INSEAD
The Business School for the World

# Faculty & Research Working Paper

## When Does the Past Repeat Itself? The Role of Self-Prediction and Norms

Pierre CHANDON
Vicki G. MORWITZ
Ronn J. SMITH
Eric R. SPANGENBERG
David E. SPROTT
2007/07/MKT

# When Does the Past Repeat Itself?

# The Role of Self-Prediction and Norms

January 26, 2007

by

Pierre CHANDON*

Vicki G. MORWITZ**

Ronn J. SMITH***

Eric R. SPANGENBERG****

and

David E. SPROTT*****

* Assistant Professor of Marketing at INSEAD, Boulevard de Constance, 77300 Fontainebleau, France; +33 1 60 72 49 87 (phone), +33 1 60 74 61 84 (fax), pierre.chandon@insead.edu.

** Professor of Marketing and Robert Stansky Faculty Research Fellow at the Leonard N. Stern School of Business, New York University, 40 West 4th Street, Room 807, New York, NY 10012; 212.998.0518 (phone), 212.995.4006 (fax), vmorwitz@stern.nyu.edu.

*** Assistant Professor of Marketing at the Sam M. Walton College of Business, University of Arkansas, 302 Business Building, Fayetteville, AR 72701; 479.575.4632 (phone), 479.575.8407 (fax), rjsmith@walton.uark.edu.

**** Dean and Maughmer Freedom Philosophy Chaired Professor of Marketing, College of Business, Washington State University, Pullman, WA 99164-4750; 509.335.8150 (phone), 509.335.3865 (fax), ers@wsu.edu.

***** The Boeing / Scott and Linda Carson Chaired Associate Professor of Marketing and Associate Dean for Graduate Programs, College of Business, Washington State University, Pullman, WA 99164-4750; 509.335.6896 (phone), 509.335.3865 (fax), dsprott@wsu.edu.

**When Does the Past Repeat Itself?**

**The Role of Self-Prediction and Norms**

## ABSTRACT

Although we know that many behaviors are repeated, we know little about what influences the strength and likelihood of behavior repetition. In this paper, we argue that asking people to predict their future behavior increases the chances that they will repeat what they have done in the past when normative beliefs are weak but reduces the likelihood when normative beliefs are strong. In two field experiments and two laboratory studies, we show that self-prediction leads to greater polarization for non-normative behaviors (e.g., it makes frequent shoppers shop more and infrequent shoppers shop less) but leads to regression toward the norm for normative behaviors (e.g., it makes daily exercisers exercise less and intermittent exercisers exercise more). By identifying a new antecedent of behavior repetition (self-prediction) and a moderator (normative beliefs), our framework and results contribute to the debate on the relative importance of habits and intentions with regard to guiding future behavior. We also contribute to the general area of question-behavior research by demonstrating a new consequence of self-prediction and reconciling some of the seemingly contradictory findings from the specific areas of mere-measurement and self-prophecy research.

Whether done intentionally or out of habit, many behaviors are repeated. Diary studies show that 45% of all the daily activities of undergraduate students occur almost every day and in the same location (Wood and Quinn 2005). Panel studies show that past behavior is an excellent predictor of future behavior in contexts as varied as grocery shopping (Roy, Chintagunta, and Haldar 1996; Uncles, Ehrenberg, and Hammond 1995), durable purchasing (Lambert-Pandraud, Laurent, and Lapersonne 2005), media use (Ouellette and Wood 1998), eating and drinking (Ji Song and Wood 2006; Khare and Inman 2006), substance abuse (Laibson 2001), voting (Green and Shachar 2000) and travel mode choice (Aarts, Verplanken, and Van Knippenberg 1998). Although no one denies the empirical evidence regarding the prevalence of repeat behavior and the predictive power of past behavior, two issues remain intensely debated.

The first issue is whether behavior repetition provides evidence of habituation or whether it is simply a proxy measure of other unobserved or poorly measured factors, such as intentions, that actually drive behavior (Bargh and Chartrand 1999; Ouellette and Wood 1998; Webb and Sheeran 2006). For example, Ajzen (2002, p. 120) argues that "the residual effect of prior on later behavior disappears when attitudes and intentions are strong and well formed." Others, however, have argued that "there is mounting evidence of the systematic, independent effects of past behavior on future behavior" (Wood, Quinn, and Kashy 2002, p. 1282). Still, all these studies share a common methodological problem: In order to assess the unique contribution of each factor, they measure both intentions and behaviors in the same groups of people. If the simple act of measuring intentions changes behavior repetition, the results of these studies a) may not generalize to the general population of people whose intentions were not measured and b) may be systematically biased by factors such as subjective norms, which, as we argue, determine whether measuring intentions strengthens or weakens behavior repetition.

The second debated issue is to determine, from a practical standpoint, which interventions can be used to reinforce the repetition of behaviors generally considered virtuous and to disrupt the repetition of harmful behaviors. This is an important question because repeated behaviors (or lack thereof) are often responsible for leading health risks (e.g., inadequate exercise or overeating) and because they are hard to change (Seetharaman, Ainslie, and Chintagunta 1999; Verplanken and Wood 2006). Understanding the impact of self-prediction on behavior repetition is particularly relevant given that we already know that it is an effective way to promote socially normative behaviors such as recycling, exercising, and voting (Sherman 1980; Spangenberg and Greenwald 1999; Spangenberg et al. 2003). It is also an important question from a public health perspective because many research and prevention programs routinely include self-prediction questions (Williams, Block, and Fitzsimons 2006), and may therefore unknowingly disrupt socially beneficial habits or reinforce socially harmful ones.

In this paper, we address these two questions by developing and testing a framework of how self-prediction[1] and social norms interact to reinforce or disrupt behavior repetition. Drawing on mere-measurement and self-prophecy studies (known collectively as question-behavior research, Sprott et al. 2006), we hypothesize that asking people to predict their future behavior disrupts behavior repetition when normative beliefs are strong but increases repetition when they are weak. Stated differently, we hypothesize that self-prediction leads to regression to the social norm—and hence reduces the likelihood of repeating past behavior—when subjective normative beliefs about the appropriate frequency of behavior are strong, but leads to behavior polarization—and hence to a higher likelihood of repeating the past—when norms are weak.

[1] In this research, we use the general term self-prediction to describe the intervention consisting of asking people about their future behavior, regardless of whether their response is measured on a binary "yes/no" scale (e.g., Spangenberg et al. 2003), on a bipolar interval scale (e.g., Chandon, Morwitz, and Reinartz 2004), on a unipolar time until behavior scale (e.g., Morwitz, Johnson, and Schmittlein 1993), or on a unipolar behavior probability scale (e.g., Juster 1966).

Two field experiments, one in a low-norm context (grocery purchasing) and one in a high-norm context (exercising), and two lab studies provide empirical support for the hypotheses of the framework. In the General Discussion, we address the implications of our findings for research and practice. Although our focus is on the effects of self-prediction (i.e., the effects of *measuring* intentions, not the effects of intentions per se), and although we remain agnostic about whether past behavior denotes true habits or other unmeasured drivers of behavior, our framework and results provide new insights on the two related debates of the relative importance of past behavior in guiding future behavior and on the factors that influence behavior repetition. Our framework and findings also contribute to the question-behavior literature by demonstrating a new consequence of self-prediction, namely that it affects behavior consistency over time, and by providing new insights on the processes underlying question-behavior effects. Finally, they help unify this literature by showing that some of its seemingly contradictory results can be explained by the fact that self-prophecy studies focused on socially normative behaviors such as exercising, whereas mere-measurement studies focused on less normative behaviors such as grocery shopping.

## CONCEPTUAL BACKGROUND

Behavior repetition is not just common; it is also hard to change. This is because even complex behaviors that are initially guided by explicit intentions can, through repetition, come under stimulus control and can be initiated and executed without conscious intent or control (Bargh and Chartrand 1999). Repetition incrementally forges direct links in memory between context and response representations (Neal, Wood, and Quinn 2006; Ouellette and Wood 1998). Once such a link has been formed, merely perceiving a context (e.g., the living room) triggers the associated response (e.g., turning on the TV). For these reasons, interventions that

attempt to break habits by changing people's beliefs and intentions are often unsuccessful, even when they are successful at changing intentions (Ouellette and Wood 1998; Verplanken and Wood 2006). For example, the effect sizes for intention change in the four studies about exercise reviewed in Webb and Sheeran's (2006) meta-analysis were all statistically significant (with *d* values between .30 and .75), but none of the effect sizes for behavior change was statistically significant (with *d* values between 0 and .30). In a consumer context, studies have shown that consumer goods purchases are also highly habitual regardless of household income, size, employment, or marital status (e.g., Seetharaman et al. 1999; Uncles et al. 1995).

Still, some factors are known to strengthen or weaken behavior repetition. First, behavior repetition is less likely when there has been a large change in intentions or normative beliefs, especially when consumers perceive that they have control over their behavior (Ajzen 2002; Webb and Sheeran 2006). Second, behavior repetition is less likely for younger consumers (Lambert-Pandraud et al. 2005) and when the original decision was not easily made (Muthukrishnan and Wathieu 2007). Third, behavior repetition is less likely for behaviors that are novel or performed in unstable contexts (Ouellette and Wood 1998). For example, Wood, Tam, and Witt (2005) found that the exercising, newspaper reading, and TV watching habits of students transferring to a new university were less likely to hold when the performance context changed between the two universities. For example, they found that students were less likely to repeat their past exercising habits if the location of the exercise had changed (e.g., from the gym to their homes).

In summary, no research has, to date, examined whether the mere act of asking people to predict what they will do in the future will influence the chances that they will repeat their past behavior. On the other hand, there is considerable evidence that asking people what they will do in the future changes subsequent behavior. In the next section, we review the empirical

evidence and theoretical explanations for these "question-behavior" effects offered by two related streams of research: mere-measurement and self-prophecy.

## Question-Behavior Effects

*Mere-measurement studies.* Mere-measurement studies provide indirect empirical evidence suggesting that self-prediction may *strengthen* behavior repetition. First, these studies have repeatedly found that measuring purchase intentions increases purchase rates for positively viewed products but decreases purchase rates for products that are not positively viewed (for a review, see Morwitz 2005). Second, Morwitz, Johnson, and Schmittlein (1993) found that repeated measurement of intentions decreased purchasing among those who initially did not intend to buy, and increased purchasing among those who initially intended to buy (although the latter effect was not statistically significant). Further, Fitzsimons and Morwitz (1996) found that measuring purchase intentions increased the likelihood that automobile owners would purchase the brand they had bought in the past from 39.4% to 51.7%. Chandon, Morwitz, and Reinartz (2005) showed that measuring intentions increases the strength of the relationship between latent purchase intentions (i.e., the intentions consumers would hold if not questioned) and behavior when purchasing automobiles, personal computers, and groceries. For example, they found that measurement increased automobile purchase rates (from 4.5% to 5.4 %) among consumers with high latent purchase intentions but decreased purchase rates (from 1.4 to 0.3%) among consumers with low latent purchase intentions.

As indicated by their robustness and persistence (Chandon et al. 2004; Dholakia and Morwitz 2002), mere-measurement effects are most probably determined by multiple causes (Janiszewski and Chandon 2007; Levav and Fitzsimons in press; Morwitz and Fitzsimons

2004). Still, the most established explanation for mere-measurement effects is that measurement increases the accessibility of underlying cognitions about the behavior, resulting in an increased chance that people will act in a manner consistent with these cognitions. In summary, to the extent that past behavior is correlated with factors examined in mere-measurement studies (e.g., past attitudes, intentions, or current brand owned), their results and theoretical explanation suggest that self-prediction should increase the chances that people will repeat their past behavior instead of acting randomly or according to changing circumstances.

*Self-prophecy studies.* Like mere-measurement research, self-prophecy studies have shown that asking people to predict their future behavior influences their behavior up to several months after the initial prediction request (e.g., Spangenberg 1997). In contrast to the mere-measurement studies, however, the results of self-prophecy studies suggest that the direction of the effects of self-prediction (i.e., whether it increases or decreases behavior) depends on normative beliefs rather than on personal attitudes and that self-prediction may therefore *weaken* behavior repetition.

A variety of studies have found that self-prediction requests increase the performance of socially desirable behaviors such as volunteering for a charity (Sherman 1980), voting (Greenwald et al. 1987), exercising (Spangenberg 1997), and recycling (Spangenberg et al. 2003) while decreasing the performance of socially undesirable behaviors such as singing over the phone (Sherman 1980), gender stereotyping (Spangenberg and Greenwald 1999), and cheating on a take-home exam (Spangenberg et al. 2003).

While this line of research has examined various theoretical explanations for self-prophecy effects, the most convincing experimental evidence has supported a cognitive dissonance explanation (Spangenberg and Sprott 2006; Spangenberg et al. 2003). Consistent with a self-concept view of dissonance (Aronson 1992), a self-prediction makes salient

normative beliefs about performing the behavior. Inconsistent knowledge of how others behave and how the person has herself behaved can lead to conflict in the person's view of herself as a good person and elicit cognitive dissonance. Behavior change motivated by the self-prediction, therefore, is based on a desire to bring actions into consistency with normative beliefs.

Empirical findings supportive of a dissonance explanation suggest that self-prediction may move individual behavior toward social norms and away from past behavior, thereby reducing behavior repetition. Directly related to this line of reasoning is a study by Smith, Gerber, and Orlich (2003), who found that self-prediction decreased voting turnout (from 63.2% to 55.9%) among people who had voted in all five prior elections but increased voting turnout (from 33.5% to 38.1%) among people who had voted in zero to four of the five prior elections. This suggests that self-prediction requests make some people less likely to repeat their past voting participation (for additional evidence, see Greenwald et al. 1988; reproduced in Figure 1 in Spangenberg and Greenwald 1999).[2]

Taken together, question-behavior studies suggest that self-prediction may influence behavior repetition, but the two related streams of research make conflicting predictions about the direction of these effects and about the underlying mechanism. In addition, existing studies have not examined behavior repetition per se. The extant research has focused on related cognitions (such as attitudes or intentions), and, when they have looked at behavior, most studies have either used self-reports or used limited measures of frequency (such as product ownership or a single post-study measure of behavior). What is missing is research using better measures of behavioral repetition (such as behavior frequency and duration over

[2] To rigorously test this proposition would require access to the original data and to voting turnout data for many post-study elections. Still, we can already see that the association between pre-study turnout level (measured via a binary variable: participation in five vs. less than five prior elections) and average post-study turnout was lower in the self-prediction condition ($\chi^2(1, 298) = 8.3$, $\rho = .17$) than in the control condition ($\chi^2(1, 286) = 22.7$, $\rho = .28$).

long time periods, before and after the self-prediction intervention) and providing triangulation across measurement methods (e.g., self-reports *and* unobtrusive behavior data).

## A Framework of How Self-Prediction and Normative Beliefs Influence Behavior Repetition

To reconcile the seemingly conflicting findings of mere-measurement and self-prophecy studies, we propose a framework of the effects of self-prediction on behavior repetition that emphasizes the moderating role of normative beliefs (see Figure 1). Our key hypothesis is that the divergence between the results of these two research streams is explained by the fact that self-prophecy papers investigated socially normative behaviors such as exercising, whereas mere-measurement studies focused on behaviors, like grocery shopping, for which normative beliefs are much weaker.

---Insert Figure 1 about here ---

Consistent with prior research on behavior repetition, we hypothesize that past behavior influences future behavior, and therefore expect that regression parameter a (shown in Figure 1) is positive. Consistent with question-behavior research, we hypothesize that asking people to predict what they will do in the future (self-prediction) influences the performance of future behavior (represented by parameter b) and that this effect is moderated by normative beliefs (parameter f). Consistent with prior work on behavior repetition, we also expect normative beliefs to have a direct effect on future behavior (represented by parameter c) and to moderate the effect of past behavior on future behavior (represented by parameter d).

The key predictions of the framework involve the effects of self-prediction. First, we hypothesize that self-prediction influences behavior repetition. This hypothesis is represented

by parameter e, which captures the interaction between the effects of self-prediction and past behavior on future behavior. This two-way interaction, however, is qualified by a three-way interaction among self-prediction, normative beliefs, and past behavior (represented by parameter g) such that the effects of self-prediction on behavior repetition depend on normative beliefs.

*For non-normative behaviors.* Consistent with the results of mere-measurement studies, we posit that, for non-normative behaviors (e.g., grocery shopping, television watching), self-predictions reinforce behavior repetition (i.e., increase the impact of past behavior on future behavior). In other words, we expect that self-prediction will lead to behavior polarization consistent with past behavior: It will increase behavior among those who have performed the behavior most often in the past and will decrease behavior among those who have performed it the least, as compared to a control group of people who have not been questioned. This hypothesized pattern of results fits the cognition-accessibility explanation for the mere-measurement effect, since those who have performed the behavior most frequently in the past should also hold more favorable cognitions about performing that behavior in the future (as compared to those who have performed the behavior to a lesser degree).

*For normative behaviors.* Consistent with self-prophecy research, we posit for normative behaviors (e.g., exercising) that self-prediction weakens behavior repetition (i.e., reduces the impact of past behavior on future behavior). In other words, for normative behaviors, self-prediction will make people less likely to follow their prior behavioral routine and more likely to follow the behavioral actions prescribed by social norms. Instead of polarizing past behavior, as in the case of non-normative behaviors, self-prediction of normative behaviors will lead to regression toward the norm regardless of past behavior. This hypothesized pattern of results fits the cognitive dissonance explanation for self-prophecy, which contends that a self-prediction will raise norm salience, which in turn will guide future behavior. Consider the

normative behavior of exercising as an example: The current level of behavior for people who rarely exercise is likely to be below the norm for exercising held by society at large, whereas the current level of behavior for those who exercise many hours every day will be above the population's norm. Compared to those not making a self-prediction, we expect to witness an increase in exercising among low exercisers but a decrease among high exercisers.

We test the preceding predictions in two field experiments and two laboratory studies. Study 1, a field experiment in a low normative situation, shows that self-prediction reinforces the purchasing habits of a panel of online grocery shoppers. Study 2, also a field experiment, but in this case in a high normative context, shows that self-prediction disrupts past exercising behavior of health club members. Study 3, a laboratory study, provides initial evidence for the role of normative beliefs in explaining the opposing results of Studies 1 and 2. Study 4, a longitudinal laboratory experiment, provides a comprehensive test of our framework by 1) using consistent interventions and diary measures of behavior repetition, 2) measuring the effects of self-prediction on behaviors with either high (exercising) or low (reading books or watching news) norms, and 3) directly examining the effects of each participant's normative beliefs.

## STUDY 1: THE EFFECTS OF SELF-PREDICTION ON THE REPETITION OF A BEHAVIOR WITH WEAK NORMATIVE BELIEFS: ONLINE GROCERY SHOPPING

The purpose of Study 1 is to test the hypothesis that self-prediction increases the strength of the relationship between past and future behavior in a non-normative context. To achieve this goal, we analyzed the results of a large pre-post field experiment conducted in collaboration with a leading French web-based grocer. The company provided detailed

information on the online grocery shopping transactions made by a sample of its customers in the nine months leading up to and following the time of a prediction request (for a detailed description, see Chandon et al. 2004).

## Method

This study employed a between-participants design with two conditions: self-prediction and control. Two hundred and fifty-one customers of the online grocer were contacted by telephone during the last week of May and the first week of June 2002 and answered three questions about their intentions to shop again with the company. These customers were chosen at random from all customers who had made their first purchase with the online grocer in October or November 2001. Another 140 consumers were randomly selected from the same cohort to serve as the control group, and were not asked the self-prediction questions.

Using the transaction data provided by the company, we computed four measures of shopping behavior for each customer: two measures of purchase frequency (the number of transactions [orders] before the time of the self-prediction request and the number of transactions after the time of the request) and two measures of total expenditures (the sum, in euros, of all the transactions completed before the time of the self-prediction request and the sum of all the transactions completed after the time of the request). The expenditure measure therefore incorporated both the number of transactions and their value.

## Results and Discussion

Table 1 shows the correlation between the pre- and post-study measures of behavior examined in Studies 1, 2, and 4. As expected, the correlation between the pre- and post-study number of transactions was higher in the group of customers whose intentions were measured

($r$ = .60) than in the control group ($r$ = .42, $z$ = 2.4, one-tailed $p$ < .01). Similarly, the correlation between the pre- and post-study expenditures was higher in the self-prediction group ($r$ = .62) than in the control group ($r$ = .40, z = 2.9, one-tailed $p$ < .01). In order to obtain better statistical tests than merely comparing correlations (which are based on the Fisher transformation), we estimated the following linear regression via ordinary least squares:

$$POST_i = \beta_0 + \beta_1 \times PRE_i + \beta_2 \times SP_i + \beta_3 \times PRE_i \times SP_i + \varepsilon_i \quad (1)$$

where $POST_i$ is post-study shopping behavior (either the number of transactions or the total expenditures for customer i in the nine months after the time of the survey), $PRE_i$ is the pre-study shopping behavior (the number of transactions or the total expenditures for customer i in the nine months before the survey), and $SP_i$ is a binary variable equal to 1/2 for customers who were in the self-prediction condition and -1/2 for customers who were in the control condition.

--- Insert Table 1, Table 2, and Figure 2 about here ---

As shown in Table 2, the effect of $PRE_i$ on $POST_i$ is positive and strongly statistically significant for both the number of transactions and for total expenditures, indicating that behavioral repetition is generally high for both behaviors. As expected, the interaction between $PRE_i$ and $SP_i$ is positive and statistically significant in both cases. This indicates that customers in the self-prediction condition were more likely to follow their past shopping behavior than those in the control group. The main effect of $SP_i$ was negative but not statistically significant.[3]

[3] This indicates that self-prediction reduces the post-study number of transactions and expenditures of customers with *zero* pre-study transactions or expenditures. Consistent with Chandon, Morwitz, and Reinartz (2004), the effects of self-prediction on post-study behavior are positive and statistically significant for consumers with *average* pre-study purchasing behavior.

The results of Study 1 support our hypothesis that self-prediction strengthens behavior repetition for grocery shopping. To provide a more intuitive illustration of the phenomenon, Figure 2 shows the mean post-study behaviors for three groups of customers categorized into groups of the same size according to their pre-study behavior level (low, medium, or high). It shows that self-prediction increases the number of transactions among the top tier of customers but decreases the number of transactions in the bottom two tiers. The same results are obtained when looking at the total expenditures. In the next study, we examine the effect of self-predictions in a more normative context.

## STUDY 2: THE EFFECTS OF SELF-PREDICTION ON THE REPETITION OF A BEHAVIOR WITH STRONG NORMATIVE BELIEFS: EXERCISING

The objectives of Study 2 are to test the hypothesis that asking questions about future behavior decreases behavior repetition for behaviors with strong norms and to assess our hypothesis that self-prediction of normative behaviors raises norm salience by examining whether the effects on behavior repetition are similar to when we simply raise the salience of normative beliefs.

### Method

Study 2 employed a between-participants design with three conditions: a control condition (where participants saw the words "Are you enjoying Spring?" on a flyer; $n$ = 589), a self-prediction condition (where participants saw the words "Will you work out at the Summit?"—a local health club—on a flyer; $n$ = 590), and a high norm salience (guilt) condition (where participants saw the words "Fitness Guilt?" on a flyer; $n$ = 579). Research participants were

randomly assigned to conditions, and there were no significant differences across conditions regarding descriptive demographic variables.

Study 2 was a replication of a previous field experiment conducted by some of the current authors (for additional details on the original experiment see Spangenberg et al. 2003). The experiment took place at a large health and fitness facility in Montana. After screening current membership for club employees, inactive and "on-hold" memberships, and corporate memberships (for which the member did not receive billing information), the total number of participants was 1,758. Each member of the population received a club newsletter and monthly billing statement. Included with this mailing was a small advertising flyer that contained one of the experimental treatments. To increase the likelihood that the health club members processed the advertising manipulation, drawings for $25 gift certificates at the club's café were advertised on the outside of the mailing envelope and next to the focal prediction in the newsletter.

The dependent variable for Study 2 was the number of visits to the health club for 14 weeks before and after the time of the mailing of the newsletter. Health club attendance was automatically collected when members swiped their membership cards at a turnstile entrance into the facility. Following Spangenberg et al. (2003), weekend visits were not counted because competitions are typically held on weekends, and members often enter the club on these days for reasons other than exercising (e.g., to change clothes). We used a longer window (14 vs. 4 weeks) than in Spangenberg et al. (2003) because our goal was to obtain reliable measures of behavioral frequency before and after the experimental interventions.

**Results**

As expected, the correlation between the number of visits before and after the mailing was lower in the self-prediction condition ($r$ = .80) than in the control condition ($r$ = .85, $z$ = -2.34,

one-tailed $p < .01$; see Table 1). Behavior repetition was also lower in the high norm salience condition than in the control condition ($r = .81$, $z = -2.0$, one-tailed $p < .05$). The difference between the self-prediction and high norm salience conditions was not statistically significant ($z = .31$, $p = .40$). In order to obtain better statistical tests, we estimated the following regression via OLS:

$$POST_i = \beta_0 + \beta_1 \times PRE_i + \beta_2 \times SP_i + \beta_3 \times GUILT_i + \beta_4 \times PRE_i \times SP_i + \beta_5 \times PRE_i \times GUILT_i + \varepsilon_i \quad (2)$$

where $POST_i$ is the number of visits in the 14 weeks after the mailing, $PRE_i$ is the number of visits in the 14 weeks before the mailing, $SP_i$ is a binary variable equal to 2/3 in the self-prediction condition and -1/3 otherwise and $GUILT_i$ is a binary variable equal to 2/3 in the high norm salience condition and -1/3 otherwise. This coding in thirds ensures that the $\beta_1$ parameter captures the average effects of pre-study behavior across all three conditions.

--- Insert Table 3 and Figure 3 about here ---

All of the coefficients were in the expected direction (see Table 3). The coefficient of $PRE_i$ was positive and strongly statistically significant, indicating reliable behavior repetition for health club attendance. As expected, the interaction between $PRE_i$ and $SP_i$ was negative and statistically significant, indicating that self-prediction reduced the likelihood that health club members would repeat their past exercising behavior. The interaction between $PRE_i$ and $GUILT_i$ was also negative and statistically significant, indicating that raising norm salience by asking people if they felt guilty about their fitness level produced effects similar to self-prediction. Finally, the coefficients of $SP_i$ and $GUILT_i$ are both positive but not statistically

significant.[4] To provide a more intuitive illustration of the phenomenon, Figure 3 shows the mean post-survey number of visits for three equal-sized groups of customers categorized according to their prior number of visits. It shows that asking people whether they will attend the health club decreases the number of visits among the top tier of customers but increases it for the bottom two tiers of customers.

## Discussion

As expected, the results of Study 2 are the exact opposite of those obtained in Study 1. In Study 1, asking questions about future online grocery shopping led shoppers to be more likely to repeat their past shopping patterns, whereas in Study 2, asking people about future attendance at a health club (i.e., a normative activity) led exercisers to be less likely to repeat their past exercising behavior. Study 2 also shows that directly priming norms by asking people if they feel guilty about their exercise level (i.e., the "Fitness Guilt" treatment) produces the exact same effects as asking them whether they will exercise in the future (i.e., the "Will you work out at the Summit?" treatment).

Taken together, the difference with Study 1 and the effects of the norm salience manipulation are consistent with our prediction regarding the role of normative beliefs. These results, however, do not allow us to rule out that other factors may explain the differences between the two studies. First, we need to confirm that exercising is indeed a behavior with greater normative beliefs than grocery shopping. Second, we need to test directly our

[4]This indicates that the effect of self-prediction on post-mailing attendance for club members with *zero* pre-study attendance was not statistically significant. We examined whether we could replicate (with these new data) the results of Spangenberg et al. (2003), who showed that self-prediction increased *overall* attendance. We followed their procedure and computed the average percentage of customers attending the health club per day during the four weeks following the manipulation intervention. The effects of self-prediction were statistically significant ($F_{(2,\ 1755)} = 3.9$, $p < .05$). Contrast tests further revealed that mean daily attendance was higher in the self-prediction condition ($M = 18.8\%$) than in the control condition ($M = 16.1\%$, $t = 2.1$, $p < .05$) or in the high norm salience condition ($M = 15.4\%$, $t = 2.5$, $p < .01$). We were, therefore, able to replicate the findings of Spangenberg et al. (2003) herein.

hypothesis that self-prediction reduces exercising habits by raising the salience of exercising norms. Third, we need to rule out that the difference between the results of Study 1 and those of Study 2 is caused by factors other than the difference in normative beliefs between exercising and grocery shopping (e.g., participant characteristics, pricing schemes, etc.). We address these three issues in two laboratory studies, the first two in Study 3 and the last one in Study 4.

## STUDY 3: CAN DIFFERENCES IN NORMATIVE BELIEFS REGARDING FOCAL BEHAVIORS EXPLAIN THE OPPOSING RESULTS OF STUDIES 1 AND 2?

The objectives of Study 3 are 1) to compare the strength of the normative beliefs associated with online shopping and exercising, and 2) to test our argument that the effects of self-prediction in Study 2 are due to raising the salience of social norms associated with the behavior.

### Method

Seventy-nine people participated in a study on the effect of technology on time allocation during the day. After providing information regarding their ownership of technology equipment (cell phones, laptop computers, etc.), participants estimated the number of minutes they had exercised or played sports in each of the three days before the study. After completing a filler task (in which they answered unrelated questions about their daily routine), participants rated their normative beliefs regarding exercising and online shopping by noting their agreement with four statements adapted from prior research (e.g., Spangenberg and Sprott 2006; Sprott et al. 2004; Sprott, Spangenberg, and Fisher 2003): "[Exercising or shopping online] is an important part of my life," "I feel committed to [exercising or shopping

online],” “People I know [exercise or shop online],” and “People I know think it is important to [exercise or shop online].” They gave answers on a nine-point scale anchored by 1 = “Strongly Disagree” and 9 = “Strongly Agree.”

In the final part of the study, participants were asked to predict their future exercising behavior by circling one of two possible answers counterbalanced between participants: “Overall, do you predict that: (a) You will exercise or play sports in the next week or (b) You will NOT exercise or play sports in the next week.” This was followed by two questions about what came to mind while they were answering this question. Specifically, they rated their agreement with two sentences (“When thinking about whether I will exercise or not next week, I thought that I should exercise more” and “When thinking about whether I will exercise or not next week, I felt bad about my current level of exercise”) on a nine-point scale, anchored at 1 = “Strongly Disagree” and 9 = “Strongly Agree.”

**Results**

The normative belief scales were reliable for both behaviors (Cronbach’s alpha = .87 for online shopping and .78 for exercising). We computed a summary index of norm importance for each behavior by averaging participants’ responses to the four items. As expected, participants reported lower normative beliefs for online shopping ($M$ = 5.9) than for exercising ($M$ = 7.0, $t$ = 3.9, $p < .01$).

To analyze the effects of self-prediction on norm accessibility, we first categorized participants into low and high exercise groups based on a median split of the number of minutes they reported they had exercised or played sports in the past three days. As expected, low exercisers were less likely to predict that they would exercise during the following week than were high exercisers ($M$ = 66% vs. $M$ = 100%; $\chi^2(1, 78) = 16.5$, $p < .001$). Despite this result, low exercisers were more likely than high exercisers to agree that they felt bad about

their current level of exercise ($M$ = 7.1 vs. $M$ = 4.3, $F(1, 78) = 30.1$, $p < .001$) and that they should exercise more ($M$ = 7.4 vs. $M$ = 6.3, $F(1, 78) = 6.3$, $p < .01$). Even though low exercisers are less likely to exercise in the future, self-prediction was more likely to prime exercise norms for them than for high exercisers.

## Discussion

Study 3 sheds light on why self-prediction increased behavior repetition for online shopping (Study 1) but decreased it for exercising (Study 2). First, it shows that norms are weaker for online shopping than for exercising. Second, it provides empirical support for the argument that self-prediction changed exercising behavior in Study 2 because it raised the salience of exercising norms, which are to exercise more than their current level for low-frequency exercisers and to exercise less than their current level for high-frequency exercisers.

Still, Study 3 leaves important questions unanswered. First, it did not directly examine how self-prediction and normative beliefs interact to influence the strength of behavior repetition. Doing this would require measuring or manipulating normative beliefs and self-prediction simultaneously and examining their effects on behavior repetition. Second, it cannot rule out that factors other than differences in normative beliefs may explain the different effects of self-prediction requests we obtained in Studies 1 and 2. For example, health club attendance in Study 2 had no incremental cost per visit since it had been prepaid, whereas shoppers in Study 1 had to pay for each additional grocery order. Participants in Studies 1 and 2 also are of different nationalities and may well differ on a variety of other dimensions (e.g., income, lifestyle, etc.). Study 4 addresses these issues.

## STUDY 4: HOW NORMATIVE BELIEFS AND SELF-PREDICTION INTERACT TO INFLUENCE BEHAVIOR REPETITION

The goal of Study 4 is to overcome the limitations of the field experiments by directly measuring and manipulating normative beliefs as well as self-prediction requests. To accomplish this goal, we examine how asking questions about future behavior influences behavior consistency for 1) behaviors with high and low normative beliefs and 2) consumers with high and low normative beliefs regarding these behaviors. By measuring normative beliefs at the individual level for each behavior, we test the direct role that these beliefs play in determining whether asking questions strengthens or weakens behavioral repetition. In addition, Study 4 complements the first three studies by using a consistent set of measures and manipulations across activities and by collecting more precise data on behavior duration (i.e., not merely incidence) through behavior diaries. Retrospective behavioral diaries have been frequently used in research on habits (e.g., Wood and Quinn 2005; Wood et al. 2005) and in question-behavior research ( e.g. Fitzsimons, Nunes, and Williams in press; Levav and Fitzsimons in press; Williams et al. 2006), and their validity is well established (Juster and Stafford 1991).

### Method

Study 4 used a 2 (self-prediction vs. control) x 3 (behaviors: exercising or playing sports vs. getting informed about news vs. reading books) mixed design. These three behaviors were chosen based on a pretest that indicated that norms are stronger for exercising than for

watching news or reading books.[5] The pretest also showed that the time students spend on each of these three activities per day is low enough to preclude cross-activity dependencies in time allocations (i.e., that people would trade off one of the activities for the other).

The study took place over a three-week period. Participants were told that the purpose of the study was to examine how advances in technology have influenced student time allocations during the day. During the first week, participants rated the importance of norms for each activity using the same measures as in Study 3. One week later, participants provided behavioral frequency data for the three activities during the three days prior to the survey. To increase the reliability of these data, participants were asked to list the time spent on specific activities. For example, for the "exercising or playing sports" activity, participants estimated the number of minutes spent with a) indoor individual or class exercise (e.g., working out, swimming, fitness classes), b) outdoor individual or class exercise (e.g., running, biking, group running clinic), c) individual or team sports, and d) other fitness activities (e.g., walking).

Approximately one hour after completing the behavioral frequency measures, participants were presented with an ostensibly unrelated survey wherein they answered a self-prediction question for one of the three activities. The measure (based on prior research; see Sprott et al. 2003) asked participants to make a self-prediction regarding the focal behavior: "Overall, do you predict that in the next six days: (a) "You will [exercise, or watch the news, or read books]" or (b) "You will NOT [exercise, or watch the news, or read books]." A full descriptor for the appropriate activity was provided in the prediction request, and the order of the two response alternatives was systematically varied across research participants. In the last week

[5] Using the scales developed in Study 3 to measure normative beliefs, the pretest showed that norms were higher for exercising ($M = 7.0$) than for reading books ($M = 6.3$, paired-$t = 2.8$, $p < .01$) and for watching the news ($M = 5.8$, paired-$t = 4.7$, $p < .01$). We initially decided to use watching news as the low-norm activity since it had the lowest norm rating. However, we had some concern that the norms for watching news could change rapidly if a major news event occurred during the time of our study. We therefore decided to include both reading books and watching news as behaviors with lower norms than exercising.

(seven days after making the self-prediction), research participants were asked to provide behavior frequency data for the seven days since the self-prediction manipulation.

Fifty research participants were present during all three time phases of data collection. Following a procedure often used in question-behavior studies (Fitzsimons et al. in press; Levav and Fitzsimons in press; Williams et al. 2006), the control group for each activity consisted of participants who provided a self-prediction for the other two activities and therefore did not make any self-prediction for the focal activity. The total number of observations was 150, with 50 in the self-prediction condition and 100 in the control condition.

**Results**

*Manipulation checks*. We asked participants to rate the importance of norms for each behavior using the same four items used in Study 3 on a nine-point scale anchored at 1 = "Strongly Disagree" and 9 = "Strongly Agree." The scales were reliable ($\alpha = .76$ for sports, $\alpha = .77$ for news, $\alpha = .88$ for books). As expected, norms are stronger for sports ($M = 7.4$) than for books ($M = 5.4$, paired-$t = 8.9$, $p < .01$) or for news ($M = 5.5$, paired-$t = 7.8$, $p < .01$). Reading books and watching news did not differ significantly (paired-$t = .3$, $p = .76$).

In each of the seven days following the study, participants spent on average 20 minutes exercising or playing sports, 15 minutes watching news, and 11 minutes reading books. The low duration values reduce the risk of cross-activity dependencies. Almost all participants who answered each self-prediction question predicted that they would exercise (94%), watch news (94%) or read books (83%), and the differences between activities were not statistically significant ($\chi^2(2, 50) = 1.4$, $p = .5$).

*Comparison of activities.* As in Study 2, the correlation between pre- and post-study time spent exercising is lower in the self-prediction condition ($r = .30$) than in the control condition

($r$ = .76, $z$ = -2.9, one-tailed $p$ < .02, see Table 1). As expected, the opposite results emerged for the two non-normative behaviors. The correlation between pre- and post-study time spent reading books is higher in the self-prediction condition ($r$ = .76) than in the control condition ($r$ = .27, $z$ = 2.2, one-tailed $p$ < .02). Similarly, the correlation between pre- and post-study time spent watching news is higher in the self-prediction condition ($r$ = .70) than in the control condition ($r$ = .46), although the difference is not statistically significant ($z$ = 1.2, one-tailed $p$ = .12). When the two non-normative behaviors (news and books) were combined, however, the difference of correlation was statistically significant ($z$ = 2.6, one-tailed $p$ < .01).

As in Studies 1 and 2, the comparison of correlations has some limitations. First, it does not allow a statistical test of whether self-prediction has a different effect on high- vs. low-normative behaviors. Second, it does not take into account the within-participant correlation of errors caused by each individual's providing data for three behaviors. Therefore, to test the hypotheses, we used a hierarchical linear model with random effects in the subject intercepts:

$$\begin{aligned} POST_{ij} = {} & \beta_0 + \beta_i + \beta_1 \times PRE_{ij} + \beta_2 \times SP_{ij} + \beta_3 \times NEWS_{ij} + \beta_4 \times BOOKS_{ij} \\ & + \beta_5 \times PRE_{ij} \times SP_{ij} + \beta_6 \times PRE_{ij} \times NEWS_{ij} + \beta_7 \times PRE_{ij} \times BOOKS_{ij} + \beta_8 \times SP_{ij} \times NEWS_{ij} \\ & + \beta_8 SP_{ij} \times BOOKS_{ij} + \beta_9 \times PRE_{ij} \times NEWS_{ij} \times SP_{ij} + \beta_{10} \times PRE_{ij} \times BOOKS_{ij} \times SP_{ij} + \varepsilon_{ij} \end{aligned} \quad (3)$$

where i denotes a study participant, j denotes one of the three activities (j =1, 2, 3), $\varepsilon_{ij}$ are i.i.d. $N(0, \sigma^2)$, and $\beta_i$ are i.i.d. $N(0, \tau^2)$. $POST_{ij}$ is the square root of the number of minutes spent on the activity in the seven days following the self-prediction intervention (we used this transformation because duration data were highly skewed), $PRE_{ij}$ is the square root of the number of minutes spent on the activity in the three days before the self-prediction intervention, $SP_{ij}$ is a binary variable equal to 1/2 if respondents made a self-prediction for this activity and -1/2 otherwise, $NEWS_{ij}$ is a binary variable equal to 2/3 if the activity is

watching news and -1/3 otherwise, and $BOOKS_{ij}$ is a binary variable equal to 2/3 if the activity is reading books and -1/3 otherwise.

As expected, the two coefficients capturing the three-way interaction between self-prediction, past behavior, and each category dummy are both positive and statistically significant (see Table 4). This shows that self-prediction increases behavioral repetition more for watching news and reading books than for exercising. In addition, Table 4 shows that past behavior is a strong predictor of future behavior on average across the three domains, that students spend less time watching news and reading books than exercising, and that, for those who did not spend time on these activities, self-prediction has a more negative impact on book reading and news watching than on exercising. This last finding is consistent with the hypothesis that self-prediction polarizes behavior when norms are weak (reading books and watching news), and hence makes low users even less likely to engage in these behaviors, but increases normative behavior among low users.

--- Insert Table 4 and Figure 4 about here ---

To illustrate these effects graphically, Figure 4 shows the mean post-study duration data for respondents with low, medium, and high levels of pre-study behavior duration, showing the expected regression to the norm for exercising and the expected polarization for news watching and book reading. Specifically, asking questions about future behavior reduces the time spent exercising among high exercisers but increases it for moderate and low exercisers. In contrast, asking questions about future behavior for the two activities with lower normative beliefs (reading books and watching news) increases the amount of time spent on the activity for heavy users but reduces it for moderate and low users.

*Effects of normative beliefs.* The individual measures of normative beliefs provide an important test of the hypothesis that norms influence whether asking questions strengthens or weakens behavioral repetition. We computed the correlation between pre- and post-study duration times for people with low and high perceived norm importance (categorized via a median split for each activity). As can be seen in Table 1, asking questions about future behavior increased these correlations for people with low normative beliefs ($z$ = 1.9, one-tailed $p < .03$) but tended to decrease them for people with high normative beliefs, although the latter effect was not statistically significant ($z$ = -.8, one-tailed $p$ = .23). These results are consistent with what we found when we compared activities that, on average, differed regarding level of normative beliefs held.

To test these effects further, the self-reported measures of normative beliefs were computed in the following hierarchical linear model (again allowing for random effects in the subject intercepts to capture within-participants correlated errors):

$$POST_{ij} = \beta_0 + \beta_i + \beta_1 \times PRE_{ij} + \beta_2 \times SP_{ij} + \beta_3 \times NORM_{ij} + \beta 4 \times PRE_{ij} \times NORM_{ij}$$
$$+ \beta_5 \times PRE_{ij} \times SP_{ij} + \beta_6 \times SP_{ij} \times NORM_{ij} + \beta_7 \times PRE_{ij} \times NORM_{ij} \times SP_{ij} + \varepsilon_{ij} \quad (4)$$

where $NORM_{ij}$ is the mean-centered perceived normative belief regarding activity j by subject i and all the other variables are the same as for equation 2.

All of the results are in the expected direction (see Table 4). The three-way interaction is negative and statistically significant. This shows that self-prediction decreases behavior repetition when perceived normative beliefs are high. In addition, results indicate that normative beliefs increase post-study behavior duration. Finally, Table 4 shows that pre-study behavior is less predictive of overall post-study behavior when normative beliefs are high. This is consistent with results found in habits research, that people are more likely to repeat the past in the absence of strong normative beliefs (Ajzen 2002).

## Discussion

Study 4 replicates the findings of the field experiments (Studies 1 and 2) and supports our hypothesis that asking questions about future behavior strengthens the relationship between past and future behavior when norms are low, but weakens it when norms are high. The effect reversal found in Study 4 rules out alternative explanations for the findings of Studies 1 and 2 because 1) the effects were obtained within-participants, 2) the effects were replicated regardless of whether norm importance was manipulated or measured, and 3) the participants, manipulations, and measures were held constant.

Additionally, the effect sizes in Study 4 are remarkable. As Figure 4 shows, asking questions about future behavior increased the time spent getting informed about world or economic news by 47 minutes (+31%) among top-tier news watchers, but led to a 25-minute reduction (-74%) among the bottom tier. For books, the corresponding effects are a 10-minute (+10%) increase among the top tier of book readers and a 25-minute reduction (-61%) among the bottom tier. Finally, self-prediction increased exercise duration by 41 minutes in seven days (+69%) among the bottom tier of exercisers, but decreased exercise duration by 141 minutes (-49%) among the top tier.

# GENERAL DISCUSSION

The objective of this research was to examine how self-predictions and normative beliefs influence the likelihood that people will repeat past behavior. To achieve this objective, we drew from research on habits and question-behavior effects in the development of our framework. Two field experiments and two lab studies provided converging evidence supporting predictions derived from our framework—specifically, that self-prediction leads to

the polarization of past behavior (and thus reinforces behavior repetition) when normative beliefs are weak, but leads to regression toward the social norm (thus weakening behavior repetition) when normative beliefs are strong.

In the context of a behavior with low normative beliefs, Study 1 demonstrated that asking people about their future online grocery shopping intentions increased the number of transactions and total expenditures among frequent shoppers, but decreased these behaviors for those with medium and low pre-study usage. The opposite results were obtained for exercising, a high-normative behavior, in Study 2. In particular, asking people about their future exercising behavior reduced attendance at a health and fitness club among the top tier of its most assiduous members and increased it among the more intermittent users. Study 2 also showed that directly priming normative beliefs had similar disrupting effects on behavior repetition as did the self-prediction. This result and those obtained in Study 3 provided empirical support for our argument that self-prediction lowers behavior repetition for normative behaviors because it raises the salience of the norms associated with the behavior. Finally, Study 4 triangulated findings of our two field studies by supporting all the predictions of the framework in a more controlled setting.

**Implications for Public Policy**

An important issue for public policy is to identify interventions that reinforce socially beneficial behaviors and weaken socially harmful behaviors. This is particularly important for habitual behaviors such as smoking, overeating, and lack of exercise, which account for a large proportion of the preventable deaths in rich countries (Verplanken and Wood 2006) and which are hard to change, even when persuasion attempts have successfully changed people's intentions (Webb and Sheeran 2006). In this context, it is encouraging to see that a seemingly innocuous (and easily implemented) intervention—asking questions regarding future

behavior—can lead to large changes in exercising behavior. This result is all the more impressive as self-prediction requests can be included in routine auto-administered questionnaires and have been shown to work even in mass communication settings, when people do not have to actually respond to someone else regarding the prediction question (Spangenberg et al. 2003).

Along the same lines, it would be interesting to examine whether the wording of the self-prediction request matters. For example, some researchers (e.g., Sprott et al. 2006) have wondered whether there may be systematic differences between self-prediction requests focusing on intentions (as in most mere-measurement studies) and those focusing on expectations of engaging in a behavior (as in most self-prophecy studies). Compared to intentions, expectations are assumed to capture factors that might facilitate or inhibit the performance of a behavior. In general, studies indicate that expectations predict future behavior better than intentions (e.g., Sheppard, Hartwick, and Warshaw 1988). Yet, this does not imply that expectations necessarily influence behavior *repetition* differently than intentions. In fact, the convergence between the results of Study 1, which used an intention wording, and those of Study 4, which used an expectation wording, suggests that the effects of wording may not be that strong. More generally, these issues raise the question of whether related interventions may not also influence the strength of behavior repetition. In particular, further research is necessary to examine whether simply priming norms, the way we did in Study 2 with the "fitness guilt?" message, might not be sufficient to influence behavior repetition for normative as well as non-normative behaviors.

On the other hand, our findings that the direction of effects depends on an individual's normative beliefs and also the person's prior behavior indicate that care is warranted in their application to public policy. Let's examine non-normative behaviors first. When there are no definitive normative beliefs regarding the optimal level of a behavior, the effects of self-

prediction may be more uniformly beneficial from a social welfare point of view. Consider sleep duration, for example. Recent research (Aeschbach et al. 2003) has argued that, beyond a certain threshold, there is not one optimal number of hours of sleep and that people should do what works for them. In this context, asking people to predict how long they would sleep in the future would increase overall sleep quality because it would lead people to repeat what they normally do rather than following haphazard sleep duration patterns.

For clearly socially normative behaviors, however, self-prediction has opposite effects on behavior repetition for people with either low or high prior behavior levels. In this context, it is therefore important to weigh the costs and benefits that self-prediction may have for each segment. In some instances, both effects are likely to be beneficial. For example, it is probably good at a broad societal level that low exercisers exercise more and that people who exercise excessively exercise less. In other instances, such as voting, for example, it may be that the positive effect of self-prediction among infrequent voters may be more than offset by the negative effects among frequent voters. In this context, asking questions about normative behaviors will increase overall behavior if the behavior of most people in the sample is below the norm, but will reduce overall behavior if most people are above the norm.

**Implications for Future Research**

*Habits research.* Our framework and findings have implications for the debate on the importance of past behavior in driving future behavior. If we agree that most behaviors are non-normative, our results weaken the conclusions of recent studies claiming that much human behavior is repetitive (Wood and Quinn 2005). In particular, they suggest that existing studies investigating the relative importance of intentions and habits overestimated the true level of repeat behavior (that is, the level of repetition among people who were not involved

in these studies), because the measurement of intentions (a type of self-prediction) artificially increased the behavior repetition among study participants.

Our framework and results also enable us to reexamine prior empirical results and to make predictions about the direction of the biases that self-prediction may have created in these studies. For example, Ji Song and Wood (2006) documented the strength of behavior repetition for three behaviors: buying fast food, watching news on TV, and taking the bus. If one assumes that norms are stronger for the former behavior than for the latter (which would be consistent with the fact that intentions were higher for buying fast food than for watching news), our results would predict that their results are more likely to underestimate the true level of behavior repetition for fast food purchases than for the two other behaviors.

Of course, to estimate the true strength of behavior repetition (i.e., the level of behavior repetition among people who did not participate in these studies), one would need to replicate these studies with one that included a control group of people whose intentions would not be measured. The same would apply to researchers interested in measuring how intentions and habits interact to predict behavior. For example, several studies have proposed that intentions are better predictors of behavior when habits have not been already formed. To obtain unbiased estimates of these effects, researchers could adapt the method proposed by Chandon, Morwitz, and Reinartz (2005), i.e., to first estimate latent (unmeasured) intentions for people whose intentions were not measured and to then measure the predictive power of these latent intentions across different levels of habits for the same control group of people. In practice, it would require building a model explaining the intention of surveyed people based on demographic or other variables, and using the fitted regression parameters to predict the unmeasured intentions of a control group of people. In a second step, researchers could use these predicted intentions to see how much they predict the behavior of people in the control group and how they interact with the habits of these consumers.

*Question-behavior research.* Our framework and findings show that asking questions about future behavior does not just influence behavior; it also influences the likelihood of repeating past behavior. This raises several avenues for future research. First, it would be interesting to examine whether other factors beyond the preexisting strength of normative beliefs influence which route predominates. For example, we would expect that self-prediction would be more likely to strengthen behavior repetition among individuals low on the susceptibility to normative influence scale (Bearden, Netemeyer, and Teel 1989). Second, it would be important to extend our work to cases in which social norms and personal habits conflict (e.g., smoking). This would provide new insights on what the boundaries of the question-behavior effect are. Existing studies (e.g., Morwitz et al. 1993; Spangenberg and Greenwald 1999) suggest that self-predictions lead to more behavior change for people with the lowest amount of experience with the behavior. Our results, however, suggest that self-predictions lead to more change in behavior *repetition* among people with either very low or very high levels of past behavior. Future research is necessary to determine whether these inconsistencies are caused by differences in how the amount of experience was defined. For example, the participants in all four of our studies had some experience with the behavior, whereas Morwitz, Johnson, and Schmittlein (1993) defined experience as having ownership of the product. In the context of normative behavior, it is possible that the effects of self-prediction are strongest for non-users (because it may lead to the creation of an attitude rather than the simple retrieval of a preexisting one) but may lead to a decrease for infrequent users (who have tried but rejected the behavior) and an increase for frequent users (who have a strong positive attitude toward the product).

More generally, our results provide new insights into the mechanisms that underlie the question-behavior effect. Specifically, they reinforce the argument that self-prediction influences behavior through at least two routes: 1) by increasing the accessibility of existing

cognitions associated with the behavior and 2) by increasing the accessibility of the normative beliefs associated with the behavior. An interesting avenue for future research would be to explore how question-behavior effects caused by other mechanisms, such as fluency (Janiszewski and Chandon 2007), may influence behavior repetition. Doing this would not just allow us to better delineate the range of question-behavior effects, it would also provide new insights into the important issue of what causes the past to repeat itself.

## REFERENCES


Aarts, Henk, Bas Verplanken, and Ad Van Knippenberg (1998), "Predicting Behavior From Actions in the Past: Repeated Decision Making or a Matter or Habit?," *Journal of Applied Social Psychology*, 28 (15), 1355-74.

Aeschbach, Daniel, Leo Sher, Teodor T. Postolache, Jeffery R. Matthews, Michael A. Jackson, and Thomas A. Wehr (2003), "A Longer Biological Night in Long Sleepers Than in Short Sleepers," *Journal of Clinical Endocrinology and Metabolism*, 88 (1), 26-30.

Ajzen, Icek (2002), "Residual Effects of Past on Later Behavior: Habituation and Reasoned Action Perspectives," *Personality & Social Psychology Review*, 6 (2), 107.

Aronson, Elliott (1992), "The Return of the Repressed: Dissonance Theory Makes a Comeback," *Psychological Inquiry*, 3 (4), 303–11.

Bargh, John A. and Tanya L. Chartrand (1999), "The Unbearable Automaticity of Being," *American Psychologist*, 54 (7), 462-79.

Bearden, William O., Richard G. Netemeyer, and Jesse E. Teel (1989), "Measurement of Consumer Susceptibility to Interpersonal Influence," *Journal of Consumer Research*, 15 (4), 473-80.

Chandon, Pierre, Vicki G. Morwitz, and Werner J. Reinartz (2004), "The Short- and Long-Term Effects of Measuring Intent to Repurchase," *Journal of Consumer Research*, 31 (3), 566-72.

--- (2005), "Do Intentions Really Predict Behavior? Self-Generated Validity Effects in Survey Research," *Journal of Marketing*, 69 (2), 1-14.

Dholakia, Utpal M. and Vicki G. Morwitz (2002), "The Scope and Persistence of Mere-Measurement Effects: Evidence from a Field Study of Customer Satisfaction Measurement," *Journal of Consumer Research*, 29 (2), 159-67.

Fitzsimons, Gavan J. and Vicki G. Morwitz (1996), "The Effect of Measuring Intent on Brand-Level Purchase Behavior," *Journal of Consumer Research*, 23 (1), 1-11.

Fitzsimons, Gavan J., Joseph C. Nunes, and Patti Williams (in press), "License to Sin: The Liberating Role of Reporting Expectations," *Journal of Consumer Research*, forthcoming.

Green, Donald P. and Ron Shachar (2000), "Habit Formation and Political Behavior: Evidence of Consuetude in Voter Turnout," *British Journal of Political Science*, 30 (4), 561-73.

Greenwald, Anthony G., Catherine G. Carnot, Rebecca Beach, and Barbara Young (1987), "Increasing Voting Behavior by Asking People if They Expect to Vote," *Journal of Applied Psychology*, 72 (2), 315-18.

Greenwald, Anthony G., Mark R. Klinger, Mark E. Vande Kamp, and Katherine L. Kerr (1988), "Increasing Voter Turnout by Vanity-Assisted Consciousness Raising," working Paper: University of Washington, Seattle WA.

Janiszewski, Chris and Elise Chandon (2007), "Transfer-Appropriate Processing, Response Fluency, and the Mere Measurement Effect," *Journal of Marketing Research*, Forthcoming.

Ji Song, M and Wendy Wood (2006), "Purchase and Consumption Habits: Not Necessarily What You Intend," *Working Paper*.

Juster, F. Thomas (1966), "Consumer Buying Intentions and Purchase Probability: An Experiment in Survey Design," *Journal of the American Statistical Association*, 61 (September), 658-96.

Juster, F. Thomas and Frank P. Stafford (1991), "The Allocation of Time: Empirical Findings, Behavioral Models, and Problems of Measurement," *Journal of Economic Literature*, 29 (2), 471-522.

Khare, Adwait and J. Jeffrey Inman (2006), "Habitual Behavior in American Eating Patterns: The Role of Meal Occasions," *Journal of Consumer Research*, 32 (4), 567-75.

Laibson, David (2001), "A Cue-Theory of Consumption," *Quarterly Journal of Economics*, 116 (1), 81-119.

Lambert-Pandraud, Raphaelle, Gilles Laurent, and Eric Lapersonne (2005), "Repeat Purchasing of New Automobiles by Older Consumers: Empirical Evidence and Interpretations," *Journal of Marketing*, 69 (2), 97-113.

Levav, Jonathan and Gavan J. Fitzsimons (in press), "When Questions Change Behavior: The Role of Ease of Representation," *Psychological Science*, forthcoming.

Morwitz, Vicki G. (2005), "The effect of survey measurement on respondent behaviour," *Applied Stochastic Models in Business & Industry*, 21 (4/5), 451-55.

Morwitz, Vicki G. and Gavan J. Fitzsimons (2004), "The Mere Measurement Effect: Why Does Measuring Intentions Change Actual Behavior?," *Journal of Consumer Psychology*, 14 (1&2), 64-74.

Morwitz, Vicki G., Eric Johnson, and David Schmittlein (1993), "Does Measuring Intent Change Behavior?," *Journal of Consumer Research*, 20 (1), 46-61.

Muthukrishnan, A. V. and Luc Wathieu (2007), "Superfluous Choices and the Persistence of Preference," *Journal of Consumer Research*, forthcoming.

Neal, David T., Wendy Wood, and Jeffrey M. Quinn (2006), "Habits—A Repeat Performance," *Current Directions in Psychological Science*, 15 (4), 198-202.

Ouellette, Judith A. and Wendy Wood (1998), "Habit and Intention in Everyday Life: The Multiple Processes by Which Past Behavior Predicts Future Behavior," *Psychological Bulletin*, 124 (1), 54-74.

Roy, Rishin, Pradeep K. Chintagunta, and Sudeep Haldar (1996), "A Framework for Investigating Habits, "The Hand of the Past", and Heterogeneity in Dynamic Brand Choice," *Marketing Science*, 15 (3), 280-99.

Seetharaman, P. B., Andrew Ainslie, and Pradeep K. Chintagunta (1999), "Investigating Household State Dependence Effects Across Categories," *Journal of Marketing Research*, 36 (4), 488-500.

Sheppard, Blair H., Jon Hartwick, and Paul R. Warshaw (1988), "The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research," *Journal of Consumer Research*, 15 (3), 325-43.

Sherman, Steven J. (1980), "On the Self-erasing Nature of Errors of Prediction," *Journal of Personality and Social Psychology*, 39 (August), 211-21.

Smith, Jennifer K., Alan S. Gerber, and Anton Orlich (2003), "Self-Prophecy Effects and Voter Turnout: An Experimental Replication," *Political Psychology*, 24 (3), 593-604.

Spangenberg, Eric R. (1997), "Increasing Health Club Attendance Through Self-Prophecy," *Marketing Letters*, 8 (1), 23-32.

Spangenberg, Eric R. and Anthony G. Greenwald (1999), "Social Influence by Requesting Self-Prophecy," *Journal of Consumer Psychology*, 8 (1), 61-89.

Spangenberg, Eric R. and David E. Sprott (2006), "Self-Monitoring and Susceptibility to the Influence of Self-Prophecy," *Journal of Consumer Research*, 32 (4), 550-56.

Spangenberg, Eric R., David E. Sprott, Bianca Grohmann, and Ronn J. Smith (2003), "Mass-Communicated Prediction Requests: Practical Application and a Cognitive Dissonance Explanation for Self-Prophecy," *Journal of Marketing*, 67 (3), 47-62.

Sprott, David E., Ronn J. Smith, Eric R. Spangenberg, and Timothy S. Freson (2004), "Specificity of Prediction Requests: Evidence for the Differential Effects of Self-

Prophecy on Commitment to a Health Assessment," *Journal of Applied Social Psychology*, 34 (June), 1176-90.

Sprott, David E., Eric R. Spangenberg, Lauren G. Block, Gavan J. Fitzsimons, Vicki G. Morwitz, and Patti Williams (2006), "The Question-Behavior Effect: What We Know and Where We Go From Here," *Social Influence*, 1 (2), 128-37.

Sprott, David E., Eric R. Spangenberg, and Robert Fisher (2003), "The Importance of Normative Beliefs to the Self-Prophecy Effect," *Journal of Applied Psychology*, 88 (3), 423-30.

Uncles, Mark, Andrew Ehrenberg, and Kathy Hammond (1995), "Patterns of Buyer Behavior: Regularities, Models, and Extensions," *Marketing Science*, 14 (3), G71-78.

Verplanken, Bas and Wendy Wood (2006), "Interventions to Break and Create Consumer Habits," *Journal of Public Policy & Marketing*, 25 (1), 90-103.

Webb, Thomas L. and Paschal Sheeran (2006), "Does Changing Behavioral Intentions Engender Behavior Change? A Meta-Analysis of the Experimental Evidence," *Psychological Bulletin*, 132 (2), 249-68.

Williams, Patti, Lauren G. Block, and Gavan J. Fitzsimons (2006), "Simply Asking Questions About Health Behaviors Increases Both Healthy and Unhealthy Behaviors," *Social Influence*, 1 (2), 117-27.

Wood, Wendy and Jeffrey M. Quinn (2005), "Habits and the Structure of Motivation in Everyday Life," in *Social Motivation: Conscious and Unconscious Processes*, ed. Kipling .D. Williams and Joseph P. Forgas, New York: Cambridge University Press, 55-70.

Wood, Wendy, Jeffrey M. Quinn, and Deborah A. Kashy (2002), "Habits in Everyday Life: Thought, Emotion, and Action," *Journal of Personality & Social Psychology*, 83 (6), 1281-97.

Wood, Wendy, Melissa Guerrero Witt, and Leona Tam (2005), "Changing Circumstances, Disrupting Habits," *Journal of Personality & Social Psychology*, 88 (6), 918-33.

**TABLE 1**

**CORRELATION BETWEEN PRE- AND POST-STUDY BEHAVIOR IN SELF-PREDICTION AND CONTROL CONDITIONS: SUMMARY STATISTICS FOR STUDIES 1, 2, AND 4**

| | | Correlation between pre- and post-study behavior | | |
|---|---|---|---|---|
| Study | Behavior or group | Self-prediction condition | Control condition | *z*-score of difference |
| Study 1 | Online web grocer (number of transactions) | .60 | .42 | 2.4** |
| | Online web grocer (total expenditures) | .62 | .40 | 2.9** |
| Study 2 | Health and fitness club attendance (number of visits) | .80 | .85 | -2.3** |
| Study 4 | Minutes spent exercising or playing sport | .30 | .76 | -2.1* |
| | Minutes spent getting informed about world and economic news | .70 | .46 | 1.2 |
| | Minutes spent reading books | .76 | .27 | 2.3* |
| | All three activities (high perceived norm importance) | .49 | .63 | -.8 |
| | All three activities (low perceived norm importance) | .77 | .47 | 1.9* |

**: $p < .01$, *: $p < .05$ (one-tailed).

**TABLE 2**

**STUDY 1: REGRESSION RESULTS FOR ONLINE GROCERY SHOPPING**

| | ***Number of Transactions*** | | ***Total Expenditures*** | |
|---|---|---|---|---|
| Factor | *B* | Std. Error | *B* | Std. Error |
| INTERCEPT | -.28 | .18 | -10.43 | 26.12 |
| PRE | .42** | .04 | .43** | .04 |
| SP | -.61 | .36 | -93.66 | 52.24 |
| SP×PRE | .15* | .08 | .19* | .08 |

**: $p < .01$, *: $p < .05$ (two-tailed)

*Note:* The dependent variables are the number of transactions with the online grocer and the total expenditures in the nine months following the self-prediction intervention.

**TABLE 3**

**STUDY 2: REGRESSION RESULTS FOR EXERCISING**

| *Factor* | *B* | *Std. Error* |
|---|---|---|
| INTERCEPT | -.22 | .23 |
| PRE | .72** | .01 |
| SP | .41 | .57 |
| GUILT | .63 | .56 |
| SP×PRE | -.07* | .03 |
| GUILT×PRE | -.09** | .03 |

**: $p < .01$, *: $p < .05$ (two-tailed)

*Note:* The dependent variable is the number of weekday visits to the fitness club in the 14 weeks following the self-prediction intervention.

**TABLE 4**

**STUDY 4: REGRESSION RESULTS FOR BEHAVIOR DURATION**

| ***Model with Activity Types*** | | |
|---|---|---|
| *Factor* | *B* | *Std. Error* |
| INTERCEPT | 3.63 | .80 |
| PRE | .76** | .10 |
| SP | -1.35 | 1.60 |
| NEWS | -5.20* | 2.11 |
| BOOKS | -3.54* | 1.83 |
| PRE×SP | .17 | .20 |
| PRE×NEWS | .45* | .23 |
| PRE×BOOKS | .35 | .24 |
| SP×NEWS | -11.85** | 4.23 |
| SP×BOOKS | -7.19* | 3.66 |
| PRE×SP×NEWS | 1.34** | .45 |
| PRE×SP×BOOKS | 1.28** | .48 |
| ***Model with Normative Belief Importance*** | | |
| *Factor* | *B* | *Std. Error* |
| INTERCEPT | 4.79 | .78 |
| PRE | .62** | .10 |
| SP | -.01 | 1.56 |
| NORM | 1.55** | .43 |
| PRE×SP | .06 | .19 |
| PRE×NORM | -.10* | .05 |
| SP×NORM | 1.56 | .87 |
| PRE×SP×NORM | -.29** | .10 |

**: $p < .01$, *: $p < .05$ (two-tailed)

*Note:* The dependent variable is the square root of the number of minutes spent on the activity in the seven days following the self-prediction intervention.

**FIGURE 1**

**HOW SELF-PREDICTION AND NORMATIVE BELIEFS INFLUENCE THE RELATIONSHIP BETWEEN PAST AND FUTURE BEHAVIOR**

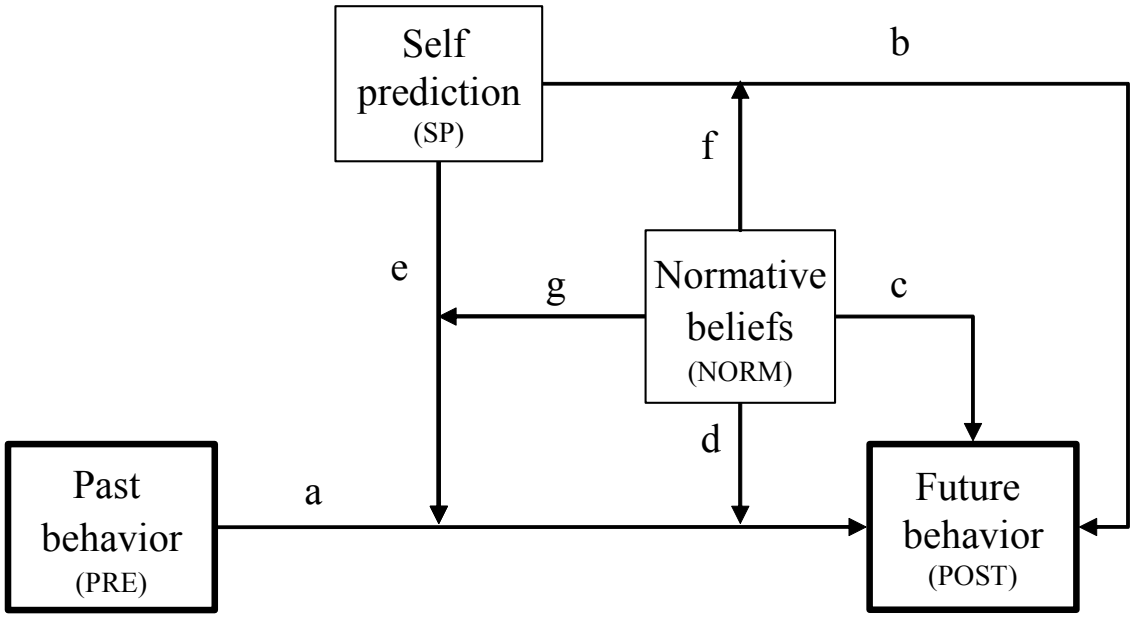


**FIGURE 2**

**STUDY 1: EFFECTS OF ASKING ABOUT FUTURE BEHAVIOR ON NUMBER OF TRANSACTIONS (TOP) AND EXPENDITURES (BOTTOM) WITH ONLINE GROCER**

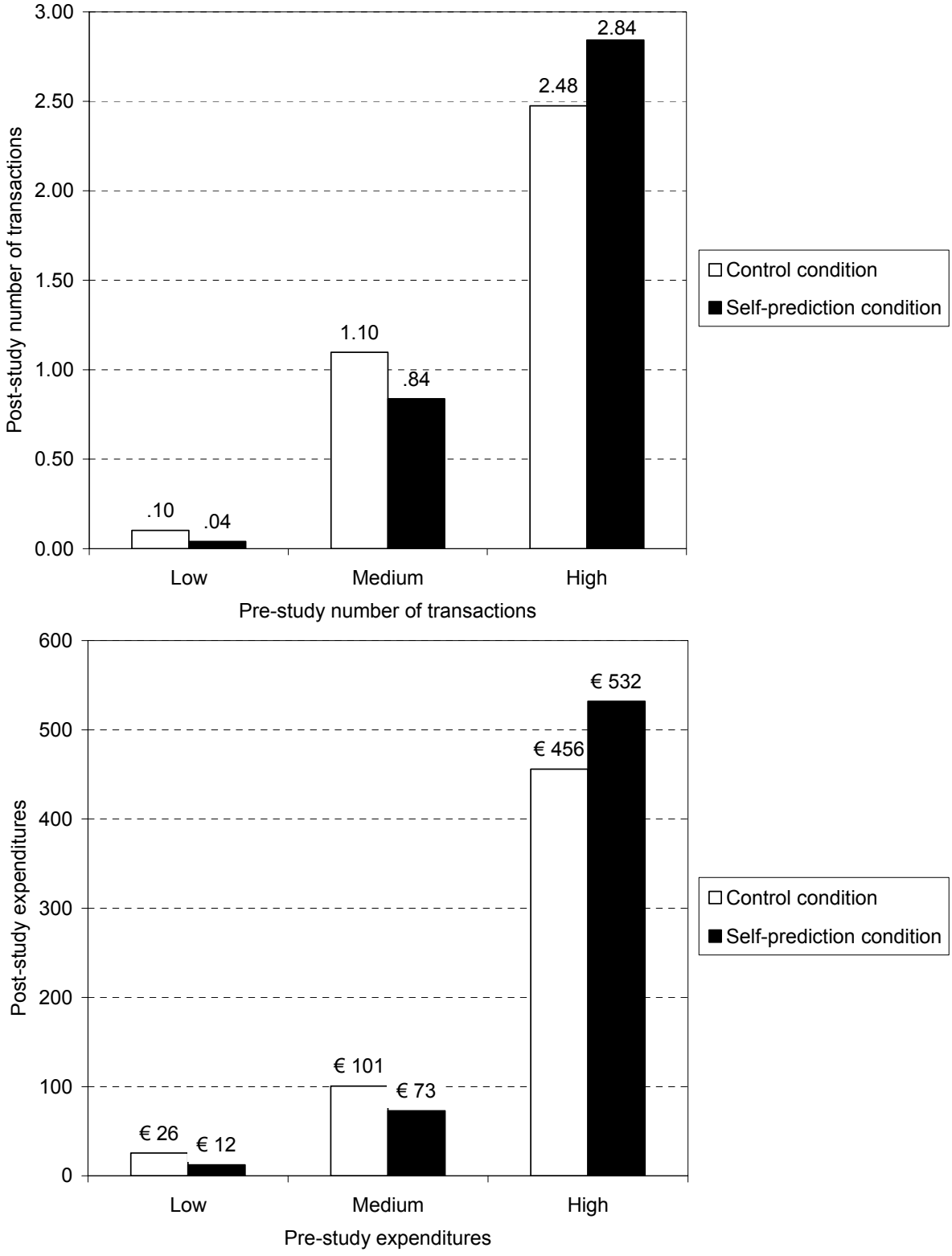


**FIGURE 3**

**STUDY 2: EFFECTS OF ASKING ABOUT FUTURE BEHAVIOR ON NUMBER OF VISITS TO A HEALTH AND FITNESS CLUB**

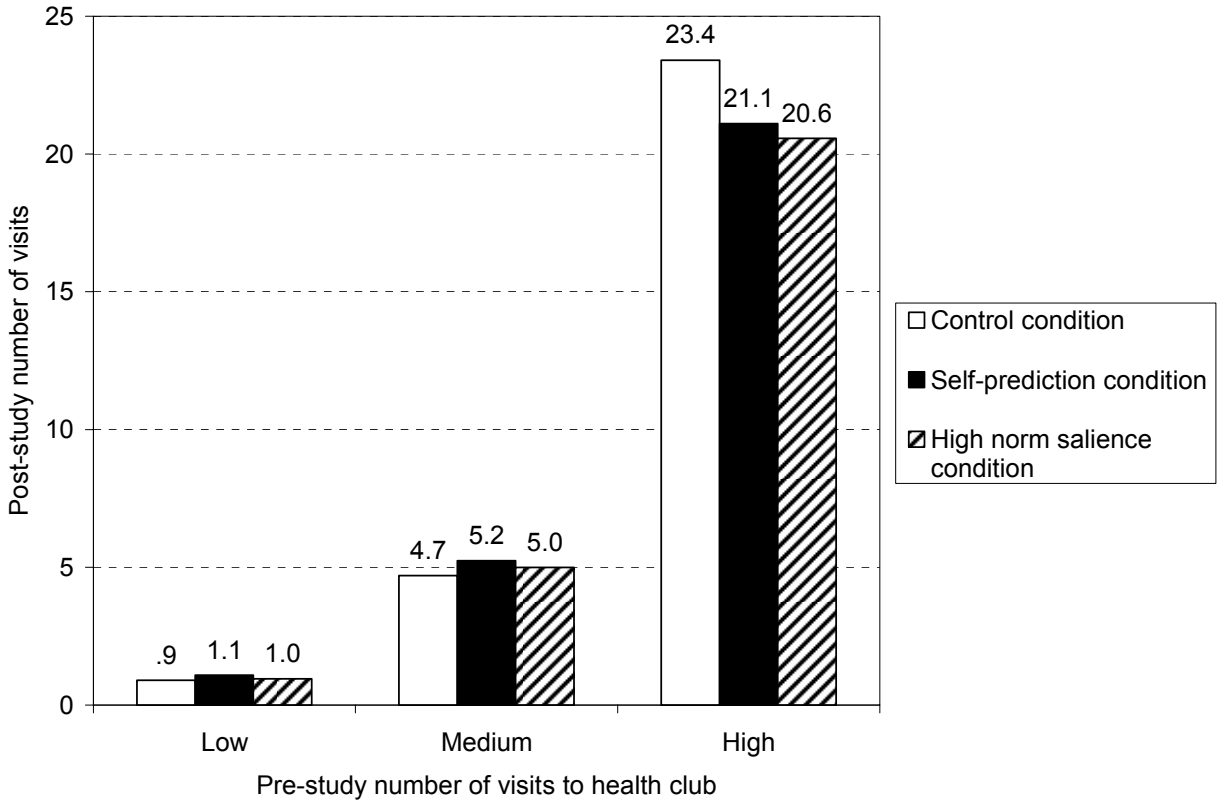
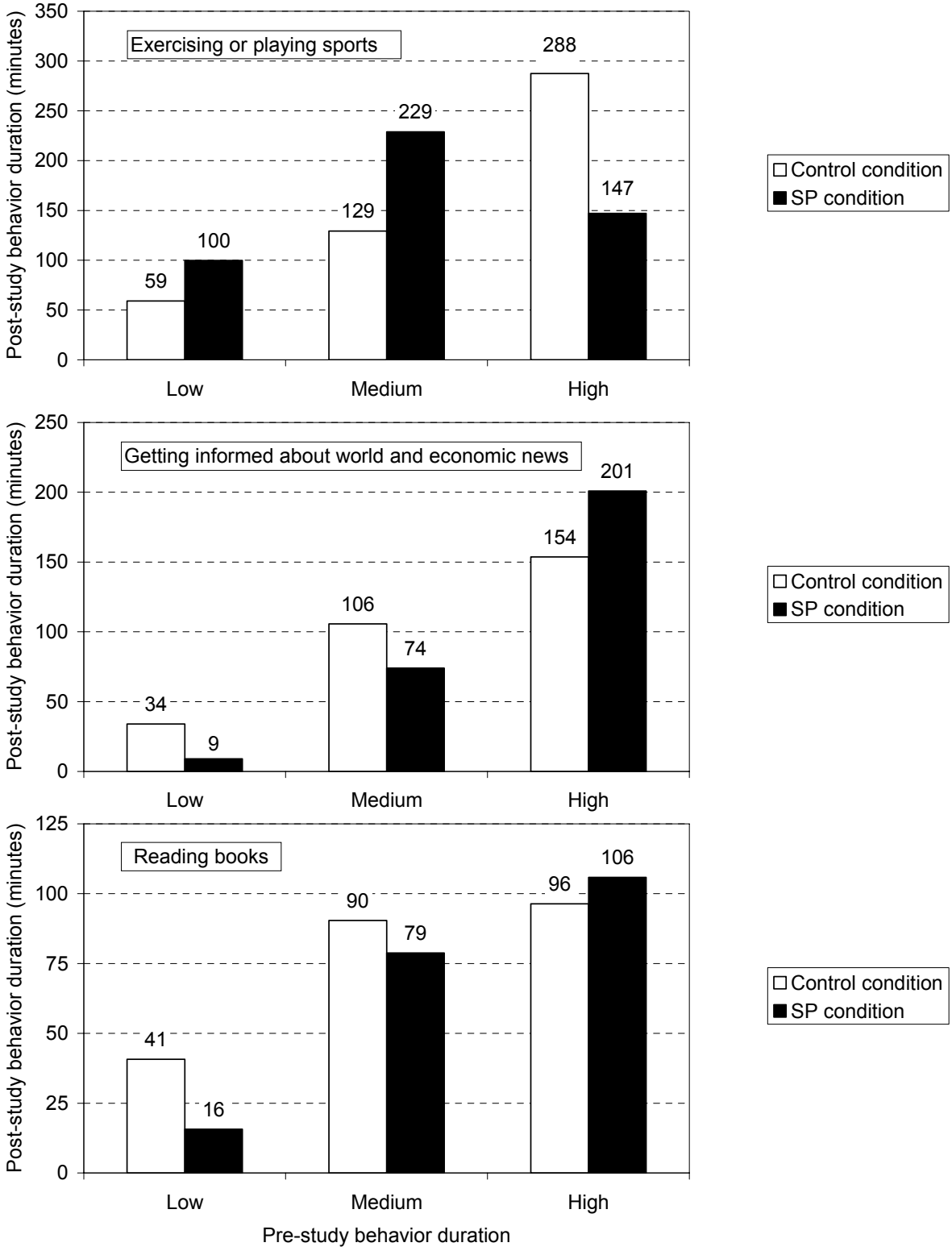


**FIGURE 4**

**STUDY 4: EFFECTS OF ASKING ABOUT FUTURE BEHAVIOR ON TIME SPENT ON THREE ACTIVITIES**



Europe Campus
Boulevard de Constance,
77305 Fontainebleau Cedex, France
Tel: +33 (0)1 6072 40 00
Fax: +33 (0)1 60 74 00/01

Asia Campus
1 Ayer Rajah Avenue, Singapore 138676
Tel: +65 67 99 53 88
Fax: +65 67 99 53 99

www.insead.edu

INSEAD

The Business School
for the World