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Combining prior theory about really new products (RNPs) with temporal construal theory, the authors show in four field studies that consumers follow through less often on positive purchase intentions to buy RNPs than on intentions to buy incrementally new products (INPs), and the decrement grows over time. Compared with consumers of INPs, consumers of RNPs are less likely to think concretely about the circumstances of buying and using the products and are more poorly calibrated in their expectations of initial product use. The authors discuss implications for both the marketing of and the market research on RNPs.

Keywords: really new products, purchase intentions, new product expectations, psychological distance, construal-level theory

As Time Goes By: Do Cold Feet Follow Warm Intentions for Really New Versus Incrementally New Products?

Firms launching really new products (RNPs) often devote considerable resources to developing and measuring demand for those products—sometimes with little success. In 2001, the Segway Scooter was unveiled, hyped by sophisticated investors, such as Jeff Bezos of Amazon.com. Steve Jobs predicted that cities would be architected to accommodate the computer-controlled, self-balancing human transporter, and John Doerr predicted that Segway would make its first billion dollars faster than any company

in history. The Segway was released for sale in 2002, but by the summer of 2004, fewer than 10,000 units had been sold (Foust 2006).

Segway's experience typifies the issues firms face in marketing RNPs and in measuring demand. As with many firms launching technologically new products, Segway failed to consider how difficult it is for consumers to estimate how useful an RNP would be for them. As Hoeffler (2003) shows, consumer uncertainty can make prepurchase trade-offs highly labile, in turn making it difficult for firms to estimate market demand for RNPs using conventional methods. Only recently have scholars begun to study how marketing research methods and marketing strategies for launching more standard, incrementally new products (INPs) should be modified to the higher-risk, higher-reward realm of RNPs (Lehmann 1994; Moreau 1997; Urban, Weinberg, and Hauser 1996).

We examine how psychological differences in consumers' thinking about RNPs versus INPs alter formation of long-term new product purchase intentions and affect the likelihood that consumers will follow through to buy and use products as they expect. Really new products promise greater benefits than INPs, but consumers are uncertain of the utility of the benefits and anticipate that they will need to change their behavior to attain potential benefits (Hoeffler 2003). We couple Hoeffler's (2003) conception of newness with Trope and Liberman's (2003) theory about differences in mental representation of events in the present versus the future to account for six stylized findings about

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the purchase and use of RNPs versus INPs. In four field studies, we find the following:

1. Consumers are less likely to express intentions to purchase RNPs than to express intentions to purchase INPs;
2. Consumers follow through on those intentions less often for RNPs than for INPs;
3. This difference in follow-through grows stronger over time after the measurement of purchase intentions;
4. Consumers who intend to purchase RNPs think less specifically about where and when they will buy than those who intend to purchase INPs (see Gollwitzer 1999);
5. Within the week before a product acquisition, consumers have more abstract representations of how they will use an RNP than an INP in the first week after purchase; and
6. Within the week before a product acquisition, consumers have less calibrated expectations about how they will use an RNP than an INP in the first week after purchase.

We discuss the implications of these findings for the launch of and the market research on RNPs.

PSYCHOLOGICAL NEWNESS AND TEMPORAL CONSTRUAL

Various definitions exist for what makes a product “really new,” focusing on chronological, technological, or psychological newness. Booz-Allen & Hamilton (1982) distinguish products that are “new to the market” from those that are “new to the firm.” Goldenberg, Lehmann, and Mazurski (2001) find that moderately-new-to-market products are more successful than completely-new-to-market products.

Work on psychological newness has focused on the inapplicability of existing category knowledge to understanding the new product (Moreau, Lehmann, and Markman 2001; Moreau, Markman, and Lehman 2001; Wood and Lynch 2002). The focus of that research is on cross-sectional variation among consumers in the perceived newness of a new product and how that variation explains processing of information about the new product.

Our focus is not on the variation among consumers in terms of perceived newness but rather on the variation among products in terms of perceived newness in the eyes of consumers who are in the market for such products.¹ We rely on the work of Hoeffler (2003), who argues that consumers are more uncertain of their ability to estimate their consumption utility before the purchase of RNPs than before the purchase of INPs. He argues that consumers perceive four specific differences between RNPs and INPs:

1. RNPs enable consumers to do things that cannot be easily done with existing ways to solve similar problems, and INPs do not;
2. The benefits of consumption are more uncertain for RNPs than for INPs;
3. Cost–benefit trade-offs in utility functions are more uncertain for RNPs than for INPs because of consumers’ lack of understanding of attribute-to-benefits links or practice in making cost–benefit trade-offs (see Hoeffler and Ariely 1999); and
4. Consumers must make greater changes in their own behavior to attain the potential benefits of RNPs than to attain the potential benefits of INPs (see Gourville 2006).

¹According to Rogers (2003, p. 96), 58% of extant innovation studies examine cross-sectional variation in who adopts, but only 1% examine the attributes of innovations that make some diffuse faster than others.

By definition of these dimensions, psychological newness is not a matter of chronological age. Streaming television and flat-screen plasma television were introduced at roughly the same time in 1997, but we show subsequently that streaming television is perceived as higher in psychological newness by those who have never owned but plan to acquire/adopt it in the near future. Flat-screen televisions do not enable consumers to do new things they could not do with prior products, the benefits are relatively certain (as are the cost–benefit trade-offs), and consumers do not believe that they will need to change their behavior to enjoy the benefits. Conversely, RNPs, such as streaming television, or other innovations, such as personal digital assistants (PDAs) or blogging, are perceived as really new along the four dimensions by those who have never used them; these technologies enable consumers to do new things, but the benefits and cost–benefit trade-offs are uncertain, and significant behavior change is required to enjoy the benefits.

We combine Hoeffler’s (2003) perspective with extant psychological literature on temporal construal (Liberman, Trope, and Stephan 2007; Trope and Liberman 2003; Trope, Liberman, and Wakslak 2007). Research on construal theory shows that people represent temporally distant actions in terms of abstract, high-level considerations of the desirability of the action. They represent more near-term actions in terms of concrete, low-level considerations of the action’s feasibility. Enabling consumers to do new things is a matter of desirability, and uncertainty about benefits of RNPs undercuts that desirability. The need to change behavior to attain the benefits is a matter of feasibility. Subsequently, we present hypotheses about how these differences between RNPs and INPs affect consumers’ likelihood of following through on stated intentions to acquire RNPs in comparison with INPs.

We further deduce predictions about the timing of follow-through for consumers who eventually acquire products they previously intended to acquire. The more temporally distant the intention judgment from the expected acquisition decision, the more different are the mental representations at the two points in time. The greater the discrepancy in mental representations, the less the follow-through should be, but this should be exacerbated for RNPs that are higher in desirability (ability to do new things; Hoeffler 2003) and lower in feasibility (because significant change in behavior is necessary to attain the potential benefits).

We first explain in more detail what construal theory implies for intention to acquire RNPs and services and why it implies that RNPs and INPs should have different patterns of follow-through on positive intentions to acquire. We report a study that scores the psychological newness of 28 entertainment and communication products according to Hoeffler’s (2003) framework. We then use these newness scores in four field studies to predict the fraction of consumers who intend to acquire each product in the next six months, the fraction of intenders who follow through, the timing of follow-through, and other downstream consequences related to use of the products after adoption. We conclude by discussing the implications of our results for construal theory and for consumer research and marketing practice.

NEWNESS AND FOLLOW-THROUGH ON STATED INTENTIONS

Consumers often form new product purchase intentions well before they expect to buy the products. Research on temporal construal shows that when consumers evaluate products well before they buy them, they tend to focus on the abstract benefits, or pros, of the products and underweight the products' more concrete constraints, or cons (Eyal et al. 2004; Trope and Liberman 2000, 2003).

Stating an intention to acquire a new product in the next N months does not mean that a consumer will actually follow through and purchase the product. Intentions expressed at a temporal distance may appear unwise when the event draws nearer in time. Zauberaman and Lynch (2005) describe the "Yes ... Damn!" effect, in which people commit themselves to time-consuming activities under the false expectation that they will be less busy in the future than they are in the present. Really new products require time investments to change behavior to accommodate the new product in the consumer's life; the cost of this investment will seem more off-putting in the present than when an intention is being formed to adopt the product in the distant future, making follow-through on intent lower.

When consumers who have stated an intention to acquire a new product go to buy it, the change in temporal frame from distant opportunity to near purchase can lead them to construe the products differently. When judging purchase intention, consumers give more weight to high-level benefits, such as the ability of a product to help them do new things they could not do before, and relatively less weight to low-level feasibility constraints, such as needing to change behavior to enjoy those benefits (Trope and Liberman 2000, 2003). When a purchase opportunity is at hand, people tend to increase the weight given to a product's low-level considerations of feasibility and to reduce the weight given to high-level benefits (Thompson, Hamilton, and Rust 2005). This devaluation effect should be stronger for RNPs than for INPs because RNPs have more extreme benefits and costs. Thus:

H₁: Consumers are less likely to follow through on their positive intentions to buy psychologically newer products.

NEWNESS AND TIMING OF FOLLOW-THROUGH ON STATED INTENTIONS

Consider a set of consumers who are asked about their intentions to acquire each of a set of entertainment and communications products and services in the next six months. Some of those responding positively for a given product expect to acquire in the next few days, but others expect to acquire in a month or several months. Eventually, these consumers will be faced with a decision of whether to acquire on a given occasion. At the time of decision, construal theory implies that the weight of feasibility should be high and the weight of desirability should be low; the imminence of the decision makes people think more concretely about constraints on their behavior than when rating long-term intentions. People making a final decision of whether to acquire a few days after expressing an intention have a relatively slight difference in temporal perspective and in the relative weights of desirability and feasibility between the time of intention judgment and the time of adoption

decision. People deciding three months after stating an intention to acquire have a much greater difference in temporal perspective and, thus, a greater difference in weights at intent than at purchase.

If we combine these premises with the reasoning underlying H₁, the probability of follow-through should be lowest when there is a large difference in temporal perspective between the time of intent and the time of final decision and when the product itself has a pattern of extremely high benefits and extremely high costs rather than more moderate benefits and moderate costs. Therefore, it follows that the effect described in H₁ should become stronger with time, and we should observe an interaction between newness and time on follow-through.

H₂: For people stating a positive intention to acquire in N months, the probability of follow-through should decline over months, but this effect should be stronger for more psychologically new products.

Other forces may produce a main effect of time on probability of follow-through that might cause follow-through to increase or decrease over time. The key prediction, though, is that the negative effect of newness on follow-through should grow stronger with time.

Before testing the hypotheses about follow-through on intentions, we need to identify a pool of people with positive intentions to purchase RNPs and INPs at some point in the next six months. Study 1 identifies such a pool and uses these intenders to score the newness of a set of 28 entertainment and communication technologies. In Study 2, we test whether people who previously stated a positive intention actually follow through.

STUDY 1: A NEWNESS INDEX PREDICTS ACQUISITION INTENTIONS

We measure the psychological newness of 28 new communication and entertainment technologies from the perspective of potential customers who do not own these products and services but who are "in the market," as determined by their stated intentions to acquire the product or service in the next six months. Although not our main focus, we also test whether the aggregate newness index predicts the fraction of those who do not own but intend to acquire the product in the next six months.

Method

Participants. In late August/early September 2004, we sent 12,237 members of the CBS Television City online panel e-mails, inviting them to participate in Study 1. Of those invited, 22% (2692) agreed to participate (57.7% female, mean age of 39).

Procedures. A link in the invitation e-mail took participants to the survey's homepage, where participants were then presented with a list of 28 new communications and entertainment products (for product descriptions, see Table 1). For each product, participants indicated whether they currently owned the product and, if they did not, whether they intended to purchase (or adopt) the product in the next six months (1 = yes, 0 = no).

For each of the products that participants intended to buy, we measured perceived product newness using a formative index (Bollen and Lennox 1991; Diamantopoulos and Win-

Table 1
NEW COMMUNICATIONS AND ENTERTAINMENT PRODUCTS USED IN STUDIES 1, 2, AND 4

Product Type	New Product	Perceived Newness	Product Penetration (%)	Intenders (%)
INPs	Flat-screen (plasma or LCD) television	8.87	9	16
	New video game titles (e.g., <i>Doom III</i> , <i>Halo 2</i> , <i>Grand Theft Auto: San Andreas</i> , <i>Metroid Prime 2</i> , <i>Metal Gear Solid 3</i> , <i>Half-Life 2</i> , <i>Gran Turismo 4</i>)	9.14	10	21
	High definition television (HDTV) and HDTV tuner	9.18	17	14
	Home theater with surround sound (Dolby)	9.32	44	16
	DVD player	9.59	88	27
	Broadband Internet service (cable modem or DSL)	9.79	56	14
	DVD recorder	9.87	17	16
	Products to detect and remove Internet "Spyware" (advertising supported software, such as Gator) or to block pop-up advertisements (e.g., Pest Patrol, Google pop-up blocker)	9.91	66	16
	Digital cable	9.98	43	8
	Digital still camera	10.04	48	32
Neither RNPs nor INPs	Camcorder	10.01	70	12
	Video game player (e.g., Xbox, GameCube, PlayStation)	10.07	46	4
	MP3 player (e.g., Apple's iPod)	10.12	26	12
	Google's Gmail (free e-mail with advertisements keyed to the content of e-mails)	10.22	4	9
	Premium cable television service or cable channels (those requiring added payment beyond basic cable)	10.23	55	10
	Broadband Internet phone service (VoIP, or Voice over Internet Protocol)	10.29	7	5
RNPs	On-demand digital cable services (e.g., HBO On Demand, Showtime On Demand)	10.38	12	5
	DVD-by-mail service (e.g., Netflix, Walmart.com)	10.38	23	10
	Digital video recorder (TiVo or Replay TV) or similar services integrated into cable television or satellite boxes (e.g., DIRECTV, Dish Network, TimeWarner Cable)	10.51	24	15
	Instant messaging (computer to computer)	10.56	63	3
	Cell phone with picture phone capability	10.62	19	14
	Cell phone with Internet access	10.63	38	6
	Home computer with Microsoft Media Center	10.68	23	6
	Cell phone with walkie-talkie feature (e.g., Nextel)	10.70	9	4
	PDA (standard PDA/Pocket PC without wireless Internet service)	10.76	35	7
	Cell phone with text messaging	11.14	66	4
	Streaming television (television programs streamed to your computer)	11.32	3	2
	Blogging (Web logging)	11.77	6	6

klhofer 2001) developed from Hoeffler's (2003) characterization of RNPs. Participants were asked to rate their agreement with each of the following four statements on a five-point scale anchored by "strongly disagree" and "strongly agree":

1. "I feel quite certain of the benefits I could expect to get if I bought (adopted) this product/service." (reverse coded)
2. "I'm quite sure of what the relevant trade-offs are among the costs and benefits of buying and using this product/service." (reverse coded)
3. "I'll have to change my behavior significantly to attain the potential benefits of this new product/service."
4. "Using this new product/service would allow me to do things that I can't easily do now."

Results

Mean newness index scores. Participants reported intentions to acquire 5207 new products. For each product, we reverse-coded intenders' responses to Statements 1 and 2 and summed scores for the four items, producing an intender's product newness score (ranging from 4 to 20) for each product he or she intended to acquire. Higher scores reflect greater product newness. We averaged intenders' product

newness scores to create a mean product newness score for that product. We used mean newness across respondents to measure properties of products, not people—a measure of aggregate psychological response by people "in the market" rather than a measure of individual perception (cf. Holak and Lehmann 1990; LaBay and Kinnear 1981; Moreau, Lehmann, and Markman 2001). Table 1 lists the 28 products as they were described to respondents, their associated newness scores among intenders, the percentage of the total sample reporting prior ownership of the products, and the percentage of nonowners intending to buy in the next six months.

In Studies 2 and 4, we retained the 12 products with the highest newness scores as RNPs (e.g., blogging service, streaming television, PDA, digital video recorder [DVR], DVD-by-mail service) and the 10 products with the lowest newness scores as INPs (e.g., flat-screen television, DVD player, home theater system, broadband Internet service). We dropped 6 products with intermediate newness scores from Studies 2 and 4 (e.g., camcorder, video game player, MP3 player).

Reliability and validity of mean newness. The interjudge reliability of the product newness scores reflects the product

portion of variance in the observed 28 product newness scores accounted for by variance in the 28 product newness true scores—the average of the newness scores of the untapped market intending to acquire these products. Following Winer (1971, p. 290) and Lynch, Buzas, and Berg (1994, p. 181), we estimated interjudge reliability with an analysis of variance decomposition of sources of variance, which resulted in a high reliability (.95). Interjudge reliability for each of the product newness scale items individually ranged from .89 to .97.

Newness scores were collected from the subset of survey panelists who did not own the product but intended to acquire it in the next six months. Newer products had slightly lower penetration rates in the CBS panel ($r = -.07$, $p < .001$), as we show in Table 1.² We present evidence of nomological validity in the studies that follow, showing that newness scores predict various outcomes that are consistent with theory after we control for penetration and price.

Newness predicts acquisition intentions. We fit a binary logit model to participants' responses to whether, in the next six months, they intended to buy a product they did not currently own (1 = yes, 0 = no).³ Our model included mean product newness and controlled for participant-specific fixed effects [P(Stating purchase intention) = f(mean newness, participant dummy)]. Intention to buy unowned products in the next six months decreased when mean newness increased ($b = -.78$, $\chi^2 = 917.30$, $p < .001$), a result that was unchanged by the addition of covariates for price of the technology and penetration of the technology in the sample as a whole. The related odds ratio estimate ($\exp[b]$) is .46, indicating that the odds of stating the intention to buy a new product decrease by a factor of .46 for a one-point increase in the product newness score. The model predicts that respondents are more than four times as likely to intend to acquire least-new products (e.g., plasma television) as they are to intend to acquire most-new products (e.g., blogging).

Our analysis is somewhat unusual because the predictor scores (mean newness) are collected only from participants who had positive intentions. This has the attractive feature of eliminating self-generated validity as an explanation of the correlation (Feldman and Lynch 1988), but readers may wonder whether nonintenders had different perceptions of newness. In Study 3, we show that people who intend and do not intend to buy these products have similar perceptions of newness.

Discussion

According to Hoeffler (2003), RNPs are extreme on both desirability (the ability to do new things) and feasibility (the need to change behavior to enjoy benefits), and INPs are more moderate on both, which might lead to the expectation that consumers would be more positive about RNPs than about INPs. Our finding that distant-future intentions are lower for RNPs than for INPs seems to clash with con-

strual theory. However, Zhao (2006) finds that people thinking about buying INPs in the distant future focus on desirability, as construal theory suggests, but people thinking about RNPs in the future have thoughts that are an even mix of desirability and feasibility. Lower intentions for RNPs could also result from loss aversion (Gourville 2006), or RNPs might be discounted because of uncertainty from missing information (Meyer 1981; Simmons and Lynch 1991).

Although theoretically overdetermined, our empirical findings have practical significance. The key implication for marketers of new technologies is that anything that makes their product seem newer actually discourages consumers in the untapped market from forming a positive intention to acquire. Intention to adopt is depressed by the uncertainty of the benefits of a new product, the uncertainty of the cost-benefit trade-offs, or the perception that new things are possible but require a change in behavior to enjoy the benefits. If someone is attempting to market a product that might be perceived as new under these criteria, it is in the marketer's interest to position the product as less revolutionary than it may really be, consistent with Hoeffler, Moreau, and Kubowicz-Malhotra (2006), who show that positioning RNPs on their less new attributes leads to more acceptance. Before drawing this conclusion, however, we examine how newness affects the likelihood that consumers will actually follow through on a stated intention to acquire a new product.

STUDY 2: NEWNESS AND FOLLOW-THROUGH ON STATED INTENTIONS

In Study 2, we returned to Study 1 respondents who intended to acquire one or more INP or RNP. On the basis of construal theory, we predicted that intenders would be less likely to follow through on their positive purchase intentions for newer products (H_1) and that this effect of newness on follow-through would increase with time after a statement of a positive intention to acquire (H_2). As long as RNPs have lower feasibility than INPs and the relative weight of feasibility versus desirability is lower when people judge intention in the distant future than make a decision at the point of purchase, both H_1 and H_2 follow.

Method

Participants. Of the 2692 participants in Study 1, 60% (1622) reported an intention to buy within six months at least 1 of either the 12 products we classified as really new or the 10 we classified as incrementally new. Approximately four months after Study 1, we invited these 1622 people to participate in a follow-up study, and 38% (620) agreed to do so (52.7% female, mean age of 38; in Study 1, these participants reported owning 4.3 INPs and 3.4 RNPs on average). Compared with participants who agreed to participate in Study 2, those who declined did not differ in age, gender, or the number of the 22 products already owned.

Procedures. Four months after Study 1, we e-mailed the 1622 intenders and provided them with a link to the Study 2 survey's homepage, which captured their respondent identification number. We then presented participants with the RNPs and INPs they reported in Study 1 that they intended to buy in the next six months. We asked participants to indicate for each product whether they bought the

²On average, participants reported owning 9.3 (33%) of the 28 new products, including 42% of the 10 products classified as INPs and 26.7% of the 12 products classified as RNPs.

³The 2692 participants reported owning 24,912 of the 28 new products, leaving 50,464 products participants did not own and for which they were asked to report their six-month purchase intentions.

product since the previous survey. For the products they bought, participants indicated the month (August, September, October, or November) they bought the product. Participants then responded to a series of questions for another related research project and were thanked for their participation.

Results

Following through on intentions. We fit a binary logit model of participants' reports of whether they bought a product (1 = yes, 0 = no) as a function of average product newness and participant random effects to control for within-subjects variance that could result from participants responding for multiple new products $\{P(\text{Acquiring}|\text{Stated intention}) = f[\text{mean newness, participant (random)}]\}$. Consistent with H_1 , participants who stated an intention to acquire a newer product were less likely to report acquiring the product ($b = -1.17, \chi^2 = 16.84, p < .001$). Figure 1 shows the results; again, error bars denote plus/minus one standard error. The predicted probability of follow-through is twice as high for the least-new products as for the most-new products studied. These results are strengthened by the addition of penetration rate and price to the model ($b = -1.15, \chi^2 = 48.67, p < .001$).

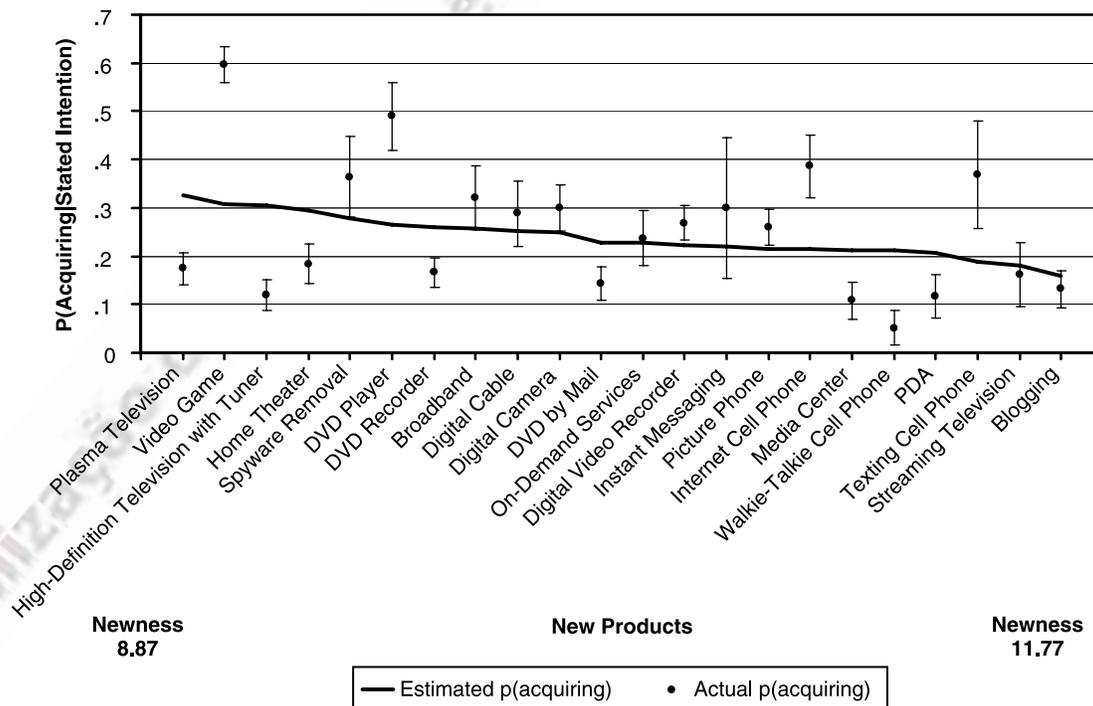
Timing of acquisition. We asked participants to provide the month they bought the product they reported buying since the Study 1 survey. H_2 predicted that the negative effect of newness on follow-through would become stronger with the passage of time after a statement of intention to acquire. We examined the conditional probability

that a person would buy a new product in the n th month after stating an intention to buy within six months, given that he or she did not buy the product in a previous month. Per Allison (1995), we structured participants' responses for a given new product so that a record for a participant was created in the data set for the focal product for each period after intention formation until the participant reported acquiring the product, after which no further records were created for the participant.

Specifically, for each month from August/September 2004 to November 2004, we used the reported purchase months to code whether, in the given month, participants bought the products they intended to buy. We removed participants who reported buying a product in a given month from the sample for subsequent months. Thus, a person who reported buying a product in October 2004 would have a record in the data set for that product indicating no purchase (0) in August/September 2004, a record indicating product purchase (1) in October 2004, and no record for that product for November 2004. The data were right censored; many participants did not report buying individual new products in the period monitored.

To estimate the conditional probabilities in the months after intention measurement, we modeled the data using a discrete-time nonproportional hazard-rate function (Allison 1995). We fit a binary logit model to the data set with the mean product newness scores and time-since-purchase-intention measurement (in months), as well as their interaction, as the independent variables, controlling for participant-specific fixed effects $[P(\text{Acquiring in Month$

Figure 1
EFFECT OF NEWNESS ON FOLLOW-THROUGH ON STATED INTENTIONS TO ACQUIRE



Notes: To make product names legible, the abscissa shows only the ordering of newness, not spacing. Error bars around each mean show plus/minus one standard error. The solid line shows the prediction of a logistic regression.

n|Stated intention and no acquisition by $n - 1$) = $f(\text{mean newness, month, mean newness} \times \text{month, participant dummy})$. Following procedures that Irwin and McClelland (2001) outline to spotlight the simple effect of one interacting variable at particularly meaningful values of the other variable, we mean-centered newness and coded month so that one month after purchase was scored as 0. There is no simple effect of newness on follow-through rate at the month coded as 0 ($b = .12, \chi^2 = .90$). Critically, however, we found a significant interaction of newness with month ($b = -.39, \chi^2 = 16.12, p < .001$), consistent with H_2 . The simple effect of newness became more strongly negative with time. The interaction appears in Figure 2. This result only strengthened when we added penetration rate, price, and their interactions with month to the model ($b = -.64, \chi^2 = 29.02, p < .001$).

We framed H_2 in terms of the increasing simple effect of newness as a function of months; alternatively, we could discuss the simple effect of months as a function of newness. Using the methods that Irwin and McClelland (2001) describe, we estimated the effect of time on the conditional likelihood of following through on purchase intentions at +2 SD (RNP), +1 SD (RNP), -1 SD (INP), and -2 SD (INP) relative to the 22 newness values. The simple effect of time was positive and significant for the -2 SD and -1 SD INPs ($b = .80, \chi^2 = 34.41, p < .001$; $b = .51, \chi^2 = 37.01, p < .001$); the likelihood that people followed through on their purchase intentions for the INP increased with time. The simple effect of time at +2 SD RNP was marginally negative ($b = -.35, \chi^2 = 3.64, p = .057$); the likelihood that

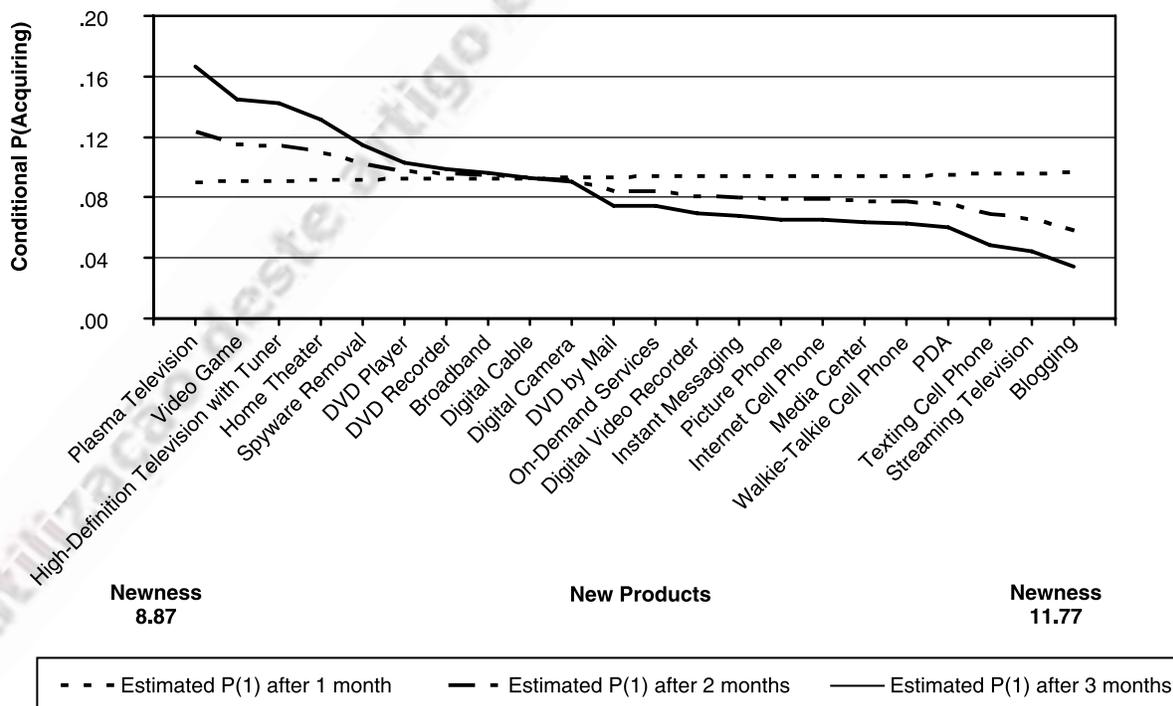
people followed through on their purchase declined with time since stating intention. These results were unchanged by the addition of penetration rate and price to the model, along with their interactions with month, except that the simple effect of time became significant and negative at +1 SD RNP and +2 SD RNP ($b = -.28, \chi^2 = 3.98, p = .046$; $b = -.76, \chi^2 = 11.87, p < .001$).

Discussion

Implications for marketing research on new products. Study 2 adds to the body of work on use of intentions in new product forecasting and to an emerging stream of work on how standard market research measurement techniques must be modified for RNPs (Hoeffler 2003; Urban, Weinberg, and Hauser 1996). It is common in marketing forecasting models, such as BASES, to use intention to buy to forecast trial sales, often by making assumptions about the percentage of respondents checking the top boxes in intention scales who will actually follow through to purchase (Clancy, Krieg, and Wolf 2006; Morwitz 2001; Morwitz and Schmittlein 1992). The key implication of our research is that standard deflators will be larger for RNPs than for INPs. Jamieson and Bass (1989) find that the deflators required are larger for durables than for consumer packaged goods; perhaps this difference can be explainable, at least in part, by the greater psychological newness of durables. Moreover, prior research has not tested how the intention-to-purchase deflators may differ as a function of temporal distance (Morwitz 1991). Figure 2 suggests that for RNPs, people are progressively less likely to follow through with

Figure 2

INTERACTION OF NEWNESS WITH TIME ON FOLLOW-THROUGH ON ESTIMATED HAZARD RATE OF ACQUIRING IN MONTH N GIVEN A STATED INTENTION TO ACQUIRE IN SIX MONTHS AND NO ACQUISITION BY MONTH N - 1



Notes: To make product names legible, the abscissa shows only the ordering of newness, not spacing.

increasing temporal distance, but for INPs, the opposite is true.

Theoretical issues. Our findings from Study 2 largely agree with deductions from combining Hoeffler's (2003) characterization of RNPs with temporal construal theory (Trope and Liberman 2003). Construal theory posits that the probability of follow-through should decline for all products with greater temporal distance between the time of intention judgment and the time of decision, but follow-through should decline more rapidly for psychologically newer products characterized by more high-level benefits and low-level costs. We observed that probability of follow-through declined with time for RNPs, consistent with the work of Castaño and colleagues (2008), but follow-through actually increased over time for INPs. This increase requires a theoretical explanation that goes beyond construal theory.

Various mechanisms could produce a positive main effect of time that might combine additively with the mechanisms of construal theory or contribute to the time \times newness interaction. A mere measurement effect of asking intentions about subsequently performing a behavior might cause a positive effect of time on follow-through. Dholakia and Morwitz (2002) find that measuring attitudes toward banks increased patronage of banks and that the effects on behavior increased for the first six months, with the maximum impact occurring several months after the survey. Levav and Fitzsimons (2006) conjecture that such persistent mere measurement effects are caused by respondents forming "implementation intentions," particularly when they can easily mentally represent the behavior. An implementation intention is an intention that states a goal to perform behavior X along with procedures by which a person will attain the goal to do X and the circumstances under which X will be accomplished. Research suggests that such concrete,

contextualized thinking dramatically increases the probability of following through on intentions (Gollwitzer 1999).

Mental representation of buying a new product might be easier for INPs than for RNPs. Dahl and Hoeffler (2004) show that people have a difficult time visualizing themselves using RNPs. Study 3 tests this line of reasoning that positive intentions will be more concrete for INPs than for RNPs (i.e., more likely accompanied by implementation intentions).

H₃: Consumers responding positively to a question about intention to buy are more likely to form implementation intentions for INPs than for RNPs.

STUDY 3: NEWNESS AFFECTS FORMATION OF IMPLEMENTATION INTENTIONS

Method

Participants. One hundred seven MBA students at Duke University were recruited to participate in a two-session research study and were paid \$15 for completing both sessions. We focus on measures relevant to testing H₃, which we collected in the first session.

Procedures. Participants were presented with a list of 22 new communications and entertainment products and services (e.g., satellite radio, DVD recorder, flat-screen [plasma] television, portable video game player) shown in Table 2. They were asked to identify those they currently owned and those they intended to acquire in the next six months.

For each product they did not currently own, participants first rated the four items in the formative product-newness index that we previously described in Study 1. Because of our small sample size here compared with Study 1, we surveyed even participants who did not intend to acquire. Next, we asked participants to rate how informed they

Table 2
NEW COMMUNICATIONS AND ENTERTAINMENT PRODUCTS USED IN STUDY 3

New Product	N	Perceived Newness	Intenders'		Nonintenders'	
			N	Perceived Newness	N	Perceived Newness
Flat-screen (plasma) television ^a	95	9.31	31	9.16	64	9.38
Broadband Internet service (cable modem/DSL)	13	9.46	2	10.00	11	9.36
Digital cable ^a	46	9.93	12	9.50	34	10.09
Portable DVD player	84	10.01	10	9.70	74	10.05
Home theater with surround sound (Dolby) ^a	64	10.11	19	9.58	45	10.33
Satellite radio (e.g., Sirius)	81	10.23	18	10.94	63	10.03
Digital photo frame	52	10.40	9	10.67	43	10.35
DVD-by-mail service (e.g., Netflix) ^a	82	10.43	15	9.53	67	10.63
Bluetooth cell phone headset	67	10.45	16	10.38	51	10.47
MP3 player ^a	42	10.45	18	12.00	24	10.92
On-demand digital cable service (e.g., HBO On Demand) ^a	77	10.68	13	10.08	64	10.80
DVD player with high-definition up-conversion	53	10.75	20	10.95	33	10.64
Cell phone with Internet/e-mail access ^a	51	10.84	13	11.08	38	10.76
Global positioning navigation system	93	10.85	19	11.42	74	10.70
Digital camcorder ^a	76	10.93	15	10.13	61	11.13
DVD recorder ^a	67	11.10	11	11.73	56	10.98
PDA (without wireless Internet service) ^a	61	11.16	18	11.28	43	11.12
Tablet computer	73	11.42	15	11.27	58	11.47
Portable video game player (e.g., Sony PlayStation Portable)	80	11.48	8	10.63	72	11.57
Digital video recorder (e.g., TiVo, Digital video recorder from Time Warner cable) ^a	68	11.48	14	12.14	54	11.33
Computer-to-Computer telephone service (e.g., Skype)	60	11.87	19	11.84	41	11.88
Blogging service ^a	44	13.41	9	12.67	35	13.60
Weighted average	65	10.75	15	10.72	50	10.79

^aProduct also used in Studies 1, 2, and 4.

believed they were about the product on a seven-point scale anchored by “completely uninformed” (1) and “completely informed” (7) (Davidson et al. 1985). Finally, we measured formation of implementation intentions (concrete intentions) by asking participants to agree or disagree with the statement “I’ve thought about exactly where and when I would [buy/sign up for] a [product name/service name]”; they responded on a five-point scale ranging from “strongly disagree” to “strongly agree.”

Results

Indexing product newness. We indexed product newness as we did in Studies 1 and 2, with two exceptions. First, participants again rated the four formative newness items only for products they did not already own, but we included responses both from those (few) who intended to acquire and from those who did not intend to acquire but expressed at least moderate familiarity with the product or service. Table 2 lists the 22 products we used in Study 3 and their average newness ratings. As in Study 1, we calculated interjudge reliability for mean newness (.91) and for the four newness components (.86–.89). Second, the list of 22 products and services only partially overlapped because more than a year passed between the studies. Thirteen products were common to the product lists for both Study 1 and Study 3 (e.g., blogging service, digital cable, digital video recorder, DVD-by-mail service). The correlation of the average product newness scores across these two studies for these 13 products is .86, suggesting that newness perceptions of products are temporally stable among those who do not own them.

Implementation intentions. For the products participants intended to acquire, we regressed implementation intention ratings against mean-centered average product newness, a mean-centered measure of how informed people were about the product, and a participant dummy [$II = f(\text{mean newness, informedness, participant dummy})$]. Formation of implementation intentions was positively related to how informed intenders were about the product or service ($b = .29$, $F(1, 42) = 11.36$, $p = .002$). Consistent with H_3 , we found that product newness had a significant, negative effect on the formation of implementation intentions ($b = -.29$, $F(1, 45) = 8.87$, $p = .005$). Intenders formed implementation intentions less often for RNPs than for INPs.

Discussion

The results of this study show that intenders are less likely to form implementation intentions for RNPs than for INPs. This may help explain our findings from Study 2 that the likelihood of following through on expressed intentions to acquire RNPs decreases with time but follow-through for INPs increases with time.

Implementation intentions are intentions that are more concrete, representing context of planned behavior. Abstractness or concreteness of representation is the foundation of construal level (Trope, Liberman, and Wakslak 2007). If newer products are represented more abstractly, newness may be another determinant of psychological distance, along with hypotheticality and temporal, geographic, and social distance (Lynch and Zauberman 2007). Support for this conjecture would be a contribution to research on construal theory and to theory of RNPs.

Study 4 tests another implication of the posited abstract representation of newer products—namely, that consumers

think more abstractly about use of RNPs than about use of INPs immediately before acquiring them and that this is associated with inaccurate estimates of the amount of initial use of RNPs. A *New York Times* story (Hafner 2003) describes the plight of consumers who buy cutting-edge electronic gadgets, only to use them lightly, if at all. Thompson, Hamilton, and Rust (2005) observe that consumers give more weight to product capability and less weight to usability when they evaluate products before use than when they evaluate products during or after use, leading consumers to tend to choose overly complex products that lead to “feature fatigue.”

Disuse of new products has negative consequences for buyers and sellers. For the buyer, disuse of a newly purchased product implies a waste of money and time in searching for the product and becoming familiar with it, as well as other forms of psychological distress (Mick and Fournier 1998). When a product is purchased but not used as expected, this is likely to lead to negative word of mouth that will dampen others’ purchases (Moldovan, Goldenberg, and Chattopadhyay 2006). Buyers who use a product less than expected will be disinclined to invest further in the technology (Farley et al. 1987).

In Study 4, we identify consumers who are within a week of acquiring a new technology product or service and ask them to describe in their own words how they expect to use the technology in the first week after acquisition. We expect that consumers will represent the use of newer products or services more abstractly than the use of less new products. Therefore, when asked to predict the anticipated use, consumers are likely to describe their use of an RNP with superordinate, high-level descriptions and to describe their use of an INP with subordinate, low-level descriptions of the activities.

H_4 : Consumers acquiring RNPs represent their initial use more abstractly than consumers acquiring INPs.

In turn, more abstract representation of initial use should be associated with inaccurate estimation of the amount of initial use. Therefore, we also measured the quantity of expected use in the first week after acquisition and compared this with reported actual use after a week of ownership.

H_5 : Expected and actual use are more discrepant for RNPs than for INPs.

STUDY 4: USE OF RNPS AND INPS

Method

Participants. Participants were recruited from the CBS Television City online panel as part of another project. Our recruiting procedures for Study 4 required that we identify consumers who were within a week of acquiring one of the 12 RNPs or 10 INPs used in Studies 1 and 2. We recruited consumers who would agree to be surveyed at three different times: a week before acquisition, one to two weeks after acquisition, and six weeks after acquisition. We report here only portions of the data from the first two waves.

Participants were paid \$20 for agreeing to participate in the study, \$5 for each subsequently completed survey, and a \$15 bonus for completing all three surveys, or \$50 in total. Two hundred fifty participants agreed to participate in November 2004. We sent them weekly e-mail reminders

that inquired whether they were within seven days of acquiring the product in question, and we directed them to the Wave 1 survey Web site if they said yes. Of these respondents, 116 completed the Wave 1 survey, and 63 completed both the Wave 1 and the Wave 2 surveys. In October 2005, we recruited another 1011 members of the panel to participate. They were paid \$10 for agreeing to participate, \$6 for each subsequently completed survey, and a \$20 bonus for completing all three surveys, or \$48 in total. Of these, 528 participants ultimately completed the Wave 1 survey, and 238 completed the Wave 2 survey.

Wave 1 survey. After participants identified a product they expected to acquire in the next seven days, we asked them to complete the Wave 1 survey. First, we asked participants to provide a one- to two-paragraph description of their envisioned use of the product during the first week it was available to them. Second, we asked participants four questions about their expected use of the product in the first week it is available to them:

1. "How many minutes or hours do you expect to spend reading through any user instructions for (Product X) in the first week after you have it available to you in your home? (Please use decimals to indicate minutes rather than hours.)"
2. "How many hours do you expect to spend using (Product X) in the first week after you have it available to you in your home?"
3. "On how many separate occasions do you expect to use (Product X) in the first week after you have it available to you?"
4. "What percentage of the available functions or features of (Product X) do you expect to use at least once in the first week after you have it available to you?"

Participants then responded to a series of items for another related research project. They were then told that they would receive an e-mail inviting them to complete a second survey one week after they indicated they would have the new product available for their use. Approximately seven days after the day they had indicated the product would be available, participants received an e-mail inviting them to complete the Wave 2 survey.

Wave 2 survey. In Wave 2, we first asked participants whether they acquired the new product and, if so, when. We then asked participants who acquired the product and had it available for 7–21 days to give a one- to two-paragraph description of their envisioned use of the product in the next week. We then asked participants about their actual use of the product:

You acquired (Product X) (Z) days ago. Please answer the following questions about your actual use of (Product X) in the first seven days after you got it and had it available at home for your own use:

- "How many minutes or hours did you spend reading through any user instructions for (Product X) in the first week after you had it available to you in your home? (Please use decimals to indicate minutes rather than hours.)"
- "How many hours did you spend using (Product X) in the first week after you had it available to you in your home?"
- "On how many separate occasions did you use this product in the first week after you had it available to you in your home?"
- "What percentage of the available functions or features of (Product X) did you use at least once in the first week after you had it available to you in your home?"

Participants then responded to items for a related research project and were dismissed.

Results

Differing product construals. A total of 602 participants provided free-form responses describing their expected use of a new product they intended to acquire. We dropped 40 of these participants who erroneously provided responses for more than one product. A total of 296 participants provided responses after they had acquired a new product. These responses were decomposed into idea units describing how the participant expected to use the product. In line with the work of Liberman and Trope (1998), these idea units were then coded for abstractness by assuming that superordinate, high-level descriptions of an activity fit the structure "[description] by [activity]," whereas subordinate, low-level descriptions fit the structure "[activity] by [description]." Consider the activity "taking pictures with my digital camera." The high-level description of this activity as "capture memories" fits the first structure (e.g., "I capture memories by taking pictures with my digital camera") but not the second structure (e.g., it is odd to say, "I take pictures with my digital camera by capturing memories"). In contrast, the low-level description of the same activity as "setting the camera on flash mode" fits the second structure (e.g., "I take pictures with my digital camera by setting it on flash mode") but not the first structure (e.g., "I set my camera on flash mode by taking digital pictures"). Three coders, blind to the hypotheses, coded each idea unit on whether its structure was superordinate, subordinate, ambiguous, or none of these. Idea units with superordinate structure were coded as 1, and idea units with subordinated structure were coded as -1. Idea units whose structure was identified as none or ambiguous were coded as 0. Two coders coded all the idea units. When these two coders disagreed, the third coder would code the idea units. If the third coder agreed with one of the first two coders, the third coder's coding was used. Otherwise, the third coder chose between the first two coders' responses. We averaged the codings for each participant's idea units for a wave to create an abstractness score for his or her envisioned product use for that wave. Higher scores indicated more abstract responses.

We analyzed the abstractness scores for participants with mean newness and the response wave as predictors while controlling for participant and the time of recruitment [Abstractness score = $f(\text{mean newness, participant, wave, recruited group})$]. In support of H_4 , participants construed newer products more abstractly ($b = 1.85$, $F(1, 596) = 36.64$, $p < .001$). The two recruitment groups differed with the previous participants providing more abstract responses, but the two groups did not differ in terms of the effect of product newness on response abstractness.

Overestimating new product use. To examine how well calibrated consumers were in their estimation of their new product use, we examined participants' responses to how long they expected to use the product and how fully they expected to use the product. We dropped 12 of the 301 participants who completed the Wave 2 survey but not the Wave 1 survey. We calculated each participant's overestimation of feature use and time of use by subtracting actual use from expected use and dividing the difference by expected use [Overestimation = $(\text{Expected} - \text{Actual}) / \text{Expected}$].

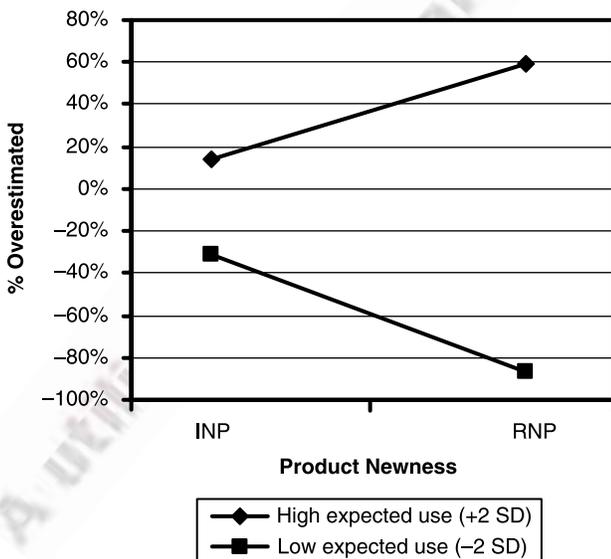
Expected]. This enabled us to compare products with different typical levels of use per week. We Winsorized the top and bottom 1% of the distribution to eliminate the influence of outliers. We then standardized participants' expected usage responses across all respondents ($M = 0$, $SD = 1$) to use this as an independent variable in predicting degree of overestimation for our tests of H_5 . If calibration is perfect, there should be no simple effect of expected use, and our overestimation index should equal 0. However, if participants are miscalibrated by being insufficiently regressive in their predictions, those expecting a high level of use will overestimate, and those expecting a low level of use will underestimate.

We examined the effect of product newness on usage overestimation by performing univariate analyses of covariance on participants' overestimation values with mean-centered product newness, standardized expected usage, and their interaction as predictors along with main effects and interactions of recruitment group.⁴ For two of our four measures, the results support H_5 . For the percentage of a product's features participants used, we found a positive main effect for expected feature usage ($b = .48$, $p < .001$). Because newness was mean centered, this implies that for a product of average newness, as expected feature usage increases, feature usage overestimation also increases. Consistent with H_5 , we found a significant interaction between product newness and expected percentage of features used ($b = .28$, $p = .011$). Figure 3 shows that participants who expected to use more product features than the average person overestimated their feature usage to a greater degree for RNPs than for INPs. Participants who expected to use

⁴We did not find significant differences between the sets of recruited participants in either analysis of covariance.

Figure 3

INTERACTION OF EXPECTED USE WITH NEWNESS ON PERCENTAGE OVERESTIMATION [(EXPECTED USE – ACTUAL USE)/EXPECTED USE]



Notes: INPs are -2 standard deviations from the mean in newness, and RNPs are $+2$ standard deviations from the mean in newness.

fewer product features than the average person underestimated their feature usage to a greater degree for RNPs than for INPs.

We found a similar pattern of results in participants' overestimation of the time they would spend using a new product. For products of average newness, we found a positive, simple effect of expected usage ($b = .049$, $p < .001$). We found an interaction between the expected time spent using a new product and product newness ($b = .29$, $p < .02$). In support of H_5 , as product newness increased, participants showed poorer calibration between their expectations and their actual use. The effect of expected use on percentage overestimation was greater for newer products. We found no such interactions for number of usage occasions or time spent reading instructions.

Discussion

In Study 3, we found that consumers think in a less specific way about purchasing psychologically newer products, making them less likely to form "implementation intentions." In Study 4, we found that people similarly think more abstractly about RNPs than INPs when they are contemplating how they would use the products in the first week after purchase. We also found that expectations of extent of use were well calibrated for INPs but were miscalibrated for RNPs for two of our four measures of use.

GENERAL DISCUSSION

Summary

At the outset of this article, we described Segway's success at raising awareness for its revolutionary product that just would not sell. In Study 1, we surveyed members of the CBS Television City online panel about their purchase intentions for 28 new communications and entertainment products; we found that they were less likely to report intentions to buy RNPs than INPs. In Study 2, we found that among Study 1 participants who expressed positive intentions to buy RNPs or INPs, follow-through was lower for those intending to buy newer products.

In Study 2, we found that as the months passed after participants expressed new product purchase intentions, follow-through was negatively related to psychological newness. Temporal construal theory predicts that follow-through should be lower for RNPs than for INPs, because the former are characterized by more extreme benefits and more extreme costs or constraints. The greater the difference in temporal perspective between the time of intention judgment and the more extreme the profile of costs and benefits, the more likely the consumer should be to fail to follow through on an intended purchase.

We also found that likelihood of follow-through increased for INPs and decreased for RNPs. That is, a momentum toward product purchase grew in participants who intended to buy INPs, but momentum never developed in participants who intended to buy RNPs. For marketers of RNPs, such as Segway, this implies that marketing actions intended to build demand for RNPs far in advance of launch may provide little value after product launch (cf. Montaguti, Kuester, and Robertson's [2002] advice to preannounce radically new products).

Several psychological mechanisms may contribute to this pattern. In Study 3, we found that consumers were less

likely to form implementation intentions for RNPs than for INPs, perhaps contributing to a lower likelihood of fulfillment over time in Study 2 (Gollwitzer 1999). In Study 4, we found that people who were within a week of acquiring INPs and RNPs represented their expected use more abstractly for RNPs. Moreover, we found that people were largely calibrated about expected use for INPs but grossly miscalibrated for RNPs.

Implications

These results are important for both consumer researchers and marketing practitioners. For consumer researchers, our findings from Study 2 show how construal theory can provide insights into how temporal distance differentially affects the intention–behavior link for RNPs versus INPs. Our findings from Studies 3 and 4 contribute to work on construal theory by showing that psychological newness of products produces abstract thinking similar to other factors that affect construal level (see Trope, Liberman, and Wakslak 2007), and we use that insight to connect work on implementation intentions (Gollwitzer 1999) and construal theory—a connection that we have not observed in prior work.

For market researchers, we found in Study 2 that for long-term purchase intentions, the intention–behavior link becomes weaker as consumers experience greater uncertainty in evaluating the products they intend to buy, but only after a delay. We would expect few product-newness-driven differences in purchase intention follow-through when consumers expect to buy a product shortly after expressing a purchase intention. However, we would expect significant product-newness-driven differences in follow-through rates when purchase intentions are formed well in advance of expected purchase opportunities. It is common in new product forecasting models (e.g., BASES) to deflate intention-to-buy measures. Our findings show that intentions to buy require more deflating for RNPs than for INPs, particularly long-term intentions.

For marketing managers, our findings highlight the challenges in marketing RNPs. We recounted unsuccessful efforts by Segway to create prelaunch buzz to stimulate intentions to buy when the product was released. Our findings from Study 2 suggest that for RNPs, purchase intentions formed long in advance result in little follow-through. Study 2 implies that prelaunch buzz may be more successful for INPs as follow-through increases over time. Thus, for example, a new video game title that is incrementally new by Hoeffler's (2003) criteria may indeed benefit from prelaunch buzz.

As marketers consider how to position RNPs, they must be aware that consumers are less likely both to form intentions to buy RNPs and to follow through on those intentions. Marketers may be better served by positioning a product such as the Apple iPhone as an incremental rather than a revolutionary improvement (Hoeffler, Moreau, and Kubowicz-Malhotra 2006). Moreover, the finding that consumers are so miscalibrated about their extent of use of RNPs implies that sellers of RNPs should expect to have more delighted customers but also more seriously disappointed customers than would be typical of INPs. This may imply that RNPs have both higher returns and more detractors (Reichheld 2006), with negative word of mouth from

those who find their RNP to be less useful than anticipated (Moldovan, Goldenberg, and Chattopadhyay 2006).

In our research, psychological newness appeared to be an unalloyed negative for marketers. However, the novelty associated with a psychologically new product may make it more likely that news media will carry stories about the new product and that consumers will pay attention to these stories or advertisements about the product (Alexander 2008). Similarly, because RNPs may be perceived as higher in novelty and usefulness than INPs, consumers may be more likely to share word-of-mouth information for RNPs, driving diffusion (Moldovan, Goldenberg, and Chattopadhyay 2006). Further research should examine the broad information environment in which people learn about new products across the full scope of processes, from becoming aware to forming intentions to following through and using RNPs and INPs.

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