A controlled examination of motivational strategies: Reviewing positive consequences for goal accomplishment, negative consequences for undesired behavior, and a relaxation exercise...
Motivation Science

A Controlled Examination of Motivational Strategies: Is It Better to Motivate by Reviewing Positive Consequences for Goal Achievement or Negative Consequences of Not Accomplishing Goals?

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CITATION

A Controlled Examination of Motivational Strategies: Is It Better to Motivate by Reviewing Positive Consequences for Goal Achievement or Negative Consequences of Not Accomplishing Goals?

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Motivation is an integral part of human life and one of the most fundamental aspects of behavior change. Although interventions have been developed to motivate goal-oriented behavior, controlled outcome studies have yet to compare the relative merits of reviewing perceived positive consequences for goal achievement (positive consequences review [PCR]) with reviewing negative consequences of not accomplishing goals (negative consequences review [NCR]). In this study, 93 undergraduate students who were interested in improving motivation for lifestyle behaviors completed baseline measures (i.e., motivation to perform healthy lifestyle behaviors, University of Rhode Island Change Assessment Scale, goal achievement, Positive and Negative Affect Schedule, likelihood of seeking professional assistance). Participants were subsequently randomly assigned to PCR, NCR, or relaxation control conditions. They were reassessed immediately after the respective experimental conditions were implemented and 7 days after baseline. Repeated measures analyses indicated that both PCR and NCR were more efficacious than relaxation in enhancing motivation, goal achievement, and positive affect, with PCR yielding larger effect sizes ($p$s < .05). No significant interaction effects were found in reducing negative affect and increasing desire to seek professional assistance ($p$s > .05). Future directions are discussed in light of the results.

Keywords: motivation, consequence review, goal achievement, mood, help-seeking

Psychologists in various fields and theoretical orientations have theorized optimal methods of increasing motivation (Ryan, 2012). From a behavioral psychology perspective, motivation can be influenced through positive and negative reinforcement. Positive reinforcement lies at the core of the incentive theory of motivation, which posits that actions are motivated by a desire for rewards (Toates, 1994; Weiten, 2013). An individual will be more likely to engage in a behavior if they perceive that engaging in it will result in a gain. The incentive theory of motivation explains why individuals initiate and sustain goal-directed behavior even when they are required to engage in challenging and oftentimes prolonged activities. Students, for instance, spend several years in school to earn an advanced degree, which is associated with incentives such as a stable career, higher salary, and knowledge. Participants who have received contingent rewards for substance use abstinence have demonstrated better outcomes compared with controls in clinical trials (S. T. Higgins et al., 1995; Petry et al., 2005). Similarly, the incentive theory of motivation is widely applied in the world of business as the mechanism for productivity (Maslen & Hopkins, 2014).

The drive theory of motivation, derived from negative reinforcement, posits that individuals
engage in goal-directed behavior to remove an aversive experience (Cannon, 1932; Weiten, 2013). To illustrate, a person who is experiencing a headache is motivated to take pain-relieving medication because this strategy worked in the past to reduce symptoms. Although the drive theory has been typically associated with biological or physiological needs to restore a certain balance (i.e., homeostasis) within the organism (Cannon, 1932), it can nevertheless explain human behaviors that do not directly involve physiological need satisfaction (McClelland, 1985).

A theory of approach-avoidance motivation, also rooted in reinforcement, explains human motivation within the context of anticipated positive and negative circumstances. Approach motivation occurs when individuals take action because they desire or expect a positive outcome. In contrast, avoidance motivation occurs when people take action (or cease to act) to prevent something bad from happening (Elliot & Covington, 2001).

**Review of Negative and Positive Consequences**

Of interest to the present study is the therapeutic application of two motivational techniques that build upon the principles of negative and positive reinforcement: the review of negative consequences of undesired behaviors and review of positive consequences of desired behaviors, respectively. These techniques evolved from early trials of behavior therapy for substance misuse and undesired nervous habits (i.e., habit reversal for tics, fingernail biting, hair pulling, etc.; Azrin & Holz, 1966; Azrin, McMahon, et al., 1994; Azrin & Nunn, 1973; Azrin, Nunn, & Frantz, 1980), and were subsequently embedded within the Community Reinforcement Approach (Azrin, Sisson, Meyers, & Godley, 1982; Meyers & Smith, 1995), Motivational Interviewing (MI; Miller & Rollnick, 2013), and Family Behavior Therapy (FBT; Azrin, Donohue, Besalel, Kogan, & Acierno, 1994). These evidence-based therapeutic interventions incorporate consequence reviews to enhance client motivation in improving undesired habits, reducing problem behaviors, increasing prosocial and healthy behaviors, and achieving goals (Azrin, Donohue, et al., 1994; Azrin et al., 2001; Azrin, McMahon, et al., 1994; Chow et al., 2015; Donohue & Azrin, 2011; Donohue et al., 2015; Hettema, Steele, & Miller, 2005; Meyers & Smith, 1995; Miller & Rollnick, 2013).

Review of negative consequences was designed to motivate individuals with their goals by identifying and elaborating on the negative consequences associated with undesired behaviors. Review of positive consequences assists motivation through a discussion of the positive consequences associated with desired behaviors. Clinicians implementing these strategies aim to heighten clients’ awareness of the actual or perceived negative consequences of undesired behaviors and the potential benefits of changing these behaviors, respectively, which, in turn, facilitates clients’ motivation for change.

Research is still unclear as to whether it is better to frame motivational messages positively or negatively (Cesario, Corker, & Jelinek, 2013). Regulatory reference refers to whether these motivational messages have a negative reference value, or a focus on an undesired outcome, as compared with a positive reference value, or a focus on a desirable outcome (Higgins, 1998). These regulatory references also involve anticipation; motivational state is not only influenced by actual positive or negative outcomes, but an individual’s anticipation of these outcomes (Van-Dijk & Kluger, 2004). Motivational messages with a negatively valenced reference are more likely to be associated with avoidance motivation, in that individuals engage in the behavior to avoid undesired consequences. On the contrary, messages with a positively valenced reference are more likely to be associated with approach motivation, and the behavior is driven by an expectation of a desirable outcome. For example, positive reference points are more effective for health promotion behaviors, whereas negative reference messages are more effective for avoiding illness (Rothman, Bartels, Wlaschin, & Salovey, 2006). As such, review of negative consequences uses a negative reference point (i.e., the undesired outcome) and the desire to avoid this undesired outcome as the anchor and basis for the motivational change. In contrast, review of positive consequences uses the desired outcome as a positive reference point to facilitate motivation toward approaching a positive behavioral outcome. From the prospect theory’s perspective
(Kahneman & Tversky, 1979), a discussion about negative consequences is likely to be associated with losses and desire to avoid loss, while a discussion about positive consequences is likely to be associated with gains and advancement from one’s reference point (e.g., current state). Although the general conclusion of the prospect theory research is that losses are more motivating than gains (Kahneman & Tversky, 1984), less consistent outcomes occur when negative and positive messages promote the same act or behavior; this effect is due to goal framing effects and situational factors (Levin, Schneider, & Gaeth, 1998).

Although these motivational techniques have proven beneficial when utilized within the aforementioned multicomponent interventions, it is unknown whether they contribute to outcomes and which of the consequence reviews (negative or positive) is more effective in enhancing motivation and subsequent goal attainment. The present study aims to elucidate these research questions. To assist in building hypotheses, we turn to a review of empirical evidence on the effects of positive and negative events on human motivation, cognition, and behavior.

The Effects of Positive and Negative Events

The effects of positive and negative events on human cognition and behavior have been of scientific interest for decades (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). In their seminal work, entitled Bad is Stronger Than Good, Baumeister and colleagues (2001) conducted a comprehensive review of research evidence pertaining to the general hypothesis that negatives are more powerful than positives across a wide variety of human experiences. Despite carefully searching for evidence to the contrary, their conclusion was unequivocal—bad is stronger than good in the majority of domains. Areas of exception included: prevailing optimism about future events (e.g., Weinstein, 1980), universal bias for positive words and ideas (Boucher & Osgood, 1969), tendency to maintain a positive self-concept and remember positive information about the self while ignoring the negative (or a self-enhancement effect; Alicke & Sedikides, 2011), and individual differences in approach-avoidance motivations suggesting that a person’s underlying goal orientation has the capacity to influence the effectiveness of a positive or a negative message (Elliot & Covington, 2001; Scholer & Higgins, 2012; Scholer, Zou, Fujita, Stroessner, & Higgins, 2010).

The disproportionally stronger effects of negative events have been reported in numerous fields within psychology. For instance, there is a greater prevalence of negatively valenced phenomena, such as psychological disorders, problems, and adversities, than positive ones (Czapiński, 1985; Seligman & Csikszentmihalyi, 2000). From a social psychology standpoint, negative information carries more weight than positive information, especially in the fields of impression formation and decision making (positive-negative asymmetry hypothesis; Peeters & Czapiński, 1990). Namely, learning something bad about an acquaintance (e.g., “dishonest”) significantly outweighs learning something equally good (e.g., “honest”). Similarly, when making decisions, humans tend to process negative information more carefully than positive (Bolster & Springbett, 1961). Neuropsychological studies further corroborate these findings by showing that the brain responds more strongly to negative information (Ito, Larsen, Smith, & Cacioppo, 1998). Findings from developmental and clinical psychology indicate that the effects of a single bad event, such as child abuse or divorce, are significantly stronger and more long-lasting than the effects of a single positive event, such as exceptionally positive childhood experiences or marriage (Baumeister et al., 2001). In the domain of task performance, thinking about negative information resulted in better performance on a test than thinking about positive information (Goodhart, 1986), which could be linked to greater goal attainment. In behavioral economics, it has been established that, all else being equal, motivation to avoid losing something, or loss aversion, is more powerful than motivation to gain something of equal value (Costantini & Hoving, 1973; Kahneman & Tversky, 1984).

From an evolutionary standpoint, it is adaptive to be more attuned to preventing and escaping aversive conditions than attempting to maximize positive gains (Baumeister et al., 2001). Indeed, the ability to remember negatively valenced information better than positive (e.g., Pratto & John, 1991) and for longer periods of time (e.g., Brickman, Coates, & Janoff-Bulman, 1978) has an adaptive value. Thus,
thinking of negative consequences is likely to elicit negative affect and distress, which, in turn, is likely to produce motivation to escape bad feelings (Baumeister, Heatherton, & Tice, 1994).

Nevertheless, some contrary evidence exists indicating that positive circumstances may be more effective in motivating behavior. Skinner, for instance, concluded that positive reinforcement is more effective in behavior modification than punishment (Skinner, 1948), and his postulations were later formally validated (Azrin & Holz, 1966). In the business realm, although negative reinforcement motivates workers’ productivity in the short-term, it may hinder creativity, engagement, and growth in the long-term (Harter, Schmidt, & Keyes, 2003). Additional examples of the power of positive phenomena include the aforementioned tendencies of humans to think optimistically about the future (Boucher & Osgood, 1969) and favor positive information in regard to the self (Alicke & Sedikides, 2011). Furthermore, positively framed messages may be more effective in motivating desired behaviors when the focus is on promotion of healthy lifestyle behaviors—a view supported by approach motivation literature (Elliot, 2006; Rothman et al., 2006).

In psychological approaches that emphasize cognitions and self-talk, therapists often encourage clients to change their thoughts and language to be more positive and action-oriented (e.g., what clients want instead of what they do not want to happen; Wright, Basco, & Thase, 2006). In an outcome study evaluating the effects of a cognitive-behavioral therapy program on mood outcomes, clients who framed their goals in terms of avoidance had less symptomatic improvement compared with clients who framed their goals positively, although they were still able to achieve their goals (Wollburg & Braukhaus, 2010). This suggests that goal attainment might be unaffected by the type of motivation, while mood symptoms may improve when goals are framed positively. In a smoking cessation study, participants who received gain-framed messages encouraging smoking abstinence (videos and printed materials emphasizing the benefits of quitting smoking) were continuously abstinent from smoking compared with participants who received loss-framed messages (emphasizing the costs of continuing to smoke; Toll et al., 2007). The authors concluded that gain-framed messages are more persuasive in promoting smoking abstinence. Similarly, positive psychology proponents focus on individuals’ strengths, virtues, and positive emotions to aid in the achievement of life satisfaction, which, in turn, can counteract the problems of living and enhance striving for self-improvement (Seligman & Csikszentmihalyi, 2000). These examples are consistent with mental health optimization approaches that focus on optimization of skills, as opposed to exclusive remediation of psychopathology, to promote goal achievement (Donohue et al., 2018; Gavrila & Donohue, 2018; Gavrila, Donohue, & Galante, 2017).

While these studies and approaches provide support for positively framed content, the effects of eliciting and reviewing potential positive consequences of goal achievement or negative consequences of not accomplishing goals in psychotherapy on motivation and goal achievement remain unexplored. Taken together, the majority of the evidence suggests that review of negative consequences should have a superior impact on the person’s memory, information processing, neurological processes, emotions, and learning, and it should produce longer-lasting effects on motivation and goal achievement compared with review of positive consequences.

Despite strong evidence for reviewing negative consequences, positive stimuli may be more compelling under certain circumstances, such as the therapeutic context used in this study. Specifically, negative information may be less pertinent for motivation when that information relates to the self because humans are motivated to preserve positive self-views and protect self-esteem (Alicke & Sedikides, 2011). In addition, a review of negative information is likely to produce negative affect (Baumeister et al., 1994), which, in turn, may limit creative goals and action repertoires (Fredrickson, 2001) and may deter an individual from seeking further psychological assistance (e.g., due to a strong desire to avoid unpleasant feelings). In contrast, a review of positive information is likely to produce a positive affective state, which has been associated with expanded creativity and behavioral activation (Bless & Fiedler, 2006; Fredrickson, 2001), which are essential for goal attainment. Having a positive experience with psychological services (e.g., re-
viewing positive consequences) may lead to a greater openness to seeking professional assistance in the future (Vogel & Wester, 2003). Lastly, it is worth noting that results may vary based on individual differences, in which individuals who are prevention-oriented may avoid unpleasantries, while individuals who are promotion-oriented may seek opportunities for growth (Higgins, 1998; Scholer & Higgins, 2012).

In conclusion, a dearth of literature on the effects of reviewing positive and negative consequences in psychotherapy and lack of agreement on the relative power of positive versus negative information on motivation and behavior warrant an empirical investigation.

Why Target Lifestyle Behaviors in College Students?

A high proportion of college students do not adhere to public health recommendations for health behaviors, such as getting restful sleep (Taylor & Bramoweth, 2010), using condoms when engaging in sexual activity (Centers for Disease Control and Prevention, 2010), avoiding substance use (Johnston, O’Malley, Bachman, Schulenberg, & Miech, 2016), and exercising and consuming healthy foods (Wald, Muennig, O’Connell, & Garber, 2014). Not adhering to these behaviors may facilitate a host of negative consequences, including poor academic performance (Buboltz, Brown, & Soper, 2001; Meda et al., 2017), unwanted pregnancy and contracting sexually transmitted diseases (Centers for Disease Control and Prevention, 2010; Ceperich & Ingersoll, 2011), postgraduation unemployment (Arria et al., 2013), and significant health consequences such as injuries and overdoses (White & Hingson, 2013). Although college-age individuals are afforded great opportunities to advance their personal and professional development (Howard, Shiraldi, Pineda, & Campanella, 2006), their lack of adherence to health behaviors may prevent them from taking full advantage of their potential. Additionally, behavioral patterns developed in college are likely to persist into adulthood (e.g., Jennison, 2004; Zuercher & Kranz, 2014). As such, it is important to assist and motivate students in establishing optimal health habits in college.

Other habits worth promoting in college students include studying for courses, maintaining employment, creating a clean and organized living environment, and eliciting positive mindsets (Aquino, 2011). Lack of motivation, poor study habits, and negative attitudes toward studying interfere with students’ educational achievement. In fact, study motivation and study skills had the strongest relationship with college GPA and grades (Credé & Kuncel, 2008). Helping students with motivation to maintain a clean and organized living environment may assist students with promoting study habits while minimizing distractions.

Helping students maintain motivation for work while they are pursuing academic degrees is another goal-worthy endeavor. Approximately 74% of undergraduate college students maintain a 25-hr work load while going to school (National Postsecondary Student Aid Society, 2000). Although, logically, one might expect students who do not work or work few hours to perform better in school, Dundes and Marx (2006) found that students who worked 10–19 hr per week performed as well or better academically than their nonworking peers. The results suggest that, through employment experiences, working students acquire the necessary skills that benefit them in college, including time-management, self-sufficiency, and personal responsibility. Therefore, it would be beneficial to motivate students to maintain employment and develop positive working habits while they are in college.

Optimism in college is associated with positive college adjustment, higher self-esteem, and lower loneliness (Montgomery, Haemmerlie, & Ray, 2003). Students who think more positively tend to perceive college as less stressful compared with students who are less optimistic (Krypel & Henderson-King, 2010). Perceived stress, in turn, can have significant effects on students’ physical and emotional health (Lepink, Odlaug, Lust, Christenson, & Grant, 2016) and can lead to student disengagement from learning (Krypel & Henderson-King, 2010). Therefore, helping students deal with stress by building optimistic mindsets can be beneficial for the students’ health and education, and it may alleviate the wait list crisis at campus counseling centers (Mowbray et al., 2006; Reetz, Bershad, LeViness, & Whitlock, 2016). In summary, it is important to promote
students’ adherence to a healthy lifestyle to facilitate successful adjustment to social, academic, and occupational demands that will likely persist into adulthood.

The primary aim of this study is to examine the relative motivational effects of reviewing perceived positive consequences for goal achievement (positive consequences review [PCR]) and negative consequences of not accomplishing goals (negative consequences review [NCR]), as compared with a relaxation control (RC), in college students.

Prior to intervention implementation, students used a menu of options to select healthy lifestyle behaviors for which they were low in motivation (i.e., exercising, healthy eating, achieving sufficient sleep, avoiding alcohol, smoking, and illicit drug use, using condoms during sex, studying for courses, performing work duties, doing chores, and thinking positively). The interventions were designed to improve motivation and goal achievement of the chosen lifestyle behavior. Secondary outcomes included improving the students’ mood and increasing openness to seek professional assistance for lifestyle behaviors. The following hypotheses were developed based on the available literature:

1. Due to a lack of agreement in the literature regarding the effectiveness of reviewing positive versus negative consequences in psychotherapy on motivation and goal achievement, we hypothesized that both PCR and NCR would be superior to RC on the measures of motivation and goal achievement from baseline to postsession and follow-up assessments, and no significant differences were expected between PCR and the RC condition on mood outcomes because the RC condition involved relaxation and mindfulness components, which also had the capacity to positively influence mood (Jain et al., 2007).

2. We also predicted that, due to the positive nature of PCR and its potential to elicit a positive affective state (Bless & Fiedler, 2006), PCR would lead to significantly better mood outcomes compared with NCR from baseline to postsession, as indicated by higher positive affect and lower negative affect scores. The discussion of negative consequences in the NCR condition was expected to lead to a negative affective state (Baumeister et al., 1994). No significant differences were expected between PCR and the RC condition on mood outcomes because the RC condition involved relaxation and mindfulness components, which also had the capacity to positively influence mood (Jain et al., 2007).

3. Lastly, because PCR participants would discuss positive, potentially inspiring content unlike NCR participants, who would discuss unpleasant consequences of their current behaviors, we hypothesized that PCR would lead to significantly greater improvements in likelihood of seeking professional assistance compared with the NCR and RC conditions from baseline to postsession and follow-up assessments. This hypothesis agrees with findings that having a positive psychological experience may lead to greater help seeking in the future (Vogel & Wester, 2003), while the aforementioned negative mood state elicited by reviewing negative consequences (Baumeister et al., 1994) may, by association, produce motivation to escape bad feelings and future psychological services.

This study is the first to our knowledge to empirically investigate the effects of comprehensively reviewing positive and negative consequences on motivation, goal achievement, mood, and help seeking in a therapeutic context, using randomized controlled methodology with an adequate sample size, intervention integrity checks, measures of consumer satisfaction, and real-world application in a college sample.

Method

Participants

Participants were 93 undergraduate students from an urban southwestern university who were interested in participating in a study aimed at increasing motivation for healthy lifestyle behaviors. Study inclusion criteria required that participants were at least 18 years of age. Demographic characteristics are presented in Table 1. Participants ranged in age from 18 to 72 years (M = 21.31, SD = 6.96), were predominately female (n = 65, 70%) and single (n = 85, 91%), and were ethnically diverse. Many of the
participants were freshman \((n = 45, 48\%)\) and employed part-time \((n = 51, 55\%)\).

**Experimental Design**

The present study utilized randomized controlled methodology in a 3 (intervention condition) × 3 (time of assessment) between-within experimental design. Participants were randomly assigned to NCR, PCR, or RC conditions. Participants were assessed at three time points: baseline, postintervention, and 7-day follow-up. No attrition occurred in the study. For a review of the procedures, the study flowchart is displayed in Figure 1.

**Procedures**

All study procedures were approved by the university’s institutional review board. Participants were recruited through the psychology subject pool (i.e., SONA Systems) and offered research credit for their participation. Upon arrival, students were screened for inclusion criteria, consented, and invited to complete baseline questionnaires. Following random assignment to conditions (i.e., NCR, PCR, or RC), study participants either met with an interviewer one-on-one or remained in a private room for the control procedures. Immediately after the assigned session, all participants completed postsession questionnaires and were reminded about a 7-day follow-up. One week after the initial session, participants received an e-mail with the survey link and completed follow-up questionnaires. At the end of the follow-up assessment, participants were invited to participate in an additional workshop if they desired to continue working on motivation.

**Experimental Conditions**

The interventions were implemented in one session (average duration = 52 min). Two interviewers with a master’s degree, who had been comprehensively trained in NCR and PCR, provided motivational interventions. Pro-

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<th>Table 1: Demographic Characteristics of Participants With Numbers Shown as Mean (SD) or Frequency (%)</th>
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*Note.* PCR = Positive Consequences Review; NCR = Negative Consequences Review; RC = relaxation control; ANOVA = analysis of variance; \(\chi^2\) = chi-square.

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tocol checklists were utilized to guide intervention implementation and assess protocol adherence. Motivational sessions were audio recorded to assess intervention integrity utilizing an independent reviewer. Ongoing clinical supervision by a licensed clinical psychologist was provided, including review of selected audio recordings and corrective feedback.

**NCR.** NCR was adapted from an intervention component of FBT (Azrin et al., 2001) designed to motivate individuals to reach goals for which their motivation is relatively low. First, participants in this condition reported their baseline level of motivation on a scale ranging from 0% to 100% (0% = not motivated at all; 100% = completely motivated), and then were asked to report negative consequences of not reaching their desired goal or not adhering to their desired behavior (e.g., “What negative consequences are likely if you do not exer-

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**Figure 1.** Study flowchart. See the online article for the color version of this figure.
cise?”). Once initial consequences were reported, the interviewer asked how these initial consequences are unpleasant. Using a peel-the-onion technique, the interviewer helped each participant identify as many potential negative consequences as possible, including more distant and global consequences. Each participant was then provided a prompting list of negative consequences reported by others to help recognize additional consequences associated with not reaching the desired goal or behavior.

During the review of negative consequences, the interviewer listened carefully and remained nonjudgmental. Once negative consequences of not reaching the goal were exhausted, the interviewer summarized all generated and prompted negative consequences, and subsequently provided empathetic feedback. Having reviewed the potential negative consequences of not reaching the goal, each participant was asked to rate his or her postreview level of motivation utilizing a 0% to 100% scale. After comparing the baseline and postreview ratings, the interviewer prompted the participant to explain why the discrepancies might or might not have occurred. The interviewer descriptively praised the participant for the insights and desire to work on the target behavior and, if motivation was less than 100%, asked how the participant could further optimize motivation. Lastly, personal goals were set to facilitate desired behavior.

PCR. Participants in this condition were asked to report positive consequences of reaching their desired goal or adhering to their desired behavior (e.g., “What positive consequences are likely if you eat healthy?”). The implementation process was similar to that of NCR described above with three exceptions: (a) each participant identified potential positive consequences associated with goal accomplishment, including more distant and global positive consequences; (b) each participant was provided a prompting list of positive consequences reported by others to help recognize additional consequences associated with desired behavior; and (c) at the end of the review the interviewer expressed excitement about the anticipated positive outcomes.

In addition to the manipulation of positive versus negative consequences, participants were prompted to frame their consequences consistent with the intervention condition. For instance, if a PCR participant stated that she would avoid something unpleasant as a result of engaging in her target behavior, the interviewer would prompt her to report what she would gain instead of avoiding something unpleasant to be consistent with the positive nature of PCR.

RC. The control condition involved listening to an audio relaxation exercise (i.e., body scan; Hickman, 2007). This exercise was selected because it is comparable with the motivational sessions in terms of duration and participation, but without the expected motivation enhancement effect. Participants in this condition were invited to sit comfortably on a sofa in a private room where they listened to a 45-min body scan exercise through noise-canceling headphones. To minimize distractions, participants were asked to avoid using cell phones during the exercise.

Measures

The study flowchart in Figure 1 outlines what measures were used at each assessment time-point (baseline, postsession, and 7-day follow-up).

Demographics form. This form was used to obtain demographic information from the participants, including gender, age, marital status, ethnicity, primary language, income, employment and financial status, and academic information.

Importance-Motivation Scales. This measure consisted of three parts. First, in the Importance Scale, participants reported the importance of various lifestyle behaviors/goals (i.e., exercising, healthy eating, achieving sufficient sleep, avoiding alcohol use, smoking, and illicit drug use, using condoms during sex, studying for courses, performing work duties, doing chores, thinking positively) on a scale from 0 to 100% (0% = not important at all; 100% = extremely important). Second, in the Motivation Scale, participants indicated how motivated they were to accomplish each of the aforementioned behaviors/goals on a scale 0 to 100% (0% = not motivated at all; 100% = extremely motivated). Items that were high on the Importance Scale (e.g., above 70% importance) and low on the Motivation Scale (e.g., below 50% motivation) were identified as target behaviors/goals. Third, the participants were asked to re-
port in an open-ended format why they would want to focus on this target behaviorgoal.

University of Rhode Island Change Assessment Scale (URICA). The URICA (McConaughy, Prochaska, & Velicer, 1983) is a 32-item self-report measure of the four primary stages of change, including Precontemplation, Contemplation, Action, and Maintenance. Participants responded to questions using a 5-point Likert scale ranging from 1 (strong disagreement) to 5 (strong agreement). The subscales can be combined using a formula to arrive at a continuous Readiness to Change Index (RCI), which can be used to predict outcomes. The URICA yields good internal consistency and validity (McConaughy, DiClemente, Prochaska, & Velicer, 1989; McConaughy et al., 1983). For the purpose of this study, the URICA was adapted for use in nonclinical populations (similar to Dozois, Westra, Collins, Fung, & Garry, 2004) to measure participants’ degree of motivation for a range of behaviors. In this study, in addition to the RCI scores, the Action subscale was considered in the outcome analyses because higher scores on the Action subscale are associated with better treatment outcomes (DiClemente, Schlundt, & Gemmell, 2004). This subscale measures individuals’ beliefs that they have the ability to modify their behaviors and that they are actively taking steps toward positive change.

Goal Achievement Scales. This measure consisted of three parts. First, participants indicated how much effort they put into accomplishing their target behavior during the past seven days on a scale from 0% to 100% (0% = nonoptimal; 100% = optimal). Second, participants indicated how successful they were with their target behavior during the past 7 days on a scale from 0% to 100% (0% = completely unsuccessful; 100% = completely successful). Third, participants were asked to report in an open-ended format specific behavioral steps taken to accomplish the goal. This item served as a behavioral marker of goal achievement.

The Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) comprises two mood scales, one that measures positive affect and the other that measures negative affect. Each scale consists of 10 items (words) that describe different feelings and emotions. Participants were prompted to report the extent to which they feel this way at the moment, using a 5-point scale that ranges from 1 (very slightly or not at all) to 5 (extremely). The two scales have high internal consistency and excellent convergent and discriminant validity (Watson et al., 1988).

Likelihood of Seeking Professional Assistance Scale. This scale assessed participants’ likelihood of seeking professional assistance for their target behavior on a 0% to 100% scale (0% = extremely unlikely; 100% = extremely likely).

Helpfulness With Session Scale. This measure was used to assess intervention acceptability from the participants’ perspective. Participants provided one through seven ratings of helpfulness with their assigned intervention (1 = extremely unhelpful; 7 = extremely helpful).

Client Satisfaction Questionnaire-8 (CSQ-8). The CSQ-8 (Larsen, Attkisson, Hargreaves, & Nguyen, 1979), a brief eight-item questionnaire (4-point scale), was used to measure participants’ satisfaction with services received. A total score can be calculated by summing the responses to all eight items, which produces a score range of 8 to 32, with higher scores reflecting higher satisfaction. The CSQ-8 yields excellent reliability (Attkisson & Zwick, 1982).

Statistical Plan and Approach

Data management and analyses. Data was obtained using Qualtrics survey software and was exported into IBM SPSS Statistics 24.0 software for analyses. Data screening was performed to ensure accuracy and to identify missing data and potential outliers. Missing data points (10 cases, each missing 1–2 items) were treated using series mean substitution. Four cases were identified as multivariate outliers (p < .001) using the Mahalanobis distance test (Tabachnick & Fidell, 2007). The outlier scores were replaced using series mean substitutions for the respective intervention group at the respective time period (Allison, Gorman, & Primavera, 1993).

Preliminary analyses were conducted on baseline measures to identify potential differences between groups (chi-square for categorical variables and one-way analyses of variance [ANOVAs] for continuous demographic variables, using α = .05). For primary and secondary outcome analyses, separate mixed-design repeated measures ANOVAs and, if the inter-
action was significant ($p < .05$), subsequent Fisher’s least significant difference (LSD) post hoc tests were conducted, using $\alpha = .05$. For consumer satisfaction analyses, one-way ANOVAs and, if significant, subsequent Fisher’s LSD post hoc tests were performed, using $\alpha = .05$. In instances where Mauchly’s test of sphericity was significant, results were reported using the Huynh-Feldt (when $\epsilon > .75$) or Greenhouse-Geisser (when $\epsilon < .75$) correction. Partial eta squared ($\eta^2$) and standardized differences between means (Cohen’s $d$) were calculated as estimates of the effect size for each outcome measure. Effect sizes were considered large at $\eta^2 = .14$ and above, medium between $\eta^2 = .06$ and .14, and small between $\eta^2 = .01$ and .06. In the interpretation of Cohen’s $d$, absolute magnitude from zero demonstrates larger effect sizes (.2 = small, .5 = medium, and .8 = large; Cohen, 1988).

**Intervention integrity.** Intervention integrity was calculated in a three-step process. First, the interviewer computed percentage of adherence to standardized session protocols (i.e., number of steps reported to have been implemented divided by the total number of steps in the protocol). Second, an independent, blind rater randomly selected and reviewed for adherence approximately 10% of all intervention session audio recordings using the same computational method. Third, interrater reliability between the interviewer and independent rater’s scores was examined by computing percentage of agreement (i.e., number of steps agreed upon divided by the number of steps agreed upon plus the number of steps disagreed upon, and multiplied by 100).

**Results**

**Preliminary Analyses**

**Comparison of experimental conditions at baseline.** Potential baseline differences between conditions (PCR, NCR, and RC) were analyzed using chi-square and one-way ANOVAs for categorical and continuous demographic/outcome variables, respectively, with the assigned condition as the independent variable. The results indicated no statistically significant differences between conditions on all variables at baseline ($ps > .05$). See Table 1 for baseline comparisons of the demographic characteristics between conditions.

**Intervention integrity.** Interviewer-reported adherence to standardized protocols in the active conditions was high ($M = 98.82$, $SD = 2.8$). Interrater reliability between the interviewers’ and independent rater’s scores was 99%, indicating that interviewers’ estimates of protocol adherence were reliable.

**Examination of Primary and Secondary Outcomes**

Mixed-design repeated measures ANOVAs with one between-subjects factor (i.e., condition with three levels: PCR, NCR, and RC) and one within-subjects factor (i.e., time with 2 or 3 levels, depending on how many times the measure was administered) were performed to examine the effects of these conditions on the outcome measures. The results below focus primarily on the interaction effects. Pretest, posttest, and follow-up means and standard deviations for the outcome measures for participants in each intervention group are presented in Table 2. Table 3 displays effect sizes (Cohen’s $d$) and 95% confidence intervals comparing standardized mean differences between PCR and RC, NCR and RC, and PCR and NCR on the primary outcome measures.

**Motivation.** There was a significant interaction between time and condition on the Motivation Scale scores, $F(3.904, 175.70) = 6.430$, $p < .001$, partial $\eta^2 = .125$. Consistent with the study hypothesis, post hoc analysis revealed that participants in the PCR and NCR conditions increased their postsession motivation significantly more than the RC group ($p = .001$, $d = .91$, and $p = .036$, $d = .58$, respectively) and maintained significantly greater motivation at follow-up ($p < .001$, $d = 1.22$, and $p = .001$, $d = .93$, respectively). As expected, there were no significant differences between PCR and NCR on the Motivation Scale scores at postsession and follow-up ($p = .118$ and $p = .293$, respectively).

On the URICA’s RCI, both PCR and NCR groups significantly improved from baseline to postsession ($ps < .001$) and only participants in the NCR condition improved from baseline to follow-up ($p = .003$). There was a significant interaction between time and condition, $F(3.691$, $166.082) = 3.118$, $p = .019$, partial $\eta^2 = .065$. 


However, post hoc examination did not reveal significant differences between conditions across time (p > .05). However, there was a significant interaction between time and condition the URI-CA’s Action subscale, $F(2.988, 134.445) = 3.472, p = .018$, partial $\eta^2 = .072$. Partially supporting the study hypothesis, post hoc test revealed that, at follow-up, only PCR (but not NCR) participants significantly improved their scores compared with the controls ($p = .04, d = .69$), although NCR approached significance ($p = .054$). There was a trend for the PCR group to be

Table 2
Pre, Post, and Follow-Up Means and Standard Deviations for Outcome Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre (n = 26)</th>
<th>Post (n = 26)</th>
<th>Follow-up (n = 26)</th>
<th>Pre (n = 39)</th>
<th>Post (n = 39)</th>
<th>Follow-up (n = 39)</th>
<th>Pre (n = 28)</th>
<th>Post (n = 28)</th>
<th>Follow-up (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSQ-8</td>
<td>41.9 (25.7)</td>
<td>92.0 (11.1)</td>
<td>86.0 (15.6)</td>
<td>41.6 (24.2)</td>
<td>84.4 (17.4)</td>
<td>79.8 (24.0)</td>
<td>44.6 (22.6)</td>
<td>74.5 (25.5)</td>
<td>60.0 (27.9)</td>
</tr>
<tr>
<td>URICA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precontemplation</td>
<td>1.9 (.4)</td>
<td>1.5 (.5)</td>
<td>1.9 (.6)</td>
<td>1.9 (.5)</td>
<td>1.8 (.6)</td>
<td>2.0 (.6)</td>
<td>1.9 (.5)</td>
<td>1.8 (.6)</td>
<td>2.0 (.6)</td>
</tr>
<tr>
<td>Contemplation</td>
<td>4.1 (.5)</td>
<td>4.1 (.4)</td>
<td>3.9 (.4)</td>
<td>3.8 (.7)</td>
<td>4.0 (.6)</td>
<td>3.7 (.7)</td>
<td>4.1 (.4)</td>
<td>4.1 (.5)</td>
<td>3.8 (.4)</td>
</tr>
<tr>
<td>Action</td>
<td>3.5 (.7)</td>
<td>4.1 (.5)</td>
<td>4.1 (.5)</td>
<td>3.4 (.8)</td>
<td>4.0 (.6)</td>
<td>4.0 (.5)</td>
<td>3.6 (.6)</td>
<td>3.8 (.5)</td>
<td>3.8 (.5)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>3.1 (.8)</td>
<td>2.9 (.9)</td>
<td>3.1 (.7)</td>
<td>2.8 (.8)</td>
<td>2.9 (.9)</td>
<td>2.8 (.9)</td>
<td>3.2 (.7)</td>
<td>3.0 (.6)</td>
<td>3.2 (.6)</td>
</tr>
<tr>
<td>Goal achievement</td>
<td>8.8 (1.5)</td>
<td>9.6 (1.4)</td>
<td>9.2 (1.4)</td>
<td>8.1 (2.0)</td>
<td>9.3 (1.8)</td>
<td>8.8 (2.2)</td>
<td>8.9 (1.2)</td>
<td>9.2 (1.5)</td>
<td>8.8 (1.3)</td>
</tr>
</tbody>
</table>

Note. PCR = Positive Consequences Review; NCR = Negative Consequences Review; RC = relaxation control; URICA = University of Rhode Island Change Assessment Scale; PANAS = Positive and Negative Affect Schedule; CSQ-8 = Client Satisfaction Questionnaire–8.

Numbers shown as frequency (%).

Table 3
Effect Sizes (Cohen’s d) and 95% Confidence Intervals$^a$ for Outcome Measures

| Measure                          | PCR vs. RC | Pre-to-post | Pre-to-FU | NCR vs. RC | Pre-to-post | Pre-to-FU | PCR vs. NCR | Pre-to-post | Pre-to-FU |
|---------------------------------|------------|-------------|-----------|------------|-------------|-----------|------------|-------------|-----------|-----------|
| Motivation Scale                | .91 [.32, 1.50] | 1.22 [.65, 1.80]$^a$ | .58 [.09, 1.06]$^a$ | .93 [.41, 1.44]$^a$ | .35 [.−22, .93] | .26 [.−29, 81] |
| URICA                           |            |             |           |            |             |           |            |             |           |
| Precontemplation                | .36 [−.04, .75] | .37 [−.03, .77] | .53 [.19, .87] | .44 [.05, .84] | .23 [.−.57, .11] | .16 [.−.55, .23] |
| Contemplation                   | .69 [24, 1.14] | .69 [16, 1.22]$^a$ | .62 [.19, 1.04] | .64 [.11, 1.18] | 0 [.−.39, .39] | 0 [.−.56, .56] |
| Goal achievement                | .132 [.71, 1.93]$^a$ | N/A | .71 [.27, 1.15]$^a$ | .65 [.18, 1.13]$^a$ | N/A | .35 [.−.19, .89] |
| Positive affect                 | 0 [.−.57, .57] | N/A | .64 [.09, 1.18] | .80 [.25, 1.36]$^a$ | N/A | .55 [.−.11, .02] |
| Likelihood of seeking           | .36 [.−.12, .84] | .43 [.00, .86] | .05 [.−.33, .43] | .22 [.−.19, .64] | .32 [.−.12, .76] | .22 [.−.22, .67] |

Note. PCR = Positive Consequences Review; NCR = Negative Consequences Review; RC = Relaxation Control; FU = follow-up; URICA = University of Rhode Island Change Assessment Scale; PANAS = Positive and Negative Affect Schedule.

$^a$ Cohen’s d and confidence intervals were calculated using mean gain scores, pre and post or pre and follow-up standard deviations, and prepost or pre-follow-up correlations ($r$). In the interpretation of Cohen’s $d$, absolute magnitude from zero demonstrates larger effect sizes ($\geq .2 = \text{small}, \geq .5 = \text{medium}, \geq .8 = \text{large};$ Cohen, 1988).

* Statistically significant at $\alpha < .05$. 

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different from the RC group at postsession assessment \((p = .051, d = .69)\) while NCR showed no such trend \((p = .223)\). As expected, there was no significant difference between the active conditions on the URICA Action scale scores at postsession and follow-up \((p = .357\) and \(p = .746\), respectively).

**Goal achievement.** There was a significant interaction between time and condition on the Effort scale of the Goal Achievement Scales, \(F(2, 90) = 6.954, p = .002, \text{partial } \eta^2 = .134\). As hypothesized, post hoc test indicated that, at follow-up, participants in the PCR and NCR conditions significantly increased their effort in accomplishing goals compared with the RC condition \((p = .005, d = 1.00, \text{and } p = .01, d = 65, \text{respectively})\). As expected, there was no significant difference between the active conditions on the Effort scale scores \((p = .63)\).

In addition, there was a significant interaction between time and condition on the Success scale of the Goal Achievement Scales, \(F(2, 90) = 4.837, p = .01, \text{partial } \eta^2 = .097\). Partially supporting the study hypothesis, post hoc analysis showed that only NCR (but not PCR, \(p = .093, d = .73\)) participants significantly improved their scores at follow-up compared with the controls \((p = .002, d = .80)\). As expected, there was no significant difference between PCR and NCR on the Success scale scores \((p = .209)\).

**Mood.** There was a significant interaction between time and condition on the PANAS Positive Affect Scale, \(F(2, 90) = 14.304, p < .001, \text{partial } \eta^2 = .241\). Specifically, the post hoc test showed that both PCR (as predicted) and NCR conditions increased participants’ positive affect compared with the RC condition \((p = .002, d = 1.32, \text{and } p = .011, d = .71, \text{respectively})\). In contradiction with the study hypothesis, there was no significant difference between PCR and NCR \((p = .365)\) and the RC condition (relaxation exercise) had no effect on participants’ positive mood \((p = .706)\).

While both PCR and NCR conditions significantly reduced participants’ negative affect (PANAS’s Negative Affect scale) immediately following participation in their respective sessions \((p = .001 \text{ and } p < .001, \text{respectively})\), no significant interaction effect was found \((p = .095)\). This finding did not support the study hypothesis that PCR would lead to a significantly greater reduction in negative affect compared with NCR.

**Help seeking.** Both PCR and NCR participants significantly increased their desire to seek professional assistance (Likelihood of Seeking Professional Assistance Scale) from baseline to postsession \((p < .001 \text{ and } p = .09, \text{respectively})\) and from baseline to follow-up \((p < .001 \text{ and } p = .004, \text{respectively})\). However, the interaction term did not produce statistically significant results \((p = .277)\). This result is inconsistent with the study hypothesis that PCR would lead to significantly greater likelihood of seeking professional assistance compared with the NCR and RC conditions.

Furthermore, at the end of follow-up assessment, participants were asked whether they would be interested in participating in a workshop to address motivation. The results revealed that while 50% of PCR and 51.3% of NCR participants were interested in coming back for a motivational workshop, only 35.7% of RC participants expressed interest, although a chi-square test was nonsignificant \((p = .408)\).

**Consumer Satisfaction**

A one-way ANOVA indicated a significant effect of condition on the Helpfulness with Session Scale scores, \(F(2, 90) = 8.145, p = .001, \text{partial } \eta^2 = .153\). Post hoc analysis revealed that participants in the PCR and NCR conditions perceived their respective sessions to be significantly more helpful than participants in the RC condition did \((p = .003 \text{ and } p < .001, \text{respectively})\).

Similarly, the one-way ANOVA yielded a significant effect of condition on the CSQ-8, \(F(2, 90) = 13.322, p < .001, \text{partial } \eta^2 = .228\). The post hoc test indicated that participants in the PCR and NCR conditions experienced significantly greater satisfaction with services compared with participants in the RC condition \((ps < .001)\). Furthermore, the mean scores for the CSQ-8 reported by participants in the PCR \((\bar{x} = 29.0)\) and NCR \((\bar{x} = 29.2)\) conditions were notably higher than the mean satisfaction scores reported in previous studies of psychological services involving CSQ-8 \((\bar{x} \text{ scores ranging from } 26.35 \text{ to } 27.8; \text{Attiksson & Greenfield, 2004})\). In contrast, the mean satisfaction score for the RC condition \((\bar{x} = 24.6)\) was notably

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lower than the average satisfaction with services scores in previous studies.

Discussion

The present study aimed to empirically evaluate the effects of reviewing positive consequences of goal achievement (PCR) and negative consequences of not reaching goals (NCR) as independent strategies designed to improve motivation, goal achievement, mood, and help seeking of college students compared with the RC condition (audio relaxation exercise). The findings indicated within-subject improvements on most measures across time and several hypothesized interaction effects. For motivational outcomes, as hypothesized, both PCR and NCR were more effective than the RC condition in enhancing college students’ motivation to perform healthy lifestyle behaviors, such as exercising, healthy eating, and studying for courses, for which students initially reported low motivation. Participants assigned to PCR and NCR evidenced greater improvements in motivation from baseline to postsession (50% and 43% improvement, respectively, as compared with 30% improvement for RC participants) and from baseline to follow-up assessment (44% and 38% improvement, respectively, as compared with 15% improvement for RC participants). PCR demonstrated a large effect size in increasing motivation compared with the RC condition while NCR demonstrated a medium to large effect size. These differences, however, were not significantly different between PCR and NCR, as expected.

As hypothesized, both PCR and NCR were more effective than the RC condition in increasing students’ effort in accomplishing goals from baseline to follow-up assessment. Participants assigned to PCR experienced an improvement of 35%, NCR participants experienced an improvement of 27%, and RC participants experienced an improvement of only 11%. PCR demonstrated a large effect size in increasing students’ effort compared with the RC condition, while NCR demonstrated a medium effect size. These differences, however, were not significantly discrepant between PCR and NCR, as expected.

In terms of success in achieving goals, only NCR participants performed statistically better than controls at follow-up. Contrary to the study hypothesis, PCR participants did not outperform controls, although there was a trend. NCR, PCR, and RC participants evidenced an increase in goal achievement success of 30%, 29%, and 9%, respectively. Both NCR and PCR demonstrated large effect sizes in increasing participants’ success in accomplishing goals compared with the RC condition, and no differences between PCR and NCR were found, as hypothesized.

On the measure of mood, both PCR and NCR were more effective in enhancing positive affect from baseline to postsession, compared with the RC condition. Participants assigned to the PCR and NCR conditions experienced an improvement of 40% and 20%, respectively, while RC participants experienced a 2% decrease in positive affect. This finding was unexpected, as the RC condition involved relaxation and mindfulness components that typically produce a positive mood state (Jain et al., 2007). PCR demonstrated a large effect size in increasing positive affect compared with the RC condition while NCR demonstrated a medium-large effect size. In contrast with the study hypothesis, PCR and NCR were not significantly discrepant in their ability to improve positive mood. Furthermore, neither PCR or NCR was more effective in reducing negative affect compared with the RC condition from baseline to postsession, although PCR and RC led to significant within-subject improvements. Specifically, PCR participants experienced an improvement of 26%, controls experienced an improvement of 27%, and NCR participants experienced an improvement of 10%. This finding did not support the study
hypothesis that PCR would significantly reduce negative affect compared with NCR. The lack of effect may be explained by the relatively low negative affect scores at baseline across all three conditions, suggesting that participants could not improve them substantially at postsession assessment.

Lastly, while both PCR and NCR conditions led to an increase in participants’ openness to seeking professional assistance from baseline to postsession and follow-up, these conditions were not significantly discrepant from the RC. Participants assigned to PCR, NCR, and RC evidenced 21%, 11%, and 10% improvements, respectively. This trend was maintained from baseline to follow-up assessment (20%, 13%, and 6% improvement, respectively). This finding did not support the study hypothesis that PCR would lead to significantly greater openness compared with the NCR and RC conditions. When assessed for desire to attend a motivational workshop following study completion, 51% of NCR, 50% of PCR, and 36% of RC participants were interested. These outcomes were statistically similar.

In regard to client satisfaction, participants in the PCR and NCR conditions believed that their respective sessions were more helpful and satisfying compared with participants in the RC condition. Interestingly, PCR and NCR participants reported greater satisfaction with services compared with other psychological studies that employed the same measure (Attkisson & Greenfield, 2004), suggesting that these interventions may be well-received by clients.

**Study Strengths and Implications**

The present study has a number of strengths, including an adequate sample size, rigorous research method, intervention integrity checks, consumer satisfaction measures, absence of attrition, and real-world application with a college sample. Given the lack of literature on the effects of reviewing positive and negative consequences in psychotherapy and inconclusive findings specific to the relative power of positive and negative information on human motivation, this investigation attempted to clarify these inquiries.

Contrary to the existing evidence that negative events are more influential on human cognition and behavior than positive events (Baumeister et al., 2001; Costantini & Hoving, 1973; Kahneman & Tversky, 1984), the present study results suggested reviewing positive consequences is as effective as reviewing negative consequences on a number of outcomes, and that reviewing positive consequences may produce a somewhat stronger effect. Specifically, in a therapeutic context, both interventions performed better than RC; however, a review of positive consequences yielded larger effects than a review of negative consequences on the measures of motivation, action-oriented mindset about behavior change, effort in achieving goals, and positive mood.

While it was not surprising that a review of negative consequences resulted in significantly better outcomes than RC given substantial empirical support in favor of negative phenomena, findings in support of PCR were noteworthy. In trying to understand these positive results, it is important to consider the existing literature suggesting that positive reinforcement is more effective in behavior modification than punishment (Azrin & Holz, 1966; Skinner, 1948), that humans are biased to think optimistically about the future (Boucher & Osgood, 1969) and favor positive information in regard to the self (Alicke & Sedikides, 2011), and that framing one’s goals positively leads to a more positive mood (Wollburg & Braukhaus, 2010). From a theoretical perspective, PCR includes all of these elements; it is rooted in positive reinforcement, it employs a future-oriented approach that highlights positive outcomes, it focuses on personal information, and it prompts the person to consider what he or she can achieve, thereby improving positive mood. Additionally, findings in support of PCR are consistent with approach motivation literature suggesting that framing motivational messages positively is more effective for health promotion behaviors, such as healthy lifestyle behaviors used in the present study (Elliot, 2006; Rothman et al., 2006). For instance, a previous study on the effects of gain-versus loss-framed messages encouraging smoking abstinence reported better outcomes in participants who received positively framed messages (Toll et al., 2007).

The development of PCR was prompted by the concern that a review of negative consequences was too unpleasant to clients and not as beneficial as a review of positive consequences, consistent with the positive psychology (Selig-
losses is more motivating; however, when both outcomes (loss vs. gain), focusing on avoiding positively framed messages lead to discrepant goal-framing effects (Kahneman & Tversky, 1984; Levin et al., 1998). When negatively and positively framed messages promote the same act or behavior (e.g., getting a sufficient amount of sleep), the effect becomes less noticeable, as is evident in the present study.

Given the positive outcomes for both PCR and NCR on the measures of motivation, goal achievement, and positive mood, this randomized controlled trial provides empirical support on the efficacy of these interventions as brief, independent motivational techniques. Indeed, the efficacy of brief psychological interventions is an area of growing interest. Providers, insurance companies, funding agencies, and legislators are concerned with maximizing the benefits of psychotherapy while cutting the costs associated with client care (“Clinical Utilization Management Guidelines,” 2017). Health industry professionals recognize the utility of integrating brief psychological interventions into existing approaches to client care to produce meaningful behavior change (Hunter, Goodie, Oordt, & Dobmeyer, 2017). Similar to existing brief interventions (e.g., MI; Motivational Enhancement Therapy; Screening, Brief Intervention, and Referral to Treatment [SBIRT]), PCR and NCR may also be integrated into various psychological treatments and health care settings. Furthermore, the availability of a step-by-step protocol checklist and handouts (available from the first author at no cost) makes these interventions user-friendly for clinicians of all skill levels and training backgrounds. Clinicians can use these interventions for a wide range of clinical and nonclinical behaviors for which individuals experience low motivation (Azrin et al., 2001; Donohue et al., 2015).

PCR and NCR can also serve as preventative interventions. One-session motivational services may help students increase adherence to a healthy lifestyle and boost goal achievement, thereby preventing poor adjustment and mental health problems. This is important because reducing student visits to campus counseling (by preventing problems from escalating) can help alleviate the wait-list crisis at campus counseling centers (Reetz et al., 2016). Thus, directors of counseling centers should consider integrating motivational techniques into curriculum as a means of preventing stress and behavioral health difficulties, as well as to promote healthy lifestyle habits that will likely persist into adulthood (e.g., Zuercher & Kranz, 2014).
In terms of help seeking, while no one intervention performed better in enhancing openness to help seeking, the within-subject results suggest that a 45–60-min psychological experience with an interviewer may have the potential to encourage future help-seeking behaviors (Donohue et al., 2016). This may be an important avenue for reducing stigma associated with seeking psychological services (Corrigan, 2004). Indeed, students with prior counseling experience have more positive attitudes toward seeking help and are more likely to seek future services (Kahn & Williams, 2003).

The present study has several limitations. First, it is important to acknowledge that the results are based on n = 93 and therefore should be interpreted with caution. Greater power through higher n might have assisted in providing more confidence in the examination of these effects. Thus, it would be advantageous to conduct future outcome research on PCR and NCR with more participants. Second, this investigation examined only short-term effects of the PCR and NCR sessions. Therefore, future research will need to focus on examining long-term effects. Long-term follow-up is warranted because negative and positive information produces a differential wearing-off effect, suggesting that negatives are remembered longer than positives (Brickman et al., 1978), with the exception of information about the self (Alicke & Sedikides, 2011). Third, although both motivational sessions have shown positive effects in college students desiring to improve motivation for healthy lifestyle behaviors, future studies should attempt to generalize the results to other populations and should include additional target behaviors that were not part of the current study, such as medication adherence, completion of therapeutic homework, and so on. Fourth, given that RC participants in this study evidenced significant improvements in motivation across time, future controlled studies should exercise caution in monitoring potential expectancy effects (e.g., not advertising the project as a study for improving motivation). Lastly, future studies might shed some light on the potential mediation effects of self-esteem or presence of self-depreciating beliefs, given that individuals with low self-esteem are concerned with self-protection (desire to avoid negative outcomes), while individuals with high self-esteem generally seek self-enhancement (desire to gain positive outcomes; Baumeister, Tice, & Hutton, 1989). Similarly, the person’s underlying goal orientation (e.g., a focus on preserving the status quo under the conditions of loss, seeking opportunities for growth) may either enhance or hinder the advantages of using PCR or NCR (Scholer & Higgins, 2012; Scholer et al., 2010). Therefore, mediation studies may prove useful in determining which intervention (PCR or NCR) should be used based on specific client characteristics, goal orientation, or preferences.

In conclusion, this investigation suggests that brief motivational sessions that focus on reviewing positive consequences for goal accomplishment (PCR) or negative consequences of not accomplishing goals (NCR) are effective in increasing: (a) motivation to engage in healthy lifestyle behaviors, (b) effort and success in achieving goals, (c) positive affect, and (d) openness to seeking professional assistance. PCR was additionally effective in reducing negative affect. Compared with the RC condition (audio relaxation exercise), PCR and NCR sessions produced significantly better outcomes on the measures of motivation, goal achievement, and positive mood at postsession and follow-up assessments. In comparing PCR to NCR, PCR did not produce statistically discrepant results, although it consistently yielded larger effect sizes on most measures. Thus, these results provide empirical support for use of both PCR and NCR. Additionally, PCR and NCR can be used as stand-alone or complementary to other interventions strategies that clinicians could easily incorporate into treatment planning with clients expressing low motivation for various lifestyle behaviors.

References


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