Strong Anxiety Boosts New Product Adoption When Hope Is Also Strong

Yu-Ting Lin, Deborah J. MacInnis, and Andreas B. Eisingerich

Abstract
New products can evoke anticipatory emotions such as hope and anxiety. On the one hand, consumers might hope that innovative offerings will produce goal-congruent outcomes; on the other hand, they might also be anxious about possible outcomes that are goal-incongruent. The authors demonstrate the provocative and counterintuitive finding that strong anxiety about potentially goal-incongruent outcomes from a new product actually enhances (vs. weakens) consequential adoption intentions (Study 1) and actual adoption (Studies 2 and 3) when hope is also strong. The authors test action planning (a form of elaboration) and perceived control over outcomes as serial mediators to explain this effect. They find that the proposed mechanism holds even after they consider alternative explanations, including pain/gain inferences, confidence in achieving goal-congruent outcomes, global elaboration, affective forecasts, and motivated reasoning. Managerially, the findings suggest that when bringing a new product to market, new product adoption may be greatest when hope and anxiety are both strong. The findings also point to ways in which marketers might enhance hope and/or anxiety, and they suggest that the use of potentially anxiety-inducing tactics such as disclaimers in ads and on packages might not deter adoption when hope is also strong.

Keywords
new product adoption, emotions, hope, anxiety, elaboration, perceived control

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When consumers consider a product that is new and previously untried, it is possible that they experience varying degrees of hope and/or anxiety about consequences that may occur when they buy or use the new product. For example, a consumer might hope that a new skincare product can improve her acne. However, she might also be anxious about whether it will irritate her skin. Hope is defined as a positive emotion experienced in the present in regard to a goal-congruent future outcome (e.g., clear skin). Conversely, anxiety is defined as a negative emotion also experienced in the present but in regard to a goal-incongruent future outcome (e.g., skin irritation). In a new product adoption context, hope and anxiety are emotions that are integral to (vs. incidental to) decisions about whether to adopt the new product (Cohen, Pham, and Andrade 2008). That is, they are evoked in response to information about the new product, and they are directly related to consumers’ decisions about whether to adopt it.

Although one might surmise that feeling anxious about possible goal-incongruent outcomes should dampen new product adoption, we make the counterintuitive prediction that strong anxiety actually heightens new product adoption when hope is also strong. We document this interactive effect of hope and anxiety on new product adoption in three studies that use different products and different consumer populations and when both measuring and manipulating hope and anxiety. We also address a novel processing mechanism that underlies this effect. Specifically, we argue that strong feelings of hope and anxiety cause consumers to engage in action planning—that is, to mentally elaborate on how hoped-for outcomes can be achieved while anxiety-evoking ones can be avoided. For example, a consumer who feels strong hope and strong anxiety about a new skincare product might plan to read usage instructions carefully, to ask friends if they have tried it, and to look up

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the product’s ingredients and potential side effects. We anticipate that by engaging in such action planning, consumers feel more in control over the outcomes that the new product might bring, thus heightening their adoption intentions. Studies 2 and 3 support this prediction. If action planning and perceived control over outcomes indeed mediate the effect of hope and anxiety on new product adoption, factors that make action planning easier should enhance the effects of strong hope and strong anxiety. One such factor is prior experience with the product category. Specifically, consumers with more (vs. less) experience with skincare products might find it easier to engage in action planning because their prior experience with other products in the category enhances their ability to identify actions that support hoped-for outcomes and avoid anxiety-arousing ones. We find evidence for this moderating effect of product category experience in Study 3.

Overall, our research makes several important contributions to the literature. We are the first to document that when products are new, strong feelings of anxiety about potential outcomes from new product adoption can actually boost (vs. dampen) adoption decisions when hope is also strong. These findings augment prior studies that show that anxiety can cause individuals to reject new products (e.g., Lee, Kim, and Vohs 2011; Meuter et al. 2003), as well as studies that document methods to reduce anxiety when new products are incongruent with expectations (i.e., Taylor and Noseworthy 2020). Our findings suggest that, in some situations, anxiety can induce an approach (vs. avoidance) response, motivating information seeking and effortful information processing. We also add to the research on the effects of hope (e.g., De Mello, MacInnis, and Stewart 2007; MacInnis and De Mello 2005) by finding that hope for goal-congruent outcomes can drive action planning, perceived control over outcomes, and adoption, particularly when it is accompanied by strong anxiety about possible goal-incongruent outcomes. Beyond documenting this effect and theoretical bases for it, our results suggest that practitioners might shape new product adoption by activating the anticipatory emotions of hope and anxiety in marketing communications.

In addition, we add to the literature on planning and perceived control over outcomes. To date, research has examined planning in the context of self-regulation and/or resource planning (e.g., Lynch et al. 2010). Our research extends this work by examining planning in the context of new product adoption and by introducing the novel construct of action planning. It also examines strong hope and strong anxiety as facilitators of action planning. Our research also augments work on perceived control. Prior work in marketing has studied threats to perceived control (e.g., Lembrets and Pandelaere 2019), feelings of low personal control (e.g., Cutright, Bettman, and Fitzsimmons 2013), and internal locus of control (Faraji-Rad, Melumad, and Johar 2017; Price et al. 2018). Research has also studied perceived control over objects (Waksal and Kim 2015) as well as perceived control over life, time, and physical space (e.g., Han and Gershoff 2018). We contribute to the literature by introducing a different control construct—perceived control over outcomes from new product adoption. We show that hope and anxiety drive such perceptions because they encourage action planning.

**Theory and Hypotheses**

**Defining and Differentiating Hope and Anxiety**

As noted previously, hope is defined as an anticipatory emotion that reflects the extent to which an individual appraises an uncertain but possible future outcome as goal-congruent (MacInnis and De Mello 2005), whereas anxiety is defined as an anticipatory emotion that reflects the extent to which an individual appraises an uncertain but possible future outcome as goal-incongruent (Lazarus 1991). Thus, consistent with appraisal theories of emotion (Averill, Catlin, and Chon 2012; Lazarus 1991), two critical appraisal dimensions constitute the defining properties of hope and anxiety: goal (in)congruence and uncertainty. Goal (in)congruence is defined as the extent to which an outcome is regarded as positive (negative) because it is appraised as good (bad) in light of activated goals. Uncertainty is defined as the extent to which an outcome is unknown in the present because whether and how it occurs is realized only in the future. Consumers experience stronger (vs. weaker) feelings of hope when the outcome is appraised as being more (vs. less) goal congruent (positive). Likewise, they experience stronger (vs. weaker) feelings of anxiety when the outcome is appraised as being more (vs. less) goal incongruent (negative).

We differentiate hope and anxiety from other emotions because they are anticipatory in nature. Specifically, consumers experience hope and anxiety when they contemplate an uncertain but possible future outcome as opposed to an outcome that has already happened. When outcomes have already occurred, consumers experience different emotions such as joy, excitement, sadness, or anger. Hope and anxiety are also different from affective forecasts (also called anticipated emotions). The former are emotions that consumers experience in the present regarding uncertain and goal (in)congruent future outcomes, whereas the latter are emotions that consumers anticipate they will experience in the future once a particular outcome is realized. Thus, a consumer might hope (in the moment) that she will have clear skin after using a new skincare product and anticipate that she will feel happy (in the future) if her skin actually does clear up. Research has also differentiated anxiety from fear; anxiety is experienced in response to an unknown future, whereas fear is experienced in response to a known present (Perkins, Kemp, and Corr 2007). For example, when hiking, one might be anxious about whether one might see a bear, whereas actually seeing a bear evokes fear.

Although they are distinct emotions, hope and anxiety can co-occur. For example, consumers might naturally hope that a new product can produce outcomes that are congruent with their goals (MacInnis and De Mello 2005). However, because
they are new and untried, consumers might also be anxious about potentially goal-incongruent outcomes. Notably, research on the joint effect of varying levels of hope and anxiety is, to our knowledge, quite limited.

Proposed Effects of Strong Hope and Strong Anxiety on New Product Adoption

Hope, anxiety, and action planning. We predict that strong hope coupled with strong anxiety regarding a new product induces consumers to engage in a form of elaboration that we call “action planning.” Scholnick and Friedman (1993) define planning as “the use of knowledge for a purpose; the construction of an effective way to meet some future goal” (p. 145). Just as hope and anxiety are future-oriented, planning is engaged with a future goal in mind. We define action planning as a form of planning that involves mentally elaborating on behaviors (actions) that one can enact so that the goal-congruent outcomes can be attained while goal-incongruent outcomes can be avoided.1

We predict that action planning will be greatest when hope and anxiety are both strong. Several factors motivate this logic. First, the act of mentally elaborating on actions that are aligned with goal-congruent and goal-incongruent outcomes involves cognitive effort (Friedman and Scholnick 1997; Skinner 1997). Prior work has suggested that when hope is strong, people expend and sustain effort to attain what they hope for (Ellsworth and Smith 1988; Smith and Ellsworth 1985). Individuals also sustain effort to avoid what they are highly anxious about because such outcomes can have considerable significance to the self. Consistent with this notion, prior research has found that strong anxiety encourages attentional vigilance (e.g., Hanin 2010), as well as selective attention to and processing of anxiety-related stimuli (Mogg et al. 1990; Quigley et al. 2012). Strong anxiety also motivates effort in seeking information (Locander and Hermann 1979) and soliciting advice from others (Gino, Brooks, and Schweitzer 2012).

Strong hope and strong anxiety should also motivate an aspect of action planning called pathways thinking—that is, identifying the various paths that might support the occurrence of hoped-for outcomes or prevent the occurrence of anxiety-arousing ones. Whereas prior research has emphasized the role of strong hope in pathways thinking (Snyder 2002; Snyder et al. 1991), pathways thinking also includes contemplating actions that can avoid the outcomes about which individuals may be anxious (Berg et al. 1997).

Strong hope and strong anxiety are also linked with problem-solving behavior (Chang 1998; Jing, Madore, and Schacter 2016; Snyder et al. 1991). Considering which actions will be most effective at attaining (avoiding) goal-congruent (goal-incongruent) outcomes is a form of problem solving. Pertinent to strong hope, strong anxiety, and problem solving, Chang (1998) found that students who were dispositionally high in hope reported thinking through possible solutions to highly anxiety-evoking academic situations. They also engaged in less avoidant coping in response to anxiety-evoking situations. In short, when hope and anxiety are both strong, individuals should be inclined to elaborate on pathways and solutions (i.e., action plans) that can attain the outcomes they hope for and avoid those about which they are highly anxious.

Action planning should be more limited when hope is strong but anxiety is weak. When anxiety is weak, goal-incongruent outcomes are less “problematic.” Thus, action plans should include only pathways that pertain to those outcomes that consumers hope to attain. There is less need to elaborate on pathways and solutions when anxiety is weak because the goal-incongruent outcomes are less negative and entail lower significance to the self.

We also expect that when hope is weak, consumers’ most natural response is to avoid the new product, regardless of whether anxiety is strong or weak. Specifically, when hope is weak but anxiety is strong, effortful action planning should be limited because the new product offers little benefit from a goal-congruity perspective. Even if anxiety-evoking outcomes could be avoided, the ultimate outcome from the new product is not one that consumers regard as highly goal congruent. As such, weak hope should not motivate individuals to confront potential anxiety-inducing outcomes by thinking through how they can be avoided. In short, weak hope does not provide the motivational energy for individuals to engage in action planning. Thus, when hope is weak, we expect to confirm prior findings that have shown that anxiety creates an avoidance response (e.g., Dymond and Roche 2009; Lee, Kim, and Vohs 2011; Meuter et al. 2003). Similarly, action planning should be limited when hope and anxiety are both weak. Because the outcomes are neither highly goal-congruent nor highly goal-incongruent, individuals should devote limited effort to developing action plans.

Action planning and perceived control over outcomes. We also predict that the process of engaging in action planning increases individuals’ perceived control over realizing (avoiding) goal-congruent (incongruent) outcomes. Perceived control is defined here as a subjective belief that one has the ability to influence desired and undesired outcomes (Skinner

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1 Action planning differs from elaboration on potential outcomes (Nenkov, Inman, and Hulland 2008) because it is situationally induced (vs. an individual difference factor), is tied to outcomes consumers hope for and feel anxious about (rather than all possible outcomes), and emphasizes behaviors that one might enact prior to (vs. following) consumption. It differs from “process” and “outcome” simulations (e.g., Zhao, Hoefller, and Zauberman 2011) because it focuses on behaviors one can enact before using or while using the product that will produce hoped-for outcomes and avoid anxiety-inducing ones (vs. the process of using the product or outcomes that follow from its use). Finally, action planning differs from implementation intentions (Gollwitzer and Sheeran 2006), because it emphasizes outcomes from new product adoption as opposed to self-regulatory success. Moreover, whereas implementation intentions simulate potential future scenarios (e.g., if the waiter brings a dessert menu) and a response (e.g., “I will refuse it”), action planning focuses on predicted outcomes (e.g., “I might have an allergic response to this product”) and actions that support (avoid) goal-(in)congruent outcomes.
If our logic is correct, the effects predicted in H1 and H2 should be more likely to adopt that new product when perceived control is high. This latter conclusion is consistent with work by Sebanz and Lackner (2007), who find that perceptions of control over outcomes predict when an intention translates into an actual behavior (in this case, new product adoption). It is also consistent with the theory of planned behavior (Ajzen 1985), which suggests that control beliefs regarding actions that can facilitate a given outcome can influence actual behavior.

Building on this logic, we predict that:

**H1:** New product adoption intentions are greatest when hope and anxiety are both strong.

**H2:** Action planning and perceived control over outcomes serially mediate the effects of strong hope and strong anxiety on new product adoption.

If our logic is correct, the effects predicted in H1 and H2 should be particularly strong when other aspects of the environment beyond hope and anxiety facilitate action planning. We presume that elaborating on potential actions requires some prior knowledge related to past experiences, such as those that consumers have encountered with other products in the product category. Work in psychology supports the notion that prior experience facilitates planning abilities (e.g., Friedman and Scholnick 1997; Scholnick and Friedman 1993). We expect that when hope and anxiety are both strong, individuals with more (vs. less) product category experience should be better equipped to draw on their past experiences to mentally simulate action plans associated with the occurrence of hoped-for and anxiety-inducing outcomes. These ideas are consistent with Alba and Hutchinson’s (1987) claim that individuals with more versus less expertise, such as those who have more experience in the product category, are “more likely to appreciate the potential complexities of a problem and are better equipped to deal with them” (p. 427). Individuals with less product category experience should have less ability to engage in action planning because their prior knowledge is more limited. In short, greater experience with the product category as a whole should provide more knowledge about potential action plans that align with the outcomes that consumers hope for and those that avoid the outcomes about which consumers are anxious. We also expect less action planning among people with more product category experience when hope is strong but anxiety is weak (vs. when both hope and anxiety are strong) because weak levels of anxiety require less action planning (see H2). Finding that the effect of strong hope and strong anxiety on action planning is moderated by prior experience with products in the product category would thus provide additional evidence of the (action planning) processing mechanism that underlies H2.

**Overview of the Studies**

Next, we report three studies designed to test H1 and H2. We also test the moderating role of prior knowledge to provide further support for the processing mechanism proposed in H2. All studies use real products. We summarize the studies in Table 1.

**Study 1**

**Design and Procedure**

Study 1 was a field study (N = 2,084) sponsored by the Bill & Melinda Gates Foundation. Our goal was to test H1 in a meaningful real-world context. Specifically, Study 1 involved respondents’ intentions to adopt a real medication called “preexposure prophylaxis” (PrEP) designed to protect individuals from contracting the human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS). The study included respondents from eight countries (Thailand, India, South Africa, Botswana, Uganda, Kenya, Peru, and Ukraine) who were deemed to be at high risk of contracting HIV/AIDS. Respondents included injecting drug users, men who have sex with men, female sex workers, individuals whose partners have HIV/AIDS, and young women who were at risk due to high rates of HIV/AIDS and rape in their country. Due to missing data or incomplete answers, 223 cases were deleted, resulting in an effective sample size of 1,861 individuals.

In this study, hope is relevant because the medication can potentially protect individuals from contracting HIV/AIDS. Taking the medication might also generate anxiety, as
respondents were informed that the medication could create goal-incongruent physical (headache, drowsiness, and bloating) and performance outcomes (it might not be effective if not taken as directed).

Ipsos MORI, a large international market research company, gathered the data using surveys. The questionnaire was translated into 16 languages by local marketing research teams and back-translated by professional translators to ensure content consistency. The final translation was approved by consensus among the professional translators. Respondents provided written consent and responded to questionnaires in their native languages. Participants were offered a monetary incentive (the local equivalent of US$5) for participating in the study, except in South Africa, where the ethics committee prohibited the use of incentives.

After being given a description of PrEP, respondents indicated their feelings about it and their willingness to use it (“Would you take PrEP as soon as it becomes available, or not?”, 1 = “no, definitely not,” 2 = “no, probably not,” 3 = “yes, probably,” and 4 = “yes, definitely”). We measured hope by asking respondents, “How much hope, if any, does PrEP give you for new possibilities in life?” (1 = “no hope at all,” 2 = “not much hope,” 3 = “some hope,” and 4 = “a lot of hope”). We measured anxiety by asking, “How anxious, if at all, does the thought of taking PrEP make you feel?” (1 = “not at all anxious,” 2 = “not very anxious,” 3 = “fairly anxious,” and 4 = “very anxious”).

We included several measures to differentiate anxiety from other negative high-arousal emotions. Fear of contracting HIV was measured by asking, “How afraid are you of contracting HIV/AIDS, if at all?” (1 = “not at all afraid,” 2 = “not very afraid,” 3 = “fairly afraid,” and 4 = “very afraid”). We measured embarrassment by asking, “How embarrassing, if at all,

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Table 1. Overview of the Studies.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>PrEP: Medication designed to prevent HIV/AIDS</td>
<td>Skin peel product designed to create younger-looking/healthier skin</td>
<td>Energy drink product designed to enhance mental clarity and offer a healthy source of energy</td>
</tr>
<tr>
<td>Population</td>
<td>Individuals in poverty-stricken areas in Africa, South America, Eastern Europe, and Asia (N = 1,861)</td>
<td>Highly educated managers from the Americas, Europe, Africa, Middle East, and Asia participating in an executive teaching program at a university (N = 475)</td>
<td>Part-time postgraduate university students (N = 557)</td>
</tr>
<tr>
<td>IVs</td>
<td>Measured hope and anxiety related to taking the medication</td>
<td>Manipulated strong vs. weak hope and strong vs. weak anxiety via online product reviews by other users</td>
<td>Manipulated strong vs. weak hope via online product reviews and manipulated strong vs. weak anxiety by providing disclaimers about risks from use of the product</td>
</tr>
<tr>
<td>Product described</td>
<td>By health care workers</td>
<td>By social media post</td>
<td>By marketing communications</td>
</tr>
<tr>
<td>DV</td>
<td>Adoption intentions</td>
<td>Actual adoption (number of sample units adopted)</td>
<td>Actual adoption (number of sample units adopted)</td>
</tr>
<tr>
<td>Process</td>
<td>N.A.</td>
<td>Measured action planning, perceived control over outcomes</td>
<td>Measured action planning, perceived control over outcomes</td>
</tr>
<tr>
<td>Moderator related to the process</td>
<td>N.A.</td>
<td>N.A.</td>
<td>Moderating role of prior product category experience. Prior product category experience moderates the influence of hope × anxiety → action planning such that action planning and new product adoption are greatest for consumers with prior category experience</td>
</tr>
<tr>
<td>Control variables (including alternative process mechanisms)</td>
<td>Gender, age group, country, fear, embarrassment</td>
<td>Measured confidence in attaining (avoiding) goal-congruent (incongruent) future outcomes, affective forecasts, pain-gain inferences, global elaboration, motivated reasoning, concerns about appearance, product relevance, brand familiarity, gender, age</td>
<td>Measured confidence in attaining (avoiding) goal-congruent (incongruent) future outcomes, affective forecasts, pain-gain inferences, global elaboration, motivated reasoning, valence of prior experience with similar product, product relevance, brand familiarity, gender, age</td>
</tr>
<tr>
<td>Findings</td>
<td>H₁ supported, H₂ not tested</td>
<td>H₁ and H₂ supported</td>
<td>H₁ and H₂ supported</td>
</tr>
</tbody>
</table>

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3 The study protocol was approved by numerous agencies, including the Health Research and Development Division, Ministry of Health (Botswana); the Independent Ethics Committee, Bangalore (India); the Kenya Medical Research Institute; Comite Institucional de Etica, Universidad Peruana Cayetano Heredia (Peru); the Human Research Ethics Committee (Medical), University of the Witwatersrand, Johannesburg (South Africa); the Director General Health Services Ministry of Health (Uganda); the Committee of Professional Ethics of the Sociological Association (Ukraine); and the Institute for the Development of Human Research Protections, Ministry of Public Health (Thailand).
would you find taking PrEP to be?” (1 = “not at all embarrassing,” 2 = “not very embarrassing,” 3 = “fairly embarrassing,” and 4 = “very embarrassing”). We included these measures to differentiate the anticipatory emotion of anxiety from the anticipated emotions of fear and embarrassment. Feeling anxious about the health consequences of taking PrEP was modestly correlated with both fear of contracting HIV/AIDS (r = .23, p < .001) and embarrassment over using PrEP (r = .25, p < .001).

Finally, respondents indicated their gender (1 = male, 2 = female, and 3 = transgender), age group (in years; 1 = up to 15, 2 = 16–18, 3 = 19–24, 4 = 25–30, 5 = 31–35, 6 = 36–40, 7 = 41–45, 8 = 46–50, 9 = 51–55, 10 = 56–60, and 11 = 61+), and country of origin (1 = Thailand, 2 = Ukraine, 3 = India, 4 = Peru, 5 = South Africa, 6 = Botswana, 7 = Uganda, and 8 = Kenya). The results reported below do not change when controlling for fear of contracting HIV, embarrassment over using PrEP, age groups, gender dummies, and country dummies.

Results

Effects on adoption intentions. The Web Appendix shows the correlations among constructs (Table WA1) and the number of respondents in each country (Table WA2). Because the independent and dependent variables were both measured and continuous, we ran a regression analysis using the full sample of respondents. All measured variables were mean-centered (Hayes 2017). The analysis modeled the main effect of hope, the main effect of anxiety, and their interaction. As we expected, the main effect of hope was significant and positive (see Model 1 in Table 2). The more respondents hoped that PrEP would offer goal-congruent life outcomes, the more positive were their intentions to adopt it (β = .40, SE = .03, t = 13.76, p < .001). There was no main effect of anxiety (β = .01, SE = .01, t = .64, p > .51); however, the predicted interaction between hope and anxiety was significant (β = .07, SE = .03, t = 2.54, p = .011).

To better understand this interaction, we conducted a floodlight analysis (Spiller et al. 2013) to observe the range of hope for which the effect of anxiety on adoption intentions was significant. As predicted by H2, we found that as hope becomes stronger, stronger anxiety has a positive impact on adoption intentions. In Table 3, we see that the effect of anxiety on adoption intentions switches from being negative and significant at weak levels of hope (< −.97) to positive and significantly greater than zero at strong levels of hope (> .27). Figure WA1 in the Web Appendix depicts the interaction between hope and anxiety at ±1 standard deviation, showing that adoption intentions were greatest when hope and anxiety were both strong. Figure WA2 in the Web Appendix depicts floodlight

Table 2. Study 1: The Impact of Hope and Anxiety on Adoption Intention.

<table>
<thead>
<tr>
<th>DV: Adoption Intentions</th>
<th>Model 1 Base Model (The Effect of Hope, Anxiety, and Their Interaction)</th>
<th>Model 2 Base Model with Controls for Fear and Embarrassment</th>
<th>Model 3 Base Model with Controls for Demographics</th>
<th>Model 4 Base Model with All Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>B (SE) 3.45 (.02) 215.81ns</td>
<td>B (SE) 3.58 (.10) 35.45ns</td>
<td>B (SE) 2.82 (.07) 40.37ns</td>
<td>B (SE) 2.91 (.12) 25.98ns</td>
</tr>
<tr>
<td>Hope</td>
<td>.40 (.03) 13.76ns</td>
<td>.38 (.03) 12.92ns</td>
<td>.36 (.02) 14.59ns</td>
<td>.33 (.03) 13.23ns</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.01 (.01) .64</td>
<td>.03 (.02) 1.81</td>
<td>.02 (.01) 1.01</td>
<td>.03 (.02) 1.95</td>
</tr>
<tr>
<td>Hope × Anxiety</td>
<td>.07 (.03) 2.54ns</td>
<td>.06 (.03) 2.13ns</td>
<td>.07 (.02) 2.87ns</td>
<td>.06 (.02) 2.45ns</td>
</tr>
<tr>
<td>Fear</td>
<td>.00 (.02) .21</td>
<td></td>
<td></td>
<td>.02 (.02) 1.01</td>
</tr>
<tr>
<td>Embarrassment</td>
<td>−.10 (.02) −4.62ns</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gender</td>
<td></td>
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<tr>
<td>Age groups</td>
<td></td>
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<td></td>
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<tr>
<td>Country (Base: Thailand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>.72 (.06) 11.39ns</td>
<td>.76 (.06) 11.98ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>.64 (.06) 10.21ns</td>
<td>.66 (.06) 10.57ns</td>
<td></td>
<td></td>
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<tr>
<td>Botswana</td>
<td>.47 (.07) 7.19ns</td>
<td>.46 (.06) 7.17ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uganda</td>
<td>.43 (.07) 6.41ns</td>
<td>.46 (.07) 6.92ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td>.47 (.07) 7.08ns</td>
<td>.49 (.07) 7.49ns</td>
<td></td>
<td></td>
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<tr>
<td>Peru</td>
<td>.47 (.06) 7.23ns</td>
<td>.47 (.06) 7.28ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>.65 (.06) 10.05ns</td>
<td>.64 (.06) 9.91ns</td>
<td></td>
<td></td>
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<tr>
<td>R²</td>
<td>.12</td>
<td>.13</td>
<td>.21</td>
<td>.23</td>
</tr>
<tr>
<td>F(3, 1857) = 70.72ns</td>
<td>F(5, 1855) = 50.11ns</td>
<td>F(12, 1848) = 41.76ns</td>
<td>F(14, 1846) = 38.58ns</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Variables are mean-centered. SEs are heteroskedasticity-consistent.
points, showing that the effect of anxiety on adoption was negative when hope was at \(-.97\) and positive at when hope was at \(.27\). Combined, these results support H1.

Robustness check. Models 2–4 in Table 2 present robustness checks by incorporating various control variables in a stepwise fashion. All measured variables were mean-centered using Hayes’s PROCESS Model (Hayes 2017).\(^4\) The regression analysis modeled the main effect of hope; the main effect of anxiety; their interaction; and several control variables, including high-arousal emotions (i.e., fear and embarrassment), gender, age groups, and country dummies. Importantly, the positive interaction remained unchanged (\(\beta = .06, p = .014\)), even when including these controls (see Model 4 in Table 2). These results also support H1.

Discussion

The results of Study 1 support H1, indicating that the combination of strong hope and strong anxiety about outcomes from taking PrEP led to more positive adoption intentions. We designed Study 2 to see if these results would be replicated when using a different population and a different product, when using multi-item measures for hope and anxiety, and when measuring actual behavior. We also wished to manipulate (vs. measure) hope and anxiety so as to rule out the potential for reverse causality.\(^5\) Finally, Study 2 tested H2.

Study 2

Design and Procedures

Four hundred seventy-five managers (53.3% female) attending an executive education program at a research university agreed to participate in a study about an actual new product. Participants’ average age was 47 years (SD = 6.49). Managers were from different parts of the world, including North America (N = 125; 26.3%), Africa and the Middle East (N = 68; 14.3%), Latin America (N = 43; 9.1%), Europe (N = 121; 25.5%), and Asia (N = 118; 24.8%).

The product was an extra-strength skin peel product called Dr Dennis Gross Skincare. Web Appendix Figure WA3 shows an image of the product’s package to which participants were exposed. The package claimed that the product can produce

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\(^4\) We tested whether the data met the assumption of collinearity. The results suggest that multicollinearity was not a concern (hope, tolerance = .99, variance inflation factor = 1.01; anxiety, tolerance = .99, variance inflation factor = 1.01).

\(^5\) Given the correlational nature of our data, it is possible that purchase intentions influence hope and anxiety, as opposed to the reverse sequence. To address this issue, we ran two additional models with purchase intentions as the independent variable (IV) and hope and anxiety as the dependent variables (DVs). Our original model best fits the data because the F-value (F(13, 1,847) = 40.97, p < .001) and adjusted R\(^2\) (.22) are relatively higher (hope as DV: F-value = 30.92, adjusted R\(^2\) = .17; anxiety as DV: F-value = 34.07, adjusted R\(^2\) = .19), suggesting that reverse causality may not be in play. Nonetheless, given the correlational nature of the data, reverse causality cannot be entirely ruled out in this study. Studies 2 and 3 are thus designed to test causality directly.

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Table 3. Study 1: PrEP, Conditional Effect of Anxiety at Values of Hope.

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<th>Hope</th>
<th>Effect Anxiety</th>
<th>SE</th>
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Notes: Figures in boldface highlight Johnson–Neyman points, identifying the range of hope for which the effect of anxiety on adoption intentions was significant.
balanced, clear, bright, and smooth skin. We manipulated (vs. measured) strong versus weak hope and strong versus weak anxiety by asking participants to read social media comments about potential goal-congruent and goal-incongruent outcomes from using the new product. These ostensible social media comments were presented as being from two users of the product. One user commented on the product’s potential goal-congruent outcomes (clear and beautiful skin), while the other commented on potential goal-incongruent outcomes (e.g., negative skin reactions). We created two versions of the social media comment that pertained to the product’s goal-congruent outcomes; one designed to evoke strong hope and the other designed to evoke weak hope in consumers, as shown here.

Strong [weak] hope: I had amazing [limited] results from using this product! I needed a product that made my skin look radiant, minimized the size of my pores, and reduced some fine lines and wrinkles. This product did everything I had hoped that it would do. [I did have some marginal improvements in skin brightness and clarity. But I didn’t see any effect on fine lines and wrinkles. The effects were clearly not as dramatic as I had hoped for.]

Likewise, we created two versions of the social media comment that pertained to the product’s goal-incongruent outcomes; one designed to evoke strong anxiety and the other designed to evoke weak anxiety.

Strong [weak] anxiety: This product is very strong! Although I didn’t have any burning or allergic reactions to it, other users might be very anxious about such outcomes. If not used properly, or if used on sensitive skin, this product could produce some worrisome results. [The product is labeled “extra strength” because it dissolves older layers of skin. But I had no burning or allergic reactions to it. It’s hard to imagine that it would produce any worrisome results, even if used improperly or on sensitive skin.]

We randomly assigned participants to one of four conditions representing a 2 (strong vs. weak hope) × 2 (strong vs. weak anxiety) between-subjects design. Next, we told participants that they could purchase one or more sample units of the product at the end of the study. One sample unit included two sachets of the skin peel product. Each sample unit cost 4 USD. The instructions emphasized that this was a real purchase decision. Participants read that as compensation for their participation they were eligible to receive US$4, which they could use to buy one sample unit of the product if they wished to do so. They could also purchase additional sample units with their own money if they desired. Participants then indicated on a notecard how many sample units, if any, they would like to purchase at the study’s conclusion. They then responded to a set of items designed to measure all focal constructs. Web Appendix Table WA3 shows all constructs, items, scale reliabilities, and descriptive statistics for all measures used in Study 2. Unless otherwise indicated, all items were evaluated on seven-point scales, with scale endpoints anchored at “not at all” (1) and “very much” (7). Finally, all participants were debriefed. During the debriefing, we told respondents that while the product was real, the social media comments to which they had been exposed were fictitious.

Measures

Dependent variables. The main dependent variable was the number of sample units that respondents opted to buy, as indicated by the index card they completed after reading the media comments.

Process variables. We then assessed perceived control over outcomes, asking participants to indicate the extent to which they felt that they had control over attaining the positive outcomes they wanted from the product and the extent to which they felt that they had control over avoiding the negative outcomes that they did not want from the product (r = .78).

Next, we assessed action planning. We asked respondents to indicate the extent to which they had mentally considered actions that they could engage in so as to facilitate goal-congruent outcomes and thwart goal-incongruent ones. Questions included “I am thinking about how I can avoid the worst outcomes from using this new product” and “I am actively planning what I should do so that I can avoid the negative outcomes that I am anxious about from using this new product.” We also asked participants to indicate the extent to which these statements characterized their planning about actions: “Considering what might go wrong with this new product helps me plan for how I can avoid any negative outcomes from using it,” “I am actively planning what I should do so that I can get the best outcomes possible from using this new product,” and “I am actively planning what I should do so that I can avoid the worst outcomes from using this new product.” These items loaded cleanly on a single factor (α = .90).

Alternative process explanations. We next asked participants questions designed to rule out alternative explanations for our proposed effects. We initially treat these alternative processes as control variables because our primary objective is to test H1 and H2. In subsequent analyses, we ask if one or more processes could act as parallel mediators. This objective is secondary and is designed to foster future theory building as opposed to theory testing.

First, it is possible that confidence in attaining hoped-for outcomes could account for the results, as strong hope might incline individuals to be overconfident in attaining outcomes. Two items (r = .63) measured confidence: “I’m confident that I will experience positive improvements to my skin from using this product” and “I’m confident that I can avoid negative outcomes to my skin from using this product.” Second, affective forecasts could play a role in influencing the observed results (Gilbert, Gill, and Wilson 2002). That is, one might argue that when thinking about the new product, individuals might anticipate that they will experience positive and/or negative
emotions following their purchase or use of the new product. Such anticipated emotions could drive their choices. Thus, we asked respondents to indicate the extent to which they would feel excited, dissatisfied, disappointed, delighted, pleased, regretful, and upset after using the product ($\alpha = .91$ after reverse coding the negative items). Third, because the social media comments noted goal-congruent (hoped-for) and goal-incongruent (anxiety-evoking) outcomes, it is possible that the former would be interpreted as gains, while the latter would be interpreted as pains (Kramer et al. 2012). Thus, we asked participants about the extent to which they believed that to obtain gains they must experience pains. Specifically, respondents indicated to what extent they felt that “experiencing the product could be painful, but it’s worth it” and “experiencing this new product could involve some suffering, but I am willing to endure it to obtain the result I want” ($r = .74$). Fourth, one could argue that because action planning is a form of elaboration, any form of elaboration might explain the results. Thus, we asked respondents to indicate the extent to which the reviews made them think a lot about the new product and the extent to which the reviews made them consider a lot of things ($r = .76$). Fifth, we assessed motivated reasoning based on the work of De Mello, MacInnis, and Stewart (2007), who postulated that when hope is strong and goal-congruent outcomes are threatened, consumers engage in motivated reasoning. It is possible that anxiety constitutes a threat to hoped-for outcomes. Thus, we asked respondents to indicate to what extent they believed that the skin peel’s downsides were not that bad and that outcomes were unlikely to occur to them personally ($r = .69$). Web Appendix Table WA4 shows the correlations among Study 2’s constructs. A factor analysis shown in Web Appendix Table WA5 indicates that action planning, perceived control over outcomes, and the aforementioned alternative process measures were empirically discriminable, with each item loading cleanly on its respective factor.

**Manipulation checks.** In Study 1, hope and anxiety were indicated by single-item measures. To reduce the potential for measurement error, we included these same measures in Study 2 while including three additional items for each construct. For hope, respondents indicated the extent to which they agreed with the following: “I really hope that the new product can help me improve the appearance of my skin.” “The new product gives me hope for experiencing bright and clear skin,” and “I yearn to have clear skin—free of the types of skin imperfections—that the new product can bring me.” For anxiety, items included “I am worried that this new product could temporarily harm my skin.” “I am anxious that I could have an allergic reaction to this product,” and “I am nervous about whether this new product will burn my skin or give me a rash.” Both multi-item measures proved to be high in reliability (hope: $\alpha = .87$; anxiety: $\alpha = .90$). Moreover, a set of factor analyses indicated that the indicators for hope and anxiety construct loaded cleanly on their respective factors.

**Additional control variables.** Finally, respondents completed several additional control variables; specifically, brand familiarity, interest in skin peel products, concern over one’s appearance, and gender. The conditions did not differ on any of these control variables.

**Results**

Table 4 shows cell means for all variables collected in Study 2.

**Manipulation checks.** A set of 2 (hope: strong vs. weak) × 2 (anxiety: strong vs. weak) analyses of variance (ANOVAs) on the manipulation checks confirmed that the manipulations were successful. Specifically, the manipulation check for hope showed only a main effect of hope. As we expected, respondents in the strong hope condition felt stronger hope for having clear and bright skin from the new product ($M_{\text{strong}} = 4.65$) than did those in the weak hope condition ($M_{\text{weak}} = 2.90$; $F(1, 471) = 162.70, p < .001$). The manipulation check for hope showed neither a main effect of anxiety ($F(1, 471) = .003, p > .95$) nor a significant interaction between hope and anxiety ($F(1, 471) = .26, p > .61$).

Likewise, the manipulation of anxiety worked as expected, revealing only a main effect of anxiety. Respondents in the strong anxiety condition reported feeling stronger anxiety about the potential for temporary harm to their skin from the new product than did those in the weak anxiety condition ($M_{\text{strong}} = 2.84$ vs. $M_{\text{weak}} = 1.23, p > .26$) nor the interaction between hope and anxiety was significant ($F(1, 471) = .16, p > .69$).

**Effects of hope and anxiety on adoption.** The overall mean of the focal dependent variable (number of units adopted) was 3.27 (SD = 6.00), with a range from 0 to 40 units. Web Appendix Figure WA4 shows a histogram of the number of units purchased. A 2 × 2 ANOVA with the number of units adopted as the dependent variable revealed a main effect of hope ($M_{\text{strong}} = 5.43$ vs. $M_{\text{weak}} = 1.11$; $F(1, 471) = 71.56, p < .001$), a main effect of anxiety ($F(1, 471) = 5.09, p = .025$), and the predicted hope × anxiety interaction ($F(1, 471) = 5.77, p = .017$). In support of H1, respondents in the strong hope/strong anxiety adopted more units of the product ($M_{\text{strong hope/strong anxiety}} = 6.62$) than did those in the other three conditions ($M_{\text{strong hope/weak anxiety}} = 4.24$; $t(236) = 2.34, p = .02$; $M_{\text{weak hope/weak anxiety}} = 1.15$; $t(235) = 6.26, p < .001$; $M_{\text{weak hope/strong anxiety}} = 1.08$; $t(234) = 6.32, p < .001$). Also as anticipated, respondents adopted the fewest units when hope was weak, regardless of the levels of anxiety (see Table 4). These results support H1.

**Effects of hope and anxiety on action planning and perceived control over outcomes.** A 2 × 2 ANOVA on the measure of action planning revealed a main effect of hope ($M_{\text{strong}} = 3.83$ vs. $M_{\text{weak}} = 2.29$; $F(1, 471) = 171.86, p < .001$), a main effect of anxiety ($M_{\text{strong}} = 3.30$ vs. $M_{\text{weak}} = 2.82$; $F(1, 471) = 16.81, p < .001$), and the predicted hope × anxiety interaction ($F(1, 471) = 12.78, p < .001$). A 2 × 2 ANOVA on the measure of
Manipulation Checks
- the end of 2019 (Future Market Insights 2019).
- Industry reports label men's skincare as an emerging disruptor in the beauty industry, with men's skincare products reaching approximately $10 billion by 2023.
- The main effect of anxiety (M_{strong} = 3.04 vs. M_{weak} = 2.80; F(1, 471) = 4.06, p = .044), and a marginally significant hope x anxiety interaction (F(1, 471) = 2.86, p = .092).
- The means in Table 4 show that action planning and perceived control over outcomes were significantly greater in the strong hope/strong anxiety condition than in any of the other three conditions. As we anticipated, action planning and perceived control were lowest when hope was weak, regardless of whether anxiety was strong or weak (see the means in Table 4).

Table 4. Study 2 Main Study Cell Means.

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<tr>
<th>Means</th>
<th>Strong Hope</th>
<th>Weak Hope</th>
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<td>Strong Anxiety (N = 118)</td>
<td>Weak Anxiety (N = 120)</td>
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<tr>
<td>Hope</td>
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<td>4.61^b</td>
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<tr>
<td>Anxiety</td>
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<td>2.93^b</td>
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<tr>
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<td>Perceived control over outcomes</td>
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</table>

Note: Means with different superscripts are significantly different at p < .05.

perceived control over outcomes also revealed a main effect of hope (M_{strong} = 3.61 vs. M_{weak} = 2.23; F(1, 471) = 124.62, p < .001), a main effect of anxiety (M_{strong} = 3.04 vs. M_{weak} = 2.80; F(1, 471) = 4.06, p = .044), and a marginally significant hope x anxiety interaction (F(1, 471) = 2.86, p = .092). The means in Table 4 show that action planning and perceived control over outcomes were significantly greater in the strong hope/strong anxiety condition than in any of the other three conditions. As we anticipated, action planning and perceived control were lowest when hope was weak, regardless of whether anxiety was strong or weak (see the means in Table 4). We also examined whether gender^6 and brand familiarity^7 might serve as proxies for prior product category experience and thus moderate the results. However, neither served as a significant moderator.

Test of the mediating mechanism. To examine whether action planning and perceived control over outcomes serially mediate the effect of strong hope and strong anxiety on adoption (H2), we used bootstrapping with repeated extraction of 5,000 samples (Hayes 2017, PROCESS v3.3, Model 6). The mediation analysis used the hope and anxiety manipulations and a serial sequence of action planning and perceived control over outcomes in mediating the relationship between hope x anxiety and the number of units adopted. The analysis also controlled for all other potential process explanations (i.e., confidence, affective forecasting, pain-gain inferences, motivated reasoning, and elaboration) as well as interest in skincare products, concerns about appearance, brand familiarity, gender, and age.8

The results in Figure 1, Panel A, showed that the interaction between hope and anxiety predicted action planning (β = .66, p < .001). The sign of the effect indicated that action planning was greatest when hope and anxiety were both strong. Greater

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^6 One might anticipate that gender is associated with product category experience in the use of skincare products, with women having more category-level experience than men. To determine whether gender acted as a proxy for product category experience, we conducted a 2 (hope) x 2 (anxiety) x 2 (gender) ANOVA on action planning. The results replicated our predicted effects but did not show any effects for gender. We expect that the lack of gender as a moderator is because men are increasingly using skincare products.

^7 One might also wonder whether brand familiarity serves as a proxy for prior product category experience. However, we did not find that brand familiarity moderated the results in either Study 2 or Study 3. These results are perhaps not surprising, because brand familiarity is distinct from product category experience. One might be familiar with a brand because one has merely heard the brand name, not because one has prior experience with it. Even if it did involve prior experience with the promoted brand, familiarity with a specific brand is not isomorphic with experience with the product category broadly defined.

^8 We also tested whether the effect of control on purchase intentions was mediated by confidence. The results showed that the R^2 of the three-mediator model was not significantly different from that of the two-mediator model illustrated in Figure 1, Panel A (R^2 = 22.70% for both models when using the manipulation conditions as the IV; R^2 = 20.55% for both models when using the manipulation check measures as the IV). We emphasize the two-mediator versus the three-mediator model given its parsimony and its consistency with our theoretical explanation.
action planning, in turn, enhanced perceived control over outcomes ($B = .39, p < .001$). Perceived control over outcomes, in turn, significantly predicted the number of units adopted ($B = .88, p < .001$). Evidence for sequential mediation was confirmed (indirect effect $= .224$, bootstrap SE $= .074$, confidence interval [CI]: $[.094, .382]$). Notably, switching the order of the mediators resulted in a nonsignificant mediation (CIs include 0), suggesting that our proposed sequence of mediators is more appropriate. In short, the results support $H_2$ when we use manipulated independent variables and control for alternative factors. Notably, the results also indicated that confidence, pain-gain inferences, and interest in skincare products were also significant as control variables. However, the interactive effect of hope and anxiety on the number of units adopted was significant even after accounting for these alternative factors ($B = 1.21, p < .001$). Furthermore, the results indicated a significant direct effect of hope and anxiety on the number of units adopted, suggesting that additional

**Figure 1.** Study 2 mediation results (DV = number of sample units adopted).
mechanisms beyond those noted in Figure 1, Panel A, are operative. We discuss this issue in the “General Discussion” section.

Testing alternative mechanisms as mediators. To test whether any of the alternative mechanisms could also serve as parallel mediators (which could prove useful in future theory building), we first conducted separate sets of bootstrap mediation analyses (Hayes 2017, PROCESS v3.3, Model 4). These results, which are reported in Web Appendix Table WA6, showed that the largest effect was for perceived control over outcomes (indirect effect = .541, bootstrap SE = .146, bootstrap 95% CI [Cl95]: [.279, .845]) and then action planning (indirect effect = .298, bootstrap SE = .156, bootstrap CI95: [.003, .606]), followed by pain-gain inferences (indirect effect = .209, bootstrap SE = .087, bootstrap CI95: [.060, .396]), affective forecasts (indirect effect = .145, bootstrap SE = .070, bootstrap CI95: [.029, .305]), and confidence (indirect effect = .116, bootstrap SE = .071, bootstrap CI95: [.011, .285]). Global elaboration, motivated reasoning, and general interest showed no effects.

To determine whether these alternative mediators were still significant when modeled as parallel mediators along with our proposed serial mediators, we ran a structural equation model (SEM) analysis. The results in Web Appendix Figures WA5 show that our proposed explanation (action planning and perceived control over outcomes), as well as confidence and pain-gain inferences, emerged as significant parallel mediators. Positive affective forecasts were only marginally significant. Notably, including these additional mediators did not result in a better-fitting model ($\chi^2$ (182) = 366.36; comparative fit index [CFI] = .97, Tucker–Lewis index [TLI] = .97, root mean square error of approximation [RMSEA] = .046, 90% CI [Cl90] = [.039, .053]; see Web Appendix Figure WA5) than the more parsimonious model that included only our proposed serial mediators ($\chi^2$ (24) = 71.91; CFI = .98, TLI = .97, RMSEA = .065, CI90 = [.048, .082]; see Web Appendix Figure WA6). A model that used our proposed mediators and only pain-gain inferences shows that both parallel mediators were significant (see Web Appendix Figure WA7), though again, the model fit was not superior to our simpler model ($\chi^2$ (39) = 73.64; CFI = .99, TLI = .98, RMSEA = .043, CI90 = [.028, .058]). A final model that used action planning and perceived control along with pain-gain inferences and confidence as parallel mediators showed support for both action planning/perceived control and pain-gain inferences and confidence as parallel mediators. The fit of this model was similar to, but not significantly better than, our more parsimonious model (see Figure 1, Panel B; $\chi^2$ (58) = 112.64; CFI = .98, TLI = .98, RMSEA = .041, CI90 = [.030, .052]).

Discussion

Study 2 replicated Study 1 in a controlled lab study that (1) manipulated and used multi-item indicators of hope and anxiety, (2) used a different product, (3) sampled a different population, and (4) used actual adoption as the dependent variable. The results support the idea that new product adoption is greatest when hope and anxiety are both strong (H1). They also suggest that strong levels of these emotions affect adoption intentions through the serial mediational effects of action planning and perceived control over outcomes (H2). We observed these effects even when accounting for other potential drivers of purchase and other control variables. Among the alternative processing mechanisms, only pain-gain inferences and confidence over outcomes also served as parallel mediators.

Although the results of Study 2 are encouraging, we wanted to determine whether the proposed effects were replicated with yet another product, a younger population, and a different operationalization of anxiety (manipulating anxiety via product disclaimers vs. social media comments). We also aimed to determine whether prior product category experience, which should enhance consumers’ abilities to engage in action planning, would provide additional evidence for the proposed action planning mechanism. We conducted Study 3 with these objectives in mind.

Study 3

Design and Procedures

Five hundred fifty-seven part-time postgraduate college students (49.40% = female, 49.70% = male, .20% = other, .70% = prefer not to disclose) participated in this study about an actual new energy drink called Neuronade, whose product package promised mental clarity and healthy energy. The average age of participants was 31.18 years (SD = 6.54).

We manipulated strong versus weak hope via an online product review, purportedly from an individual who had used the product and posted the review on social media. We created two versions of the review: one designed to evoke strong hope and the other designed to evoke weak hope.

Strong hope: I felt energized and clear-headed even hours after drinking it. The mental focus the product gave me allowed me to accomplish a lot more in my day than I typically accomplish. This product did everything I had hoped that it would do.

Weak hope: I did have some marginal improvements in energy and clear-headedness, but only for a very short time. Any improvements in mental focus were marginal, though, as it didn’t allow me to accomplish too much more than what I typically accomplish. The effects were clearly not as dramatic as I had hoped for.

We manipulated strong versus weak anxiety by using product disclaimers in an ad. The disclaimers were as follows:

Strong anxiety: Use with care. Can cause rapid heartbeat, gastric distress, and sour breath odor.

Weak anxiety: Use with care. Can cause slight increase in heart rate, mild stomach flutters, and slight breath odor.

Web Appendix Figure WA8 shows the ad to which respondents were exposed. Participants were randomly assigned to
one of four conditions representing a 2 (strong vs. weak hope) × 2 (strong vs. weak anxiety) between-subjects design.

The procedure for Study 3 closely followed that of Study 2. Participants were endowed with the equivalent of US$2 as a token of appreciation for participating in the study. They were informed that they would see information about a real energy drink product that was new to the market and that they could purchase one or more sample units of the product at the end of the study if they chose to do so. Each sample unit cost the equivalent of .50 USD. After reading the social media comment and seeing the ad participants indicated on an index card how many sample units they would like to purchase. Participants then answered a set of questions related to perceived control over outcomes and action planning. They also responded to a set of questions regarding the same alternative mediators examined in Study 2. They then responded to a set of manipulation check measures of hope and anxiety.

Participants then indicated the extent to which they had prior experience with the product category of energy drinks (1 = “not at all,” 7 = “very much”). Note that product category experience is measured (not manipulated). This measure of prior category experience theoretically maps onto one’s ability to engage in action planning. As noted previously, if H2 is correct and hope and anxiety do encourage action planning, we should find that the interaction between hope and anxiety is strongest for people who have the greatest ability to engage in action planning (i.e., those with more vs. less product category experience). We also asked about the valence of one’s prior category experiences as a control variable. Respondents indicated whether their experiences were “positive,” “negative,” “mixed,” or “not applicable; I have not used these types of products before.”

As in Study 2, we asked participants to indicate their interest in the product category, brand familiarity, gender, and age. We debriefed participants after they paid for the number of sample units they had elected to buy, if any. At that time, we told them that while Neuronade is a real product, the social media comment and the disclaimers were fictitious.

**Results**

**Manipulation checks.** A set of 2 (hope: strong vs. weak) × 2 (anxiety: strong vs. weak) ANOVAs on the manipulation checks confirmed that the manipulations were successful. Specifically, the manipulation check for hope showed only a main effect of hope. As we expected, respondents in the strong hope condition felt stronger hope about achieving enhanced mental clarity and healthy energy ($M_{strong} = 4.32$) than did those in the weak hope condition ($M_{weak} = 2.55$; $F(1, 553) = 248.89, p < .001$). The manipulation check for hope showed neither a main effect for anxiety nor a significant interaction between hope and anxiety. Likewise, the manipulation of anxiety worked as expected, revealing only a main effect of anxiety. Respondents in the strong anxiety condition reported feeling stronger anxiety than did those in the weak anxiety condition ($M_{strong} = 4.57$ vs. $M_{weak} = 2.92$; $F(1, 553) = 160.78, p < .001$). Neither the main effect of hope nor the interaction between hope and anxiety was significant. Prior experience did not have any effect on the hope and anxiety manipulations. Table 5 shows cell mean results pertinent to all measures collected in Study 3.

**Effects of hope and anxiety on purchase.** The overall mean of the focal dependent variable (number of units adopted) was .99 (SD = 1.53), with a range of 0–16 units purchased. Web Appendix Figure WA9 shows the distribution of the number of units purchased. A 2 × 2 ANOVA with the number of units purchased as the dependent variable revealed a main effect of hope ($M_{strong hope} = 1.56$ vs. $M_{weak hope} = .41$; $F(1, 553) = 92.47, p < .001$), no main effect of anxiety ($F(1, 553) = 2.40, p > .12$), and the predicted hope × anxiety interaction ($F(1, 553) = 8.54, p = .004$). In support of H1, those in the strong hope/strong anxiety condition purchased the greatest number of units of the new product ($M_{strong hope/strong anxiety} = 1.83$) relative to those in the other three conditions ($M_{strong hope/weak anxiety} = 1.29, t(277) = 2.36, p = .019$; $M_{weak hope/weak anxiety} = .49, t(275) = 6.43, p < .001$; $M_{weak hope/strong anxiety} = .33, t(277) = 7.38, p < .001$).

**Effects of hope and anxiety on action planning and perceived control over outcomes.** A 2 × 2 ANOVA on the measure of action planning revealed a main effect of hope ($M_{strong hope} = 3.85$ vs. $M_{weak hope} = 2.19$; $F(1, 553) = 243.83, p < .001$), a main effect of anxiety ($M_{strong anxiety} = 3.28$ vs. $M_{weak anxiety} = 2.76$; $F(1, 553) = 24.30, p < .001$), and the predicted hope × anxiety interaction ($F(1, 553) = 43.47, p < .001$). The means in Table 5 show that action planning was greater in the strong hope/strong anxiety condition than in any of the other three hope/anxiety conditions. Similarly, a 2 × 2 ANOVA on perceived control over outcomes showed that both the main effects of hope ($M_{strong hope} = 3.70$ vs. $M_{weak hope} = 2.17$; $F(1, 553) = 257.63, p < .001$) and anxiety ($M_{strong anxiety} = 3.08$ vs. $M_{weak anxiety} = 2.79$; $F(1, 553) = 9.52, p = .002$) and the predicted interaction terms were significant ($F(1, 553) = 14.10, p < .001$). The means in Table 5 show that perceived control over outcomes was greater in the strong hope/strong anxiety condition than in any of the other three hope/anxiety conditions.

**Moderating effects of experience in the relationship between hope × anxiety and action planning.** To test the moderating role of product category experience on mediators and outcome variable, we first ran three sets of moderated mediation moderation analyses.
using Hayes’s (2017) PROCESS Model 3. We observed the predicted three-way interaction for action planning \((\beta = .23, p = .013)\) and a marginally significant three-way interaction on the number of units adopted \((\beta = .21, p > .086)\). The three-way interaction for perceived control over outcomes was not significant. The pattern of results remained unchanged when alternative explanations and controls were taken into account.

To further examine whether prior product category experience moderates action planning, which in turn affects perceived control over outcomes and the number of units purchased, we used bootstrapping with repeated extraction of 5,000 samples (Hayes 2017; PROCESS v3.3, Model 85). The moderated mediation analysis included a serial sequence of action planning and perceived control over outcomes in mediating the relationship between hope \(\times\) anxiety and actual purchase, with prior experience moderating the link between hope \(\times\) anxiety and action planning. The results remain unchanged when alternative explanations and controls were taken into account.

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Table 5. Study 3 Main Study Cell Means.

<table>
<thead>
<tr>
<th>Means</th>
<th>Strong Hope (N = 139)</th>
<th>Weak Hope (N = 140)</th>
<th>Strong Hope (N = 140)</th>
<th>Weak Hope (N = 153)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manipulation Checks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hope</td>
<td>4.31a</td>
<td>4.33a</td>
<td>2.51b</td>
<td>2.60b</td>
</tr>
<tr>
<td>Anxiety</td>
<td>4.54a</td>
<td>2.90b</td>
<td>4.60a</td>
<td>2.93b</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units adopted</td>
<td>1.83a</td>
<td>1.29d</td>
<td>.33d</td>
<td>.49a</td>
</tr>
<tr>
<td><strong>Proposed Process Mechanisms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action planning</td>
<td>4.46a</td>
<td>3.24b</td>
<td>2.10c</td>
<td>2.28c</td>
</tr>
<tr>
<td>Perceived control over outcomes</td>
<td>4.02a</td>
<td>3.37c</td>
<td>2.14a</td>
<td>2.20c</td>
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<tr>
<td><strong>Proposed Moderator</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior product category experience</td>
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<td>3.49a</td>
<td>3.52a</td>
<td>3.68a</td>
</tr>
<tr>
<td><strong>Alternative Process Mechanisms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence in hoped-for outcomes</td>
<td>3.13b</td>
<td>3.56a</td>
<td>2.39c</td>
<td>2.49c</td>
</tr>
<tr>
<td>Affective forecasts</td>
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<td>4.30d</td>
<td>2.47d</td>
<td>2.83c</td>
</tr>
<tr>
<td>Pain-gain inferences</td>
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<td>2.94c</td>
<td>2.54b</td>
<td>2.37b</td>
</tr>
<tr>
<td>Global elaboration</td>
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<td>2.31b</td>
<td>1.90b</td>
</tr>
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<td>2.04c</td>
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<td><strong>Control Variables</strong></td>
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<td></td>
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<tr>
<td>Valence of prior experience</td>
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<td>2.06a</td>
<td>2.11b</td>
<td>2.18a</td>
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<td>Interest in energy drinks</td>
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<td>1.77a</td>
<td>1.69a</td>
<td>1.73a</td>
</tr>
<tr>
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<td>1.52a</td>
<td>1.54a</td>
<td>1.53c</td>
<td>1.49a</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>31.32a</td>
<td>31.46a</td>
<td>30.78a</td>
<td>31.15a</td>
</tr>
</tbody>
</table>

Notes: Means with different superscripts are significantly different at \(p < .05\); Each participant was given the equivalent of US$2 as a token of appreciation for participating in the study. Energy drink sample units could be purchased for the equivalent of US$0.50 each.

Both strong. This relationship was significantly moderated by the degree of prior experience with the product category \((\beta = .19, p < .001)\), such that action planning among those in the strong hope and strong anxiety condition increased as product category experience increased. Action planning, in turn, influenced perceived control over outcomes \((\beta = .28, p < .001)\). Subsequently, perceived control over outcomes significantly predicted actual purchase of the energy drink \((\beta = .36, p < .001)\). Conditional indirect effects revealed a more pronounced positive serial moderation for more experience (indirect effect = .098, bootstrap SE = .023, CI: [.058, .147]) than for minimal experience (indirect effect = .025, bootstrap SE = .008, CI: [.011, .044]). Notably, switching the order of the mediators resulted in a nonsignificant moderated mediation (all CIs include 0). The results in Figure 2, Panel A, also show a direct effect of hope and anxiety on the number of units purchased \((\beta = .13, p = .043)\), suggesting that alternative mediators are operative.

Web Appendix Figure WA10 depicts the effect of hope and anxiety at high versus low levels of prior product category on action planning (for effects on purchase, see Figure WA11). Both figures show that hope and anxiety had the greatest effect at high levels of product category experience, providing further support for H2. We also plotted the Johnson–Neyman turning point of the continuous measure of product category experience on action planning and purchase. Web Appendix Figure WA12
suggests that the conditional effects of hope and anxiety at mean-centered values of experience were $-2.473$ and $-0.078$, respectively. The greater the experience, the greater effect of hope and anxiety on action planning and purchase.

**Testing alternative mechanisms as mediators.** As in Study 2, we conducted a set of individual PROCESS analyses (Hayes 2017, Model 4) to assess whether any alternative process mechanisms mediated the relationship between hope $\times$ anxiety and adoption and hence could serve as parallel mediators. Although these analyses are not relevant to our hypotheses, testing these effects could be useful for future theory-building purposes. Web Appendix Table WA9 shows the results of a factor analysis that demonstrates the empirical distinctiveness of these processes.

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**Figure 2.** Study 3 mediation results (DV = number of sample units adopted).
potential alternative mediators. Web Appendix Table WA10 shows the indirect effects for the proposed and alternative mechanisms when tested individually. The largest effects were for variables associated with our proposed mechanism (i.e., perceived control; indirect effect = .258, bootstrap SE = .043, bootstrap CI95: [.179, .349]) and then action planning (indirect effect = .147, bootstrap SE = .042, bootstrap CI95: [.072, .234]), followed by pain-gain inferences (indirect effect = .045, bootstrap SE = .020, bootstrap CI95: [.014, .093]), positive affective forecasts (indirect effect = .038, bootstrap SE = .013, bootstrap CI95: [.015, .064]), confidence (indirect effect = .035, bootstrap SE = .017, bootstrap CI95: [.009, .074]), and motivated reasoning (indirect effect = .028, bootstrap SE = .013, bootstrap CI95: [.004, .055]). Neither general elaboration nor general interest in the product category were significant.

To determine whether these alternative mediators were still significant when modeled along with our proposed serial mediators (action planning and perceived control), we conducted a SEM analysis involving hope and anxiety, action planning, perceived control over outcomes, the number of units of the product adopted, and those alternative mediators that were significant when tested individually. The results in Web Appendix Figure WA13 show that action planning (β = .57, p < .001), perceived control over outcomes (β = .41, p < .001), pain-gain inferences (β = .20, p < .001), and confidence (β = .14, p < .001) emerged as significant mediators. These results did not result in a better-fitting model (χ²(221) = 501.54; CFI = .94, TLI = .94, RMSEA = .048, CI90 = [.042, .053]) than the results presented in Web Appendix Figure WA14, which included only our proposed serial mediators (χ²(24) = 58.53; CFI = .99, TLI = .98, RMSEA = .051, CI90 = [.034, .068]) (see also Web Appendix Table WA11).

In Study 2, only pain-gain inferences, confidence, and our proposed serial mediators were significant. For the purpose of further exploration, we ran a SEM model that included our proposed mediators and pain-gain inferences (see Web Appendix Figure WA13). The mediating effect of pain-gain inferences was significant (along with our proposed mediators). However, this model did not fit the data better than the model that included only the mediators noted in H2 (χ²(39) = 76.98; CFI = .99, TLI = .98, RMSEA = .042, CI90 = [.028, .056]). Because pain-gain inferences and confidence affected adoption in both Studies 2 and 3, we ran a SEM model that included our proposed mediators, pain-gain inferences, and confidence (see Figure 2, Panel B). Whereas both pain-gain inferences and confidence served as mediators along with our proposed mediators, the strongest effects were for our proposed mediators. Moreover, that model did not show a better fit (χ²(58) = 190.90; CFI = .96, TLI = .94, RMSEA = .064, CI90 = [.054, .074]) than our original and more parsimonious model shown in Web Appendix Figure WA14.

Discussion

Study 3 replicated H1 and H2. In addition, Study 3 provided further evidence of the underlying process by highlighting the moderating role of prior product category experience. Specifically, the effect of strong hope and strong anxiety on action planning, perceived control over outcomes, and adoption decisions was greater for consumers who had the greatest ability (by virtue of their prior category experiences) to engage in action planning. In Studies 2 and 3 we also found that pain-gain inferences and confidence in outcomes mediated the relationship between hope × anxiety and actual adoption decisions.

General Discussion

Summary

We demonstrated the novel and provocative finding that when hope is strong, anxiety regarding possible outcomes from product use can actually enhance new product adoption intentions (Study 1) and real adoption behavior (Studies 2 and 3). The interaction of strong hope and strong anxiety was driven at least in part by the psychological process of action planning and its effects on perceived control over outcomes. We observed these effects when using respondents from diverse geographical locations and socioeconomic backgrounds, when measuring and manipulating hope and anxiety, when using different emotion-induction methods, when using diverse products, and when accounting for alternative explanations. Our theoretical mechanism was also supported by evidence that prior product category experience, a variable that should enhance consumers’ abilities to engage in action planning, moderates the results. As predicted, our effects were stronger for those individuals with more (vs. less) prior experience in the product category. To our knowledge, our research is the first to show the interactive effect of strong hope and strong anxiety on new product adoption decisions. Our findings contribute to both theory and managerial practice as discussed next.

Contributions to Theory

Research on hope. First, our work contributes to research on hope. Whereas prior research has focused hope in the contexts of self-regulation (e.g., Passyn and Sujan 2006) and information search and evaluation of message arguments (e.g., De Mello, MacInnis, and Stewart 2007), to our knowledge, we are the first to examine the role of hope on new product adoption. Notably, whereas prior research suggests that threats to hoped-for outcomes can foster individuals’ motivated reasoning (De Mello, MacInnis, and Stewart 2007), we found that when examined alone, motivated reasoning had a smaller effect than did other mechanisms in mediating the relationship between hope and anxiety on new product adoption. One reason why might be that a threat to what consumers hope for is distinct from anxiety about goal-incongruent outcomes. In addition, in De Mello, MacInnis, and Stewart’s (2007) work, the threat was not related to the product but rather to information external to the product. In our work, anxiety was directly tied to the product.
Research on anxiety. Moreover, our work contributes to the literature on consumer anxiety. Whereas some work in marketing has considered the effect of incidentally evoked anxiety on information processing (e.g., Raghunathan, Pham, and Corfman 2006), our focus is on the information-processing consequences of anxiety that is integral to a decision (here, new product adoption). Outside of marketing, work on the motivational effects of anxiety is empirically mixed. For instance, on the one hand, anxiety can create an avoidance motivation that makes consumers want to distance themselves from anxiety-inducing stimuli (e.g., Dymond and Roche 2009). This motivation should reduce new product adoption. On the other hand, anxiety has sometimes been found to create an approach motivation, resulting in information seeking and vigilance (e.g., Hanin 2010; Locander and Hermann 1979). Our findings suggest that strong hope provides the motivational energy that spurs individuals to confront their anxieties and use them for adaptive purposes. That is, when hope for a goal-congruent outcome is strong, anxiety may enhance adoption by allowing individuals to engage in action planning, considering what actions they can enact, so as to mitigate the occurrence of anxiety-evoking outcomes and maximize hoped-for ones. The notion that strong hope can play a significant role in understanding when individuals confront versus withdraw from their anxieties is novel and important.

Action planning and perceived control over outcomes. Our work also augments prior work on planning by focusing on the effortful process of action planning—that is, mentally contemplating the set of actions that one will undertake to achieve a goal-congruent outcome and avoid anxiety-inducing ones. Whereas prior research finds that consumers’ desires for control can reduce new product adoption (Faraji-Rad, Melumad, and Johar 2017), our research suggests that action planning might enhance new product adoption by increasing perceptions of control. Action planning might be a useful construct for understanding not just new product adoption decisions but also planning in other contexts, such as resource planning. We also contribute to the literature in marketing and consumer behavior on control by emphasizing perceived control over outcomes and demonstrating the role of strong hope, strong anxiety, and action planning in enhancing such perceptions. Notably, whereas some consumer research has studied drivers of low feelings of perceived control, we are the first to study when and why hope and anxiety can enhance perceptions of control over outcomes.

Managerial Implications

From a managerial perspective, our findings suggest that when bringing a new product to the market, adoption might increase when hope and anxiety are strong. Thus, if market research reveals that consumers already have strong anxiety about outcomes from new product adoption, it would behoove marketers to develop communications that evoke strong hope rather than trying to downplay anxiety. Although we did not test the role of ads in fostering hope, prior research identifies several tactics that marketers can pursue to foster hope in marketing communications (MacInnis and De Mello 2005).

Conversely, if market research reveals that consumers have strong hope for the product but low anxiety, our results suggest that marketers might benefit by providing information designed to enhance consumers’ anxiety about possible goal-incongruent outcomes of new product adoption. Warning labels, disclaimers, disclosures, and vivid images are potentially valid vehicles for enhancing potential anxiety. Beyond encouraging new product adoption, such communications could also enhance product satisfaction. That is, to the extent that consumers consider goal-incongruent outcomes and plan for how they can be avoided, they may ultimately be more satisfied with the product than would consumers who never considered potential anxiety-evoking outcomes or engaged in action planning.

Our findings also suggest that disclosures or labels that evoke strong anxiety about goal-incongruent outcomes from new product use might encourage more thoughtful decision making when hope is also strong. Whereas marketers may be loath to use such disclaimers, our research suggests that when a new product evokes strong levels of hope, anxiety-inducing disclosures might not harm, and could potentially help, new product adoption.

Future Research

In Studies 2 and 3, we consistently observed that pain-gain inferences and confidence in outcomes also mediated the effects of hope and anxiety on new product adoption decisions. While including these variables did not result in a better-fitting model, it did not result in a worse-fitting model either. From a theory development standpoint, these results raise the interesting possibility that strong hope and strong anxiety might influence adoption intentions through both thoughtful/systematic processing (e.g., action planning) and heuristic processing (e.g., pain/gain inferences; see Chaiken and Trop 1999; Petty and Cacioppo 1986). Future research might assess whether these “dual routes” are replicated and examine the conditions under which one or both routes are most likely to occur. Such research could enhance our understanding of the effects of emotions such as hope and anxiety on consumer choices.

Future research might also examine whether our predictions are replicates when hope and anxiety are incidental (vs. integral) to the decision (as was the case here). For example, Lowe, Loveland, and Krishna (2019) found that incidentally evoked anxiety enhanced risk avoidance. However, this article did not examine the interaction of incidentally induced hope and anxiety. Nor did it emphasize new product adoption decisions. Overall, the effects of hope and anxiety on intentions to adopt new products represents a rich domain for future research. The notion that consumers might embrace their anxiety when hope is strong is particularly interesting from both academic and pragmatic perspectives.
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