A Meta-Analytic Synthesis of the Question-Behavior Effect

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Abstract

Asking people a question about performing a target behavior influences future performance of that behavior. While contextually robust and methodologically simple, this "question-behavior effect" reveals theoretical complexity as evidenced by the large number of proposed explanations for the effect. Furthermore, considerable heterogeneity exists regarding the "question" used to elicit the effect and the variety of different types of target "behaviors" for which the effect has manifested. A meta-analytic synthesis of 104 question-behavior studies across 51 published and unpublished papers is presented. Grouping proposed theories for the effect into four overarching categories, we derive and test systematic predictions regarding potential moderators of conceptual and practical significance. Our findings provide varying degrees of support for four different theoretical mechanisms (attitudes, consistency, fluency and motivations) proposed to underlie the effect. Insights into these mechanisms are presented and outstanding gaps in our understanding are identified as opportunities for future research.

Keywords: question-behavior effect; mere-measurement; self-prophecy; self-erasing nature of errors of prediction; social influence; meta-analysis

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"There is nothing so theoretical as a good method"

(Greenwald, 2012)

This quote is the title of an article in which Greenwald (2012) documents the near-impossibility of establishing superiority of one among competing theoretical interpretations of a novel, interesting, and empirically well-established phenomenon. One such simple effect was introduced to psychology by Sherman (1980) as "the self-erasing nature of errors of prediction." The effect is seemingly straightforward: Question a person about his or her behavior regarding a target action and the likelihood of performing the behavior in the future significantly changes. Much early work was conducted under either the label of self-prophecy (Greenwald, Klinger, Vande Kamp, & Kerr, 1988) or mere-measurement (Morwitz, Johnson, & Schmittlein, 1993). Methodological similarities prompted scholars from both streams to join the taxonomically separate areas under an overarching paradigm now referred to as the "question-behavior effect" (Sprott et al., 2006).

The question-behavior effect has been demonstrated for a variety of behaviors including: registering to vote and voting in elections (Gerber & Green, 2005a;b; Greenwald, Carnot, Beach, & Young, 1987); influencing consumer purchases (Morwitz et al., 1993); reducing cheating in college (Spangenberg & Obermiller, 1996); impacting risky behaviors among adolescents (Fitzsimons & Moore, 2008); increasing exercise and other health-related behaviors (e.g., Spangenberg, 1997; Sandberg & Conner, 2009); increasing recycling (Sprott, Spangenberg, & Perkins, 1999); reducing implicit gender stereotyping (Spangenberg & Greenwald, 1999); and helping a charity (Liu & Aaker, 2008). Far from exhaustive, this list gives one a sense of the practical import of question-behavior-based interventions. However, a synthesis of conditions

under which the effect consistently manifests is lacking. Thus, one aim of our work is to identify effective means and contexts within which the technique can be applied.

Although the robustness and practical importance of the effect is evident, its theoretical underpinnings remain a matter of some debate. Much of this debate stems from the sheer number of theories proposed for the effect. For such a relatively simple influence technique, researchers have suggested a remarkable quantity and diversity of explanations (Dholakia, 2010; Sprott et al., 2006), with relatively few having been tested and very few given the attention of more than a single study. Further, most existing support comes from theoretically relevant boundary conditions, rather than direct mediational process evidence. Theoretical uncertainty for such an operationally clear-cut effect may be unsurprising, especially to those who have wrestled with similarly "simple" effects, finding them more complex than initially expected (e.g., halo effect; Thorndike, 1920). While several question-behavior studies contain information critical to our understanding, many fail to inform with regard to its theoretical underpinnings. Furthermore, non-systematic consideration of moderators and boundary conditions has hampered our understanding of the effect. Thus, a critical aim of the current work is to make progress on the challenge identified in Greenwald's (2012) article quoted at our outset—namely, by advancing theoretical understanding of the question-behavior effect "method" through meta-analytic examination of existing work.

Opportunely, there is a sufficient quantity of research and consistency in approach across question-behavior studies to allow for meaningful meta-analysis. This empirical synthesis of over 100 published and unpublished question-behavior effect studies represents the most comprehensive investigation of the phenomenon to date. Contributions of our work are two-fold: First, we document the basic nature of the question-behavior effect and develop an understanding

of how one might best practically implement this influence technique. Second, and perhaps more importantly, we identify a series of moderators influencing the effect, helping shed new light on four theoretical mechanisms postulated to underlie the effect.

Theoretical Underpinnings of the Question-Behavior Effect

Question-behavior theorizing began with Sherman's (1980) foundational work wherein he proposed (but did not test) script evocation and impression management as candidates for explaining the effect. Although much speculation occurred, theoretical tenets for the effect were not empirically tested until nearly a decade after Sherman's seminal publication. Of the many explanations proposed in the literature, attitude accessibility (e.g., Morwitz & Fitzsimons, 2004) and cognitive dissonance (e.g., Spangenberg & Greenwald, 1999) have arisen as the most prominent and extensively tested accounts for the effect. More recently, empirical work based on response fluency (Janiszewski & Chandon, 2007) and motivation (e.g., van Kerckhove, Geuens, & Vermeir, 2012a) has emerged. One reason that various mechanisms have been suggested for the question-behavior effect is that several cognitive or motivational processes may be active at the time of questioning and/or opportunity to perform a focal behavior, and any one, or a combination these processes, may be responsible for subsequent behavioral change.

Based on our examination of the question-behavior literature, we propose four broad theoretical perspectives shared by scholars attempting to explain the effect; these are based on: 1) attitudes; 2) consistency; 3) fluency; and 4) motivation. Specific theoretical explanations and indications of empirical support within each of these four groups are summarized in Table 1.

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Insert Table 1 about here
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Attitude-based Explanations

This family of explanations share the premise that questioning activates attitudes which in turn influence future performance of the questioned behavior. The most researched of these explanations is that of attitude accessibility, holding that questioning makes attitudes associated with the behavior more accessible, with those attitudes guiding future behavioral performance (Morwitz et al., 1993). This account is compelling due to evidence that highly accessible attitudes are strong predictors of behavior. As such, attitudes are likely to be employed as decision criteria when the behavioral opportunity emerges (e.g., Fazio, 1989; Alba, Hutchinson, & Lynch, 1991). Morwitz and Fitzsimons (2004) found support for attitude accessibility, while ruling out other theoretical accounts (i.e., label and intent accessibility). Specifically, they found that asking general intent questions about candy bars increased (decreased) people's choice of candy bars for which they held positive (negative) attitudes, but had no effect on the choice of other products in the category. The effect of increased attitude accessibility implies an automatic rather than an effortful process—a prediction supported by Fitzsimons and Williams (2000).

Attitude accessibility is one of the few theoretical mechanisms that has been tested by researchers in comparison to other proposed theories. For example, Spangenberg et al. (2003, study 2), Janiszewski and Chandon (2007, experiment 1A) and van Kerckhove et al. (2012a, study 3) included contexts addressing the extent to which attitude accessibility can account for the question-behavior effect. While more comparative theory testing is warranted, these studies indicate that attitude accessibility does not always account for observed effects. Also challenging attitude accessibility is work showing that questioning people directly about attitudes does not change behavior to the same degree as does asking an intention question (Chapman, 2001).

Two additional attitude-based accounts for the effect have been offered, both receiving

limited support. One theorizes that in some situations, automatic activation of cognitions triggered by an intention question may make implicit (rather than potentially conflicting explicit) attitudes more accessible. Support for this account comes from Fitzsimons, Nunes, and Williams (2007) who showed that when participants were asked about intentions regarding vice behaviors (e.g., skipping class, drinking alcohol), they engaged in such behaviors more than a control group. Also suggested is attitude polarization, which holds that the effect of repeated questioning makes accessible attitudes toward behavior more extreme (Morwitz et al., 1993). Later research, however, does not corroborate this theoretical perspective (Morwitz & Fitzsimons, 2004).

Consistency-based Explanations

Various theories for the question-behavior effect are predicated on some form of consistency between the question and behavior. Primary among these is one of the most enduring consistency-based theoretical perspectives in history—cognitive dissonance. As conceptualized by Festinger (1957), cognitive dissonance creates a motivational state aimed at alleviating a negative psychological state generated by an inconsistency among one's cognitions. The question-behavior-related explanation has primarily drawn on the discrepancy-from-self-concept view developed by Aronson (1968). In support, Spangenberg et al. (2012) point out that the question-behavior technique is reminiscent of classic induced compliance procedures for eliciting cognitive dissonance. Initially proposed by Spangenberg and Greenwald (1999), answering a behavioral question is proposed to elicit normative beliefs regarding a behavior, as well as prior personal failures to behave normatively; the discrepancy between these sets of cognitions evokes dissonance, motivating behavioral change. Consistent with this explanation, research shows that people make self-predictions in socially normative directions (e.g., Sherman, 1980) and they generally under-perform with regard to engaging in normative behaviors (e.g.,

Spangenberg, Sprott, Grohmann, & Smith, 2003).

Considerable empirical support has been provided for a dissonance-based explanation of the effect (e.g., Spangenberg et al., 2003; Spangenberg & Sprott, 2006; Spangenberg et al., 2012). For example, Spangenberg and Sprott (2006) found that low self-monitors were more likely to manifest a question-behavior effect than high self-monitors—a finding consistent with a dissonance explanation, since low self-monitors should be more threatened by behavioral inconsistencies made salient by questioning. Other research has shown the importance of social norms influencing the effect. Sprott et al. (2003) for instance, found stronger effects of questioning for those with stronger social norms regarding performance of the behavior.

Researchers have proposed two additional consistency-based explanations. Cialdini and Trost (1998) suggested commitment and consistency (i.e., response to a question results in behavioral performance consistent with the query), an account tested, but not supported (Sprott et al., 2003). Self-awareness has also been posited (e.g., Spangenberg & Greenwald, 1999), whereby the question makes one mindful of the discrepancy between one's actual and ideal self and the accompanying negative affect results in behavioral change aimed at reducing this discrepancy. No empirical support has been provided for self-awareness, but this explanation is conceptually close to the cognitive dissonance view of the question-behavior effect.

Fluency-based Explanations

This explanation suggests that processing fluency arises from the redundancy between questioning and the decision to engage in the behavior at the time of behavioral opportunity. "Response fluency" (created by responding to the intent-question) facilitates easier cognitive processes supporting a particular behavioral response (Janiszewski and Chandon, 2007). In other words, responding to an intent-question makes a person more willing to engage in an action

because response fluency serves as evidence for behavioral disposition. Janiszewski and Chandon (2007) provide evidence that differential response fluencies underlie the effect. In their first experiment, they asked participants a sole-intent question about a novel brand of ice cream, dual-intent questions about two novel brands, a general-intent question about purchasing ice cream, or did not ask an intent question. Consistent with their theory, only the sole-intent condition influenced behavior where response fluency for only one brand was established.

The fluency-based explanation suggests that the question-behavior effect is driven not only by the question, but also by cognitive processing at the time of behavioral opportunity. This notion is akin to Sherman's (1980) original (yet still untested) proposal of script evocation; he argued that questioning creates a "good person" script that is activated when a behavioral opportunity arises and in turn guides behavioral performance. Proposed by Spangenberg, Greenwald, and Sprott (2008), ideomotor theory provides yet another theoretical view consistent with fluency, suggesting that a question activates a perceptual image or idea of an action being questioned and this image guides future behavioral performance. This interpretation is somewhat supported by Levav and Fitzsimons (2006) who demonstrated that "easy to represent" behaviors were more likely to exhibit question-behavior effects. This automatic "everyday actions" interpretation is consistent with findings that question–behavior effects are more likely to occur without conscious cognitive mediation (Fitzsimons & Shiv, 2001; Fitzsimons & Williams, 2000).

Motivation-based Explanations

A motivation-based process proposed by van Kerckhove et al. (2012a) holds that questioning activates an intention that uniquely guides future behavioral performance by increasing accessibility of intentional concepts in memory and enhances commitment to perform a certain action. These researchers compared the effects of questioning intentions directly with

attitudes, finding the question-behavior effect to be stronger when participants answered an intention versus an attitude question. Moreover, by manipulating the timing of response latency measurement (before or after making a choice), the authors showed that once the intention is fulfilled by making a choice, intention-related information was inhibited, providing support for a motivational mechanism. Another of their studies showed the question-behavior effect to persist as the time interval between questioning and choice increased—a finding not replicated with an attitude measure.

Another motivation-based approach worth considering is that of implementation intentions (e.g., Dholakia, 2010)—a self-regulatory method using if-then planning to achieve a particular goal (Gollwitzer, 1999; Gollwitzer & Oettingen, 2008). The underlying idea is that questioning facilitates an if-then plan in one's mind, guiding future behavioral performance. While conceptually similar, an important operational distinction exists between these paradigms; namely, the question-behavior effect relies upon a single question, while implementation intentions are often generated more elaborately by asking people to describe in detail "where, when, and how" they will perform a focal behavior (Bamberg, 2000).

Perkins et al. (2008) suggested a motivation-related mechanism, whereby questioning may activate social identities (i.e., self-definitions of group identification) that motivate behavior consistent with activated identities. In essence, social identity serves as a superordinate goal inspiring future behavior. As a point of divergence from van Kerckhove et al. (2012a), social identity activation was originally aimed at accounting for the observed role of social norms in the question-behavior effect and suggests a process driven by self-esteem. Within a socially normative context, Perkins et al. (2008) found that asking respondents if they would recycle in the future activated self-knowledge related to recycling, thereby boosting self-esteem.

Theoretical Diversity and Some Confusion

While these four categories of theoretical explanation have received varying degrees of empirical support, confusion remains (perhaps not surprisingly so) as to the mechanism(s) underlying the question-behavior effect. This state of affairs seems driven by at least three issues.

First, there is relatively limited direct process evidence supportive of any of the primary theories. Most theory-relevant testing involves exploration of boundary conditions. Further, while a number of boundary conditions have been identified, systematic replications of these conditions have not been reported. Second, only a modest number of comparative theory tests have been published. Ideally, researchers should consider how alternate theoretical accounts could be informed within an existing study, thereby providing a competitive theory test. As noted earlier, we are aware of three comparative theory tests, all of which provide evidence against attitude accessibility yet support for three other explanations (Janiszewski and Chandon, 2007; Spangenberg et al., 2003; van Kerckhove et al., 2012a). Finally, and perhaps most importantly, clear evidence supporting "the mechanism" for the effect simply might not exist, as the question-behavior effect may well be shaped by multiple mechanisms. Researchers generally share the view that none of the theoretical explanations seem to completely account for all demonstrations of the effect (e.g., Dholakia, 2010; Sprott et al. 2006; van Kerckhove et al., 2012a).

As no single study or set of studies adequately informs the processes and mechanisms underlying the effect, we approached our work by considering all relevant and eligible literature to determine what conclusions might legitimately be drawn with regard to specific aspects of manipulation, measurement, and manifestation of the question-behavior effect. This backdrop forms the context for our meta-analysis.

Theoretical Predictions for Moderating Variables

A range of variables consistently occurs across empirical demonstrations of the question-behavior effect allowing application of meta-analytic techniques. While some of these variables do little to enlighten us regarding the nature of the effect, others are informative as to theoretical mechanisms underlying the effect. We now turn our attention to this latter category of variables, including: (1) characteristics of the question and (2) characteristics of the target behavior. For each potential moderator under these two categories, we explore whether attitude-, consistency-, fluency- and/or motivation-based explanations make specific predictions regarding magnitude or direction of the effect. Theoretical predictions are summarized in Table 2. It is important to note that not every explanation makes a theoretical prediction for each of the meta-analytic variables.

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Insert Table 2 about here

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Characteristics of the Question

Question response modality. A variety of approaches have been used to ask the question initiating a question-behavior effect. Response modalities for question administration have included computer surveys, paper and pencil instruments, snail mail inserts, telephone calls, posters, and face-to-face interviews. Modes of questioning have been extensively evaluated by researchers (e.g., Holbrook, Green, & Krosnick, 2003) with response modality affecting participants' performance on self-report questionnaires by triggering different mechanisms (Richman, Kiesler, Weisband, & Drasgow, 1999). In terms of the question-behavior effect, an important dimension underlying response modality is the level of anonymity provided during question administration. When the question is answered under non-anonymous conditions (e.g., an individualized mailer), a consistency-based mechanism predicts larger question-behavior effects due to increased salience of norms and normative dimensions of the questioned behavior

(e.g., Bowling, 2005; Cialdini & Goldstein, 2004). The remaining three explanations for the question-behavior effect would not reasonably predict anything regarding response modality.

Type of question. Various types of questions have served as independent variables in question-behavior research including measures of intentions, expectations, and predictions. Interestingly, few studies have employed attitude measures, even though one of the major explanations for the effect is built around attitudes becoming more accessible after questioning. The use of different question types is based largely on area-specific research traditions. For example, self-prophecy researchers have most often used self-predictions (e.g., "Do you predict that you will recycle?"), while mere-measurement scholars have typically employed measures of intent (e.g., "Do you intend to increase your number of steps to 12,500 steps per day over the next week?"). Measurement research finds that relatively subtle changes in survey questions can result in outcome variation—a point raised by prior question-behavior scholars (e.g., Dholakia, 2010; Sprott et al., 2006). For example, a meta-analysis of the theory of reasoned action shows that expectations and intentions differentially relate to other constructs within that framework (Sheppard, Hartwick, & Warshaw, 1988). The attitude-based account of the question-behavior effect, however, does not predict a moderating effect of question type, as predictions, intentions, and expectations should make attitudes equally accessible (i.e., denoted as a null effect in Table 2). In terms of consistency, a prediction should likely challenge a person's prior failings to perform a behavior as norms would dictate (in contrast to a less constrained intention or expectation question), thereby eliciting greater dissonance and larger effects. Similarly, for motivation-based views, the prediction should yield larger effects since the "I will perform behavior X" wording implies a more concrete implementation plan to perform the behavior in the future (Gollwitzer, 1999) than an intention or expectation. Similar to attitudes, the type of

question is not expected to moderate effects if fluency underlies the effect as all behavioral questions should make the simulated behavioral responses equally fluent.

Time frame of question. There is wide variability regarding the time frame referenced in the question. A consistency-based explanation predicts smaller effects of questioning when a specific time frame is referenced as the questioned person may more easily discount dissonance generated by questioning. When time frame is unspecified, a person's ability to discount dissonance is greater as there are no constraints as to when the questioned behavior must be performed thereby yielding a larger effect. For example, if a person is questioned about going to the gym next week, it is relatively simple to ignore the dissonance evoked by the question. Such a discounting process is less effective, however, when the time frame is unspecified. Motivation-based accounts, on the other hand, predict greater effects for time-specified questions than for those where time is unspecified. For instance, implementation intentions predict greater effect with if-then plans requiring a person to specify under which conditions they would perform a certain behavior. In the case of motivation, specifying a time frame should create a clear if-then strategy to be pursued during a given time period. Attitude- and fluency-based accounts do not predict how time frame of the question may affect the question-behavior effect.

Response scale of question. Questions used in prior research have varied in terms of scaling including dichotomous, continuous, or multinomial options. Prior research shows that changes to a question's measurement scale can have important outcomes. For example, research on the relationship between ambivalence and the availability of a neutral response argues that scale differences in intention measures are likely to affect subsequent behavioral responses (Nowlis, Kahn, & Dhar, 2002). Specifically, these authors posit that dichotomous choices result in overweighting of particular features of a focal behavior (e.g., product quality judgments), in

turn giving rise to behaviors favoring that particular feature (e.g., choosing high quality items).

Attitude accessibility does not predict an effect of the question's response scale, as the mere act

of questioning should activate preexisting attitudes, regardless of the response scale (assuming

the behavior is familiar and one toward which people hold well-defined attitudes). In terms of

consistency, questions with dichotomous scales would be more likely to increase the

accessibility of social norms associated with the questioned behavior (e.g., "Will you donate a

few hours of your time to assist the American Cancer Society in your community?" with

response options: "Yes" or "No"), as compared to questions with continuous or multinomial

response scales. The fluency account similarly predicts stronger question-behavior effects for

questions with non-continuous scales, since questioning to choose among choice options should

be more redundant (and therefore more fluent) with actual behavioral choice. The motivation

account does not make any predictions regarding the influence of a question's response scale.

Question-behavior overlap. Prior question-behavior research has only peripherally

touched upon the issue of overlap between the question and the questioned behavior. The closest

work is by Sprott, Smith, Spangenberg, and Freson (2004) who explore how changes to the

question can influence the effect's magnitude. In that work (study 2), specific predictions

resulted in larger effects compared to general predictions or a control condition. While these

manipulations were based on a specific question, the findings are more readily interpreted as

reflecting the degree of overlap between the prediction and the behavior. All four theoretical

explanations predict a positive relationship between overlap and the size of the question-behavior

effect. Attitude research has shown that consistency in terms of time, action, context, and target

between an attitude measure and behavior yields stronger prediction of behavior (Ajzen &

Fishbein, 2005); as such, greater attitude-behavior overlap should lead to stronger question-

behavior effects. Cognitive dissonance (as detailed by Sprott et al., 2004) triggered by questions overlapping with a particular behavior are more easily addressed by changes in behavior than dissonance generated by a general question (which could be alleviated via a variety of approaches). Similarly, response fluency should guide behavior more effectively when question and behavior overlap because a simulated response would be more readily applied to the current behavioral decision. The motivation-based account makes a similar prediction. Specifically, from an implementation intentions perspective, the action plan laid out at the time of questioning should lead to the performance of consistent behaviors. If the intent-question asks more general questions, respondents may not specify the target behavior in their implementation plans.

Specificity of the question. Research has long established that the level of specificity associated with a question can influence how people react to a survey and whether those measures predict actions. For example, measuring attitudes toward specific behaviors is more predictive of subsequent behaviors than are more general attitude measures (Ajzen & Fishbein, 2005). In contrast, the attitude-based view of the question-behavior effect makes a null effect prediction regarding question specificity. We expect that similarly accessible attitudes will be generated from questions with varying levels of specificity. As noted earlier, only one paper in the question-behavior arena has explored the nature of the question (Sprott et al., 2004), finding specific questions resulting in larger effects. We contend that these findings are more supportive of the question-behavior overlap than question specificity; as such, a consistency-based explanation would not predict anything regarding question specificity. In contrast, as outlined by Janiszewski and Chandon (2007), fluency suggests larger effects for specific questions as general questions should make different behavioral responses equally fluent. As expected in their studies, the question-behavior effect manifested following single intention questions regarding a specific

brand, but not when general intention questions about product category were asked. Finally, a motivation-based process suggests a null effect of question specificity. As van Kerckhove et al. (2012a) suggest, goal-directed behaviors can follow both activation of goals and activation of specific intended behaviors. The relative magnitude of these effects on motivated behavior, however, would depend on the strength and uniqueness of mental associations among motivational concepts rather than their specificity (Kruglanski et al., 2002).

Characteristics of the Behavior

Category of behavior. Question-behavior research has examined a variety of behaviors, including those related to one's personal welfare (e.g., health checkup, exercising, avoiding cheating), broader social welfare (e.g., voting, recycling, volunteering), and spending (e.g., durable and consumable purchases). In addition to informing practitioners (e.g., social marketers, managers) as to which behaviors are most readily influenced by this technique, the type of behavior is also relevant to teasing out the theoretical mechanism(s) underlying the effect. While explanations based on attitudes, fluency, and motivation are silent regarding differences based on type of behavior, the consistency-based explanation of dissonance predicts larger effects when there are normative dimensions (whether personal or societal) associated with performing the behavior. In support of this proposition, Sprott et al. (2003) reported stronger question-behavior effects for those who held stronger (vs. weaker) social norms associated with the behavior.

Reporting of behavior. Whether a behavior is observed or self-reported is expected to moderate the size of the question-behavior effect. While untested in question-behavior research, a long tradition of behavioral research has identified the distinction between importance of self-reported and observed measures, particularly due to social desirability biases associated with self-report (Levy, 1981; Zerbe & Paulhus, 1987). Attitude-based accounts for the effect of

questioning on behavior predict a stronger effect for self-reported (vs. observed) behavior as there should be greater salience of consistency between attitudes and behaviors when one reflects on the questioned behavior (as with self-reports). In support of this expectation, a meta-analysis of the theory of planned behavior found that intentions correlated more highly with self-reported than observed behaviors (Armitage & Conner, 2001). Similarly, the consistency-based explanation of dissonance predicts stronger effects for self-reported behaviors, as reflection upon the behavior at time of performance would likely increase salience of prior failures and/or social norms associated with the behavior. Motivation- or fluency-based views predict a null effect as one would expect similar outcomes from an activated intention (per the motivation of van Kerckhove et al., 2012a) and likewise for levels of fluency (per Janiszewski & Chandon, 2007).

Timing of behavior. Procedures used to elicit question-behavior effects vary in terms of elapsed time between questioning and focal behavior measurement. Delay between the question and the behavior ranges from no delay (e.g., exp. 1, Fitzsimons & Shiv, 2001) up to a one-year delay (e.g., Dholakia & Morwitz, 2002). Cognitions generated by a question should become less salient after longer time delays, as the cognitive drivers of the effect would likely decay over time. Therefore, attitude-, consistency-, and fluency-based explanations predict a diminishing influence of questioning over time. For motivation-based processes, however, we expect that the activation of intentions should persist until the moment of intention fulfillment/completion. In support of such a null effect, van Kerckhove et al. (2012a) showed the effect of questioning to persist as the interval between the intention-question and choice task increased.

Novelty of behavior. Novelty of the behavior should moderate the size of the question-behavior effect due to differential cognitive structures developed around less versus more familiar behaviors. (Novelty in our analyses was coded as a continuous variable with higher

values indicating more novel [i.e., less familiar] behaviors.) Attitude-based explanations predict

a negative effect of novelty. As Janiszewski and Chandon (2007, p. 310) aptly observed, "It is

unlikely that consumers hold attitudes toward novel products, so it is unlikely that responding to

an intent question could increase attitude accessibility." In addition, prior research has found that

attitudes based on direct experience are more accessible (Fazio et al., 1983) and have a greater

influence on behavior (Fazio & Zanna, 1981) than those based on indirect experience. Given that

novel behaviors are less likely to be experienced, we expect weaker effects of questioning for

such behaviors. Some work, however, suggests a positive effect of novelty on the question-

behavior effect. For example, Morwitz et al. (1993) found stronger effects of measuring intent

for those without prior experience with personal computers (vs. those more experienced); while

not explained by attitude accessibility, these findings are consistent with a fluency mechanism

(Dholakia, 2010). In particular, questions regarding novel (vs. familiar) behaviors are more likely

to create response fluency due to a lack of competing cognitions. When a novel behavioral

opportunity is present, a single behavioral response may be evoked with relative ease. Similar to

attitude accessibility, dissonance predicts a negative relationship between novelty and effect size

as social norms and/or prior behavioral failures are less likely to exist for relatively novel

behaviors. The motivation-based perspective, on the other hand, predicts a null effect of novelty.

Regardless of how novel a behavior is, once an intention is activated, people should feel equally

motivated to satisfy that intention with their subsequent actions.

Psychological and social risk of nonperformance. Varying types of risk are associated

with performing or not performing behaviors. Regarding risk and prior research in the area, most

prominent is work examining adolescent behaviors considered socially risky. Fitzsimons and

Moore (2008) show that questioning can increase participation in short-term risky behaviors by

adolescents. Partially consistent with an attitude-accessibility explanation, Gollwitzer and Oettingen (2008) argue that questioning can activate implicit attitudes, resulting in greater performance of certain explicitly risky behaviors to which adolescents are implicitly drawn. Similarly, Fitzsimons et al.'s (2007) findings support that questioning elicits actions consistent with implicitly held positive attitudes for explicitly negative behaviors. However, it is unclear how attitude accessibility can account for why questioning would make implicit or explicit attitudes more accessible. Thus, we cannot reasonably make a prediction for this variable based on attitudes. When there is high social and/or psychological risk of failing to perform a behavior, a consistency-based explanation predicts an increase in the question-behavior effect since the greater social and personal norms regarding the behavior would be more likely to induce cognitive dissonance (Sprott et al., 2003). The motivation-based account of social identity activation provides similar predictions for which questions about psychologically and socially risky behaviors would generate larger effects by activating corresponding self-knowledge. The fluency-based account for the effect does not make a prediction regarding risk.

Behavioral effort required. Behaviors can vary with regard to how effortful they are to perform (effort was coded as a continuous variable with higher values indicating greater effort associated with performing a questioned behavior). Effort is central to our understanding of how attitudes influence performance of a behavior, as illustrated by the theory of reasoned action's focus on behaviors under complete volitional control (Ajzen & Fishbein, 2005). While not extensive, research has demonstrated that behavioral effort plays a role in the relationship between attitudes and behavior (Bagozzi, Yi, & Baumgartner, 1990; Schultz & Oskamp, 1996). In the context of the current work, we contend that attitudes made salient by a question are more likely to influence behavior when effort is low. As Bagozzi et al. (1990) note, if effort is required

to perform a behavior, planning and deliberation are required in addition to attitudes. Thus, we expect that reduced effort will lead to stronger question-behavior effects. Consistency makes a similar prediction, albeit through a different process. In particular, dissonance theory would predict that behavior change is less likely to occur as a means to alleviate dissonance for behaviors more difficult to perform. In such cases, people experiencing dissonance could alleviate it either by discounting it or simply by changing attitudes associated therewith. Fluency-based processes do not predict differences based on effort required. The motivation-based explanation predicts larger effects for less effortful behaviors as intentions may be more likely to guide future performance of behavior, and plans would be easier to develop and execute due to greater perceptions of self-efficacy (Bandura, 1989).

Method

Study Collection and Inclusion Criteria

An exhaustive search of published and unpublished question-behavior research was conducted to identify papers for inclusion in our analyses; details of this search are provided in the Methodological Details Appendix (accessible online). This search yielded 186 question-behavior effect studies appearing in 84 manuscripts spanning several decades (1973-2012). A study was eligible for inclusion only if four clearly defined criteria were all met. The first two criteria define what the field considers to be the question-behavior effect (Sprott et al., 2006); the latter two are driven by meta-analytic requirements (Hunter & Schmidt, 2004).

Inclusion criteria are: (1) *Test of Questioning on Future Behavior.* Eligible studies reported the effect of questioning on future performance of the questioned behavior and provided information necessary to code methodological procedures. Measures of behavior have taken

several forms. Nearly half of all studies included in the meta-analysis used a direct measure of one-time actual behavioral performance (e.g., product purchase; Morwitz et al., 1993). The remainder of the studies used either: a measure of behavior over a period of time (e.g., flossing frequency; Williams, Fitzsimons, & Block, 2004), choice (e.g., cake over fruit salad; Fitzsimons & Shiv, 2001), stated intentions or expectations to behave (e.g., intention to make a charitable donation; Liu & Aaker, 2008), or written commitments to perform a target behavior (e.g., signing a health assessment commitment; Spangenberg & Sprott, 2006). (2) *Use of a Control Group.* Included studies assessed the impact of questioning on behavior as compared to performance in a control condition (i.e., response to a neutral, control question, or no question), with random assignment to treatment conditions. Correlational or qualitative studies were excluded. (3) *Independent Samples.* No duplications or redundancies were included. For example, data collected from the same participants and reported in multiple manuscripts appear only once in the database, avoiding violation of the assumption of data independence. (4) *Provision of Necessary Statistics.* Included studies reported the Pearson product-moment correlation coefficient for the question-behavior effect or provided statistics needed to calculate it (e.g., χ^2, *t*, and *F* statistics with 1 *d.f.*, or means, standard deviations, and respective sample sizes of treatment and control groups). Missing data were requested from original investigators.

A total of 104 question-behavior effect studies from 51 manuscripts (including over two million participants) met our inclusion criteria, comprising the set of eligible studies. Studies not meeting one or more of the inclusion criteria are listed in the Methodological Details Appendix.

Effect Size Estimation

The effect size metric used to represent study results was the product-moment correlation coefficient (*r*). A positive (negative) *r* indicates that questioning increased (decreased)

subsequent performance of a target behavior compared to a control group. This common and easy to interpret effect size is scale-free and allows for straightforward study integration and comparison (Hedges & Olkin, 1985; Hunter & Schmidt, 2004). Although the r metric is a standardized index, in its basic form it possesses a problematic standard error formulation (Lipsey & Wilson, 2001). In particular, Type I error rates of untransformed r values increase as k (i.e., the number of studies) increases, and decrease as n (i.e., the number of participants) increases (Alexander, Scozzaro, & Borodkin, 1989). Fisher's Z_r-transformation addresses these problems (Hedges & Olkin, 1985) and was therefore adopted for our meta-analysis. Z_r-transformed values are reconverted to r's for ease of interpretation.

As previously noted, effect sizes were based on single samples to satisfy the assumption of data independence (Rosenthal, 1991). Some papers, however, reported multiple, relevant, tests from a single sample, including studies with: (1) multiple behavioral dependent measures; (2) repeated measurements of the same behavior over time; and (3) comparisons of different manipulations to the same control condition. When multiple, compatible dependent variables were collected from the same participants, an effect size was calculated for each and averaged into a single effect per sample. If dependent measures could not be meaningfully merged, the effect size for the dependent variable most consistent with the question-behavior effect definition was used. When dependent variables were collected at different points in time, we followed the Lipsey and Wilson (2001, p. 80) convention, such that the first measure in a time series after the treatment was coded. Finally, when multiple question-behavior treatments were contrasted against a single control condition, the average of the effect sizes was used. Where effect sizes were averaged, a representative sample size was calculated (cf. Hunter & Schmidt, 2004), whereby the total number of observations was used to calculate average effect size. Thus, all

effect sizes are statistically independent, each unique sample contributed a single observation to the meta-analysis, and non-overlapping samples within a study contributed unique effects and thereby, multiple effect sizes per study (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Data Coding

Several key researchers in the area provided input to our coding protocol resulting in the incorporation of several recommended variables of theoretical and practical significance. In total, we coded six moderator variables related to characteristics of the *question*, and seven moderators related to characteristics of the *behavior* as summarized in Table 2 (additional coded variables and results are provided in the Methodological Details Appendix). Two coders separately coded all eligible studies with relatively high inter-rater reliability (mean intra-class correlation = .911; *S.D.* = .053); disagreements were resolved by discussion (Motyka et al., 2014; van Laer, Ruyter, Visconti, & Wetzels, 2014).

Data Analyses

Analyses utilized "Comprehensive Meta-analysis, Version 3" (Borenstein, Hedges, Higgins, & Rothstein, 2014). The typical reduction of several effects to a single effect size estimate can be misleading if effects across individual studies are heterogeneous. Heterogeneity may reflect real differences across studies, or may be attributed to sampling error (Borenstein et al., 2009). Thus, meta-analysts typically employ two indices of heterogeneity: Q and I^2 (Huedo-Medina, Sánchez-Meca, Marín-Martínez, & Botella, 2006). The Q-value is the basis for all indices of heterogeneity with a significant *p*-value indicating unexplained variance beyond sampling error, suggesting that relevant moderators of the underlying effect should be examined (Motyka et al., 2014). I^2 represents the proportion of variance attributed to "real differences," potentially explained by moderators (Higgins & Thompson, 2002).

All moderator analyses reported herein are univariate. This choice was driven by the fact that several different theoretical explanations exist for the effect and univariate analysis allowed us the best opportunity to test multiple perspectives without favoring one over another. Mixed-effects analyses were used to analyze categorical and dichotomous moderators, such that a random-effects model was used to combine studies within each subgroup and a fixed-effects model was used to combine subgroups. A common among-study variance was assumed across subgroups (i.e., within-group estimates of tau-squared were pooled). For categorical variables, all pairwise contrasts were estimated with unpooled tau-squared. A random-effects model using method of moments as the method of estimation was used to analyze continuous moderators.

Results

Based on the 104 data points, the weighted mean effect size for the question-behavior effect is $r_+ = .137$ under random-effects assumptions ($CI = .115, .158$). The 95% confidence interval does not include zero, and the summary effect has a Z-value of 12.305 ($p < .001$), thus strongly indicating a significant, positive effect size for the question-behavior effect. This finding is not dependent on any single study; that is, the summary effect did not change when any one effect size was removed from analysis. With regard to the dispersion of effect sizes across studies, a Q-value of 1,337.913 ($d.f. = 103; p < .001$) was observed, supporting the conclusion that true effects sizes vary from study to study. Further, $I^2 = 92.301$, supports that 92% of observed variance is real and can be explained by moderators of the effect. Results of the univariate moderator analyses contained in Table 3 (categorical variables) and Table 4 (continuous variables) correspond to the predictions and results summarized in Table 2. Given our univariate analysis approach, a correlation matrix for continuous variables is provided in the

Methodological Details Appendix.

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Insert Tables 3 and 4 about here
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Characteristics of the Question

Response modality of the question was a significant moderator of the question-behavior effect ($Q = 48.328$, $p < .001$), with the largest effect associated with computer surveys ($r_+ = .230$), followed by paper and pencil ($r_+ = .162$), telephone ($r_+ = .110$) and individual mailers ($r_+ = .090$). Face-to-face interviews yielded negative effect sizes ($r_+ = -.187$), suggesting a decrease in associated target behaviors (three of five of these studies, however, came from the same article, limiting generalizability of this finding). As noted in Table 3, pairwise contrasts between various levels of this moderator showed significant differences between computer administration, paper and pencil ($p = .043$), individual mailers ($p < .001$), and telephone ($p < .001$); computers marginally differed from face-to-face interviews ($p = .074$). Paper and pencil also differed from individual mailers ($p = .018$), and marginally differed with telephone ($p = .096$). Given that the relatively anonymous nature of computer and paper and pencil response modalities yielded larger effect sizes, the consistency-based prediction was not supported.

Type of question was a significant moderator of the effect, ($Q = 9.181$, $p = .027$), with prediction questions ($r_+ = .183$) resulting in the largest effect sizes, whereas intentions ($r_+ = .115$) and expectations ($r_+ = .099$) resulted in smaller effects. Contrasts showed significant differences between predictions and intentions ($p < .001$) and a marginal difference between predictions and expectations ($p = .083$). This pattern of results is supportive of the consistency- and motivation-based hypotheses and effectively speaks against attitude- and fluency-based explanations.

Time-frame of question significantly moderated the effect ($Q = 11.319$, $p = .001$), such

that asking about a specific time frame regarding performance of a focal behavior resulted in smaller effect sizes (r_+ = .101) than did not asking about a specific time frame (r_+ = .177). This result supports a consistency explanation, and is evidence against a motivational mechanism.

Response scale of the question was a significant moderator of the question-behavior effect (Q = 8.990, p < .05). With regard to the response scale of the question, most studies utilized dichotomous or continuous responses. When the treatment question required a dichotomous response, effect sizes were larger (r_+ = .171) than when continuous (r_+ = .116) or multinomial (r_+ = .108) response options were used. Questions with dichotomous scales significantly varied from questions using a continuous scale (p = .041) and marginally differed from multinomial scales (p = .066). These results are supportive of consistency- and fluency-based explanations for the effect, thereby not supporting the null effect prediction of attitudes.

In terms of the two continuous question characteristics (see Table 4), neither question-behavior overlap nor specificity of the question had a significant impact on the question-behavior effect. Notably, all four theoretical paradigms predicted a positive relationship between overlap and the size of the question-behavior effect, yet we found no support for this singularly shared prediction. On the other hand, with regard to specificity of the question, the attitude and motivation explanations predicted a null effect which is consistent with our findings.

Characteristics of the Behavior

Category of the behavior (Q = 11.212, p < .05) was a significant moderator (see Table 3) such that behaviors related to participants' personal welfare (r_+ = .193) yielded larger effect sizes than did behaviors related to societal welfare (r_+ = .142), consumption (r_+ = .088), or other types of behaviors (r_+ = .144). Contrasts showed behaviors with a personal welfare dimension to differ from those with a societal welfare (p = .040) or consumption (p = .002) target. Given norms

associated with personal welfare (e.g., health checkup, exercising, snack food choice, avoiding cheating), these findings are somewhat supportive of consistency-based explanations.

Reporting of behavior ($Q = 6.827$, $p < .01$) was a significant moderator of the effect, with self-reported behaviors resulting in larger effect sizes ($r_+ = .175$) compared to observed behaviors ($r_+ = .116$). These findings support attitude- and consistency-based predictions, therefore not supporting the null predictions of the fluency and motivation perspectives.

Timing of target behavior (i.e., after the question) did not significantly moderate the effect ($Q = 8.159$, $p = .148$); effect sizes generally shrank (but remained significant) as time separation increased between measurement of the question and that of the behavior (e.g., $r_+ = .191$ with no delay, whereas $r_+ = .119$ with greater than a six-month delay). While pairwise contrasts revealed some significant differences, these should be interpreted with caution given the non-significant overall Q value for this variable. This result is supportive of the motivation-based prediction of a null effect. The direction of this non-significant effect is, however, consistent with the predicted negative effect of the other three theoretical perspectives.

In terms of continuous behavioral characteristics (see Table 4), novelty of behavior had a significant positive effect ($Z = 2.61$, $p < .01$), which supports the fluency-based account of the question-behavior effect and fails to support the competing predictions of the other accounts. Psychological ($Z = 2.71$, $p < .01$) and social ($Z = 1.87$, $p < .10$) risks associated with not performing the target behavior also had positive influences on observed effect sizes, supporting predictions by consistency- and motivation-based explanations for the effect. Finally, in contrast to the negative predictions offered by attitudes, consistency, and motivation-based views, behavioral effort required to perform the behavior was non-significant ($Z = -.27$, $p = .790$).

Summary of Results

Each of the four theoretical perspectives received some support from our meta-analysis. The number of predictions and percentage supported is summarized at the bottom of Table 2. We found the least support for attitude- and fluency-based explanations with 25 percent (two of eight) and 28.571 percent (two of seven) of predictions supported respectively. Five of ten (50.0 percent) motivation-based predictions were supported. Consistency-based explanations garnered the greatest support with 58.333 percent (seven of twelve) of predictions being supported.

General Discussion

The effects of asking a question about a behavior on subsequent behavioral performance have been studied for over four decades. While the operational nature of this question-behavior effect appears straightforward, existing research reports considerable heterogeneity with regard to what constitutes the "question" and the "behavior." To complicate matters further, barring few exceptions, theory testing has typically examined a single theory and has included no more than one moderator at a time. Thus, while question-behavior research has led to a large accumulation of empirical findings yielding critical insights, uncertainty remains regarding theoretical foundations for the effect, and a lack of clarity exists regarding how to best implement the technique in practical applications. By addressing these issues, the current meta-analysis provides not only guidance to those wishing to implement this behavioral influence technique, but also insight into the mechanisms posited to underlie the effect.

Theoretical Insights

Although it is intuitively appealing to postulate that a well-defined psychological process drives such a simple, clear-cut phenomenon, existing research does not suggest a unified theoretical explanation for the question-behavior effect. To reiterate, we view the various

explanations in the literature as following one of four general perspectives: attitudes, consistency, fluency, and motivation (see Table 1). Some empirical support exists for each of these theoretical perspectives, with few studies pitting competing explanations against one another. Given this situation, directly meta-analyzing the theory underlying the effect was unviable. We therefore explored a series of moderating variables related to the "question" and "behavior" in order to speak to the theoretical mechanism(s) underlying the effect.

When looking globally at our findings, it is important to note that the theoretical predictions summarized in Table 2 are not all created equal. Due to the level of specification provided by each theory, these predictions require differing degrees of assumptions and may not be equally valid in light of theoretical evidence (or lack thereof). Further, predictions differ in terms of their diagnosticity with regard to the underlying theoretical mechanism. Therefore, while our univariate moderator analyses provide varying degrees of support for each of the four theoretical perspectives proposed to underlie the effect, the percentage of tests supported (as summarized in Table 2 and discussed directly below) serve only as a rough indicator of "theory success." The mechanism receiving least support (i.e., 25 percent; two of eight) was the attitude-based perspective that purports questioning to activate attitudes, which in turn guide future performance of the focal behavior. As predicted, specificity of the question had a null effect and self-reported behaviors led to larger effects for directly observed behaviors. In contrast to the modest support from our meta-analysis, considerable experimental evidence exists for attitude accessibility. The potential disconnect between these outcomes may be due to the fact that variables tested within the mere-measurement framework (e.g., prior attitudes; Morwitz and Fitzsimons 2004) were not captured by our meta-analysis.

Fluency (i.e., arising from redundancy between questioning and a decision to engage in

behavior at the time of behavioral opportunity) received similarly modest support with 28.571

percent of predictions (two of seven) upheld. Fluency was supported in terms of response scale

of the question (i.e., dichotomous response options lead to larger effects than multinomial or

continuous options) and novelty of behavior (i.e., effects are more likely to manifest for novel

behaviors). The novelty of behavior finding is supported by empirical fluency-testing evidence,

albeit limited (Janiszewski & Chandon, 2007).

Greater support was provided for the motivation-based view of the effect that proposes

questioning to activate or form an intention, which then motivates future behavioral

performance. Fifty percent of the predictions (five of ten) aligning with a motivation-based

explanation were supported, including a greater effect for predictions (vs. other types of

questions), the null effect of question specificity, a null effect of timing between the question and

behavior, and positive influences of psychological and social risk of not performing the behavior.

While the null effect of timing is consistent with prior published research (van Kerckhove et al.,

2012a; b), this meta-analytic finding provides new support for a motivation-based process.

Table 2 shows greatest support for consistency-based theoretical predictions (58.333

percent; seven of twelve). The most popular of the consistency theories proposes that the

question-behavior effect is predicated on a desire to alleviate cognitive discomfort (i.e.,

dissonance) elicited by the question. In particular, support for consistency is provided by the

type, time frame, and response scale of the question, such that predictions lead to stronger effects

(compared to intentions and expectations), non-specific time frames in the question lead to larger

effects, as do dichotomously (compared to multinomial or continuously) scaled questions.

Regarding the behavior, findings for category and reporting of behavior are supportive of

consistency; personally normative behaviors manifested stronger effects, as did self-reported (vs.

observed) behaviors. Moreover, the positive influences of psychological and social risk of not performing a behavior support this theoretical perspective. Consistent with our results, considerable empirical evidence has been published by self-prophecy researchers directly testing the consistency explanation (e.g., Spangenberg et al., 2003).

The nature and weight of our findings strongly suggest multiple theoretical mechanisms at play—primarily motivation and a drive for consistency—perhaps less so by fluency and attitudes. This conclusion is reinforced by the fact that six of the ten moderators (i.e., type, specificity and response scale of the question, reporting of behavior, and psychological and social risk of nonperformance) support multiple theoretical explanations.

Practical Implications

This meta-analysis of over 100 studies reports a weighted mean effect size for the question-behavior effect of $r_+ = .137$; a small (according to Cohen, 1988), but significant, positive effect of a magnitude similar to that of many proven psychological phenomena (Richard, Bond, & Stokes-Zoota, 2003). The robustness and reliability of the effect is such that even this relatively "small effect" is not trivial in practical application. It can be a game-changing influence technique, particularly in contexts where small behavioral changes can have large substantive outcomes. As Greenwald et al. (1987, p. 318) stated regarding an electoral context: "In a large-scale application even the relatively weak effect of Experiment 1 could be of great importance; and the effect observed in Experiment 2 is certainly large enough to alter the outcome of an election." By the same token, use of this straightforward technique could sway a meaningful percentage of people toward potentially life-saving behaviors such as vaccination, or similarly influence a portion of a market segment toward a specific product choice, resulting in substantial respective impacts on society or a firm's bottom line.

Our findings provide considerable guidance for those desiring to practically influence behavior. For instance, we found stronger effects when questions are administered via computer or paper-and-pencil versus individual mailers, and when question response was requested via dichotomous (vs. continuous or multinomial) scale. While research suggests specificity in terms of questioning to enhance the effect (Sprott et al., 2004), our analysis found no effect of question specificity on effect size, nor did we find an effect of question-behavior overlap. Interestingly, we found that those using the technique are better off not providing a specific time frame as to when the target behavior will/should be performed. Notably, effect sizes did not significantly vary with regard to elapsed time between answering a question and behavioral response. While the trend is for weaker effects to be reported over longer time periods, the basic effect remained significant regardless of the timing of the target behavior after questioning. Remarkably, the effect remains positive and significant up to, and past, six months (e.g., Dholakia & Morwitz, 2002), suggesting promise for stimulating behaviors in the distant future.

Characteristics of the behavior itself were also found to influence the magnitude of observed effects. Regarding novelty of the behavior, results suggest that the question-behavior technique will have less impact on behavior in domains for which consumers have had greater past exposure or experience, and where habits already exist. Our results regarding category of behavior support social marketers and policy makers' use of questioning to encourage personally normative behaviors (e.g., recycling or healthy food choices), as compared to marketing managers whose primary aim is to boost purchase behaviors. Lastly, the effect is stronger if consumers perceive greater levels of psychological or social risk by foregoing performance of the target behavior; this result coupled with the findings of Fitzsimons et al. (2007) suggests we may want to exercise caution for certain populations when questioning about vice behaviors.

Finally, one should keep in mind that stronger effects emerged for self-reported behaviors (although the effect was also significant for observed behaviors).

Implications for Future Research

Our results suggest a number of directions for future research that will improve understanding of the question-behavior effect. While providing some clarity regarding theoretical underpinnings for the effect, future research should focus on replications of prior theory testing (Hunter, 2001), provide clearer process evidence, and systematically test similar (if not identical) boundary conditions. Given that some evidence supports each of the proposed theoretical mechanisms, we need a clearer understanding of when each of the generative mechanisms supported by our meta-analysis may drive the effect. Such an effort would make it possible to examine whether multiple mechanisms are simultaneously at work. For example, making attitudes salient while concurrently evoking dissonance for a specific behavioral category and providing motivation may be the perfect question-behavior storm.

Although questioning normally increases performance of a behavior, sometimes behavioral performance can be decreased—a finding that initially seems counterintuitive. Recall, however, that this information was captured in the meta-analysis via a positive (or negative) *r* indicating that questioning increased (or decreased) the questioned behavior. A closer look at our meta-analytic data reveals that, for most behaviors studied, norms play a significant role in determining direction of behavioral change, a finding in line with consistency-based predictions. For example, when questioned about voting, people are more likely to vote, whereas when asked about cheating on a test, such negative behavior decreases—both results consistent with prevalent personal and social norms. As noted earlier, however, some studies have found an increase in counter-normative behaviors, like skipping class (Fitzsimons, Nunes, & Williams,

2007) and illegal drug use (Williams, Block, & Fitzsimons, 2006) after questioning. While these results are intriguing and perhaps troubling (Fitzsimons & Moore's 2008 discussion generated lively scholarly debate), in both instances, the questioned behaviors (i.e., skipping class and drug use) may be classified as acceptable and perhaps even desirable under the subjective norms of the studies' respective participants. That is, questioning in such instances may activate sub-group norms differing from those of broader society. Following this conjecture, future research could usefully explore countervailing norms by juxtaposing social, sub-group, and personal norms.

In terms of consumption-related behaviors, most observed effects suggest that questioning about a particular product or retailer increases the corresponding choice share or repurchase rate. An exception was found by Ofir & Simonson (2007; studies 1, 2 and 4), who reported a negative effect size for face-to-face questioning of shoppers about to enter a supermarket. Notably, this design was unique in that the questioning intervened with a behavior already underway. Ofir & Simonson (2007) argued that "negativity enhancement" explained their results, such that stating expectations led participants to have better recall of the negative aspects of their overall shopping experience. It is also likely, however, that when a target behavior is interrupted with questioning, people may experience psychological reactance and reduce future behavioral intentions. These hypotheses warrant future empirical test.

Perhaps one of the most intriguing dimensions of the effect warranting future research regards the significant effects of questioning on behavior over time. While these findings are consistent with a motivation-based mechanism (which clearly predicts a null effect, and has been suggested to elicit a positive effect, van Kerckhove, et al., 2012a; b), additional research is required to understand if other factors may account for longer term behavioral changes. Attitude, consistency, and fluency mechanisms predict more immediate effects of questioning on behavior

and are less compelling when pressed to account for longer lasting effects. In particular, one would expect dissonance to be quickly alleviated after questioning (i.e., at the first opportunity to perform the behavior or an alternative means of dissonance reduction is encountered). It also seems unlikely that an attitude or fluent cognitions would be accessible for more than a limited period of time after questioning. Beyond a motivation-based explanation for the persistence of effects, a possibility is that initial questioning, may "kick start" the process of behavior change (via a variety of processes such as attitude accessibility or dissonance activation), with other cognitive processes taking over in terms of behavioral guidance over the longer term. Research aimed at gaining understanding of such temporal differences would be particularly enlightening.

Building on our finding that certain types of behaviors are more conducive to manifestation of question-behavior effects, future work could explore whether there are behaviors for which the effect simply will not manifest. For example, reducing cigarette consumption or drug use may be more resistant to the effects of questioning since these behaviors are largely driven by physiological dependence and personal norms. Further, as earlier noted, Fitzsimons and Moore (2008) provide initial evidence that the performance of illicit behaviors after questioning may increase for some population segments. In any event, the clear and simple nature of the question-behavior effect is a potentially attractive influence technique to intervention programs and certainly warrants further consideration in such realms.

A limitation of the current research is the use of univariate (rather than simultaneous models) for the meta-analysis. Our choice of univariate analysis was driven by a variety of factors, including the large number of coded variables and the theoretical complexity surrounding the question-behavior effect. This choice of analysis, however, should not imply that the factors examined herein are unrelated, in fact many are interrelated (as seen in the correlation

matrix presented in the Methodological Details Appendix). We encourage future researchers to control for (or perhaps simultaneously manipulate) relevant characteristics (question and behavioral) of the effect. More complex designs considering multiple moderators will allow researchers to more completely test competing mechanisms for the effect and provide greater theoretical clarity. Future research could explore possible moderators for the positive effect of behavioral novelty, such as the presence or absence of personal norms. For example, Chandon et al. (2011) found that questioning increased (decreased) the likelihood of repeating past behavior when personal norms were absent or weak (vs. present or strong).

Conclusion

Our meta-analytic review of the question-behavior effect synthesizes and quantifies a theoretically intricate body of findings spanning over 40 years of research. While qualitative reviews have previously combined and discussed mere-measurement and self-prophecy (Dholakia, 2010; Sprott et al., 2006), the current work is the first comprehensive, empirical integration of the collective stream of question-behavior research. Our results clearly support that questioning people about a target behavior is a relatively simple yet robust influence technique producing consistent, significant changes in behavior across a wide set of behavioral domains. Of interest to researchers and practitioners alike, our synthesis also identified several factors contributing to the effectiveness of questioning on subsequent behavior. Of theoretical import, we identified a set of moderating variables related to the "question" and the "behavior." Findings regarding these variables provide varying degrees of support for four categories of theoretical mechanism derived from the literature (attitude-, consistency-, fluency- and motivation-based), suggesting that multiple processes are likely in operation. Consistent with the meta-analytic research tradition, our results not only provide answers but also raise a new set of research

questions offering promise for better understanding the theoretical underpinnings, and improving the practical application of the question-behavior effect as an influence technique.

We opened by quoting the title of Greenwald's (2012) article—"There is nothing so theoretical as a good method"—a somewhat tongue-in-cheek, but ultimately very practical, and relevant play on Lewin's (1945) famous statement that, "Nothing is so practical as a good theory" (p. 129). To some degree, our meta-analysis embodies Greenwald's quote. Remarkably simple to elicit, the question-behavior effect has been demonstrated as robust over time and across multiple circumstances—in short, a "good method." At the same time, however, we find this apparently simple effect to be theoretically complex; it is moderated by a number of factors indicating that multiple theoretical mechanisms are driving the phenomena. We suggest that the next generation of question-behavior research forego simply testing isolated theoretical explanations. Rather, the future requires work incorporating the once "competing" theoretical mechanisms, combining perspectives in head-to-head tests, not so one theory might "win," but so we can more clearly identify when and where each of the apparently competing theories complement each other—working together to elicit the effect as robustly, practically and predictably as possible.

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Table 1: Theoretical explanations for the question-behavior effect

Proposed Explanation[a]	Description	Empirical Evidence
Attitude-based	These explanations share the premise that questioning activates attitudes which in turn guide future performance of the questioned behavior. Variants include: attitude accessibility, implicit attitudes, and attitude polarization.	Substantial evidence exists for attitude accessibility (e.g., Morwitz & Fitzsimons, 2004); Limited evidence exists for both implicit attitudes (e.g., Fitzsimons, Nunes & Williams, 2007) and attitude polarization (Morwitz et al., 1993).
Consistency-based	These theories are predicated on some form of consistency between the question and the focal, questioned, behavior. Variants include: cognitive dissonance, commitment and consistency, and self-awareness theory.	Substantial evidence exists for cognitive dissonance (e.g., Spangenberg et al., 2003); No evidence has been provided for commitment and consistency or self-awareness theory.
Fluency-based	This mechanism arises from the redundancy between questioning and the decision to engage in the behavior at the time of behavioral opportunity. Variants include: response fluency, script evocation, and ideomotor theory.	Some evidence exists for response fluency (Janiszewski & Chandon, 2010); There is no evidence for script evocation, and limited evidence for ideomotor theory (Levav & Fitzsimons, 2006).
Motivation-based	These processes occur when questioning activates or forms an intention which then motivates future behavioral performance. Variants include: the motivational perspective, implementation intentions, and normative social identity.	Some evidence exists for the motivational perspective (van Kerckhove et al., 2012). No evidence exists for implementation intentions and there is limited evidence for normative social identity (Perkins et al., 2008).

a. Impression management has been suggested as a possible mechanism (Sherman 1980). However, the anonymous nature of questions and behaviors of an overwhelming number of question-behavior study designs renders impression management an untenable explanation for the effect.

Table 2: Predictions for moderators by theoretical explanations of the question-behavior effect

Moderator	Attitude-based[a]	Consistency-based[a]	Fluency-based[a]	Motivation-based[a]
Characteristics of the question				
Question response modality	---	Non-anonymous > anonymous	---	---
Type of question	Null effect	Prediction > intention, expectation[b]	Null effect	Prediction > intention, expectation[b]
Time frame of question	---	Not specific > specific[b]	---	Specific > not specific
Response scale of question	Null effect	Dichotomous > multinomial, continuous[b]	Dichotomous > multinomial, continuous[b]	---
Question-behavior overlap[c]	Positive relationship	Positive relationship	Positive relationship	Positive relationship
Specificity of the question[c]	Null effect[b]	---	Positive relationship	Null effect[b]

Moderator	Attitude-based[a]	Consistency-based[a]	Fluency-based[a]	Motivation-based[a]
Characteristics of the behavior				
Category of behavior	---	Normative > consumption[b]	---	---
Reporting of behavior	Self-reported > observed[b]	Self-reported > observed[b]	Null effect	Null effect
Timing of behavior	Negative relationship	Negative relationship	Negative relationship	Null effect[b]
Novelty of behavior[c]	Negative relationship	Negative relationship	Positive relationship[b]	Null effect
Psychological risk of nonperformance[c]	---	Positive relationship[b]	---	Positive relationship[b]
Social risk of nonperformance[c]	---	Positive relationship[b]	---	Positive relationship[b]
Behavioral effort required[c]	Negative relationship	Negative relationship	---	Negative relationship
Predictions supported	25.0% (2/8)	58.333% (7/12)	28.571% (2/7)	50.0% (5/10)

[a.] Empty cell (---) indicates that respective literature does not inform theoretical prediction for this variable. In comparison, a null effect indicates that a particular theoretical mechanism predicts no influence of a respective moderator.

[b.] Prediction supported by current meta-analysis.

[c.] Continuous variables.

Table 3

Results of categorical and dichotomous moderators of the question-behavior effect

Moderator	r_+ (95% CI)[a]	k[b]	Z	Q	df_Q
Characteristics of the question					
Question response modality					
Computer survey	.230 (.180, .279)[A]	28	8.749***		
Paper and pencil	.162 (.126, .197)[B]	41	8.852***		
Individual mailers	.090 (.038, .142)[C]	10	3.393**	48.328***	4
Telephone	.110 (.068, .152)[B, C]	20	5.078***		
Face-to-face interview	-.187 (-.300, -.070)[A, B, C]	5	-3.109**		
Type of question					
Prediction	.183 (.144, .221)[B, C]	34	9.039***		
Intention	.115 (.073, .157)[A]	27	5.288***	9.181*	3
Expectation	.099 (.054, .143)[A, C]	28	4.352***		
Other	.133 (.087, .179)[A, C]	14	5.583***		

Moderator	r_+ (95% CI)[a]	k[b]	Z	Q	df_Q
Characteristics of the question (cont.)					
Time frame of question					
Not specific	.177 (.145, .209)[A]	58	10.556***		
Specific	.101 (.071, .131)[B]	45	6.507***	11.319**	1
Response scale of question					
Dichotomous	.171 (.132, .209)[A]	51	8.545***		
Continuous	.116 (.080, .152)[B, C]	45	6.282***	8.990*	2
Multinomial	.108 (.052, .163)[A, C]	7	3.785***		
Characteristics of the behavior					
Category of behavior					
Personal welfare	.193 (.148, .236)[A]	29	8.348***		
Societal welfare	.142 (.100, .184)[B, C]	30	6.561***		
Consumption/buying	.088 (.046, .130)[B, C]	36	4.094***	11.212*	3
Other	.144 (.070, .217)[A, C]	9	3.776***		

Moderator	r_+ (95% CI)[a]	k[b]	Z	Q	df_Q
Characteristics of the behavior (cont.)					
Reporting of behavior					
Self-reported behavior	.175 (.139, .210)[A]	51	9.480***		
Behavior observed by researcher	.116 (.090, .142)[B]	53	8.777***	6.827**	1
Timing of behavior after question					
No delay	.191 (.132, .248)[A]	12	6.329***		
Within experimental session delay	.152 (.074, .228)[A, C, D]	44	3.811***		
1-7 days	.113 (.071, .155)[B, C, E, F]	20	5.248***		
8 days-1 month	.153 (.047, .254)[A, E, G]	8	2.835**	8.159	5
Over a month-6 months	.099 (.064, .133)[B, D, G, H]	13	5.558***		
Over 6 months	.119 (.028, .207)[A, F, H]	6	2.563*		

Note: Tabled are weighted mean effect sizes (r_+) using mixed-effects analyses (random-effects model used to combine studies within each subgroup; fixed-effects model used to combine subgroups). Larger effect sizes indicate that questioning makes focal behavioral performance more likely relative to people not questioned. Common among-study variance was assumed across subgroups (i.e., within-group estimates of tau-squared were pooled); for pairwise contrasts, estimates of tau-squared were not pooled. CI = Confidence Interval; k = number of independent effect sizes; Z = two-tailed test of the null hypothesis that the mean effect is zero; Q = test of difference between levels of each moderator; df_Q = degrees of freedom for the test of difference between moderator levels.

[a] Levels of moderators sharing a superscript (i.e., uppercase letters) are not statistically different from one another ($p < .05$).
[b] The total number of independent effect sizes for some variables differ due to missing data.
†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 4

Results of continuous moderators of the question-behavior effect

Moderator	Coefficient (95% *CI*)	Standard Error	*k*	*Z*
Characteristics of the question				
Question-behavior overlap	-.008 (-.032, .016)	.012	103	-.64
Specificity of question	.006 (-.012, .024)	.009	103	.68
Characteristics of the behavior				
Novelty of behavior	.016 (.004, .029)	.006	104	2.61**
Psychological risk of nonperformance	.025 (.007, .042)	.009	104	2.71**
Social risk of nonperformance	.025 (-.001, .051)	.013	104	1.87†
Behavioral effort required	-.002 (-.017, .013)	.008	104	-.27

Note: Tabled are regression coefficients using the random-effects model (method of moments).

CI = Confidence Interval; *k* = number of independent effect sizes (totals differ for some variables due to missing data); *Z* = two-tailed test of the null hypothesis that the coefficient is zero.

†*p* < .10; **p* < .05; ***p* < .01; ****p* < .001.