Consistent Behavior Development: Is a Personal-Rule or a Deliberation-Based Strategy More Effective?

L. ALISON PHILLIPS
GRETCHEN B. CHAPMAN
Rutgers University

ABSTRACT. The development of consistent health behaviors is important for chronic illness prevention and management. The current study experimentally compared two strategies—a personal-rule and a deliberation strategy—designed to help participants consistently perform their intended behaviors over a 7-week period in a real-world setting. Although the personal-rule strategy had theoretical support from behavioral economics and empirical support from both animal and human lab experiments, the deliberation strategy group was significantly more successful than the personal-rule strategy group, both initially (time to first violation, \( p < .01, \) Cohen’s \( d = .51 \)) and over the entire 7-week period (overall success, \( p < .05, \) Cohen’s \( d = .18 \)). These effects were significant even after controlling for known predictors of behavioral success, including individual-difference variables, person-behavior factors, and resolution-related factors.

Keywords: behavior maintenance, deliberation, health behavior, personal rules

SUPPOSE YOU WANT TO ALTER YOUR BEHAVIOR so as to achieve a long-term goal—for example, eating a healthier diet so as to reduce your risk of chronic disease. One strategy for altering your behavior would be to make deliberative, explicit decisions at each choice point. For example, at each trip to the dining hall you would consider which meal options meet your goals of high fiber, low fat, etc. An alternative strategy for altering your behavior would be to set a personal rule or policy, which you then follow without making further deliberative decisions. For example, you might adopt a rule always to choose the vegetarian entrée, if there is one, or never to eat the dessert. The deliberative strategy is more flexible (allowing you to chose the lean chicken over the fried potato pancakes, even though the latter

Address correspondence to L. Alison Phillips, Rutgers University, Psychology, 30 College Ave., New Brunswick, NJ 08901, USA; lphillips@ifh.rutgers.edu (e-mail).
are vegetarian), but the personal-rule strategy might make you more immune to temptations to make exceptions. Which strategy is better?

The current study was designed to test a personal rule strategy for behavior development in young adults, for whom prevention of chronic illness through healthy, life-long habits is a primary concern of health researchers (Brownson, Haire-Joshu, & Luke, 2006; Viner & Barker, 2005). The comparison strategy is a deliberation-based strategy—a strategy whose mechanisms are theoretically opposite to those of the personal rule strategy. Below we review evidence from the fields of social psychology and behavioral economics that support the likely efficacy of each strategy for consistent behavior development, both in initiation of behavioral intentions and in the longer term.

**Theoretical Support for a Personal-Rule-Based Strategy**

The theory on which the personal-rule based strategy in the current study was primarily based is that of George Ainslie and colleagues (Ainslie & Monterosso, 2003; Monterosso & Ainslie, 2007). Their research, within the field of behavioral economics, has focused on the topic of hyperbolic discounting and the proposed ameliorative process of reward bundling for consistent behavior development—especially for behaviors that bring rewards in the long term rather than the short term. Hyperbolic discounting posits that the amount by which a smaller, sooner-received reward is valued above a larger, later-received reward does not change with the amount of time delay in an exponential way but in a hyperbolic fashion. As a consequence, the individual, when far away in time from a choice, often prefers the “larger-later” reward, but at the moment of the choice, the individual values the “smaller-sooner” reward disproportionately to its actual value (i.e., the individual experiences a “preference reversal” at the time of behavioral performance; Tversky & Thaler, 1990). To overcome the tendency to choose the smaller sooner reward, an individual can “bundle the rewards” of a series of smaller-sooner rewards and larger-later rewards, making the decision about the long term instead of only about the immediate instance—e.g., “if I smoke this one cigarette, then I will fail in my entire attempt to quit smoking.” The averaging effect of reward bundling makes the discount function less hyperbolic and more exponential. For example, Ainslie and Monterosso (2003) showed that the amount of the smaller-sooner reward needed to make rats indifferent between the smaller-sooner and larger-later rewards was greater in the bundled condition (in which the rat’s decision determined three subsequent rewards rather than just one reward) than in the single condition (in which one reward was given for each decision). Kirby and Guastello (2001) showed that when their human subjects knew their current decision would likely be repeated in the future (bundled condition), they were more likely to choose the larger-later reward over the smaller-sooner reward than if they thought their decision was a one-time occurrence.
The tenet of the bundling approach, as tested in the studies above, is the bundling of multiple, future decisions with the single, immediate decision. Translated to a real-world setting in which human individuals are engaging in repeated behaviors (not just making a decision repeatedly as in Kirby and Guastello, 2001), the bundling approach is a bundling of multiple, future *behavioral performances* with the most immediate behavioral performance. Bundling a single decision to perform a behavior into all subsequent such decisions sets up a personal standard to influence the decision rather than a momentary preference; that is, the personal rule strategy in the current study is theorized to accomplish what a bundling approach has accomplished in rat studies and studies regarding human decision making.

Functionally, a personal-rule strategy may also decrease the amount of thought given to the context in which the target behavior is performed (including possible alternative behaviors) in each single instance, because the decision to perform the behavior in order to maintain one’s personal standards or goal-attainment progress has already been made. If a personal rule strategy decreases deliberation on each behavioral performance, as theorized, then it would avoid barriers to behavioral performance (e.g. reversal of preferences for a behavior).

Furthermore, motivation to perform the desired behavior—i.e., to take the larger later reward—is potentially strengthened by making the behavior part of one’s view of himself/herself through personal standards or personal rules. This supposition does not come directly from the theories of Ainslie and Monterosso, as they have only studied the bundling approach in rats, but is a part of our current hypotheses regarding human endeavors to change their behaviors over a period of time in a real-world setting. Hamilton and White (2008), among others, have shown that personal identification with a behavior increases its likeliness to be performed.

**Evidence in Support of a Deliberation-Based Strategy**

Rothman and colleagues (King, Rothman, & Jeffery, 2002; Rothman, 2000) theorize that consistently performed behaviors go through two distinct phases, initiation and maintenance, each of which is characterized by a different type of decision-based process. That is, they theorize that an individual decides to initiate a behavior because of greater positive than negative expectations for the behavior, but the individual maintains a behavior when he/she consciously reevaluates the behavior and decides it is still accomplishing what it is supposed to. Finch and colleagues (2005) showed that positive expectations regarding weight loss predicted actual weight loss in a longitudinal intervention study, and Baldwin and colleagues (2006) showed that self-efficacy (expectations for personal success) best predicted smoking cessation success initially, but satisfaction with smoking cessation predicted success in the longer term, or maintenance phase of a longitudinal smoking cessation program. The point at which a behavior reaches a maintenance phase
likely depends on the individual, the particular behavior, and the situational context (Baumeister & Vohs, 2004). But in general the theory of Rothman and colleagues indicates that long-term behavioral performance is managed through a decision-based or deliberative process. Therefore, their theory and work is considered evidence for the likely effectiveness of a deliberation-based strategy.

Perhaps counter-intuitively, literature in the field of habitual (i.e., automatic, behavior) also provides support for a deliberation-based strategy—for initial development of those behaviors. Habit researchers make a distinction between goal-directed habits and habits that are developed incidentally to other routine behaviors (Wood & Neal, 2007) in their development and maintenance. However, in the case of goal-directed habits, most researchers agree that habits develop with deliberative, repeated pairing of a behavior with environmental cues and that this pairing must at first be consciously done (Aarts & Dijkstra, 2000; Verplanken, 2006). Aarts and Dijkstra (2000) showed that when the goal to travel to a location was activated (by giving participants primes of travel destinations—e.g., to the grocery store or to work), participants who had a strong travel mode choice habit (a habit to always choose the same travel mode such as a bike versus a car) showed faster reaction times to choosing their preferred travel mode over alternative travel modes in a response latency task, but participants with weak habits did not. The authors concluded that repeated choice of a particular travel mode when a specific goal is activated leads to strong habits to choose that travel mode in the future, given that the specific goal is activated.

Danner, Aarts, and de Vries (2007) demonstrated that the processes by which automatic associations initially form between an environmental cue and a behavior may be through inhibition of alternative behaviors in a goal-context rather than through repeated pairing of an environmental context with the target behavior. The researchers primed participants with goals and told them which means of goal-acquisition the participants should target for each goal; they then presented repeated choices of means after goal-activation to see how many repetitions of the exercise would be required before the participants automatically chose the target means over alternative means. They found that alternative means were not inhibited until after three to nine repetitions of the task had been completed. Their results support the idea that before a behavior can become automatic, a period of deliberation is first required, during which time the behavior is consciously repeated through choice. Their results are therefore considered as support for the likely efficacy of a deliberation-based strategy for consistent behavior development, at least in the first few performances of the behavior.

Evidence Against a Deliberation-Based Strategy

Research on implementation intentions (e.g., Achtziger, Gollwitzer, & Sheeran, 2008) provides support against the likely efficacy of a deliberation-based strategy. Implementation intentions are action plans made by individuals
for performing their intended behavior in a specific manner given specific situations that arise (“when situation X arises, I will do Y”); deliberation at the time of implementation is theorized to be detrimental for the individual’s efforts to carry through with behavioral intentions (e.g., Sniehotta, Scholz, & Schwarzer, 2005). Implementation intentions differ from a personal-rule-based strategy because they anticipate ahead of time the situations and temptations that may arise and explic ate particular actions for each planned-for circumstance. A personal-rule based strategy is not specific to particular circumstances or temptations and can conceivably be applied in expected as well as unexpected circumstances. Some potential benefits of a personal-rule-based strategy therefore lie in its relative simplicity and context-independency.

Further evidence against the likely efficacy of a deliberation-based strategy comes from research on individuals’ ability to self-regulate. Self-regulation (Muraven & Baumeister, 2000) is a process by which individuals overcome inhibitory impulses to not perform a desired behavior or impulses to perform a counter-intentional behavior. Evidence from Vohs et al. (2008) suggests that deliberating before performing a behavior depletes self-regulatory power to actually perform the behavior or subsequent behaviors, and therefore their research and theory is considered as support for the likely efficacy of the non-deliberative, personal-rule-based strategy in the current study.

Overview of the Current Study

A personal-rule-based strategy attempts to eliminate attention to contextual information in the initiation as well as the maintenance stage—an individual may use a personal rule to eliminate deliberation about performing a particular behavior in each new circumstance in which he/she attempts it. The personal-rule strategy was designed to institute a bundling of rewards through the making of a personal rule or standard by the participants. In contrast, the deliberation strategy was designed to foster deliberation each time participants were to perform the behavior by considering what their goal was and what the benefits and drawbacks of the behavior were in each specific context.

A convenient setting in which to study goal-related behavioral initiation and maintenance over a discrete amount of time is the religious period of Lent. Many Christians, including Catholics and Episcopalians, make personal resolutions to behave in a particular way for a period of exactly 47 days (note: resolutions are often made to exclude Sunday). Each Lenten resolution can be viewed as a behavioral intention that has a higher-order goal (Carver & Scheier, 1998), such as making a substantial personal change (eating more healthfully, exercising, losing weight, quitting smoking or drinking). Each person making a Lenten resolution therefore attempts to perform a target behavior consistently for a substantial amount of time (approximately 7 weeks). Their success at following their resolutions was assessed both by the number of days before they first violated their resolution (to
assess success at initial stages of development) and by the total number of days they were successful (to assess success overall).

Previously demonstrated moderators of the relationship between intention and behavior were assessed because of their theoretical importance and because they were measured after participants were randomly assigned to groups and therefore could have varied from group to group by chance. They therefore functioned both as control variables in assessing the efficacy of each strategy but also as predictor variables of successful behavior maintenance. These variables include the following: a person’s perceived ability to carry through with a behavior (self-efficacy, Lightsey, 1999; perceived behavioral control, Ajzen, 1991), a person’s ability to inhibit impulses and to plan for his/her behavior (e.g., impulse control, self-regulation, and planfulness; Goldberg et al., 2006; Muraven & Baumeister, 2000; Webb, Christian, & Armitage, 2007), external support (e.g., whether or not a person engages in a behavior with a friend; Eyler et al., 1999), enjoyableness of the behavior (intrinsic reward of performing the behavior at initiation; Bassi, Steca, Delle Fave, & Caprara, 2007), and perceived difficulty of behavior (King, Rothman, & Jeffery, 2002). Since an individual’s religiousness may closely approximate his/her personal motivation to adhere to a Lenten resolution, the religiousness of participants was also assessed.

Method

Participants

Seventy-five participants were recruited from introductory psychology courses at Rutgers University and compensated with required course credits. The only exclusion criterion was age below 18 years. Participants were on average 18.8 years (SD = 1.06 years); 57% were female; 66% were Caucasian; and the following percentages of religious-affiliation were observed: 57% Catholic, 27% other Christian, 5% Jewish, 11% non-religious. One participant dropped out of the study due to a medical situation.

Procedure

In a 30-minute in-person session, participants were told the details of the study, including the fact that the purpose of studying Lenten resolutions was to better understand how chronic illness management could be improved, and gave their informed consent. They were randomly assigned to one of the strategy groups (38 in the personal-rule strategy group; 37 in the deliberation-strategy group), given a paper-and-pencil questionnaire that assessed the control variables, and then coached on their strategies. Participants chose resolutions that were to occur once a day for 5–7 days of each week so that their success on a particular day could be uniformly assessed across participants. Examples of the resolutions
participants made include “exercising at the gym Monday-Friday” (41% of the resolutions regarded regular exercising behavior); “studying at the library after dinner for two hours every day”; “reading the Bible for 15 minutes every night before bed”; “not having dessert except for Saturday.”

The strategy coaching was designed to be as similar as possible in length and wording for each strategy. The personal-rule strategy participants were told that they should make a personal rule to engage in their resolution behaviors and to consider the longer-term consequences of violating their resolutions on any particular day. They were further coached to avoid deliberating on the behavior and alternative behaviors as much as possible—”stick to your personal rule, regardless of the circumstances.” The deliberation strategy participants were told to think about the pros and cons of performing their resolution behavior versus alternative behaviors on every given day and to be aware of the daily context (how they were feeling).

Participants were e-mailed twice a week to remind them of their strategies and to assess resolution success. The e-mails provided identical amounts of text that described the strategies, differing only in the content of the text. Participants in the personal-rule group were asked about their resolution success and strategy-implementation success for the previous day; participants in the deliberation group were additionally asked two questions about the context of the previous day to match their strategy. E-mails were sent on random weekdays and only two days out of each week so that participants could not anticipate when their resolution success would be assessed and also so that the e-mails did not cause participants to be consistent. Study outcomes were assessed via online questionnaire after the last day of Lent.

Measures

Overall Resolution Success—Concrete

After Lent, participants were asked, ‘Please give your best estimate of how many total days of Lent you were successful at keeping your resolution (not just the days I e-mailed you on, but ALL days of Lent): ___out of 47 days (if resolution was for every day of the week), ___out of 40 days (if resolution was for 6 days of every week), or ___out of 33 days (if resolution was for 5 days of every week).” Proportion Success was then calculated using the number of applicable days (out of 47, 40, or 33 days) that each participant was successful at following his/her resolution. Retrospective assessments can be invalid due to problems with patient memory or retrospective bias (Bernard et al., 1984), and so a validity check was structured into the design: Participants were asked in the twice-weekly e-mails, “Were you successful yesterday: Yes, No, N/A.” An N/A response was warranted if the day being assessed was not one of the 5 days of the week on which the participant had resolved to perform the behavior. Scores on the variable were calculated as the average number of applicable days that
the participant was successful at performing his/her resolution behavior, and this measure was correlated with the retrospective measure. A perfect correlation was not expected, since participants were e-mailed on only 14 of the 47 total days, and the resolution success item was often not applicable on the assessed days, but a high correlation would provide evidence that the retrospective measure is a valid measure of success.

**Overall Resolution Success—Perceived**

Two 5-point Likert scale items were given at the end of Lent to assess the participants’ perceptions of overall success at keeping their Lenten resolution. The two perception items of resolution success were combined in order to enhance the reliability of the outcome variable, labeled Perceived Success, and were worded: “How successful were you in sticking to your resolution during Lent” and “How happy are you with how you did during Lent at keeping your resolution.”

**Time to First Violation**

When assessing the utility of a behavioral initiation strategy, an especially relevant outcome variable regards the initial successes and the time until the first failure to perform the desired behavior occurs. At the end of Lent, participants were asked, “When did you first go against your resolution: after ___ days (please enter a numeric value)?” This item was scored as a proportion of the applicable days (33, 40, or 47) that each participant successfully performed his/her resolution up until the first time he/she went against the resolution; the variable is labeled, First Violation. The twice weekly assessments of success (14 total assessments possible per participant) were used to calculate the number of assessments until a participant’s first reported failure, and this variable was correlated with First Violation, as a validity check for the retrospective measure. We did not expect these two variables to correlate perfectly, because participants were only e-mailed two times per week, so the actual day of first violation likely occurred on a day previous to that assessed in the e-mails. It is even possible that a participant failed early and often, but never on days that were not assessed via e-mail; the variable created from the twice-weekly assessments would then erroneously give the participant a perfect success score, which would be completely unrelated to his/her actual time to first violation. However, a high correlation between the twice-weekly data and the retrospective data would support the validity of the retrospective report, making it less likely that a memory or perception artifact was driving any difference between the strategy groups.

**Strategy Implementation**

As purely a manipulation check, participants were asked twice weekly whether they were able to implement the strategy or not, on a scale from 1 = not at all to 5 = very much. They were explicitly told (and repeatedly reminded)
that they were to report if they were able to implement the strategy, not if the strategy had worked.

Religiousness

Religiousness was measured at the beginning of the study and was assessed with a composite of the International Personality Item Pool (IPIP) Religiousness-Spirituality scale (Goldberg et al., 2006), the number of reported days per year that the participant went to a Church-related function, and a single item assessing the degree to which the participant was making his/her resolution for God (1 = Not at all to 5 = Very much). Inclusion of study participant regardless of level of religiousness afforded a broad range of scores on this measure. Scores on the IPIP Religiousness scale had high levels of internal consistency: alpha = .85.

Control Variables

All control variables were measured at the beginning of the study. Internal consistencies for scale measures are given in Table 1. Impulse Control, Self-Regulation, and Planfulness were measured using validated IPIP (Goldberg et al., 2006) scales. Perceived Difficulty was measured with the item: “How difficult will this resolution be for you to follow during the period of Lent: Not at all difficult (= 1) to Very difficult (= 5).” Enjoyableness of the resolution behavior was measured with the item: “Please rate how enjoyable this resolution behavior will be for you: Not at all (= 1) to Very much (= 5).” Resolution Confidence, akin to self-efficacy (Lightsey, 1999), was calculated as the average of two items: “How confident are you that you will stick to your resolution for the entire period of Lent: Not at all confident (= 1) to Very confident (= 5),” and “How successful do you think you will be in sticking to your resolution: Not at all successful (= 1) to Very successful (= 5).” Resolution Type was measured with the item, “Is your resolution giving up a behavior or taking on a behavior,” with answer response “Giving Up” assigned a score of 0 and “Taking On” a score of 1. Finally, External Support was measured with the item: “Are you doing this resolution with a friend,” with answer response “No” assigned a score of 0 and “Yes” assigned a score of 1.

Results

Table 1 reports bivariate correlations between variables as well as internal consistencies for scales. The two measures of overall resolution success (perceived overall success and overall proportion of successful days of Lent) correlated highly enough, r(73) = .87 to combine them into one measure of overall resolution success (variables were standardized and averaged). Table 1 can be used to see which predictors are useful as single predictors of proportion of successful days (Proportion Success), perceived overall success (Perceived Success), and time to first violation (First Violation). Correlated scores on the composite success measure—Resolution Success—and the predictor variables are listed in the final
TABLE 1. Correlations of Scores from Non-Manipulation Predictor Variables and Three Outcome Measures of Resolution Success, with the Final Column Presenting Correlated Scores of Predictor Variables with Composite Measure of Overall Resolution Success. Internal Consistencies are Given in Diagonal Cells Where Applicable.

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<td>1 Proportion Success</td>
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<td>2 First Violation</td>
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<td>3 Perceived Success</td>
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<td>4 Religiousness</td>
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<td>5 Impulse Control</td>
<td>0.41</td>
<td>0.23</td>
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<td>6 Self Regulation</td>
<td>0.18</td>
<td>0.14</td>
<td>0.29</td>
<td>0.21</td>
<td>0.61</td>
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<td>7 Planfullness</td>
<td>0.19</td>
<td>0.08</td>
<td>0.21</td>
<td>0.24</td>
<td>0.70</td>
<td>0.53</td>
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<td>8 Resolution Type</td>
<td>-0.26</td>
<td>-0.18</td>
<td>-0.16</td>
<td>0.23</td>
<td>-0.16</td>
<td>0.09</td>
<td>-0.11</td>
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<td>-0.22</td>
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<td>9 External Support</td>
<td>0.01</td>
<td>0.04</td>
<td>0.05</td>
<td>-0.24</td>
<td>-0.10</td>
<td>-0.19</td>
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<td>0.08</td>
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<td>10 Enjoyableness</td>
<td>0.21</td>
<td>0.10</td>
<td>0.23</td>
<td>0.22</td>
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<td>11 Perceived Difficulty</td>
<td>-0.12</td>
<td>-0.07</td>
<td>-0.20</td>
<td>0.03</td>
<td>-0.11</td>
<td>-0.34</td>
<td>-0.07</td>
<td>-0.21</td>
<td>-0.03</td>
<td>-0.14</td>
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<td>12 Resolution Confidence</td>
<td>0.41</td>
<td>0.27</td>
<td>0.34</td>
<td>0.21</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
<td>0.21</td>
<td>0.02</td>
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A correlation of .23 or higher is significant at p < .05.
column of Table 1. The retrospective reports of both time to first violation and proportion of successful days correlated highly with the twice-weekly validity checks: the correlations were .78 and .68, respectively, indicating an excellent degree of validity for the two retrospective variables.

The strategy manipulation had a significant effect on each of the success outcome measures: Cohen’s $d$ effect size estimates for the comparison between the deliberation and personal-rule strategy groups were .51 for time to first violation and .18 for overall resolution success. Furthermore, the strategy manipulation had a significant effect on each of the success outcome measures after taking into account the effect of all other predictor variables: multiple, hierarchical regression models were tested for each of the two outcome variables to determine the particular effect each of the non-manipulation predictor variables and the strategy manipulation. The non-manipulation predictor variables considered all together in the first step of the model had a significant effect on overall resolution success ($F$-Change = 4.17, $R^2$-Change = .38, $p < .001$) but not on time to first violation ($F$-Change = 1.40, $R^2$-Change = .17, $p = .21$). The strategy group variable demonstrated incremental predictive validity to the non-manipulation predictors for overall resolution success ($F$-Change = 4.90, $R^2$-Change = .05, $p = .03$) and for time to first violation ($F$-Change = 9.72, $R^2$-Change = .12, $p = .002$).

The standardized regression coefficients (betas) for each of the predictor variables and the strategy group variable are presented separately for each outcome in Table 2. The betas for strategy group indicate that those in the deliberation group were significantly more successful both in time to first violation ($\beta = -.38$; the
median number of days to first violation was 12 days for the deliberation group and 6 days for the personal-rule group) and in overall resolution success than were those in the personal-rule group ($\beta = -.21$). Significant predictors of overall resolution success in the total model were impulse control ($\beta = .43$), resolution confidence ($\beta = .25$), enjoyableness ($\beta = .31$), and resolution type ($\beta = -.31$)—indicating higher levels of these qualities at behavior-initiation lead to greater resolution success, and individuals who took on a task were less successful than those who gave up a behavior.

Resolution type was the only significant predictor of time to first violation ($\beta = -.32, p = .02$), although the effect of enjoyableness on time to first violation was marginally significant ($\beta = .25, p = .06$); these results indicated those who gave up a behavior were more successful in the beginning part of Lent than were those who took on a behavior, and those who found their resolution behavior more intrinsically rewarding at the beginning of Lent were more successful than those who had less intrinsically rewarding resolution behaviors.

Implementation of the two strategy manipulations seemed to be equally successful: both strategy groups reported an acceptably high average degree of strategy implementation ($M = 3.00, SD = .75$ for the deliberation strategy group; $M = 3.22, SD = .94$ for the personal-rule strategy group), and there was no significant difference in overall implementation ability between the groups ($F(1, 72) = 1.22, p = .27$).

**Discussion**

The deliberation strategy group performed significantly better than the personal-rule strategy group in time to first violation and in overall resolution success. The fact that the deliberation strategy strongly affected time to first violation but more weakly affected overall resolution success indicates that such a strategy may be most helpful in initial stages of consistent behavior development. Direct linkage of one’s behavior to the overall goal each time the behavior is to be performed might be necessary or at least beneficial in the initial stages of consistent behavior development, until the behavior itself has become associated with the positive reward associated with progressing towards a goal. It may be that the deliberative mindset (Gollwitzer, 1999) remains important in the initial performances of a proposed and intended goal-relevant behavior, and that one’s actions must be procedurally linked with one’s goal-intentions before an implemental mindset is of use or even possible.

These results provide initial evidence against the efficacy of a bundled-rewards/personal-rule strategy for consistent behavior development. Once a behavior has become conditioned enough through being associated with positive affect or with the goal itself (an automatic association through the practice of consciously linking behavior with goal-attainment), then perhaps the personal-rule strategy may prove more helpful in one’s efforts to continue consistent performance of a
behavior that is still not habitual or relatively automatic. Such a process may take longer than seven weeks, however, because in the current study, overall success across the entire Lent period was higher for the deliberation group. Future studies might test a combined strategy in which individuals are told to consciously deliberate on the behavior and situational context in order to keep the end goal clearly in mind until the behavior has become associated with goal progress, at which point individuals are told to use a personal-rule strategy to continue performing the behavior. It is in the latter stage that the motivation to perform a goal-related behavior may dwindle with fatigue or boredom. Therefore, a personal rule to perform the behavior at this stage might preserve the motivation to perform the behavior by linking the continuation of the behavior with a personal standard and possibly the self-concept. The personal-rule strategy may have been harmful in the initial stage of consistent behavior development, because telling oneself to “just do it” before the behavior has proven itself useful in goal-attainment would not stand up as well to the temptations of performing counter-intentional behaviors.

The current study has implications for theories of habit development, in that it indicates that conscious linking of a behavior with a goal is beneficial for successful performance of that behavior. The behaviors involved in the current study were personally meaningful resolutions, which are inherently goal-related, so the results are not necessarily applicable to the development of habits that are not goal related.

A person’s confidence in his/her ability to perform the resolution, how enjoyable a person found the resolution behavior at initiation, and his/her level of impulse control were significant prospective predictors of overall resolution success. These results support prior research that has demonstrated the effect of individual differences in behavioral performance (e.g., Tangney, Baumeister, & Boone, 2008) and the effect of behavioral self-efficacy (Lightsey, 1999) and perceived behavioral control (Ajzen, 1991) on successful bridging of the intention-behavior gap, which is important for repeated behavioral performance. How enjoyable a person found his/her resolution behavior was also a significant predictor of time to first violation; this is not surprising given that intrinsically rewarding behaviors are more likely to be performed than those that are less enjoyable.

The type of resolution made by participants was a significant prospective predictor of time to first violation and overall resolution success, with resolutions to “take something on” being less successful than resolutions to “give something up” in the initial stage of Lent. The reason for this may be that taking on a behavior is more specific (the required behavior is inherently specified), whereas giving up a behavior may entail substituting any number of alternative behaviors. Also, approach and avoidance processes have long been known to be distinct from each other (e.g., Elliot, 1999), so it is reasonable that predictors of resolution success to give up a behavior would be different from those of resolution success to take on a behavior. The current results seem to agree with recent work by Sullivan and Rothman (2008), in which they theorize and find evidence to support the
idea that approach and avoidance health goals may benefit from different strategic mechanisms.

It is of interest that religiousness did not predict individuals’ success at performing their resolutions, because in a study of Lenten resolutions, one would expect a person’s degree of religiousness to predict strongly motivation to adhere to their resolution and success at performing that resolution. One might think that perhaps more religious individuals made more difficult resolutions, thereby equaling out differences in resolution success. However, religiousness did not correlate with perceived difficulty of resolution, as shown in Table 1, indicating that if there were differences in resolution difficulty by degree of religiousness, the differences were not perceived or reported by the participants.

The current study has some limitations. Results from Lenten resolutions of college students may not generalize to goal-directed behaviors of other populations such as adults in the workforce or chronic illness patient populations, due to the young age of the participants and their generally flawless health relative to elderly populations. However, prevention of chronic illness through health habits developed from a young age is of primary importance in the fight to ameliorate chronic disease. Future research should also test the benefit of the strategies (or a combination of strategies) for periods longer than 7 weeks; showing the effectiveness of a strategy for much longer periods of time is important for demonstrating that such a strategy could help individuals with chronic illness manage those illnesses indefinitely.

Another limitation, despite the twice-weekly checks on strategy implementation and resolution success, was that all measures were self-reported by participants. Self-reports of behavioral success may be affected by social desirability bias (Nederhof, 2006); therefore, replication of the current results utilizing objective measures of behavioral success would be beneficial. Some of the measures were assessed with single-items, which were chosen for simplicity and for practical reasons. The reliability of measures may be superior in multi-item measures, but a greater number of constructs may be assessed in a limited-length survey if some measures are single-item measures. Bergkvist and Rossiter (2007) showed that a “concrete” concept (such as the number of days of success) may be sufficiently assessed with single-item measures, whereas broader traits (e.g., personality) may be better assessed with multi-item measures, as done in the current study. Furthermore, Drolet and Morrison (2001) showed that additional items contributed very little to the explained variance in an outcome and caused participants to be annoyed with the task.

A no-strategy group was not included in the current investigation due to the small number of participants available for the longitudinal and time-intensive study. It is possible that both strategies may have helped individuals perform their resolutions. Participants reported at the end of Lent how helpful and how harmful each strategy was to his/her efforts to consistently perform the participant’s resolution. There was no significant difference in the average ratings of helpfulness
of the strategy for the two groups \((F(1, 72) = .969, p > .05)\); nor was there a significant difference between the groups on the average rating of how harmful the strategy was to participants’ efforts, \((F(1, 71) = 3.94, p > .05)\). In future studies, the helpfulness and harmfulness of the strategies could be assessed within a week or two of the beginning of the study. If the deliberation strategy helps individuals last longer before they violate their resolution for the first time, this should be reflected in participant reports of the helpfulness of the deliberation strategy compared to participant reports of the personal-rule strategy, if participants indeed have insight into what is causing their behavior.

The current study allowed for assessment of the processes involved in consistent behavior development and provided evidence for the value of deliberation as a strategy in the initial stages of such development. Simple strategies such as the two tested in the current study—if efficacious—would be very useful in interventions to improve the behaviors of the young and old alike. Therefore, further research to improve such strategies for chronic illness management behaviors, for example, would be potentially very fruitful.

**AUTHOR NOTES**

**L. Alison Phillips** graduated from Rutgers University in October 2011 with her PhD in social psychology and is interested in the health applications of social psychological theory. Her research focuses on the development of health habits, including medication adherence, exercising, and dietary behaviors. **Gretchen Chapman** is a professor of psychology at Rutgers University. Her research focuses on judgment and decision-making processes involved in health behaviors, such as individuals’ flu vaccination behaviors.

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