from others fuel a great degree of self-esteem threat, entity theorists should try to avoid situations in which they may offer avenues for others to negatively evaluate them. Conversely, because incremental theorists likely have a relatively lower fear of negative evaluation, their actions will reflect less concern about self-esteem threat. Indeed,

Schlenker and Weigold (1990) found that fear of negative evaluation was negatively related to self-esteem and positively related to social anxiety and shyness. Usage of fear of negative evaluation in the marketing literature is light, but research by Johnson, Tariq, and Baker (2018) implicates fear of negative evaluation in shifting individuals' product preferences towards conspicuous consumption of pro-social goods when need for status is high. Managerially, fear of negative evaluation can stifle decision-making comprehensiveness, harming a business' performance in generating ideas for innovative new products (Mohan, Voss, & Jiménez, 2017).

Altogether, given the information presented, one may be able to make the inference that a fear of negative evaluation will be one of the primary reasons for entity theorists to passively avoid new products. Indeed, as White and Argo (2009) show, consumers typically avoid products that are related to threatened areas of their self. If entity theorists subconsciously understand that new products present higher risks of product-use failures and self-demeaning high effort, then their resistance of new products is likely a self-defense strategy that leads to them avoiding putting themselves in situations where they could be negatively evaluated.

However, to be more modular in our approach for the upcoming Study 3, we are interested in hypothesizing about the impact of fear of negative evaluation on each of the second-order components of passive innovation resistance, namely inclination to resist change and status quo satisfaction. As mentioned before, inclination to resist change itself contains four first-level components: routine seeking, an emotional reaction to imposed change, short-term focus, and cognitive rigidity. A case can be made for each of these constructs to be impacted by fear of negative evaluation.

Routine seeking would likely be higher in individuals with a fear of negative evaluation because routines represent as established norm (that avoids new potential avenues for negative

evaluation). Similarly, if something changes and breaks the norm, uncertainty allows for mistakes and potential negative evaluations, creating a greater emotional reaction to imposed change. Fear of negative evaluation could also foster short term focus, as avoiding possible present negative evaluations takes attention away from longer-oriented goals. Finally, cognitive rigidity presents the least certain outcome. On one hand, a stalwart position could allow one to better defend themselves against potential negative critiques (thus, fear of negative evaluation would increase cognitive rigidity as a defense mechanism.) On the other hand, it is possible that those with high fear of negative evaluation actually find their positions quite malleable in order to not invite criticism and negative evaluation at all (thus, fear of negative evaluation would decrease cognitive rigidity). Thus, while the direction of the impact of fear of negative evaluation on cognitive rigidity is somewhat unclear, it is our hypothesis that, *overall*, inclination to resist change will be increased by fear of negative evaluation.

Related literature on individual differences in *attention to social comparison information* (ATSCI) has found evidence that seemingly supports our hypothesis. First, Lennox and Wolfe (1984) reported finding social anxiety-neuroticism ($r = 0.29$) and fear of negative evaluation ($r = 0.64$) had significant positive correlations with ATSCI. Furthermore, ATSCI has been studied in relation to innate consumer innovativeness (i.e., primarily adoption-oriented, using a scale measuring items such as “I am willing to try new things”). Specifically, Clark and Goldsmith (2005) found increasing ATSCI scores to be associated with lower scores on innate consumer innovativeness. Thus, some tangential evidence points to a related construct to fear of negative evaluation lowering consumer’s proclivity to support innovative products.

On the other hand, fear of negative evaluation may not impact status quo satisfaction. Status quo satisfaction comprises of two first-order components: satisfaction with the extent of

innovations and satisfaction with current products. And while entity theorists likely present a greater bias towards the status quo (due to a similar of line of thinking as above, i.e., entity theorists prefer norms), it is of my belief that any of fear of negative evaluation's impact on status quo bias would work indirectly, moving through the factors described in the inclination to resist change hypothesis instead of directly inflating status quo satisfaction. Thus, any additional variance of fear of negative evaluation on status quo satisfaction will be minimal and nonsignificant. In conclusion, we formally denote:

H3: With regards to passive innovation resistance, (a) differences in entity and incremental theorists' *inclination to resist change* will be mediated by a *fear of negative evaluation*, while (b) differences in entity and incremental theorists' *status quo satisfaction* will *not* be mediated by a *fear of negative evaluation*.

Hypotheses 2 and 3 form the foundation for our explorations in Study 3. That is, we want to confirm that entity beliefs are associated with increased levels of *passive innovation resistance* and that *fear of negative evaluation* can be found to mediate this linkage when analyzed as an enduring disposition through passive innovation resistance (the core of inclination to resist change).

Study 3

In Study 3, we explore the hypothesized impact of implicit theories on innovation resistance by running a structural equation model study of the association between a measure of implicit beliefs and passive innovation resistance. Specifically, we use SEM because we want to test how implicit theory, and our proposed mediator fear of negative evaluation, impact the various components of passive innovation resistance. In the following section, the methodology

to discover what specific dimensions of passive innovation resistance are being driven by implicit theories and mediated by fear of negative evaluation is described.

Method, design, and procedure

Two-hundred fifty-one MTurk workers (103 female, M_{age} = 34.26, SD = 10.12) participated for a small amount of money ($0.80). The survey was ostensibly split into two unrelated studies to disguise our true intentions. The first part consisted of the Heidenreich and Handrich (2015) passive innovation resistance scale, while the second part presented participants with a domain general Implicit Person Theory Measure (Levy et al., 1998) and a brief Fear of Negative Evaluation scale (Carleton et al., 2006).

Measures

Passive innovation resistance. Participants responded to the passive innovation resistance scale from Heidenreich and Handrich (2015) on a 7-point Likert scale. The scale consists of a total of 18 statements (e.g., "I generally consider changes to be a negative thing," "When I am informed of a change of plans, I tense up a bit," and "Often, I feel a bit uncomfortable even about changes that may potentially improve my life;" see the Appendix for the full scale) anchored by "strongly disagree (1)/strongly agree (7)." The passive innovation resistance scale consists of two second-order components and six first-order components. The two second-order components are an inclination to resist change and satisfaction with the status quo. Inclination to resist change contains four first-order components: (1) routine seeking, (2) emotional reactions to imposed change, (3) short-term focus, and (4) cognitive rigidity. Satisfaction with the status quo contains two first-order components: (1) satisfaction with the extent of innovation, and (2) satisfaction with existing products.

Each first-order component consists of three items. All of our items are the same as Heidenreich and Handrich (2015), except for a change made to satisfaction with the extent of innovation. Originally, this first-order component consisted of three reverse-coded items. However, in a pre-test, participants appeared to find the wording of these questions confusing. Therefore, in an effort to reduce cognitive load, we flipped the wording of these items to be straightforward. In the end, higher scores on each first-order component are associated with greater passive innovation resistance.

Implicit theory. Participants responded to the same domain general implicit person theory scale as Study 1 on a 6-point Likert scale, as in previous studies.

Brief fear of negative evaluation. Finally, participants responded to the 12 item, 5-point Likert revised Brief Fear of Negative Evaluation scale proposed by Carleton et al. (2006). The revised Brief Fear of Negative Evaluation scale is an extension to the Leary (1983) Brief Fear of Negative Evaluation scale, that flips the reverse-worded items into straightforward equivalents. This revision of the brief fear of negative evaluation scale was proposed for several reasons. Primarily, while Leary (1983) assumed the Brief Fear of Negative Evaluation scale to be theoretically unitary, a confirmatory factor analysis by Rodebaugh et al. (2004) revealed that the model actually contained two factors segregating the reverse-coded items from the straightforwardly-coded ones. It was presumed that the reverse-worded items caused confusion and erroneous responding. Thus, according to Carleton et al. (2006), it is possible that past use of the reverse-scored items has resulted in an underestimation of the effect of fear of negative evaluation.

With this revised scale, all 12 items are straightforward statements (e.g., “It bothers me when people form an unfavorable impression of me,” “I worry about what kind of impression I

make on people," "Sometimes I think I am too concerned with what other people think of me," and "I often worry that I will say or do wrong things;" see the Appendix for the full scale). Higher scores indicate a greater fear of negative social evaluations.

Scale reliability and validity

We begin our investigation of scale reliability and validity, as summarized in Table 1, by looking at the composite reliability (CR) indices and average variances extracted (AVE) across each scale (for implicit person theory and fear of negative evaluation) and subscale (for each of the third-order constructs of passive innovation resistance). The minimum recommended values for these two scores are 0.70 and 0.50, respectively (Anderson & Gerbing, 1988). If each scale meets this criterion, we can say we have evidence of internal consistency in our scales. All our scales pass these two tests, except for cognitive rigidity, which fails both (CR = 0.64; AVE = .39). Therefore, while almost all of our scales have strong evidence of convergent and divergent validity, along with high reliability, results related to cognitive rigidity must be viewed with caution.

[Insert Table 1 around here.]

Further, we looked at the loadings of each item for each scale to diagnose any potential issues with specific items. For the implicit person theory measure, we find that all eight items load onto a single factor, with all loadings greater than 0.79. With fear of negative evaluation, all twelve items load onto a single factor, with all loadings greater than 0.82. Finally, with regards to passive innovation resistance, each subscale has high factor loadings (greater than 0.70), except for all three items tapping cognitive rigidity ("I often change my mind," $\lambda = 0.47$; "I don't change my mind easily," $\lambda = 0.62$; "My views are very consistent over time," $\lambda = 0.62$) and one

item in satisfaction with the extent of innovations ("Overall, my personal need for innovations in the field of technological products has been by far covered in the past," $\lambda = 0.26$).

SEM Results

We utilize path analysis to simultaneously assess the hypothesized relationships among our focal constructs. First, we assess the overall fit of the structural equation model. Our structural model was estimated using maximum likelihood and shows overall model fit to be mediocre. For instance, our model has a CFI = 0.798, where Hu and Bentler (1998) recommend a value of 0.95 or higher to ensure that misspecified models are not accepted. With regards to the RMSEA, MacCallum, Browne, and Sugawara (1996) called values between 0.10 and 0.08 to be a mediocre fit, while anything lower than 0.08 represents a good fit. This places our RMSEA = 0.105 just a tad bit above the area of mediocre fit. Similarly, SRMR values lower than 0.08 are generally considered to be acceptable (MacCallum et al., 1996), but our SRMR = 0.121 sits a bit above this value. Finally, our metric of relative chi-squared sits at 3.75. Recommendations for the relative chi-squared vary with some stating anything lower than 5.0 as acceptable (Wheaton, Muthen, Alwin, & Summers, 1977), while other recommend being lower than 2.0 (Tabachnick, Fidell, & Ullman, 2007). Thus, the general takeaway from an assessment of overall model fit is that it hovers above values that are considered to be indicators of good fit.

However, we do not think that mediocre fit statistics takes away from the general knowledge gained from our structural equation model for several reasons. First, we do not purport that our model is fully specified; that is, we acknowledge that there is a litany of missing variables from our structural equation model. Our primary goal was to analyze the impact of implicit theory and fear of negative evaluation simultaneously on the multiple aspects of passive innovation resistance, not identify every factor that may create variance in passive innovation

resistance and fear of negative evaluation. Second, one way to improve the fit statistics in a structural equation model is to covary items, either a priori or post hoc, but per the recommendations by Hermida (2015), we opt to not do so as improvements to our fit statistics would be spurious. We do note, however, simply covarying the straightforwardly worded items in the implicit persons theory measure is sufficient to drive our fit statistics up to the recommendations for "good fit." Finally, per the discussion in Hooper, Coughlan, and Mullen (2008), while fit indices are a "useful guide," structural models must also be examined in the context of their substantive theory. Some scholars are currently arguing that the current attraction to strict adherence of fit indices cutoffs lead to instances of Type I errors (Marsh, Hau, & Wen, 2004), while others even argue for dropping fit indices all together (Barrett, 2007). Thus, while we recognize the general importance of fit indices, we argue that our moderately poor fitting model is evaluated in the context of the substantive theory we are trying to evaluate, and not as a comprehensive view of passive innovation resistance and implicit theory.

With evaluations of overall model fit completed, we move our attention to the individual paths. Table 2 shows the results of the structural equation model in relation to our proposed hypotheses, while a holistic visual representation of the structural model can be seen in Figure 2. All path coefficients are standardized for easy comparison. Our set of hypotheses 2a through 2f have to do with the impact of a person's implicit theory orientation on the various subcomponents of passive innovation resistance. As the model shows, all hypotheses 2a through 2f are supported by our model, except for implicit theory's impact on cognitive rigidity. Specifically, we find that individuals with a higher incremental orientation show less routine seeking (H2a; $\beta = -0.37$, $p < 0.001$), less emotional reaction to imposed changes (H2b; $\beta = -0.16$, $p = 0.005$), a lesser degree of short-term focus (H2c; $\beta = -0.27$, $p < 0.001$), along with less

satisfaction with the current state of innovations (H2e; $\beta = -0.40$, $p < 0.001$) and existing products (H2f; $\beta = -0.16$, $p = 0.032$). As can be seen, the two most powerful drivers of implicit theory on passive innovation resistance appear to be routine seeking and satisfaction with the current extent of innovation. Cognitive rigidity, on the other hand, was directional, but not significant (H2d; $\beta = -0.13$, $p = 0.131$). Given how the measure of cognitive rigidity failed tests for convergent and divergent validity, we are not sure if this lack of significance can be attributed to entity and incremental beliefs genuinely not correlating with cognitive rigidity, or whether psychometric flaws in this subscale contaminated our results.

Moving on to our third hypothesis, we want to see how fear of negative evaluation mediates the linkage between implicit theory orientation and variance in passive innovation resistance. Hypothesis 3a posited that fear of negative evaluation should be responsible for mediating the inclination to resist change subfactors for passive innovation resistance, while 3b posited that fear of negative evaluation should not mediate the status quo satisfaction subfactors. Our structural equation model points to initial evidence in favor of these hypotheses, as the path from implicit theory to fear of negative evaluation is negative and significant (H3a/b; $\beta_{RS} = -0.26$, $p_{RS} < 0.001$), while each path from fear of negative evaluation to the inclination to resist change subfactors is significant and positive, except for cognitive rigidity (H3a; $\beta_{RS} = 0.40$, $p_{RS} < 0.001$; $\beta_{ER} = 0.61$, $p_{ER} < 0.001$; $\beta_{STF} = 0.55$, $p_{STF} < 0.001$; $\beta_{CR} = -0.20$, $p_{CR} = 0.013$). Further, fear of negative evaluation does not impact the two status quo satisfaction subfactors (H3b; $\beta_{SQSI} = 0.05$, $p_{SQSI} = 0.482$; $\beta_{SQSP} = 0.00$, $p_{SQSP} = 0.985$).

[Insert Figure 2 and Table 2 around here.]

Mediation Analysis

We also employ the PROCESS macro (Hayes, 2013), bootstrapped with 5,000 samples to formally test mediation in our model. In order to be conducive for our PROCESS analysis, we simplify the model to analyze the composite scores for inclination to resist change and status quo satisfaction. Thus, inclination to resist change's score is the average of routine seeking, emotional reaction to imposed change, short-term focus, and cognitive rigidity, while status quo satisfaction's score is the average of satisfaction with the extent of innovations and satisfaction with the extent of current products. We also add several covariates to the model to control for possible confounding effects. Specifically, we control for age, gender, income, and education in our mediation analyses.

The results suggest that fear of negative evaluation works as a mediator for inclination to resist change, but not for status quo satisfaction. The direct effect of implicit theory on inclination to resist change is -0.158 ($p < 0.001$), while the completely standardized indirect effect through fear of negative evaluation is -0.0941, with a 95% bias-corrected bootstrapped confidence interval that excluded 0 (95% confidence interval [CI] = -0.170, -0.017). Contrasted, the direct effect of implicit theory on status quo satisfaction is -0.136 ($p = 0.015$), while the completely standardized indirect effect through fear of negative evaluation is -0.009, with a 95% bias-corrected bootstrapped confidence interval that *includes* 0 (95% confidence interval [CI] = -0.044, 0.018).

Thus, results from our PROCESS analysis suggest that fear of negative evaluation mediates the relationship between implicit beliefs and the inclination to resist change, but not status quo satisfaction, as is consistent with our Hypothesis 3a/3b.

Discussion

In Study 3, we utilized structural equation modeling to simultaneously test several hypotheses related to implicit theory and passive innovation resistance's components. We found that an implicit theory measure predicted scores on almost every component of passive innovation resistance, except for cognitive rigidity. Specifically, the results from our structural model suggest that incremental theorists exhibit lower scores on the passive innovation resistance scale. Additionally, we added a scale tapping fear of negative evaluation into our structural model. Results with fear of negative evaluation suggest that it acts as a mediator linking implicit theory and its impact on passive innovation resistance, at least with regards to the dispositional inclination to resist change subfactors. We confirm this by rerunning our mediation through the PROCESS macro (Hayes, 2013) to the same results. However, while we have growing evidence of the impact of implicit beliefs on new product adoption and resistance tendencies, more evidence of how fear of negative evaluation might mediate the effect is desirable.

Fear of Negative Evaluation as a Mediator between Implicit Theories and Innovative Product Evaluations

In the upcoming study, the hypothesis that entity theorists' *reactions to innovative products* are potentially mediated by their fear of negative evaluation is tested. Whereas in Study 3 we explored whether fear of negative evaluation mediated implicit theories' impact on a measure of passive innovation resistance, in Study 4, we investigate whether fear of negative evaluation mediates implicit theories' impact on product evaluations with a specific innovative product. To test these ideas, we utilize an experimental-causal-chain design where we experimentally manipulate our proposed mediator, fear of negative evaluation, and measure its

impact on evaluations of innovative products. Under this paradigm, we would expect incremental theorists to be insensitive to the salience of fear of negative evaluation, while expecting entity theorists to show more adverse reactions when fear of negative evaluation is salient. Specifically, we hypothesize:

H4: Entity theorists' relatively lower evaluations for new products will be mediated by their relatively greater *fear of negative evaluation*.

Study 4

Method, design, and procedure

One-hundred seventeen MTurk workers (50 female, M_{age} = 36.21, SD = 9.99) participated in our study for a small amount of money ($0.50). The survey was ostensibly split into two unrelated studies to hide our true intentions. The first part consisted of the domain general Implicit Person Theory Measure (Levy et al., 1998). Participants were then randomly assigned to either the control or high salience of fear of negative evaluation condition, followed by the brief Fear of Negative Evaluation (Carleton et al., 2006) measure along with two additional items that tapped into the salience of potential judgements for purchases, adapted from Eisingerich, Chun, Liu, Jia, and Bell (2015). In the second part, participants were presented with a market research study that ostensibly solicited their feedback on an advertisement for an innovative portable printing device (see Appendix).

Independent variables

Implicit theory. Participants responded to the domain general implicit person theory scale from Levy et al. (1998) on a 6-point Likert scale, as in previous studies.

Fear of negative evaluation. Our manipulation of fear of negative evaluation was adapted from a manipulation for stimulating high salience of social risk (Eisingerich et al., 2015). Those in the

high salience of fear of negative evaluation condition were given a text ostensibly from *Psychology Today* (see Appendix). The article described the high possibility of consumers being judged negatively for the purchases that they make. Those in the control condition did not view any article.

Dependent variables

Manipulation and other checks. Our manipulation check for fear of negative evaluation is the brief Fear of Negative Evaluation scale (Carleton et al., 2006), as described previously. We also include two items that tap into the salience of potential judgements for purchases (I believe other people are likely to form impressions of me based on my purchases; I believe other people are likely to evaluate the things that I decide to buy) on a 5-point Likert scale ("not characteristic of me at all (1)/extremely characteristic of me (5)").

Product evaluations. The innovative product advertisement stimulus was taken from Chung and Lee (2019), who pre-tested it to confirm its perceived innovativeness. The advertisement describes a product called the "ZUtA," a portable robotic printer that can be used anywhere or on any size of paper. After viewing the advertisement for the innovative portable printer, participants answered whether they liked the product ("strongly dislike (1)/strongly like (7)"). and how likely they would be to buy the product ("extremely unlikely (1)/extremely likely (7)"), which we aggregated together for a measure of product evaluations.

Results

Manipulation and other checks. Both fear of negative evaluation ($\alpha = .98$) and salience of potential judgements ($\alpha = .95$) had high internal reliability. Unfortunately, the manipulation for fear of negative evaluation did not have an impact on participants' fear of negative evaluation ($M_{control} = 3.07$, $M_{high\_fne} = 2.93$, $t_{115} = 0.61$, $p_{one\text{-}tailed} = 0.73$), but did influence their awareness of

potential purchase-related judgements ($M_{control}$ = 2.60, M_{high_fne} = 3.25, t_{115} = -2.67, $p_{one\text{-}tailed}$ = 0.004).

Product evaluation. As outlined by Hayes (2013), we regressed the mean-centered implicit theory measure (α = .94), the salience of fear of negative evaluation manipulation (dummy coded), their interaction, and our control variables on respondents' product evaluation metric (α = .85). Unfortunately, the results showed an insignificant effect of all three independent variables.

Exploratory diagnostic analyses. In light of the insignificant results above, as a part of a series of diagnostic follow up analyses, we utilized the PROCESS macro (Hayes, 2013), bootstrapped with 5,000 samples and mean-centered predictor variables. Since it is theoretically possible that fear of negative evaluation only mediates innovation adoption tendencies for entity theorists, we conduct a conditional process analysis (i.e., moderated mediation with the independent variable also acting as the moderating factor; model 74) with implicit theories as our independent variable, evaluations of the innovative product as our dependent variable, the continuous fear of negative evaluation measure as our proposed mediator, and implicit theories functioning as the moderator for the indirect effect of fear of negative evaluations on product evaluations.

In this specific moderated mediation model, we find that implicit theories do have a significant and positive direct effect on innovative product evaluations (0.18; $p_{one\text{-}tailed}$ = .040). Additionally, results confirm the importance of running a moderated mediation model, as our index of moderated mediation was positive and significant (0.05; 95% confidence interval [CI] = 0.007, 0.114). Thus, the indirect effect of implicit theories on product evaluations through fear of negative evaluation depends on the level of implicit theories. We note that the conditional indirect effects of implicit theories on product evaluations through fear of negative evaluation is

only significant for those who scored around the 16th percentile on our implicit persons theory measure (i.e., fear of negative evaluation only works as a mediator for entity theorists). Specifically, the conditional indirect effect for entity theorists is negative and significant (-0.09; 95% confidence interval [CI] = -0.223, -0.006). Further, the conditional indirect effects are insignificant for those around the median implicit theory score (-0.28; 95% confidence interval [CI] = -0.100, 0.027), or those who tend towards stronger incremental beliefs (0.04; 95% confidence interval [CI] = -0.009, 0.134).

While the insignificance of fear of negative evaluation as a mediator for incremental theorists is consistent with theory, the direction of the indirect effect of implicit theories on innovative product evaluations through fear of negative evaluations is counter to my hypothesis. To decompose this further, we look at the conditional effects of the focal predictor (fear of negative evaluation) at varying levels of implicit beliefs. For incremental theorists and those towards the median score, increases in fear of negative evaluation have insignificant effects on product evaluations. However, entity theorists have a positive and significant conditional effect of fear of negative evaluation on product evaluations ($\beta = 0.42$; $p = .015$). Thus, as fear of negative evaluation increases for entity theorists, evaluations of the innovative product also increases. Since entity beliefs are associated with greater fear of negative evaluation ($\beta = -0.22$; $p_{one\text{-}tailed} = 0.003$), this causes the conditional indirect effect of entity beliefs on product evaluations to be negative and significant.

Altogether, the total effect of implicit theories on innovative product evaluations remains consistent with our hypothesis. That is, the combined direct effect and conditional indirect effect at the 16th (entity theorists), 50th, and 84th (incremental theorists) percentiles are all positive.

[Insert Figure 3, Table 3, and Table 4 around here.]

Discussion

After an unsuccessful manipulation, Study 4 employed a correlational moderated mediation analysis. While this was not my intention at the beginning of the study, once again the results still seem to suggest that entity theorists are, overall, less open than incremental theorists when it comes to new product adoption—however, the role of fear of negative evaluation in mediating this linkage (H4) was not supported.

The results of Study 3 and Study 4 appear to be contradictory, at least with respect to the hypothesis underlying the psychological mechanism behind innovation resistance in entity theorists. Study 3 shows, at least correlationally, that implicit theories are associated with passive innovation resistance, and this effect is in part due to entity theorists' higher fear of negative evaluation. Yet in Study 4, the results seem to suggest that fear of negative evaluation might be responsible for partially mitigating the negative effect of entity beliefs on innovative product evaluations (i.e., the total effect for entity theorists is smaller due to the conditional indirect effect of enhanced fear of negative evaluation).

There are several potential reasons for this finding. In Study 3 and Study 4, the dependent variable utilized is substantively different—with Study 3 covering measurement of a psychological trait (i.e., passive innovation resistance) and Study 4 covering evaluations of a specific innovative product (i.e., the ZUtA portable electronic printer). As such, Study 4 is more susceptible to "product-specific effects." Additionally, perhaps fear of negative evaluation might be indexing participants' awareness that people are judged (both positively and negatively) for the products that they purchase. This heightened awareness may have sparked entity theorists' interest in signaling positive qualities associated with a potentially 'cool' product (Park & John,

2012). Finally, it is of course possible that fear of negative evaluation simply does not function as a mediator in the way that was originally hypothesized.

Boundaries: An Exploration of Perceived Learning Cost

Coming off the heels of our contradictory finding with regards to fear of negative evaluation, we seek to better understand how entity and incremental theorists differentially evaluate innovative products. As such, we shift our exploration to potential boundary conditions constricting our findings—specifically, we look at the role of perceived *learning cost* as a potential moderating factor. To explicate, if a new product is perceived to have a high learning cost, then it, by definition, should encompass substantive effort to learn and provide for an opportunity to problem solve. If learning costs for a new product are perceived to be sufficiently low, then entity theorists will have less of a reason to avoid the new product (and may even have social reasons to desire it)—all while incremental theorists, who value self-improvement through learning (Ommundsen, 2001), will have less of a reason to desire the new product. Formally, we denote:

H5: The *perceived learning cost* of a new product will moderate the linkage between implicit beliefs and new product evaluations, such that relatively low perceived learning costs (high perceived learning costs) will be associated with smaller (larger) differences between entity and incremental theorists in their evaluations of new products.

Thus, the focus of Studies 5 and 6 are to attempt to test this hypothesis.

Study 5

Method, design, and procedure

For this initial exploratory study of the role of learning cost, Study 5 employed a continuous (Implicit Persons Theory Measure), within-subjects design. One-hundred twenty-two

MTurk workers (M_{age} = 36.59, SD = 11.61) participated for a small amount of money ($0.70). The survey was ostensibly split into two unrelated studies to mask our true intentions. The first part consisted of the domain general Implicit Person Theory Measure (Levy et al., 1998), as in previous studies. In the second part, participants were presented with a scenario study (detailed in the next paragraph) and were tasked to respond to a situation as if they were in a consumer's shoes. We then followed with relevant measures and an attention check. Regarding the attention check, nine participants failed to successfully identify the type of product described in the scenario and were removed from further analyses, though the results did not change in any substantiative way if the analyses were run including these participants.

All participants were presented with a scenario that asked them to read about a fictional consumer named Sarah who was now working from home due to the pandemic and needs to scan and print documents for her job. Her current all-in-one printer/scanner combo was described as serving her well for years but was recently starting to become unreliable in its scan quality, so she was in the market for a new unit. After searching online, she narrows her options down to two choices. The first choice was described as being the *direct successor* (emphasis was also included to participants) to her current model—almost identical in features to her current device, but offering modest improvements to the existing features she uses. The second option was described as being *the newest* all-in-one from the same manufacturer—having many new and innovative features not found in her current model. It was stated to participants that Sarah had seen positive reviews for both options, and both were described in those reviews as "sophisticated" devices. Finally, price was discarded as a factor in this scenario because, as a work device, participants were told Sarah's company would reimburse her for the cost of both options.

Measures

Product scores. Following the description of the scenario, participants were immediately asked to rate both options (i.e., the direct successor and the newest model) on a scale from 0 to 100 with regards to how good each option would be for them if they were in the fictional character's position ("this option would be terrible for me (0)/this option would be the best for me (100)").

Capturing unique scores for both options additionally allows us to create a within subject relative preference score for the innovative product. Specifically, we subtract each participant's score for the direct successor from the newest model—meaning that positive scores indicate a relative preference for the innovative option, negative scores indicate a relative preference for the classical option, and a score of zero indicates equal evaluations of both options.

Product-specific factors. Finally, participants were asked to evaluate both product options on two product-specific factors, namely how innovative they would rate each option ("not innovative at all (1)/very innovative (5)") and how difficult they thought it would be to set up and learn to use each option ("no effort to learn at all (1)/very difficult to learn (5)").

Results

Product innovativeness and other checks. Participant evaluations of the innovativeness of each option reveals that the new product was viewed as more innovative than the direct successor ($M_{New} = 4.20$, $M_{Successor} = 2.39$, $t_{120} = -15.63$, $p_{one\text{-}tailed} < 0.001$). Similarly, the new product was viewed as being more difficult to learn ($M_{New} = 2.96$, $M_{Successor} = 1.93$, $t_{120} = -10.88$, $p_{one\text{-}tailed} < 0.001$).

Product scores. We begin by regressing the relative preference created by subtracting evaluations of the direct successor from the innovation option on mean-centered implicit theory and its interaction with mean-centered learning cost of the new product. Results show a

significant main effect for implicit theory ($\beta = 8.41$, $p_{one\text{-}tailed} < 0.001$), where greater incremental beliefs are associated with a greater relative preference for the new printer, and a significant interaction with the reported learning cost of the new printer ($\beta = 6.68$, $p_{one\text{-}tailed} = 0.006$), where reporting higher perceived learning costs of the new printer enhances the positive effect of incremental beliefs on relative preference for the innovative option.

Since we are interested in contrasting entity and incremental theorists, we performed a spotlight analysis (Fitzsimons, 2008). To achieve this, we consider entity theorists to be one standard deviation below the mean and incremental theorists to be one standard deviation above. Additionally, we consider one standard deviation above and below the mean of perceived learning cost of the new printer. Results also revealed that amongst entity theorists the conditional marginal effect of increased learning cost was negative and significant ($M_{ET\text{-}High} = 17.4$, $M_{ET\text{-}Low} = 4.5$, $\beta = -7.91$, $t_{113} = -1.68$, $p_{one\text{-}tailed} = 0.048$). Conversely, amongst incremental theorists the conditional marginal effect of increased learning cost was positive and significant ($M_{IT\text{-}High} = 42.1$, $M_{IT\text{-}Low} = 25.4$, $\beta = 10.23$, $t_{113} = 1.94$, $p_{one\text{-}tailed} = 0.028$). Thus, it appears entity theorists' relative preference for the new printer decreases as the perceived learning cost of the product increases, while the opposite occurs for incremental theorists. Contrasting between entity and incremental theorists, at relatively low learning costs (one standard deviation below the mean), we see no difference between entity and incremental theorists in their relative preference for the new printer ($M_{IT\text{-}Low} = 25.4$, $M_{ET\text{-}Low} = 17.4$, $\beta = 2.95$, $t_{113} = 0.93$, $p_{one\text{-}tailed} = 0.177$), but at relatively high learning costs, we see a significant difference in the relative preference ($M_{IT\text{-}High} = 42.1$, $M_{ET\text{-}High} = 4.5$, $\beta = 13.87$, $t_{113} = 4.86$, $p_{one\text{-}tailed} < 0.001$). Thus, when learning costs were perceived as low, implicit theories had no impact on product preference, but when learning costs

were perceived as high, incremental theorists were associated with much higher relative evaluations of the new printer against the more classical option than entity theorists.

[Insert Figure 4 around here.]

Discussion

The central hypothesis that entity and incremental theorists evaluate new and classical products dissimilarly was replicated, as our results showed a stronger general relative preference for the innovative option by incremental theorists than by entity theorists. Additionally, we found initial evidence to support Hypothesis 5's assertion that the perceived learning cost of an innovative product has a significant moderating effect on these relative preferences, such that incremental theorists raise their overall relative preference for the innovative option when its learning cost is perceived as high, while entity theorists lower their overall relative preference in the same scenario. However, due to the correlational nature of the design of Study 5, another study is desirable to rule out alternative explanations for the learning cost effect.

Study 6

Study 6 continues our exploration into the moderating role of perceived learning cost on evaluations of innovative products. While Study 5 employed a correlational design measuring perceived learning cost, the intention of Study 6 is to test whether entity and incremental theorists vary in their evaluations of an innovative product when we, instead, manipulate the perceived learning cost. Further, we change both the context of the innovative product to one we have not tested before (3D printers) and employ a student-based subject pool (rather than MTurk subject pool) for more robust external validity.

Method, design, and procedure

This study employed a continuous (Implicit Persons Theory Measure) x 2 (Learning Cost: Low vs. High), between-subjects design. Three-hundred sixty-eight undergraduate students (161 female) enrolled at a large public Pacific Northwestern university participated for course credit. The survey was ostensibly split into two unrelated studies to mask our true intentions. The first part consisted of the domain general Implicit Person Theory Measure (Levy et al., 1998), as in previous studies. In the second part, participants were shown a product advertisement for a new 3D printer (pre-tested to be perceived as innovative, $M_{innovativeness} = 6.81$ on a 9-point Likert scale). Unbeknownst to them, the participants were divided evenly into two conditions representing low and high learning costs. Following the advertisement, we collected answers to relevant measures and a manipulation check.

Independent variables

Implicit theory. Participants responded to the domain general implicit person theory scale from Levy et al. (1998) on a 6-point Likert scale, as in previous studies.

Low vs. high learning cost. We operationalized the low and high learning cost conditions through a subtle change to the body of a product advertisement. Participants were asked to participate in our market research study looking at consumer interest in learning about 3D printing technologies. They were told they would view an advertisement for a new 3D printer and be asked to answer basic questions to quantify their engagement. All participants were told to ignore cost and assume the product was financially feasible.

The advertisement contained the headline "Innovative by design, 3D printing comes to the masses." The body of the advertisement described that 3D printing was no longer only for engineers and tinkerers, and that the "all-new" α-3D could conjure anything in your imagination.

It stated even without creative skills, the 3D printer contained access to a digital library of thousands of useful and fun designs ready to be printed immediately. Finally, it was stated that the 3D printer could be learned by anyone.

To induce our manipulation of learning cost, we changed the sentence immediately following. In the low learning cost condition, the α-3D was described as "requiring little to no effort to learn, you can be getting perfect prints after watching our short instructional video." In the high learning cost condition, the α-3D ad noted that "our complementary live virtual instructional seminars will guide you through the setup, operation, and maintenance of your new printer." All other aspects besides this sentence were the same in both conditions.

Dependent variables

Manipulation and other checks. Checks for our manipulation of learning cost came in the form of participants' ratings of the extent to which the advertisement conveyed a product that would take time, effort, and energy to effectively learn, each on 9-point Likert scales, anchored by "no time at all (1)/a very long time (9)," "no effort at all (1)/a lot of effort (9)," and "no energy at all (1)/a lot of energy (9)," respectively. Finally, we also asked participants if they had previous experience working with 3D printers and their gender, to ensure we could control for potential endogeneity in our analyses.

Product evaluation. After seeing either the low or high learning cost 3D printer advertisement, participants reported the likelihood that they would buy the product ("no chance at all (1)/very likely would (9)"), their favorability towards the product ("very unfavorably (1)/very favorably (9)"), whether they thought the product was a good for them ("very bad (1)/very good (9)"), and their overall interest in learning more about 3D printing technologies ("no interest at all (1)/a lot of interest (9)").

Results

Manipulation and other checks. We average respondent ratings of the time, effort, and energy required to learn to use the product ($\alpha = .91$) and see that high learning cost was moderately successfully manipulated as taking more time, effort, and energy to learn ($M_{low\_cost} = 5.20$, $M_{high\_cost} = 5.48$, $t_{366} = -1.58$, $p_{one\text{-}tailed} = 0.057$). Since this is slightly above the standard criterion of 0.05, we decomposed the differences between the two advertisements for each individual component of time ($M_{low\_cost} = 5.16$, $M_{high\_cost} = 5.54$, $t_{366} = -2.05$, $p_{one\text{-}tailed} = 0.021$), effort ($M_{low\_cost} = 5.22$, $M_{high\_cost} = 5.39$, $t_{366} = -0.84$, $p_{one\text{-}tailed} = 0.200$), and energy ($M_{low\_cost} = 5.23$, $M_{high\_cost} = 5.52$, $t_{366} = -1.52$, $p_{one\text{-}tailed} = 0.065$). This suggests our manipulation was most strong at changing participants perceptions of the amount of time it would take to learn the 3D printer and least strong at changing perceptions of effort required.

Relating to our measure of product evaluation, neither gender ($\beta = -0.06$, $t_{368} = -0.41$, $p = 0.68$) nor previous 3D printer usage ($\beta = -0.10$, $t_{368} = -0.55$, $p = 0.58$) appear to have an impact on how respondents rated the 3D printer. Because none of these variables appear to impact our results, we do not discuss them further, but we do control for them in our subsequent regression analysis.

Product evaluation. As outlined by Hayes (2013), we regressed the mean-centered implicit theory measure ($\alpha = .90$), the learning cost manipulation (dummy coded), their interaction, and our control variables—gender and 3D printer usage—on respondents' product evaluation metric ($\alpha = .80$). The results show a significant interaction between implicit theory and our learning cost manipulation ($\beta = 0.46$, $t_{368} = 2.52$, $p_{one\text{-}tailed} = 0.012$, $R^2 = 0.024$), though we see insignificant main effects of our learning cost manipulation ($\beta = -0.09$, $t_{368} = -0.55$, $p = 0.582$) and implicit theory ($\beta = -0.14$, $t_{368} = -1.02$, $p_{one\text{-}tailed} = 0.15$).

Since we are interested in contrasting entity and incremental theorists, we performed a spotlight analysis (Fitzsimons, 2008). To achieve this, we consider entity theorists to be one standard deviation below the mean and incremental theorists to be one standard deviation above. A simple slope analysis reveals that entity theorists prefer the lower learning cost printer to the relatively higher learning cost one ($M_{ET\text{-}High} = 5.48$, $M_{ET\text{-}Low} = 5.96$, $\beta = -0.48$, $t_{368} = -2.18$, $p_{one\text{-}tailed} = 0.015$), however, the same analysis reveals that incremental theorists only marginally prefer the higher learning cost printer to the relatively lower learning cost one ($M_{IT\text{-}High} = 6.03$, $M_{IT\text{-}Low} = 5.72$, $\beta = 0.31$, $t_{368} = 1.39$, $p_{one\text{-}tailed} = 0.083$). When we contrast entity and incremental theorists directly, we see that incremental theorists prefer the higher learning cost to a greater degree than entity theorists ($M_{IT\text{-}High} = 6.03$, $M_{ET\text{-}High} = 5.48$, $\beta = 0.32$, $t_{368} = 2.60$, $p_{one\text{-}tailed} = 0.005$), while entity and incremental theorists were roughly equal in their evaluations of the low learning cost product ($M_{IT\text{-}Low} = 5.72$, $M_{ET\text{-}Low} = 5.96$, $\beta = -0.14$, $t_{368} = -1.02$, $p_{one\text{-}tailed} = 0.155$).

Interestingly, it also appears that how entity and incremental theorists might *perceive* the learning cost of an innovative product is unique amongst the two groups. Indeed, running a regression on learning cost with mean-centered implicit theory and its interaction with the complexity manipulation as the predictors, we see a significant main effect of incremental beliefs reducing the perceived learning cost of the product ($\beta = -0.36$, $t_{368} = -2.37$, $p_{one\text{-}tailed} = 0.01$) and an insignificant interaction. Thus, regardless of the advertisement seen, incremental theorists tended to view the product as less complicated than entity theorists.

[Insert Figure 5 around here.]

Discussion

The results of Study 6 are broadly consistent with the results from Study 5 and our fifth hypothesis. When learning costs were perceived as relatively lower, entity theorists and

incremental theorists were not significantly different in their evaluations of an innovative product. However, when the learning cost of the product was perceived to be relatively higher, the difference between the two mindsets became significant—such that incremental theorists had a relatively greater evaluation of the innovative product than did entity theorists.

Mediation Revisited: Negative Effort Beliefs and Need for Cognition

In the past two studies we have seen evidence of the role of learning cost as a boundary condition constricting and enhancing the differences between entity and incremental theorists in their evaluations of new products, we return attempting to understand the psychological mechanisms at play. While we originally hypothesized fear of negative evaluation would serve as one of the primary mediators between implicit theory and evaluations of new products, it is unlikely to serve as the *only* potential mediator. Due to the counter-intuitive results of Study 4—particularly regarding fear of negative evaluation's role in mediating the linkage—we shift attention to exploring other potential mechanisms through which implicit theories might impact new product evaluations. Therefore, the moderating account of perceived learning cost suggests that cognitive effort may be central to understanding why innovative products are differentially processed by entity and incremental theorists.

As discussed earlier, implicit theories tend to impact people's perceptions of effort. Specifically, incremental theorists respect and value high effort, while entity theorists believe that if you have high ability, then effort should be unnecessary—and potentially even threatening to their belief in their high abilities (Grant & Dweck, 2003; Miele & Molden, 2010; Murphy & Dweck, 2016). When studying implicit theories of intelligence, Blackwell et al. (2007) found incremental theories of intelligence to correlate with positive effort beliefs (i.e., the belief that hard work and effort will pay off in the long run). Conversely, Blackwell et al. (2007) also

directly show a correlation between entity theories of intelligence and negative effort beliefs (i.e., the belief that hard work is unnecessary compared to natural ability). As new products often require effort to learn and integrate, it appears logical that entity theorists might avoid them out of a belief that innovative products may require excessive effort that may not pay off, resulting in potential doubts in one's abilities. Formally, we denote:

H6: An individual's *negative effort beliefs* will mediate the relationship between implicit theories and evaluations for innovative products, such that stronger entity beliefs will be associated with stronger negative effort beliefs and, therefore, lower evaluations of innovative products.

Up to this point, we have only posited a potential mechanism driving entity theorists to have lower evaluations of new products. However, it is possible that a different mechanism drives incremental theorists to desire adopting new products. In other words, while a mechanism such as fear of negative evaluation or negative effort beliefs might suppress entity theorists' evaluations of new products, another mechanism may increase incremental theorists' evaluations of the same new product. While it has been previously outlined why incremental theorists are likely to have a preference towards adopting innovative products, no specific psychological mechanism that might account for this tendency was given. To answer this question of mediation, it is likely the concept of *need for cognition* (Cacioppo & Petty, 1982) must be investigated.

Need for cognition refers to the individual difference variable which describes "the tendency for people to vary in the extent to which they engage in and enjoy effortful cognitive activities" (Petty, Briñol, Loersch, & McCaslin, 2009). In other words, need for cognition asks to what degree does one relish situations requiring complicated abstract reasoning and creative

problem solving. Individuals high in a need for cognition tend to enjoy participating in challenging activities, while those low in a need for cognition tend to use simple cues and heuristics over deliberative cognitive processing (Haugtvedt, Petty, & Cacioppo, 1992).

Since the notion that innovative products often encompass substantial effort on the part of the user to learn and integrate into their routines has already been set forth (Hoeffler, 2003), it flows logically that those who score higher in a need for cognition will value the additional effort the innovative product allows them to engage with—and indeed, this correlation is backed up by an empirical analysis of high vs. low need for cognition individuals (Wood & Swait, 2002). Although implicit beliefs correlate with a need for cognition, the two constructs are clearly empirically distinct, with one study finding a significant correlation of around a level of .20 (Chiu et al., 1997). This correlation is likely because incremental theorists tend to adopt learning goals, enjoy enhancing their overall competence, and focus on the process, rather than the results. Thus, a portion of incremental theorists' higher evaluations of new products will be driven by their enhanced need for cognition. Formally, this is stated as:

H7: An individual's *need for cognition* will mediate the relationship between implicit theories and evaluations for innovative products, such that stronger incremental beliefs will be associated with stronger need for cognition and, therefore, higher evaluations of innovative products.

While Studies 5 and 6 explored moderation through perceptions of learning costs, by focusing on new products that had varying learning costs, we may have indirectly seen the mechanisms of negative effort beliefs and need for cognition at play. Thus, this line of thought is the focus of our investigation in Study 7 as process is investigated once again.

Study 7

Method, design, and procedure

This study employed our Implicit Persons Theory Measure, as in past studies. One-hundred eighty-one MTurk workers (69 female; M_{age} = 36.59, SD = 11.61) participated for a small amount of money ($0.80). The survey was ostensibly split into two unrelated studies to mask our true intentions. The first part consisted of the domain general Implicit Person Theory Measure (Levy et al., 1998), as in previous studies, and additional measures related Need for Cognition (Lins de Holanda Coelho, HP Hanel, & J. Wolf, 2020) and Negative Effort Beliefs (Blackwell et al., 2007). In the second part, participants were presented with an advertisement for an innovative technological product (specifically, we used a slightly modified version of the landing page for Microsoft's HoloLens 2—an augmented reality computing device; see the Appendix for the full stimulus) and asked to provide their opinion on several aspects of the product. We followed up with questions on demographic information before thanking them for their participation.

Independent variables

Implicit theory. Participants responded to the domain general implicit person theory scale from Levy et al. (1998) on a 6-point Likert scale, as in previous studies.

Need for cognition. We operationalized Need for Cognition through the six-item version of the scale developed by Lins de Holanda Coelho et al. (2020). This measure includes items such as "Thinking is not my idea of fun," "I really enjoy a task that involves coming up with new solutions to problems," and "I would rather do something that requires a little thought than something that is sure to challenge my thinking abilities," anchored by "strongly disagree (1)/strongly agree (7)."

Negative effort beliefs. We operationalized Negative Effort Beliefs as in Blackwell et al. (2007). Specifically, we include two items measuring "To tell the truth, when I work hard at work, it makes me feel like I'm not very smart," and "If you're not good at a subject, working hard won't make you good at it," anchored by "strongly disagree (1)/strongly agree (6)."

Dependent variables

Product innovativeness and other checks. Checks for how innovative the product advertisement was perceived came in the form of participants' ratings of the extent to which the advertisement conveyed a product that was innovative on 7-point Likert scale, anchored by "no innovative at all (1)/extremely innovative (7)." Finally, we also asked participants their age, gender, highest education level, and income bracket estimation to ensure we could control for potential endogeneity in our analyses.

Product evaluation. For product evaluations, participants reported the likelihood that they would demo the product ("extremely unlikely (1)/extremely likely (7)"), how much they like the product ("strongly dislike (1)/strongly like (7)"), and their likelihood that they would buy the product if it were affordable ("extremely unlikely (1)/extremely likely (7)").

Results

Product innovativeness and other checks. The HoloLens 2 advertisement was perceived as sufficiently innovative, scoring well above the mid-point ($M_{innovativeness} = 6.09$, $SD = 1.12$). Additionally, we include our demographic variables in our analyses, though as none of these variables appear to impact our results, we do not discuss them further, but we do control for them in our subsequent regression analyses.

Product evaluation. As outlined by Hayes (2013), we regressed the mean-centered implicit theory measure ($\alpha = .87$) on evaluations of the HoloLens. Since we are interested in exploring

the potential mediators of the relationship between individual's implicit theories and innovation adoption, we utilized the PROCESS macro (Hayes, 2013), bootstrapped with 5,000 samples to test a parallel multiple mediation model with need for cognition and negative effort beliefs as our mediating variables and mean-centered implicit theory measure as our independent variable. Results from our intermediary PROCESS regressions indicate that our implicit theory measure is negatively correlated with negative effort beliefs (β = -.22; $p_{one\text{-}tailed} < 0.001$) and positively correlated with need for cognition (β = .07; $p_{one\text{-}tailed} = 0.036$). Hence, higher scores on the Implicit Person Theory Measure (indicating a greater overall agreement with incremental beliefs) are associated with lower scores on negative effort beliefs and higher scores on need for cognition.

With regard to the direct and indirect effects, we find the direct effect of implicit theories on evaluations of the HoloLens 2 to be positive and on the border of significance (0.13; $p_{one\text{-}tailed} = 0.051$). This implies that the stronger one agrees with an incremental perspective, the greater the evaluations of the HoloLens 2. The indirect effect of implicit theories was also found to be positive and significant through need for cognition (0.035; 95% confidence interval [CI] = 0.002, 0.081), but not significant for negative effort beliefs (0.039; 95% confidence interval [CI] = -0.016, 0.107). Hence, implicit theories can enhance evaluations of the HoloLens through increased need for cognition, though the mediation of negative effort beliefs is less conclusive. [Insert Figure 6 & Table 5 around here.]

Discussion

Study 7 attempted to more directly answer the question of process in implicit theories' role in innovation adoption and resistance tendencies. As Study 5 and 6 showed the moderating role of learning costs, Study 7 shows the mediating role of need for cognition, as hypothesized.

Indeed, this result appears logical since higher learning costs are viewed negatively by entity theorists and positively by incremental theorists. The reason for this then appears to be differences in entity and incremental theorists' enjoyment of effortful cognitive activities.

However, while we expected negative effort beliefs to also have a significant mediating effect, it appears the construct's indirect effect on evaluations were less conclusive, though at least directional. Specifically, we found that implicit theories were significantly correlated with negative effort beliefs, such that entity theorists had higher negative effort beliefs as predicted, but that its overall effect on evaluations of the innovative product in this specific scenario was just shy of significant ($\beta = -.182$, $p_{\text{one-tailed}} = 0.059$). Thus, its bootstrapped confidence interval in the PROCESS analysis was inclusive of zero. However, it is likely inappropriate to make the argument that, while negative effort beliefs show a weak correlation with the evaluations of the HoloLens, negative effort beliefs has no role in mediating the linkage between implicit theories and innovative product evaluations—but that in this case, its role is muted and inconclusive. Though taken from past research, it is possible that this measure of negative effort beliefs was too weak (i.e., the scale is only two items and may not tap exactly into the true construct as intended). It is also possible that with more subjects, the indirect effect could have become significant. Therefore, the conclusion should not be that negative effort beliefs do not mediate, but that further research is required to ascertain its role more accurately.

General Discussion

Throughout this dissertation, we have tried to establish a linkage between implicit theories of the malleability of human traits and innovation resistance and adoption tendencies. Our first two studies provide evidence of our foundational hypotheses—notably in Study 1, we manipulate exposure to a new versus classical product and show that domain-general implicit

beliefs led to differences in evaluations of these products. Specifically, we found that those who possessed an entity belief evaluated the innovative product less favorably than incremental theorists and, conversely, also evaluated the classical product more favorably than incremental theorists. In Study 2, we instead manipulated implicit beliefs and contrasted evaluations of several innovative and classical products to a similar finding. Specifically, participants who read an article instilling incremental beliefs exhibited a relatively greater preference for the innovative options than the classical product options, compared to those who read an article instilling entity beliefs.

Study 3 utilized an established measure of innovation resistance, where implicit theory, fear of negative evaluation, and passive innovation resistance were all measured and analyzed using accepted scales with structural equation modeling. In this study, we found evidence that linked implicit beliefs to a measure of passive innovation resistance and, at least on a dispositional level, fear of negative evaluation was responsible for mediating this linkage. Study 4 also attempted to address the topic of mediation through fear of negative evaluation by showing an innovative product and measuring product evaluations. But while the findings of this study in a post-hoc exploratory analysis replicated the central hypothesis that entity theorists appear to, overall, resist innovative products to a greater degree than incremental theorists, the data also suggested—counter to our hypothesis—that an increased fear of negative evaluation in entity theorists could function as a ‘shield’ from negative reactions to innovative products. While this finding was unexpected, it does suggest the existence of boundary conditions with regards to the attributes of innovative products that may change how entity theorists evaluate new products.

As such, in an effort to better understand potential boundary conditions—Studies 5 and 6 explored the moderating effect of perceived learning cost. Specifically, we observed how the

perceived learning cost of an innovative product constrains the central finding of our hypothesis—notably shrinking the differences in evaluations between entity and incremental theorists for innovative products with a low perceived learning cost. Study 5 arrived at this conclusion by presenting participants with a scenario study that consisted of choosing between an incremental upgrade and a larger, more innovative upgrade. Measured perceptions of learning cost moderated the choice for the more innovative product, enhancing the positive effect of incremental beliefs on relative preference for the innovative option. Study 6, on the other hand, arrived at this conclusion by manipulating perceived learning cost. Specifically, a 3D printer advertisement was shown to participants and described as either having a short instructional video to learn the operations of the printer or having a complementary live virtual instructional seminar. Incremental theorists preferred the higher learning cost printer to a greater degree than entity theorists, while entity and incremental theorists were roughly equal in their evaluations of the low learning cost product.

Finally, Study 7 returned to address mediation again—this time by looking at entity theorists' elevated negative effort beliefs and incremental theorists' elevated need for cognition. After measuring all relevant constructs, participants viewed an advertisement for an innovative augmented reality computing device. While we found that negative effort beliefs and need for cognition were both associated with entity and incremental beliefs respectively, only need for cognition significantly mediated the linkage between implicit theories and new product evaluations.

In summary, we found favorable results across all seven studies present in this dissertation—indicating that entity and incremental theorists process and evaluate innovative and non-innovative products in unique manners. Additionally, we found an important boundary

condition for this effect involving perceived learning cost. While there is still work to be done in isolating the psychological mechanisms behinds these differences, the studies present suggest promising avenues for exploring possible mediators, such as fear of negative evaluation, negative effort beliefs, and need for cognition. In the following three sections, we identify the theoretical and managerial implications we believe our work has on the field of consumer psychology and conclude with a discussion of our limitations and potential directions for future research.

Theoretical Implications

Our work makes theoretical contributions to several different fields, most notably the implicit theories and innovation adoption/resistance literatures. First, we provide evidence of a new downstream consequence of implicit theory, notably a desire to avoid purchasing new and innovative products. Second, we provide some potential evidence of several new mediators within the context of implicit theory, specifically that entity theorists exhibit higher degrees of fear of negative evaluation than incremental theorists and incremental theorists exhibit higher degrees of need for cognition than entity theorists. Third, we contribute to the literature on fear of negative evaluation by showing evidence that fear of negative evaluation is associated with higher amounts of three of four components of passive innovation resistance (specifically routine seeking, emotional reactions to imposed change, and a greater short-term focus). Fourth, we provide evidence that the perceived learning cost of a good can interact with implicit beliefs, changing the way that consumers evaluate innovative products and product upgrades. Finally, we also implicate incremental theorists' elevated need for cognition as having a partial role in mediating the linkage between implicit theories and evaluations of new products.

Managerial Implications

In addition to our theoretical implications, our work has several managerial implications. First, we notice that if the objective of the firm is to sell new/innovative products, particular care must be taken in how the product is presented depending on a consumer's mindset. If product messaging can be targeted to entity and incremental theorists differently, then such a tactic may be able to raise purchase intentions of the new product for entity theorists. Further, due to our implication of perceived learning cost in the process of innovation adoption and resistance tendencies, care must be given to how marketing messages for new products are cast.

Ideally, one would try to design a message that both avoids raising entity theorist's perceived learning cost, while simultaneously trying to balance incremental theorists' desire to be cognitively stimulated. However, targeting both these messages simultaneously may be a challenging task. As such, the tension created by how entity and incremental theorists differentially process new product advertisements may necessitate marketing managers to discover their targeted consumer segments' dominant implicit belief so marketing messages can be designed to stimulate one theory or the other's desire for a new product. In other words, if a target segment is known to have a greater contingent of entity theorists, new product advertisements should emphasize lower learning costs. If a target segment is known to have a greater contingent of incremental theorists, describing how the new product can stimulate their learning and cognition may be the more effective technique.

Ultimately, when viewed broadly, incremental theorists are not the 'problem' when it comes to matters of innovation adoption. It is the other side of the implicit theories coin—the entity theorists—who appear to be the ones resisting and rejecting innovations at a rate greater than the average. Thus, perhaps the goal should be to reduce entity theorists' resistance by

reducing the perceived learning cost, even if there is a slight trade-off in incremental theorists' adoption.

Limitations and Future Research

We recognize that our work has several limitations. First, fear of negative evaluation's full role in innovation resistance and adoption tendencies for new products is not yet fully understood. Specifically, Study 3 and Study 4 appear to contradict one another to a certain extent on how the construct impacts evaluations of innovative products. Future research should explore fear of negative evaluation's precise role in the framework of innovative product adoption and resistance tendencies, finding potential boundaries where the effect can go in opposing directions. As a suggestion, it may be that *perceived signaling value* and *perceived learning cost* interact with entity theorists' enhanced fear of negative evaluation. For instance, if the learning cost of an innovative product is perceived to be sufficiently low, and the signaling value is perceived to be sufficiently high, then entity theorists may have a net desire for the innovative product.

Second, further research should be done isolating the mediating role of need for cognition and negative effort beliefs in the framework of implicit beliefs and innovation adoption and resistance. While we have some theory and initial data implicating these two constructs in the overall framework, more could be done to understand precisely when these two constructs mediate the linkage between implicit theories and innovative product evaluations, and when other potential mediators have a greater effect. For instance, under what boundary conditions might fear of negative evaluation become the most significant mediator, or under what conditions might that switch to need for cognition, or negative effort beliefs? Unfortunately, the current set of studies in this dissertation cannot begin to answer questions as to the relative

strengths and potential interactions of these proposed mediators. Thus, there is much more to be explored on the topic with large potential contributions to the implicit beliefs literature to be made.

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Figures and Tables

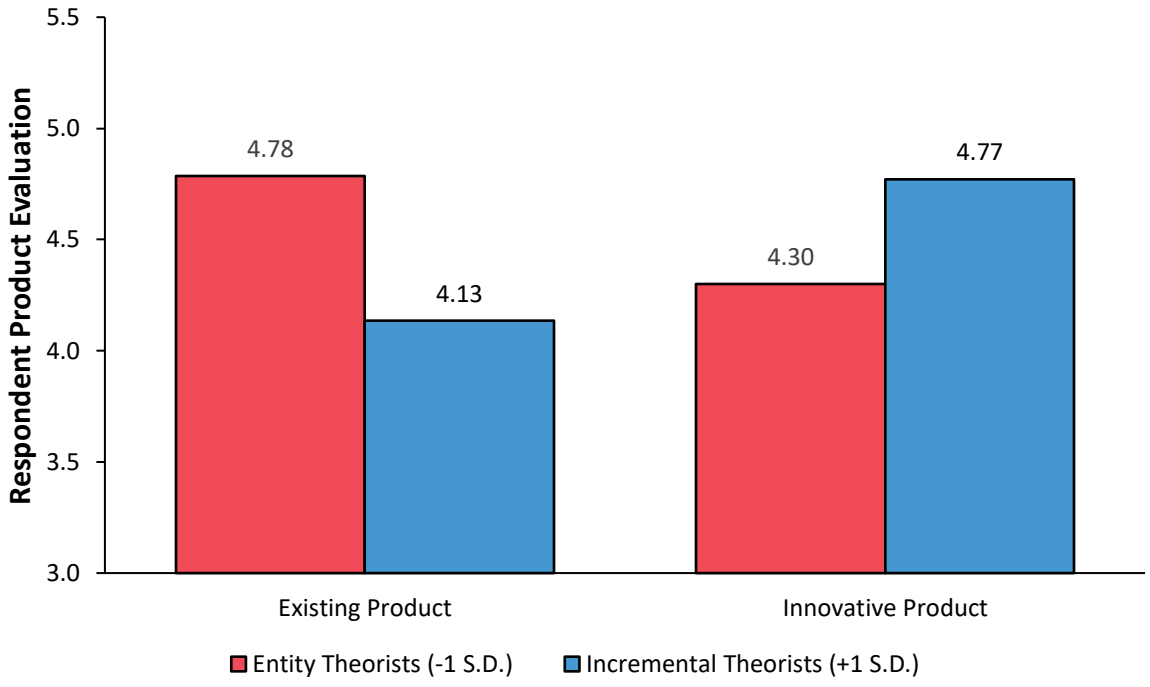


Fig. 1. Study 1. Entity and incremental theorists' mean ratings of product evaluation by innovative vs. existing product manipulation.

Table 1. Study 3. Construct reliability

Construct	No. of Items	CR	AVE
Implicit Person Theory	8	0.934	0.625
Fear of Negative Evaluation	12	0.975	0.766
Passive Innovation Resistance			
Routine Seeking	3	0.833	0.627
Emotional Reaction to Imposed Change	3	0.899	0.748
Short-Term Focus	3	0.853	0.656
Cognitive Rigidity	3	0.638	0.394
Satisfaction with the Extent of Innovations	3	0.796	0.551
Satisfaction with Existing Products	3	0.816	0.599

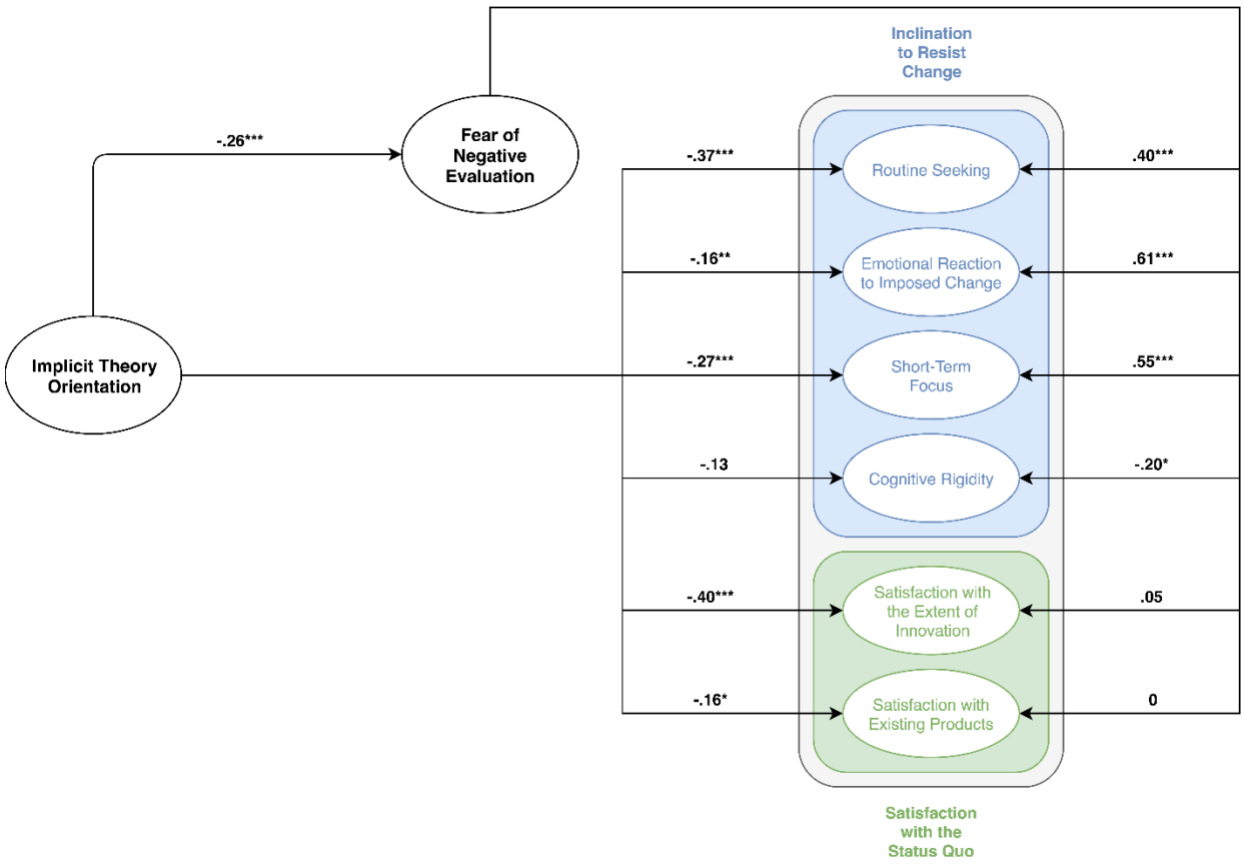


Fig. 2. Study 3. Results of structural equation model on components of passive innovation resistance.

Table 2. Study 3. Results of hypotheses tests

Hypothesized Path	Hyp.	Expected Direction	Std. Path Coefficient	p-value	Hypothesis Supported
IPTM → RS	H2a	-	-0.37	<0.001	Yes
IPTM → ER	H2b	-	-0.16	0.005	Yes
IPTM → STF	H2c	-	-0.27	<0.001	Yes
IPTM → CR	H2d	-	-0.13	0.131	*No*
IPTM → SQSI	H2e	-	-0.40	<0.001	Yes
IPTM → SQSP	H2f	-	-0.16	0.032	Yes
IPTM → FNE	H3a/b	-	-0.26	<0.001	Yes
FNE → RS	H3a	+	0.40	<0.001	Yes
FNE → ER	H3a	+	0.61	<0.001	Yes
FNE → STF	H3a	+	0.55	<0.001	Yes
FNE → CR	H3a	+	-0.20	0.013	*No*
FNE → SQSI	H3b	N.S.	0.05	0.482	Yes
FNE → SQSP	H3b	N.S.	0.00	0.985	Yes
Fit Statistics					
CFI	0.798				
SRMR	0.121				
RMSEA	0.105				
Chi-Squared (df)	2445.31 (652)				

Note: IPTM, Implicit Person Theory Measure; RS, Routine Seeking; ER, Emotional Reaction to Imposed Change; STF, Short Term Focus; CR, Cognitive Rigidity; SQSI, Satisfaction with the Extent of Innovations; SQSP, Satisfaction with Existing Products; FNE, Fear of Negative Evaluation

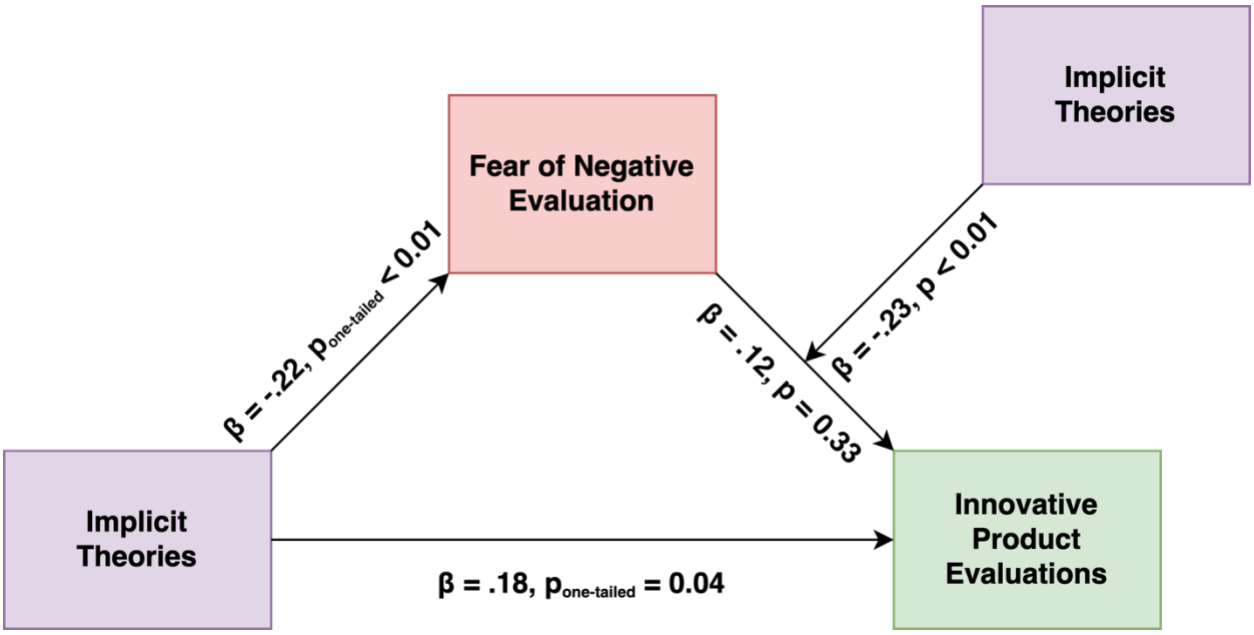


Fig. 3. Study 4. Results of moderated mediation analysis on innovative product evaluations.

Table 3. Study 4. Conditional effects of fear of negative evaluation on product evaluation

	IPTM Score	Effect Size	Standard Error	p-value
Entity Theorists	-1.28	0.419	0.169	0.015
Median	-0.03	0.129	0.124	0.300
Incremental Theorists	1.40	-0.205	0.144	0.157

Table 4. Study 4. Conditional indirect effects of moderated mediation analysis

	IPTM Score	Effect Size	Bootstrapped Standard Error	Bootstrapped Confidence Interval
Entity Theorists	-1.28	-0.090	0.056	[-0.2228, -0.0059]
Median	-0.03	-0.028	0.031	[-0.0965, 0.0268]
Incremental Theorists	1.40	0.044	0.038	[-0.0089, 0.1344]

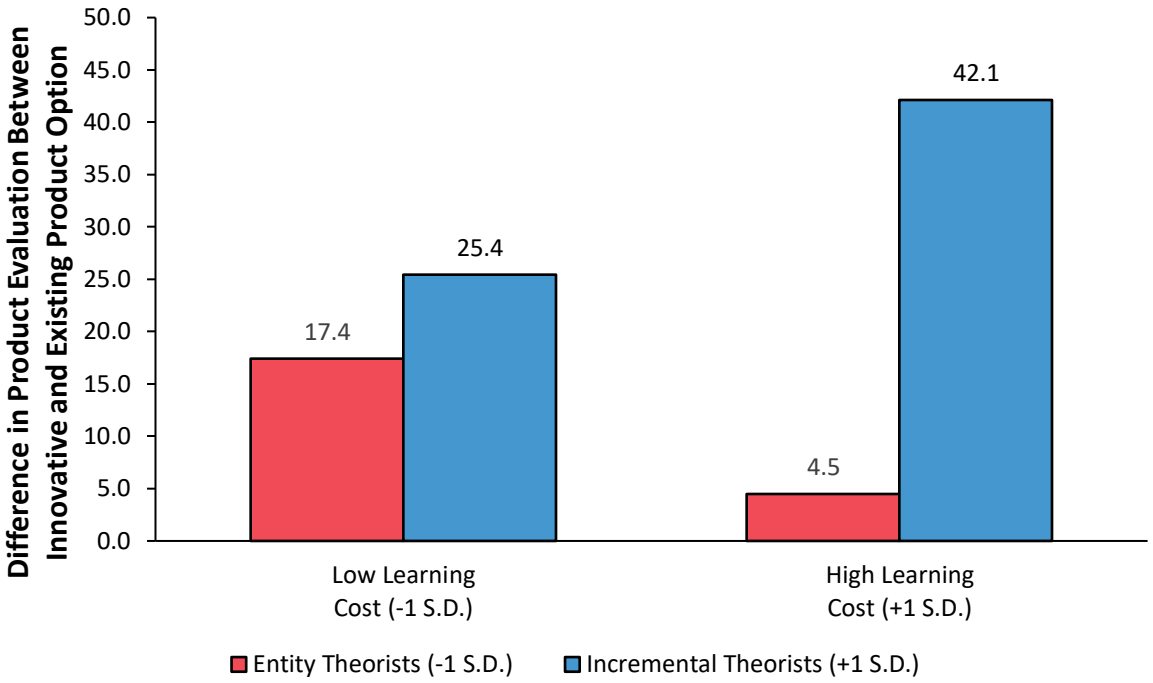


Fig. 4. Study 5. Entity and incremental theorists' relative preference for the innovative option with spotlights at high and low perceived learning cost of the innovation option.

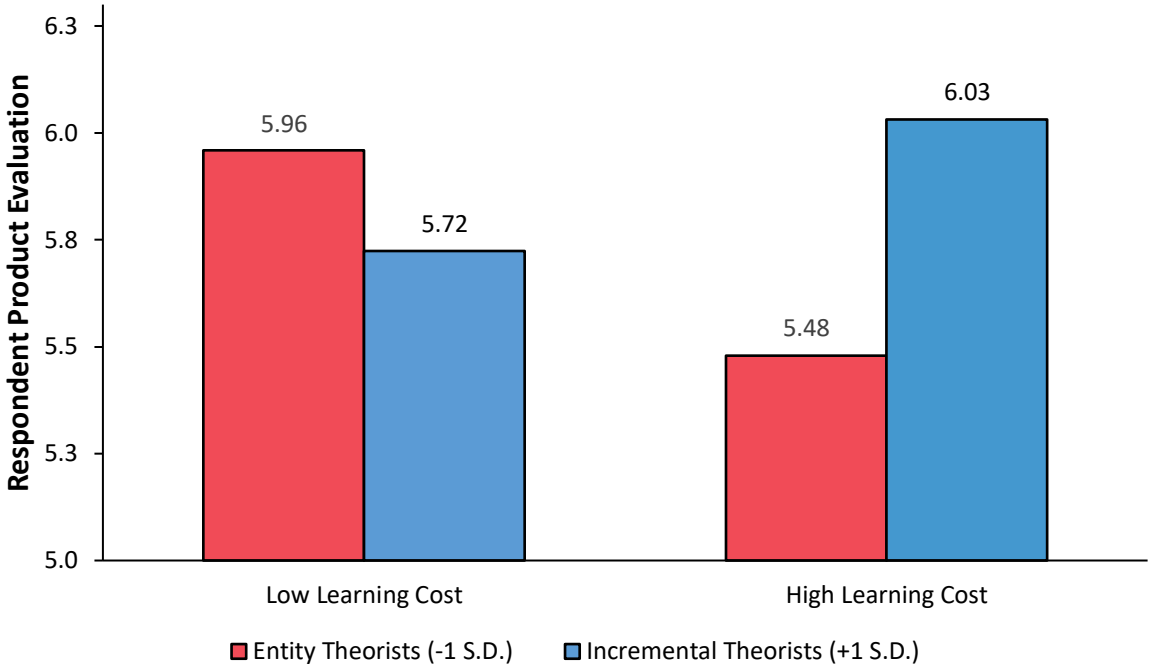


Fig. 5. Study 6. Entity and incremental theorists' mean ratings of product evaluation by low vs. high learning cost product manipulation.

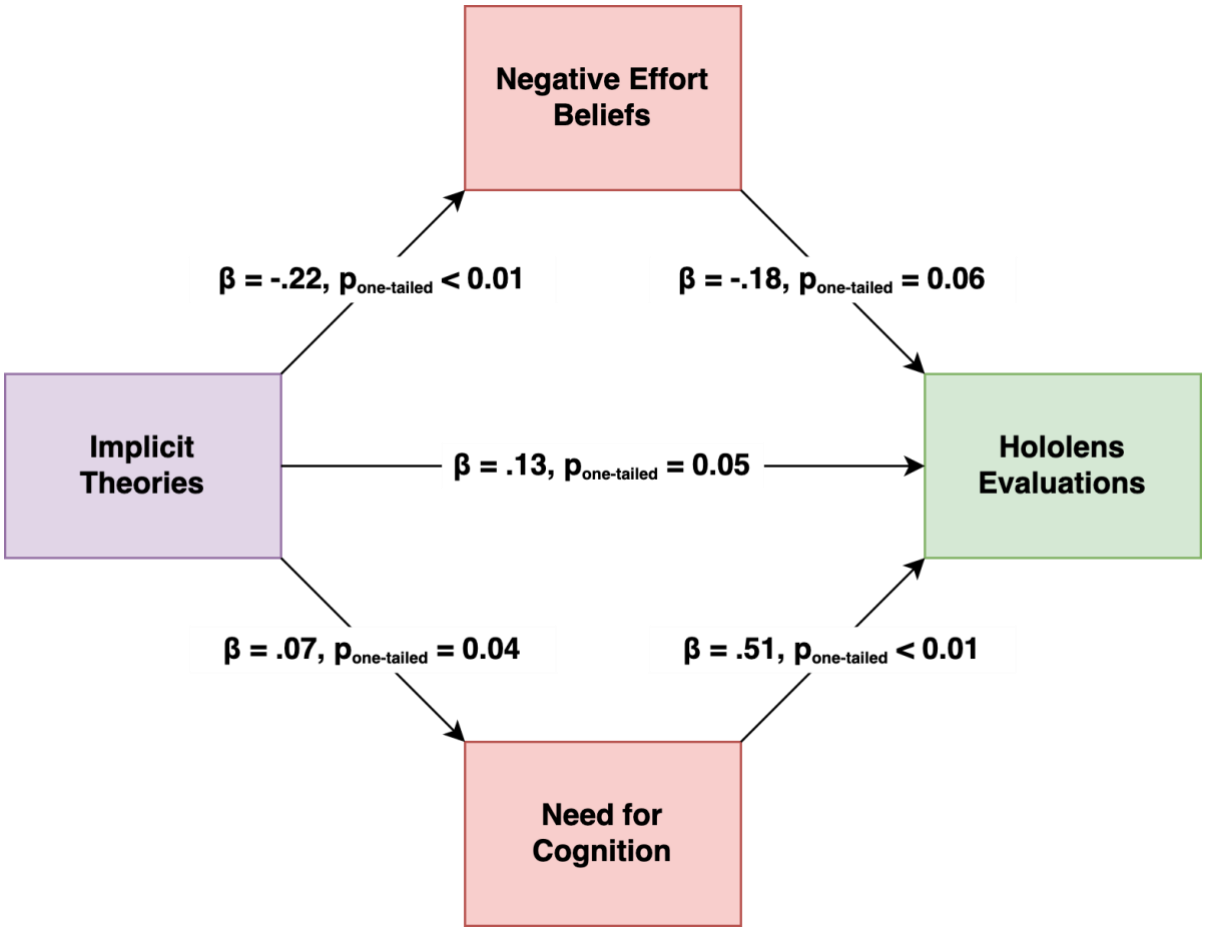


Fig. 6. Study 7. Results of mediation analysis on innovative product evaluation.

Table 5. Study 7. Indirect effects of negative effort beliefs and need for cognition on product evaluation

	Effect Size	Bootstrapped Standard Error	Bootstrapped Confidence Interval
Negative Effort Beliefs	0.039	0.031	[-0.0156, 0.1066]
Need for Cognition	0.035	0.021	[0.0018, 0.0806]
Total Indirect Effects	0.074	0.040	[0.0024, 0.1563]
TOTAL EFFECT	0.207	0.078	[0.0530, 0.3610]

Appendices

Implicit Persons Theory Measure (Levy et al., 1998)

Please indicate your agreement or disagreement with each of the following statements, using the response choices shown below.

Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree
1	2	3	4	5	6

- The kind of person someone is, is something basic about them, and it can't be changed very much. (R)
- Everyone, no matter who they are, can significantly change their basic characteristics.
- People can do things differently, but the important parts of who they are can't really be changed. (R)
- People can substantially change the kind of person they are.
- No matter what kind of person someone is, they can always change very much.
- Everyone is a certain kind of person, and there is not much that they can do to really change that. (R)
- As much as I hate to admit it, you can’t teach an old dog new tricks. People can’t really change their deepest attributes. (R)
- People can change even their most basic qualities.

Passive Innovation Resistance Measure (Heidenreich & Handrich, 2015)

Please indicate your agreement or disagreement with each of the following statements, using the response choices shown below.

Strongly Disagree	Disagree	Mostly Disagree	Neutral	Mostly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

- I generally consider changes to be a negative thing.
- I like to do the same old things rather than try new and different ones.
- I'd rather be bored than surprised.
- If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.
- When I am informed of a change of plans, I tense up a bit.
- When things don't go according to plans, it stresses me out.
- Often, I feel a bit uncomfortable even about changes that may potentially improve my life.
- When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.
- I sometimes find myself avoiding changes that I know will be good for me.
- I often change my mind. (R)
- I don't change my mind easily.
- My views are very consistent over time.
- Overall, my personal need for innovations in the field of technological products has been by far covered in the past.
- Overall, I consider the number of innovations in the field of technological products as being too high.
- Overall, I consider the pace of innovations in the field of technological products as being too high.
- In the past, I was very satisfied with available technological products.
- In my opinion, past technological products were completely satisfactory so far.
- Past technological products fully met my requirements.

Revised Brief Fear of Negative Evaluation (Carleton et al., 2006)

Please indicate your agreement or disagreement with each of the following statements, using the response choices shown below.

Not characteristic of me at all	Somewhat not characteristic of me	Neither characteristic nor not characteristic of me	Somewhat characteristic of me	Extremely characteristic of me
1	2	3	4	5

- I worry about what other people will think of me even when I know it doesn't make any difference.
- It bothers me when people form an unfavorable impression of me.
- I am frequently afraid of other people noticing my shortcomings.
- I worry about what kind of impression I make on people.
- I am afraid that others will not approve of me.
- I am concerned about other people's opinions of me.
- When I am talking to someone, I worry about what they may be thinking about me.
- I am usually worried about what kind of impression I make.
- If I know someone is judging me, it tends to bother me.
- Sometimes I think I am too concerned with what other people think of me.
- I am afraid that people will find fault with me.
- I often worry that I will say or do wrong things.

Efficient Need for Cognition (Lins de Holanda Coelho et al., 2020)

Please indicate your agreement or disagreement with each of the following statements, using the response choices shown below.

Strongly Disagree	Disagree	Mostly Disagree	Neutral	Mostly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

- I would prefer complex to simple problems.
- I like to have the responsibility of handling a situation that requires a lot of thinking.
- Thinking is not my idea of fun. (R)
- I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (R)
- I really enjoy a task that involves coming up with new solutions to problems.
- I would prefer a task that is intellectual, difficult, and important to one that is somewhat important, but does not require much thought.

Product Stimuli Used in Study 1

Product Stimuli Used in Study 2

Large Room HEPA Air Purifier

This true HEPA air purifier helps remove 99.97% of airborne particles as small as 0.3 microns.

Large Room PECO Molecular Air Purifier

This molecular air purifier uses nanocatalyst-coated filter layers to destroy pollutants and leave behind clean air. A Bluetooth-connected mobile application can help guide you through tuning the air purifier for optimal results in your home.

Bluetooth Alarm Clock

This classically designed alarm clock connects to your phone and gradually wakes you up in the morning to your favorite tunes.

Ambient Alarm Clock with Wake-up Light

This alarm clock pairs with your phone to help track your sleeping habits and wakes you up refreshed with subtle ambient light replicating the rising sun. It also offers extensive app-enabled customization for personalizing your sleeping environment.

In-Home Recumbent Bike

This stationary bike fits perfectly in most home offices and allows for a quick, easy, and convenient workout experience.

In-Home Recumbent Bike with Touchscreen

This stationary bike fits perfectly in most home offices. A large touchscreen built into the bike allows for you to attend virtual live exercise sessions with others around the world.

Refrigerator with Ice Dispenser

With a sleek finish, this power-efficient French door refrigerators serves every need.

Smart Refrigerator with Touchscreen

Unlike any refrigerator you've used before, this touchscreen enabled design allows you to keep track of all your groceries, lets you know when products are expiring, and alerts you if any temperature issues are detected.

Windows Laptop

Packed with power-efficient hardware, this Windows-based laptop is the perfect computing companion for all.

Windows Laptop with Additional Touchscreen Panel

This laptop allows you to get more done by presenting dynamic information in the touchscreen embedded above the keyboard. Use the touchscreen to map important quick-access functions for all of your most commonly used programs.

Home Thermostat

This home thermostat allows you to effortlessly control your central heating and air conditioning system, along with basic scheduling features to automatically control the temperate throughout the day.

Digital Home Thermostat

This digital home thermostat connects to your wireless network and allows for deep customization of your central heating and air conditioning system throughout the day.

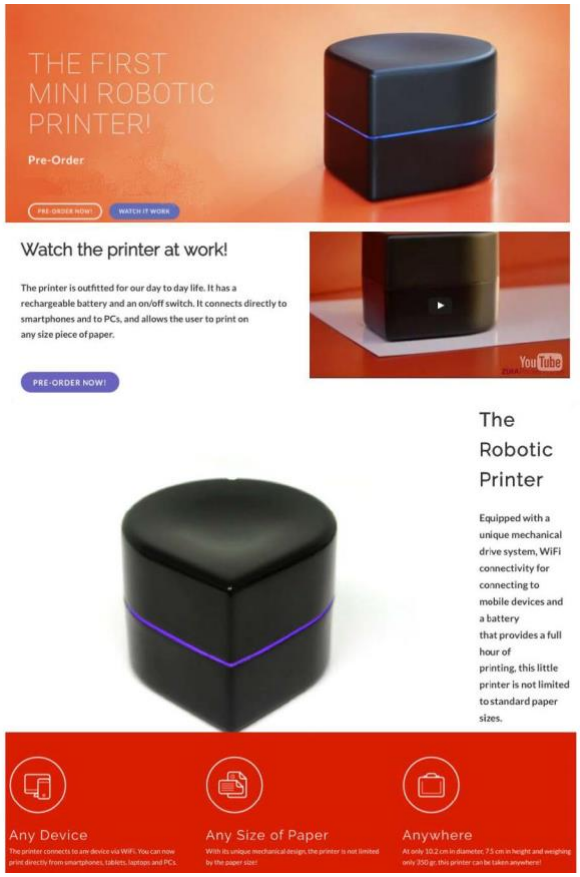
Electronic Vacuum with Additional Attachments

This corded vacuum has a range of additional attachments that allows you to clean every nook and cranny with ease.

Robotic Vacuum Cleaner

This robotic vacuum cleaner cleans your room for you while you're away. The complementary mobile application guides you through the process of training the robotic vacuum cleaner how best to clean your room.

Product Stimuli Used in Study 4



Social Risk Manipulation Used in Study 4

Social Interaction

Judged by what you buy

By Dr. Susan Wise, published on October 1, 2016

Research has found that the products people buy often put them under scrutiny—leading to potential critical and negative judgements by those surrounding them. People, perhaps unsurprisingly, form impressions of friends and strangers alike based on the products they choose to buy. These impressions may be influenced by the product's level of prestige, or even by the likelihood that someone can use the product effectively. This process of judging people based on what they buy is actually quite common in our daily lives. A recent study highlighted that 82 percent of the people surveyed agreed that they had drawn negative conclusions about others based on the products they had purchased. After all, we are social animals and cannot be fully free from how others think of us. ■

Scenario Story Used in Study 5

Sarah is working from home during the pandemic. Her job often requires her to print and scan documents to her computer. Her current all-in-one printer/scanner combo—which she has been using for quite a few years—is starting to become unreliable in the quality of its scans, so she decides she needs to purchase a new device.

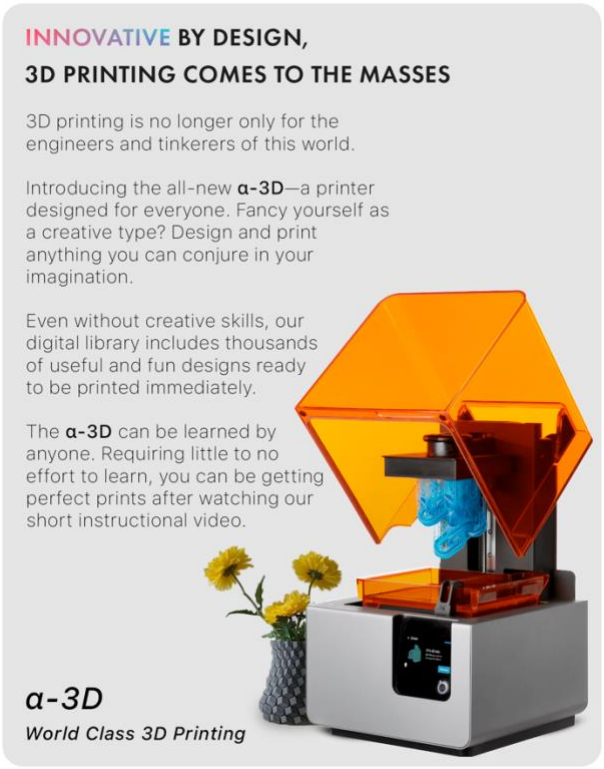
Sarah searches the internet and narrows her choice down to two options:

(Option #1) She can purchase the model of the all-in-one that appears to be the *direct successor* to her current all-in-one. She reads that this all-in-one adds very little in the way of new features, but does offer modest improvements to each of the existing features she uses.
(Option #2) She can purchase *the newest* all-in-one model from the same manufacturer, which is advertised as having many new and innovative features not found in her current model.

She has seen positive user reviews for both options, and both have been described as "sophisticated" devices that, while quite functional, require some effort to learn. The technology that allows both options to interface with her computer has changed since she bought her last scanner, so replacing her current setup will take some work. Finally, price isn't an issue for Sarah since she needs the device for work and her company will reimburse her for the cost of all three options.

Imagine that you are in Sarah's position. Please answer the following questions as to what you would do if you found yourself in the same scenario as Sarah.

Product Stimuli Used in Study 6



Product Stimuli Used in Study 7