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"Ten Million Readers Can't be Wrong!," or Can They? On the Role of Information About Adoption Stock in New Product Trial

Coby Morvinski,[a] On Amir,[b] Eitan Muller[a, c]

[a] Interdisciplinary Center (IDC) Herzliya, Herzliya 46150, Israel; [b] University of California, San Diego, La Jolla, California 92093;
[c] New York University, New York, New York 10012
Contact: cobym@idc.ac.il (CM); oamir@ucsd.edu (OA); emuller@stern.nyu.edu (EM)

Abstract. Most new-product frameworks in marketing and economics, as well as lay beliefs and practices, hold that the larger the stock of adoption of a new product, the greater the likelihood of additional adoption. Less is known about the underlying mechanisms as well as the conditions under which this central assumption holds. We use a series of field and consequential choice experiments to demonstrate the existence of nonpositive and even negative effects of large adoption stock information on the likelihood of subsequent adoption. The results highlight the degree of homophily with the adopting stock as well as the level of customer uncertainty as key characteristics determining the nature of the effect of stock information. In particular, information about a large existing adoption stock generates a positive effect on adoption only under moderate customer uncertainty combined with sufficient homophily; in other levels of uncertainty and/or homophily we find effects ranging from null to negative. This is the first direct test and demonstration of the intricate role of information about a large stock of adoption in the new product diffusion process, and it carries direct implications for marketers.

Keywords: product diffusion • new product adoption • social influence • homophily

Introduction

Most, if not all, new-product frameworks in economics and marketing, as well as practitioners' beliefs, hold that information about a large stock of initial sales of a new product increases the likelihood of subsequent adoption, presumably because of its positive signal to potential customers (e.g., Bass 1969, Mahajan et al. 1990). Evidently, advertisers use statements like "Ten million housewives can't be wrong [about purchasing the product]," and "Over 19 billion served," to attract additional customers. However, it is less clear *when* a customer will draw a positive inference from information about a large initial sales volume, if at all. We use a series of field and consequential choice experiments to demonstrate the existence of nonpositive and even negative effects of large adoption stock information on the likelihood of subsequent adoption. The results highlight the degree of homophily with the adopting stock as well as the level of customer uncertainty as key characteristics determining the nature of the effect of stock information. In particular, information about a large existing adoption stock generates a positive effect on adoption only under moderate customer uncertainty combined with sufficient homophily; for other levels of uncertainty and/or homophily, we find effects ranging

from null to negative. That is, under some conditions, communicating about a large adoption stock may have a negative effect on purchase likelihood. We find these effects repeatedly and for a variety of product types. We discuss this complex relationship in the context of social influence and information credence, and we conclude with implications for marketing practitioners.

Research around the diffusion of new products and the adoption decision has centered on the information that the customer transmits and receives (Muller et al. 2009). In general, individuals can adopt innovation as a result of two types of information: *firm-based influences* (*exogenous or external*), such as advertising and other communications by the firm, and *social influences* (*endogenous or internal*) resulting from peer interactions in the social system, based on word-of-mouth (WOM) and other interpersonal communications (Peres et al. 2010, Mayzlin 2006). The main difference between the two is the locus of control of information. Diffusion processes have become much more complex than the scenario envisioned by the Bass model (Bass 1969), and the validity of the many basic assumptions of the original model has been challenged. For example, while in the past most social influences were due to WOM and direct communication mechanisms, higher

information and media availability these days enable individuals to be influenced by others without direct communications and to learn about the current stock of adoption (hereafter CSA) via firm-based means. Irrespective of the source of the information, when an individual's purchase choices are influenced by others (which includes information about CSA), the process broadly falls under the umbrella of social influence.

Social influence has been a central area of research across the social sciences. Employing a variety of related theories such as *social proof*, *social comparison*, *conformity and social norms*, *herding behavior*, and *information cascades*, researchers have demonstrated that people are greatly influenced by the behaviors of others (Asch 1951, Banerjee 1992). Notably, social influence is most effective when uncertainty is high (Wooten and Reed 1998) and when following the lead of others that are perceived to be close, similar, or aspirational (Cialdini 2001, p. 140; Festinger 1954; Abrams et al. 1990; Burn 1991). Thus, we will focus on customer *uncertainty* and *homophily* as critical factors in the influence process.

While *homophily* is defined as the tendency of individuals to associate themselves with similar others (or to hope to), customer uncertainty may be multifaceted. Customers may be uncertain of the new product's quality, about its fit with their preferences, or even about their own preferences. Customer *uncertainty* is, therefore, derived from a lack of objective and subjective knowledge and expertise regarding the product category, as well as the gap between the new product and related existing products. To attempt to resolve some of this uncertainty, customers rely on both the firm-based and the social information available to them at the time of decision. Importantly, while customer uncertainty may at times stem from the individual's particular needs, interest level, or preferences, in the case of new products and categories, some level of uncertainty is inevitable, due to the lack of available information and/or prior experience. In our experiments, we manipulate uncertainty independently, so that the potential correlation is less likely to matter. A firm that communicates the current stock of adoption is exogenously describing the (endogenous) state with the hope of eliciting social influence. The actual effect, however, would depend on a number of factors including the information value of the signal relative to the existing customer uncertainty, the identity of the CSA (i.e., its degree of homophily), as well as specific product/market effects. Moreover, we expect customer uncertainty and the degree of homophily alluded to in the firm-based CSA information to interact, as their various combinations affect the perceived diagnosticity, informativeness, and credibility of the firm-based information and its ability to resolve uncertainties about the quality and fit of the product.

For ease of analysis, we categorize customer uncertainty into three levels: low, moderate, and high; and CSA-customer homophily into two levels: low and high. This yields six potential combinations to be explored (summarized in Table 1). Importantly, homophily and uncertainty are not assumed to be independent, but we use a table for ease of exposition.

When uncertainty is low, little information is needed; thus, regardless of homophily, we expect a negligible effect of CSA information. When uncertainty is moderate, CSA information of high homophily is both diagnostic and useful, and it can reduce uncertainty about the quality and fit of the product. Under these conditions, we expect the canonical result of increased adoption. However, with moderate uncertainty and low homophily, there is still a positive signal about product quality (e.g., conformity), but a potential signal of low product fit (e.g., social proof depends on homophily; see also the discussion of identity-relevant products in Berger and Heath 2007). Therefore, we cannot predict the direction of the effect, as the relative strength of these two forces may vary. When uncertainty is high yet homophily is high, a firm-initiated claim about high CSA might create suspicion, reactance, or the questioning of information credibility (Clee and Wicklund 1980, Laurin et al. 2012, Goldfarb and Tucker 2011). This should lead to a null to negative effect of the CSA information. Finally, when uncertainty is high, we expect CSA information of low homophily to provide little useful information and thus to have neglectable impact on adoption.

Combining our predictions above, we suggest that CSA information may help customers resolve uncertainties about the product but only when presented in the right context. Importantly, we also propose the novel idea that in certain contexts, CSA information can have a negative impact on product diffusion. To test these hypotheses, we designed a consequential choice experiment with newly released books, a field experiment with a brand new energy supplement product for surfers, and additional experiments involving three different hypothetical new products in the lab. The general structure of the experiments conformed to the above analyses and is described below. We then follow with experiment specifics and a discussion of the results and their implications.

Experiments
General Design of Experiments
The experiments were designed to explore the customer's adoption decision regarding a new product as a function of uncertainty and homophily levels. Our main dependent measure was choice (i.e., the proportion of participants who adopted the product). To study the effect of CSA information, we manipulated

Table 1. The Effect of Large Current Stock of Adoption (CSA) Information on the Purchase Likelihood for Different Levels of Homophily and Uncertainty

		Uncertainty		
		Low	Moderate	High
Homophily	Higher	No effect (ceiling effect) *Experiment* 3	Positive effect (highly diagnostic information) *Experiments*: 1, 2, 3	Negative effect (low credibility and resultant reactance) *Experiments*: 1, 2
	Lower		Unclear effect (tension between low fit and high quality signals) *Experiments*: 1, 2, 3	No effect (floor effect)[a] *Experiments*: 1, 2, 3

[a]It is important to note that this floor effect is not a theoretical derivation but an empirical artifact. It is not impossible to imagine a state of high uncertainty where even a relatively low homophily signal may affect behavior. However, with the already small purchase likelihood of new products, we were unable to create such a state in our experiments.

the stock size communicated (large-stock versus no-stock-size information), its identity (higher homophily versus lower homophily), and the customer's uncertainty level (via the provision of either detailed or vague product information) in a between-participants design. This resulted in eight treatment conditions, where participants first received the above information and then decided whether to buy the product. Note, we chose to operationalize the low CSA condition as no-information about CSA, rather than information about *small CSA*, because the latter inherently carries a negative signal.

In the first two experiments (books, energy drink), participants make real consequential decisions, while in the last experiment (mattress, massage, laptop), the choice is hypothetical. We manipulate *stock size* information by including a statement about how many other individuals have already adopted the product. We manipulate *uncertainty* by including either a detailed (very informative) or a vague (noninformative) description of the new product. We manipulate the *homophily* level in the first two experiments by varying the identity of the described current adopters and matching it to the participants' self-reported identity (ex post). Furthermore, in the last experiment we hold stock identity constant and let the customers place themselves on a continuous scale with regard to their homophily with the stock. Participants in Experiment 3 also report their subjective level of expertise with the product category, an additional factor influencing product uncertainty. We then follow with a short survey administered to all participants, regardless of their purchase decision.

The description of the important details of each experiment follows, while the complete descriptions can be found in the online appendix.

Experiment 1 (Books, Online Experiment)

We offered one of two newly released books to 700 participants from an online panel and measured their willingness to obtain the books as a function of the information provided in a 2 (stock-size information: large-stock versus no-stock-size) × 2 (stock-identity: highbrow versus mid-class individuals) × 2 (product information: detailed versus vague description) between-subjects design. Participants in the large-stock condition read that the book had already attracted "*thousands of individuals*," while those in the no-stock-size condition had no information about the number of current adopters. To manipulate homophily, we relied on the increase in educational homophily as part of social status over the past two decades (Smith et al. 2014).[1] We used participants' stated level of education as a proxy for homophily with our description of the books' current stock identity. We assumed that those who report having a four-year college degree or more are more likely to perceive homophily with a stock described as "*graduate-degree holding highbrow individuals*" and those who report having a two-year college degree or less with a stock described as "*mid-class curious readers*." This resulted in categorizing 344 participants as *high-homophily* (49.1%) and 356 participants as *low-homophily*.

Finally, half the participants read a detailed description of the book and its author(s) (informative), while the other half read a vague single-sentence description of the book's main idea (less informative), which served to manipulate their uncertainty level: participants who received detailed information about the book reported being more confident in having sufficient information to make their choice than those who

read a vague description of the book ($M_{\text{detailed desc.}}$ = 4.59, $M_{\text{vague desc.}}$ = 3.98, $t[698]$ = 4.68, $p < 0.001$, one-tailed). In other words, detailed information decreased product uncertainty.

We used two different books that were published shortly before we conducted the study to implement two versions of the same experiment, as a means of conceptual replication. The first book, *The Why Axis*, is about recent findings from behavioral economics and was written by economics professors. The second book, *Talent Wants to Be Free*, discusses drivers for successful innovation and was written by a law professor. The two versions of the study shared the same design. The study participants were told that they would be entered into a lottery for a chance to win an Amazon gift certificate. As an alternative, we offered them the chance to win the book instead of the gift certificate. Although the value of the book was similar to that of the gift certificate, the book lottery offered much better winning odds than the gift certificate lottery. Online Appendix A provides the scripted information for *The Why Axis* study under the conditions of large stock, highbrow fit, and detailed information.

Experiment 2 (Energy Drink, Field Experiment)

Working with an innovative new brand, we designed an experiment in which we attempted to sell a new and unfamiliar product (a performance supplement drink) to 419 individuals, approached at on-campus and off-campus locations, at an introductory promotional price. The structure was identical to that of Experiment 1, where in each sales engagement, the salesperson communicated to the individual one of the eight scripts selected at random. After hearing information about the new drink, individuals were offered to buy it for $0.50, described as a promotional discount price. The product was a new performance supplement drink that comes in a small 2-oz. energy-shot-like bottle designed for surfers and had not been released to the market at the time the study took place. Conducting our study in a southern California beach city where surfing is extremely popular, we were likely to have a fair amount of surfing enthusiasts in our data. Research assistants who were dressed in brand-related wear supplied by the firm served as salespeople. After announcing their decision about whether they wished to buy the drink in the promotional offering, we asked the potential buyers to complete a very short "marketing research" survey. We attempted to collect post-decision information regardless of individuals' purchase decision, and all but 10 agreed to take the survey. Individuals who did not wish to complete the survey were distributed randomly across conditions.

It was not feasible to test our product information manipulation given the constraints of a field experiment, so we pretested it with 104 individuals from

Amazon Mechanical Turk (62.5% males, M_{age} = 32.2 years). After reading a description of the new performance supplement product using our field experiment stimuli, participants reported that the detailed product information led to greater product quality perceptions (M_{detailed} = 59.07, M_{vague} = 42.96, $t[102]$ = 3.98, $p < 0.001$) and increased perceived source credibility (M_{detailed} = 52.69, M_{vague} = 37.93, $t[102]$ = 3.51, $p < 0.001$), thus supporting our experimental design.

To construct the homophily measure, we generated a match measure such that those who both perceived themselves as surfers and were in the surfers condition (e.g., "…*designed for surfers*"), as well as those who did not perceive themselves as surfers and were in the nonsurfers condition (e.g., "…*people*") were all marked as high homophily ($n = 155$). Conversely, those whose condition mismatched their self-perception were marked as low homophily ($n = 179$). Finally, those who marked themselves as surfers only to a certain degree were coded as middle homophily regardless of whether they were randomized to the surfers or the nonsurfers condition ($n = 70$).[2] Individuals who fell into the *high homophily* category reported a higher preconsumption perceived product fit than those who belonged to the *low homophily* category; this difference was marginally significant ($M_{\text{high homophily}}$ = 3.08, $M_{\text{low homophily}}$ = 2.93; $t[332]$ = 1.40, $p = 0.08$, one-tailed), infusing some validity into our categorization. As a robustness check, we also created an alternative, dichotomous measure of homophily which led to a stronger, albeit still small, perceived fit difference ($M_{\text{high homophily}}$ = 3.15, $M_{\text{low homophily}}$ = 2.95; $t[403]$ = 2.16, $p = 0.01$, one-tailed) and to similar overall results in the regression analyses. The robustness check is detailed in the online appendix.

Experiment 3A (Hypothetical Products, Lab Experiments)

In general, the design of Experiment 3A followed that of the previous experiments but differed in several important aspects. Unlike the previous experiments, the 1,130 participants from an online pool (M_{age} = 30.9) in Experiment 3A faced a hypothetical choice, allowing us to test our theory with a wider range of product types (laptop, mattress, or massage treatment). Furthermore, instead of manipulating participants' homophily with the product target group directly, we used the extent of their homophily with the target group highlighted in the product description (e.g., "avid gamers" in the laptop condition) as a continuous self-reported measure of homophily ranging from "Extremely weak homophily" to "Extremely strong homophily." Thus, Experiment 3A consisted of a 3 (product type) × 2 (stock-size information) × 2 (uncertainty: high versus low) between-subject design. The laptop and massage treatment conditions mirrored the design of previous experiments. However,

in the case of the mattress condition, the product description remained constant, and instead we manipulated uncertainty around product quality and fit through source credibility: half the people read that the description was "*provided by ConsumerReports.org, the nation's premier independent product rating organization,*" while the other half read that the information was taken from "*the www.oldbedguy.com mattress blog.*" After reading the product description, participants reported whether they would buy the product for a given price, based on the information provided ($1,399, $1,199, and $59.99/hour for the laptop, mattress, and massage, respectively).

Our manipulations were effective, as participants in the large-stock information condition reported that more people had already bought the product than those in the no-stock-size information condition ($\beta = 9.33$, $t[1,122] = 6.28$, $p < 0.001$);[3] in the laptop and massage product experiments, those who received detailed product information reported that they knew more about the product than those who received vague information ($\beta = 0.38$, $t[691] = 5.13$, $p < 0.001$); in the mattress experiment, those who read information from ConsumerReports.org indicated that the product information was more credible than those who read information from the mattress blog ($\beta = 7.19$, $t[434] = 3.79$, $p < 0.001$). Moreover, receiving detailed (as opposed to vague) product information in the laptop and massage conditions also predicted higher perceived credibility ($\beta = 5.66$, $t[434] = 3.23$, $p < 0.01$), which confirms our earlier contention that detailed product information helps create trust in the information source. More importantly, perceived source credibility was correlated with the reported reduced uncertainty ($\beta = 0.16$, $t[1,122] = 5.15$, $p < 0.001$).

The relatively large number of online participants in Experiment 3 also allowed us to investigate other dimensions that potentially affect the role of uncertainty. In Experiment 3A, we let self-reported product expertise interact with CSA size, uncertainty level, and homophily, and showed that the predictions detailed in Table 1 still hold under this complex four-factor setting. In addition, Experiment 3A also demonstrates the effect of information credibility on product uncertainty.

Experiment 3B (Hypothetical Product: Mattress, Lab Experiment)

Extending the findings of Experiment 3A, we used a 2 (stock-size information) × 2 (information detail level) between-subject design retaining the mattress stimuli, but instead of manipulating the source credibility, we informed the 610 online participants (61.5% males, $M_{age} = 31.2$ years) in all conditions that they were about to read product information provided by the firm. After reading the information and using a 0–100 point scale (labeled "Very unlikely" to "Very likely") to

report the likelihood that they would buy the mattress for an introductory price of $699, participants were asked to reflect on their decision and to answer questions relating to the importance of the stock size and product description in making their decision (two participants did not answer the question about perceived CSA). As in the previous experiments, participants' responses to the two questions about the perceived current adopters and the level of product information confirmed our manipulations ($\beta = 4.65$, $t[606] = 2.7$, $p < 0.001$ and $\beta = 0.43$, $t[608] = 6.26$, $p < 0.001$, respectively). We discuss the main results of this and the other experiments in the next section.

Results

We report the results of the experiments in two parts: first, we describe the robust, consistent findings that converge across experiments, products, settings, and populations. Next we describe results that are idiosyncratic to one or a subset of the products or manipulations.

Table 2 depicts the main results of all three experiments using mean-centered binary logit models of book lottery selection (Experiment 1) and real and hypothetical purchase decisions (Experiments 2 and 3, respectively) on stock size, information quality, and homophily, as well as their interactions. Raw regressions, as well as models that include all of the control variables, can be found in Online Appendix A. Figure 1 shows the average results of each condition in the first two experiments. Across all experiments we do not find a direct positive effect of information about a large CSA (Table 2).

We do find the intricate pattern outlined by our conceptual development: a large CSA signal has no effect on adoption likelihood when uncertainly is low (Experiment 3); it has a positive effect under high homophily and moderate uncertainty (13.5%, 12.4%, and 4% increase in purchase propensity in Experiments 1, 2, and 3, respectively); and finally, it has a negative effect on adoption likelihood both with high homophily and high uncertainty (−9.6%, −14.5%, −1.8%, in Experiments 1, 2, and 3) and with low homophily and moderate uncertainty (−13%, −8.9%, in Experiments 2 and 3).[4]

In addition to the variables displayed in Table 2, from Experiment 1 we also obtain some external validity: as one would expect, education significantly predicts book choice ($\beta = 0.20$, $Z = 2.67$, $p < 0.01$) where the more educated the participants, the greater their tendency to select the book. Additionally, participants who perceive themselves as greater risk takers were also more inclined to choose the book ($\beta = 0.57$, $Z = 7.30$, $p < 0.001$), supporting the critical role of uncertainty mitigation in new product adoption (e.g., Shimp and Beardern 1982, Grewal et al. 1994). Similarly, in

Table 2. Binary Logit Model Results of Choice on Stock Size, Information Quality, and Homophily, as Well as Their Interactions

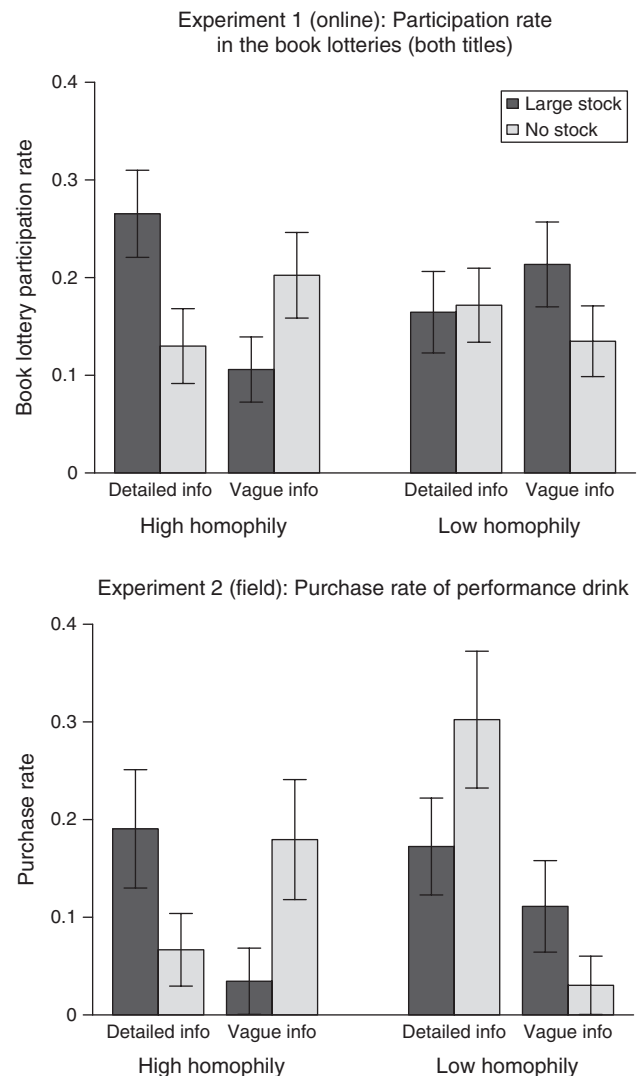|	Experiment 1	Experiment 2	Experiment 3	
			Low expertise	High expertise
	$N = 700$	$N = 404$	$N = 485$	$N = 645$
Intercept	−1.60***	−2.48**	−2.21***	−0.75***
	(0.10)	(0.71)	(0.58)	(0.15)
CSA Size (CSA)	0.16	−0.27	0.14	0.16
	(0.21)	(0.67)	(0.20)	(0.17)
Info. Detail Level (IDL)	0.14	0.08	0.21	0.36
	(0.20)	(0.55)	(0.20)	(0.17)
Homophily (HMF)	−0.01	1.05	0.03***	0.03***
	(0.21)	(1.49)	(0.004)	(0.003)
CSA × HMF	−0.18	−1.57*	0.01	0.005
	(0.41)	(0.73)	(0.01)	(0.006)
CSA × IDL	0.50	0.38	0.11	−0.32
	(0.41)	(0.77)	(0.40)	(0.34)
HMF × IDL	0.31	−1.90**	−0.002	0.02
	(0.41)	(0.59)	(0.008)	(0.01)
CSA × HMF × IDL	2.25**	2.56**	0.035*	−0.01
	(0.83)	(0.86)	(0.015)	(0.006)
χ^2 [*d.f.*]	700 [692]	394.6 [385]	590.3 [475]	788.1 [635]
AIC	655.1	323.2	610.3	808.1
BIC	691.5	399.2	652.1	852.8

Notes. Dependent variables are book lottery selection (Experiment 1), sports supplement purchase decision (Experiment 2), and hypothetical product purchase decision (Experiment 3). Standard errors are in parentheses. Experimenter (Experiment 2) and product (Experiment 3) fixed-effect coefficient estimations are not shown. Models are mean-centered for ease of interpretation; we report raw regressions as well as the entire models' estimations in the online appendix.

*p < 0.05; **p < 0.01; ***p < 0.001.

Figure 1. Experiments 1–2 Results

Experiment 1 (online): Participation rate in the book lotteries (both titles)

Experiment 2 (field): Purchase rate of performance drink

Notes. Error bars represent one standard error above and below the mean.

Experiment 2 we see that as one would expect, energy drink consumption clearly predicts individuals' purchase decision ($\beta = 1.5$, $Z = 0.33$, $p < 0.001$), indicating that energy drink consumers were much more likely to buy our product. Also, those who perceived themselves as risk takers showed a greater tendency to buy ($\beta = 0.34$, $Z = 2.1$, $p = 0.03$).

In Experiment 3A we tested the effects of expertise with the product category, an important proxy for customer uncertainty, more directly. As customer expertise is predicted to be an important moderator of the effect of product uncertainty, for clarity's sake we explore the effect of self-reported expertise separately for high-expertise (individuals who reported having less than a fair knowledge about the product category) and high-expertise customer groups (Table 2, columns 4 and 5, respectively; see Online Appendix D for a unified analysis). On average, more detailed information, as well as greater information credibility, increased the probability of buying the product ($\beta = 0.29$, $Z = 2.25$, $p = 0.02$), although the effect was

not significant for low-expertise customers suggesting that detailed information, at least in certain product categories, requires a degree of expertise to be processed. More importantly, once again we did not observe a main effect of information about a large CSA in any customer group or in the entire sample. However, familiar results emerged for those who reported low product expertise (i.e., those with some product uncertainty) for whom the interaction between the CSA information, quality information, and homophily was significant ($\beta = 0.035$, $Z = 2.19$, $p = 0.028$), corroborating the context dependence property of CSA information on new-product adoption.

To illustrate the important role of uncertainty in the effect of CSA information on new product trial, we used the binary logit model to forecast the purchase probability of each product at different levels

of homophily, CSA size, and quality information (Figure 2). The results suggest that large CSA information mostly affects customers with some (but not too much) uncertainty. Those may be either knowledgeable customers who do not have sufficient (or credible) product information, or customers with little product expertise who receive a detailed (or credible) product description. In such cases, the model predicts that large CSA information should have a negative effect when homophily is low and a positive effect when homophily is high.

However, two additional results emerge from the model. First, CSA information appears to have no effect when uncertainty is minimal: expert customers who received a detailed (or credible) product description were not affected by large CSA information. In other words, large CSA information is expected to play no role in alleviating customer uncertainty about the product's quality and fit when there is little uncertainty to begin with. Second, CSA information may also have a null to negative effect when there is too much uncertainty: large CSA information had no effect (and even a detrimental one in some low-homophily situations) on those customers with low product expertise who also received vague (or noncredible) product descriptions. This suggests that large CSA information may play no role in alleviating customer uncertainty (quality and fit) when such uncertainty is too large.

Arguably, some of our most intriguing findings suggest that when large CSA information is coupled with a vague (rather than informative) product description, the more knowledgeable the target customers are, the greater the positive influence of CSA information on the purchase decision. This suggests that experts would benefit more from stock information in the absence of other means to alleviate their (moderate) product uncertainty. On the contrary, as argued earlier, less knowledgeable customers who encounter vague product descriptions are likely to discard the CSA information and avoid the offer altogether. We designed Experiment 3B to shed light on this interesting insight.

In Experiment 3B we verify that the extent to which CSA information played an important role in participants' purchase decisions varied as a function of their expertise and the information detail level they received. That is, we test for the role of CSA information in participants' decisions, assuming that the more impactful this information was on their decision, the greater the weight they would report. Table 3 summarizes the regression results of stock information importance on information detail level and expertise (five participants failed to provide their CSA importance). As shown, both information detail level and expertise positively affected the perceived importance of CSA information in making the purchase decision

($\beta = 18.39$, $t[601] = 2.33$, $p = 0.02$ and $\beta = 5.6$, $t[601] = 4.42$, $p < 0.001$, respectively).

However, the significant negative interaction suggests that the effect of expertise is moderated by information detail level. That is, a more informative product description decreases the importance of CSA information for experts ($\beta = -3.85$, $t[601] = 2.03$, $p = 0.042$). In other words, as predicted, CSA information and an informative description are substitutes in decreasing uncertainty for the more knowledgeable customers. As is evident in Figure 3, the influence of expertise on the importance of CSA information to the purchase decision was mainly driven by the negative effect of the vague product description. Expert consumers deem CSA information more valuable to their purchase decision when the product description is vague, rather than clear. Conversely, as before, novice consumers who lack sufficient product information purport to being less affected by the CSA information, because of the high uncertainty state they are in. This underscores the role of product uncertainty in determining the effect of CSA information, as both sources of decreased uncertainty, i.e., more detailed product information and greater consumer product expertise, have similar and substitutionary effects.

Discussion

By and large, most if not all new-product frameworks in economics and marketing, as well as lay beliefs, hold that the larger the current stock of adoption of a new product, the greater the likelihood of additional adoption. Employing both controlled experiments and a field experiment we show that the influence of information about large current stock of adoption on product diffusion is more complicated than the commonplace assumption. That is, not only does information about a large stock of adoption need to refer to high-homophily individuals to increase purchase likelihood, consistent with social influence theories, it only does so when some product uncertainty exists. Otherwise, information about a large current stock of adoption may be insignificant to or even harm marketing efforts.

Participants in Experiment 1 were more inclined to choose a lottery that offered a newly released book not only when they received information that thousands of others of high homophily (similarly educated, in this case) had already adopted the book but also only when they received diagnostic information about the book. However, the effect reversed when the book description was vague. On the other hand, when the information about current readers referred to low-homophily individuals, participants did not find this information diagnostic, regardless of the detail level of the book description. Experiment 2 replicated the main results in the field, in the context of the launch

Figure 2. Experiment 3 Prediction Models of Purchase Probabilities
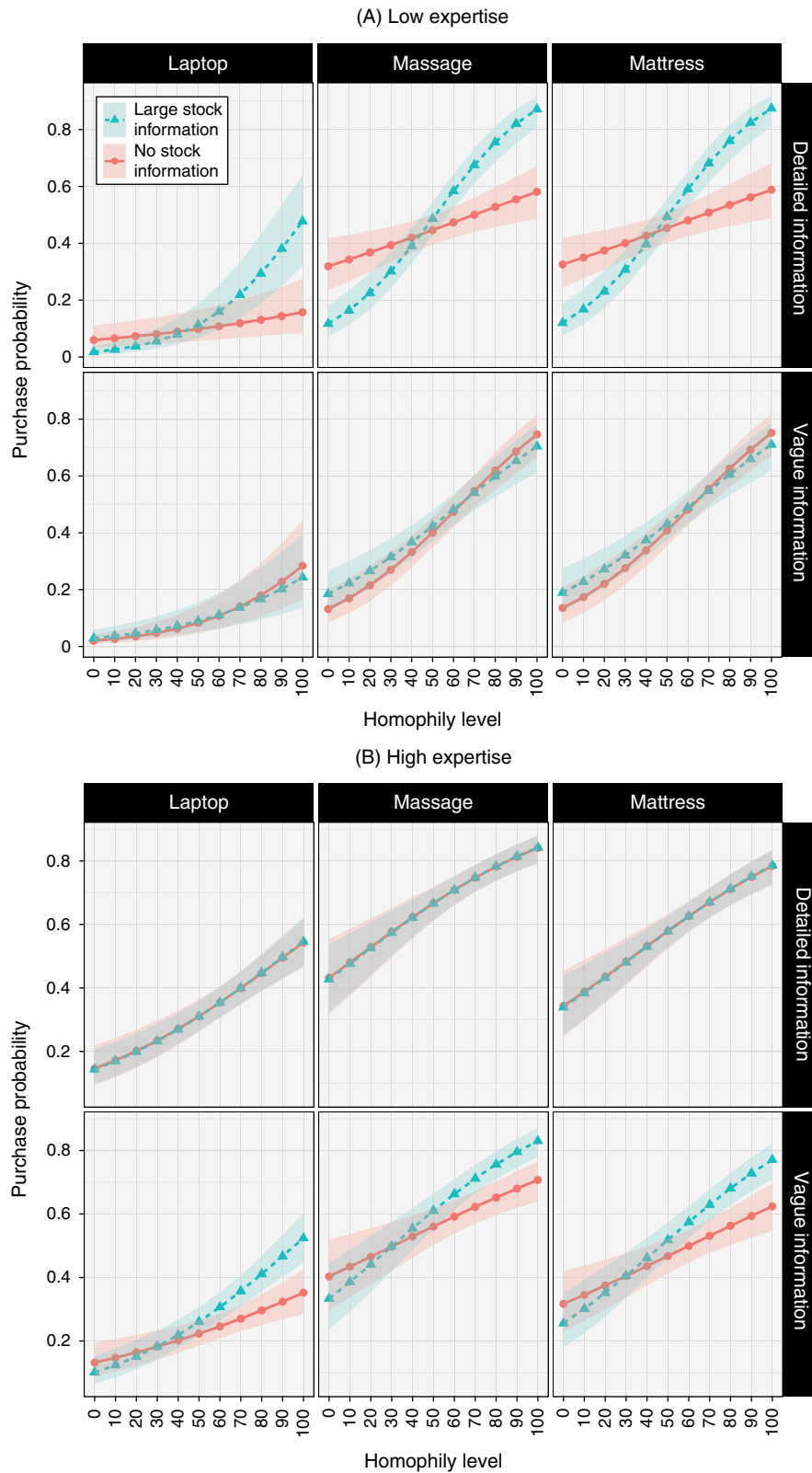
Notes. The shaded area around the prediction line represents one standard error above and below the point estimate.

Table 3. Experiment 3B—Factors Affecting the Perceived Impact of CSA Information on the Mattress Purchase Decision

	B
Intercept	36.6***
	(5.26)
Information Detail Level (IDL)	18.39*
	(7.89)
Expertise	5.60***
	(1.27)
IDL × Expertise	−3.85*
	(1.89)

Note. Standard errors are presented in parentheses.
  $^*p < 0.05$; $^{***}p < 0.001$.

of a new performance drink. This replication, despite major contextual differences (product, personal selling, manipulation wording, physical interaction with the product), speaks volumes as to the robustness and generalizability of the findings. Finally, in Experiment 3A, we replicated and extended these results using three hypothetical new products (gaming laptop, mattress, and massage service). In line with the theoretical role of uncertainty, we found expertise with the product category to be an important qualifier for the aforementioned effects. When experts received detailed information, the added signal about the current stock of adoption did not further reduce uncertainty and had no effect. However, when experts did not have detailed information, we found results similar to the other studies, whereby the effect of information about current adoption stock depends on the level of homophily with the adopting stock. For nonexperts, we replicated the same effects as in the other studies. In addition, we con-

Figure 3. Experiment 3B—Perceived Importance of CSA Information as a Function of Expertise and Information Quality
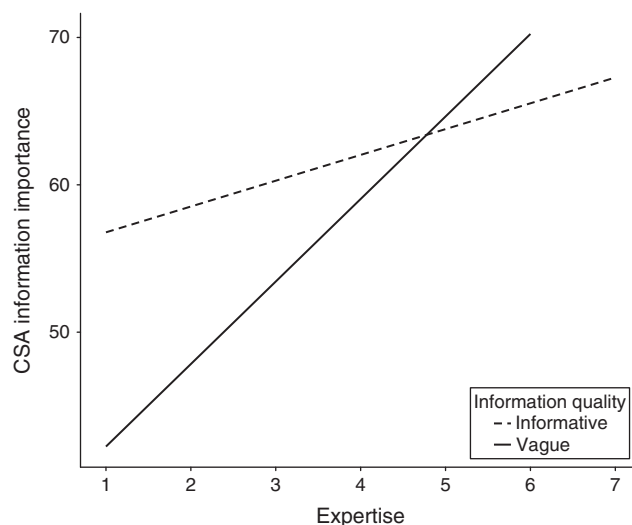
firmed the role of product uncertainty using a different but conceptually equivalent manipulation: information source credibility. When the same information was presented as coming from a credible source, it reduced uncertainty in a manner similar to detailed information in the other studies, but when its source was less credible, behavior conformed to the vague information conditions of other experiments. Moreover, in Experiment 3B, we confirmed the assertion that for expert customers, information about a large CSA and an informative product description are substitutes in reducing product uncertainty. Novices, alas, may not be able to use the informative description to reduce uncertainty to a significant extent, yet they still enjoy some uncertainty reduction from the large CSA information.

Marketers have long documented the idea that large stock information can increase sales, and recently scholars and practitioners have been increasingly investigating the influence of social networks and contagion among customers on new products' adoption (e.g., Godes and Mayzlin 2009, Hartmann et al. 2008). Recent studies also acknowledge the fact that uncertainty about the product characteristics plays a major role in determining customers' product evaluation (Hong and Pavlou 2014). What is less known, however, is how these signals interact, and in particular how information about a large stock of adoption influences people to try new products in conjunction with the presence (or absence) of other signals. Testing this broadly held assumption, the main contribution of the current work is in refining the conditions in which customers are influenced by information about current adopters, and those conditions in which they are not. This is the first direct test and demonstration of the fickle role of information about a large current stock of adoption. Indeed, we find a nonuniform effect of information about a large current adopting stock. This result joins other works in finding nontrivial effects driven by negative inferences caused by a specific stock identity (Anderson et al. 2015), or niche versus mainstream positioning inferences (Tucker and Zhang 2011). The current work adds the roles of uncertainty and homophily to the factors that may challenge the overarching assumption that more is better.

Our findings should allow marketers to more effectively communicate information about stock of adoption and to better understand the scope in which such information would be beneficial. For example, if marketers cannot clearly communicate their product's characteristics (e.g., limited ad space, media choice) or if product quality uncertainty is very high, avoiding using information about a large stock of adoption might be preferable (but see Mayzlin and Shin 2011). On the other hand, when information about the stock of adoption can be coupled with a detailed product description, information about adoption by a

large stock of high-homophily others might be an effective tactic. Therefore, information about a large stock of adoption is a marketing tool that should be used with caution. Our findings also help scholars better understand the mechanisms underlying product diffusion in the context of information about stock of adoption, underscoring the roles of homophily and product uncertainty. This should allow model refinement and, potentially, improved diffusion forecasts.

Limitations and Future Research

The first potential limitation of any experimental study lies in the specificity of its design. We attempted to tackle this by using consequential choices of real, new-to-the-market products, as well as by employing field and hypothetical choice experiments. Despite the converging results in five distinctly different product domains supporting generality, signal effects may still be contingent on the nature of the product, the customer, and the information source; thus, more evidence from the field would help paint the overall picture. Moreover, we investigated a firm-initiated information transfer, and our results may not generalize to an active search conducted by the customer.

The current work investigates the effect of large stock information while taking into account the interactions with stock identity and information detail level. Although stock identity and complementary product descriptions are some of the most common signals coinciding with information about current stock of adoption, other types of signal may also interact and could be further investigated. For example, the effect of a large stock may be moderated by the price (e.g., Grewal et al. 1994), seller reputation, communication channel, warranty coverage (Shimp and Beardern 1982), customer or culture heterogeneity, and even temporal moods or feelings. Although we discussed several alternative accounts for our results, we could not include all potential effects within the scope of this work. For example, while low seller credibility could potentially account for the negative effect of large stock information in some of the conditions, we did not directly measure the credibility of the seller itself, but only of a third-party information source. We leave this deeper investigation to subsequent research.

In the context of our current investigation sending a message about a small current stock of adoption would be an unambiguous negative signal. However, one can see how such a message could signal exclusivity and be framed as positive. In such cases, we can think of the CSA information as having multiple levels and dimensions. Moreover, information about a small CSA might lead to increased motivation of innovators or early adopters while at the same time deter the more risk-averse customers. Along the same line, under some conditions, CSA information may actually hurt sales.

An example might be the case of conspicuous consumption of fashion, as discussed in Pesendorfer (1995) and Amaldoss and Jain (2005a, b), whereby one group of consumers ("snobs") adopts the fashion trend as a signal that sets themselves apart from the rest of the consumers. In other words, the value of the signal depends on the "right" sort of people delivering it. This suggests that the nature of the stock of adoption in the diffusion process, and in particular its perceived homophily by the potential customer, should play a major role in its influence on potential adoption (White and Dahl 2007, Berger and Heath 2007). Alas, fully investigating the breadth of potential effects and the generality of our results to such product categories is beyond the scope of the current work.

The current research uses the homophily to the adopting stock as a proxy for reduction of uncertainty regarding product fit. While we mostly used homophily as a high-low scale, it may range from positive to negative, where negative homophily adoption reflects negatively on the product and zero homophily is simply nondiagnostic. We suspect that this distinction (negative-zero) would drive the existence of a negative effect of CSA information for the former, but a null effect for the latter. Moreover, there may be other ways for customers to reduce uncertainty regarding product fit, such as looking to role models, expert opinions, or geographic and/or group membership (Godes and Ofek 2004, Bell and Song 2007, Grinblatt et al. 2008, Manchanda et al. 2008, Duflo and Saez 2003). Inclusion of such information may potentially lead to somewhat different interactions. Since we base our predictions on broad rather than specific theories of social influence, our best guess is that the same results would hold, as these constructs influence the same factors as those investigated here, but this remains an empirical question.

A related topic of interest may be the particular type of uncertainty affected by the CSA signal. While some of our results point to a reduction in uncertainty about quality and others suggest a reduction in uncertainty about fit, we cannot easily disentangle the two. To see this, one can regard a high-homophily CSA information as reducing uncertainty about fit, but it may reduce quality uncertainty at the same time. For example, Tucker and Zhang (2011) propose that popularity information may actually be of greater benefit to narrow-appeal products because such products are less likely to attract customers, so when they are actually chosen, this choice conveys a greater quality signal to other customers. Conversely, CSA information of low homophily may or may not signal low quality, and as mentioned above, may be a negative or a non-informative signal of fit. Identifying separable effects, therefore, is the subject of future research. Hence, our

findings should be read as relative as opposed to absolute (e.g., when the reduction in quality uncertainty is greater than the reduction in fit uncertainty, and so forth). The qualitative nature of our findings, however, should conceptually remain the same.

Acknowledgments

Endnotes

[1] A separate test also confirmed our approach of relying on the social influence of educational homophily. We report the results in the online appendix.

[2] Fifteen individuals failed to report their agreement with the statement about being a surfer; therefore, their homophily could not be categorized.

[3] Six participants were excluded due to missing observations. The significant difference holds for each product separately.

[4] Calculated at ±1 standard deviation from the mean of the homophily distribution.

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