On the Automatic Evaluation of End-States

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The author's research examined automatically activated attitudes toward desired end-states. Across 4 studies, participants' automatic attitudes toward goals (i.e., thinness, egalitarianism) significantly predicted their goal pursuit, including behaviors, intentions, and judgments. Such attitudes predicted behavior and judgments that are difficult to monitor and control (i.e., restrained eating, subtle prejudice), but not judgments that are easy to monitor and control (i.e., blatant prejudice). Automatic attitudes toward goals also possessed unique predictive validity compared with explicit measures of motivation and with automatic attitudes toward more physical, "graspable" objects. The findings are discussed with regard to the predictive validity of automatic attitudes, the use of automatic attitudes toward goals as an implicit measure of motivation, and the role of automatic evaluative processes in goal-pursuit and self-regulation.

Keywords: automatic evaluations, automatic attitudes, automaticity, implicit motivation, goal pursuit

Research has suggested that as people move through the environment, we seamlessly and spontaneously evaluate the stimuli in our paths, including physical objects, people, words, pictures, faces, letters, and even odors (e.g., Bassili & Brown, 2005; Fazio & Olson, 2003; Greenwald & Banaji, 1995; Musch & Klauer, 2003; Zajonc, 1980). These *automatically activated attitudes* predict our behaviors toward the corresponding stimuli. For instance, those who automatically evaluate pictures of group members in a positive fashion tend to display more friendliness, warmth, and relationship satisfaction with an actual group member (for reviews, see Fazio & Olson, 2003; Poehlman, Uhlmann, Greenwald, & Banaji, 2005). Automatic attitudes are especially predictive of those behaviors that are hard to monitor or difficult to control, and they often predict such behaviors better than explicitly generated attitudes (e.g., Asendorpf, Banse, & Mücke, 2002; Devine, 1989; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Egloff & Schmukle, 2002; Fazio, 1990; Wilson, Lindsey, & Schooler. 2000).[1] These findings together suggest that peoples' immediate, evaluative reactions to the stimuli in their surroundings are important determinants of their behavior (see also Damasio, 1994, 2001).

To date, researchers have focused almost exclusively on the automatic activation of attitudes in response to objects that one can literally move toward or away from in space—in other words, "graspable" stimuli such as physical objects (e.g., puppy, garbage) and group members (e.g., Blacks, the elderly, women; Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, Jackson, Dunton, & Williams, 1995; Fazio, Sanbonmatsu, Powell, & Kardes, 1986;

Greenwald, McGhee, & Schwartz, 1998; Karpinski & Hilton, 2001; cf. Nosek, Banaji, & Greenwald, 2002). For example, almost all of the research on the predictive validity of automatic attitudes has examined whether such attitudes toward a given group predict judgment and behavior toward members of that group (e.g., Dovidio et al., 1997; Fazio et al., 1995; Fazio & Olson, 2003; McConnell & Leibold, 2001). The group-relevant stimuli used in the attitude measures in such studies have usually consisted of pictures of group members or of names that are stereotypical of group members (e.g., McConnell & Leibold, 2001; Wittenbrink, Judd, & Park, 2001).

In contrast, there has been virtually no research on whether people spontaneously evaluate more "invisible" objects, such as goals and values. What would an automatic attitude toward an abstract, desired end-state reflect? If the theoretical underpinning of the automatic attitude literature is correct, then the evaluative information that is spontaneously activated on the perception of words related to a goal should reflect the tendency of the person to approach—that is, pursue—that goal. The more people automatically evaluate *egalitarian* in a positive manner, for instance, the more they should behave in an egalitarian fashion. In this way, an automatic attitude toward a goal should indicate that goal's influence on the person's behavior.[2]

The analysis of whether, and to what effect, people automatically evaluate goals addresses two related literatures in social cognition. First, if automatic attitudes toward goals do meaning-

[1] As is typical in this research area, the term *automatic attitudes* is used to refer to those attitudes that are implicitly measured and, therefore, unintentionally generated. The term *explicit attitudes* is used to refer to those attitudes that are measured explicitly and, therefore, intentionally and deliberately generated.

[2] Although there are some important theoretical distinctions between values and goals, such as the purportedly more explicit nature of the former (e.g., see Hitlin & Piliavin, 2004), the objective of the current research was to examine automatic attitudes toward abstract end-points that serve to guide behavior across situations. Thus, from the present perspective, values are considered as goals.

fully predict behavior, that finding adds to the evidence for implicit mechanisms of goal pursuit (e.g., Moskowitz, Li, & Kirk, 2004; Shah, Kruglanski, & Friedman, 2002) by demonstrating the role of implicit *evaluative* processes (e.g., Ferguson & Bargh, 2004; Moors & De Houwer, 2001; Moors, De Houwer, & Eelen, 2004; Sherman, Presson, Chassin, Rose, & Koch, 2003). Such a finding would suggest that the influence of a goal on behavior depends on the person's spontaneous evaluative reaction to it. If so, automatic attitudes toward goals could be utilized as an implicit measure of motivation, and they might at times possess more predictive validity for behavior than do explicit goal measures. Second, the finding that automatic attitudes toward goals possess predictive validity would broaden researchers' understanding of how automatic attitudes guide behavior—automatic attitudes toward visible as well as invisible objects influence what people do and how they act. And, it is interesting to note, behavior might at times be driven more strongly by automatic attitudes toward one type of referent versus another.

To address these questions, the current article tests the overarching hypothesis that an automatic attitude toward a goal predicts the pursuit of that goal. The research also tests the hypothesis that such attitudes possess unique predictive validity compared with explicit measures of motivation. Additionally, the third hypothesis is that automatic attitudes toward goals have a unique predictive validity compared with automatic attitudes toward more "graspable" objects. In what follows, the automatic evaluation of goals is discussed in more detail, along with the specific hypotheses tested in this series of experiments.

The Automatic Evaluation of a Goal

What would an automatic attitude toward a goal reflect? If the evaluative information that is automatically activated on perception of a stimulus reflects the person's approach versus avoidance tendencies toward that stimulus (e.g., Cacioppo, Priester, & Berntson, 1993; Fazio, 1986, 1989, 2001; Ferguson & Bargh, 2002, 2004; Katz, 1960; Lang, Bradley, & Cuthbert, 1990; Öhman, 1986; Pratkanis, Breckler, & Greenwald, 1989; Roskos-Ewoldsen & Fazio, 1992; M. B. Smith, Bruner, & White, 1956), then one's automatic attitude toward a goal should reflect the person's tendency to approach (i.e., pursue) that goal, which in turn should predict her or his goal-consistent behavior.[3] Just as automatic attitudes toward stereotypically Black names predict behavior toward a Black person, automatic attitudes toward egalitarianism might be equally or differentially predictive of egalitarianism-related behavior.

Recent research and theory suggest how a goal construct, such as egalitarianism, is automatically evaluated. This work conceptualizes goals from a cognitive perspective—that is, with the assumption that a goal is mentally represented and contains information about the end-state and the means, activities, and objects that can either facilitate or prevent the pursuit of that end-state (e.g., Aarts & Dijksterhuis, 2000, 2003; Bargh, 1990; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Jeannerod, 1994; Kruglanski, 1996; Moskowitz et al., 2004; Shah et al., 2002). Some theorists have argued that evaluative information is also part of the goal construct (Carver & Sheier, 1981; Custers & Aarts, 2005; Ferguson & Bargh, 2004; Fishbach & Ferguson, in press; Kruglanski et al., 2002; Pervin, 1989; Young, 1961). If so, an automatic attitude toward the word *egalitarianism*

would reflect the type of evaluative information that is included in that goal representation and able to be immediately and unintentionally activated whenever the goal is activated. In this way, an automatic attitude toward a goal should reflect the type of evaluative information that is activated whenever the person enters a goal-relevant situation.

Automatic Attitudes Toward Goals as an Index of Goal Strength

What determines how much a goal will influence one's behavior in any given situation? Researchers have traditionally answered this question by asking participants to reflect on the desirability of a goal and then report the results of that introspection (e.g., "To what extent is egalitarianism desirable? How much do you want to lose weight?"; Locke & Latham, 1990; Pervin, 1989; Rokeach, 1973; Schwartz, 1992, 1994; Young, 1961). Such measures capture the positivity that participants experience as they intentionally think about the end-state, as well as their inclination to report that positivity (Schwarz & Bohner, 2001). Another way of explicitly assessing people's positivity toward an end-state or value is to measure their explicit attitude toward it (e.g., "To what extent is equality positive?"; Bem, 1970). These types of explicit measures are alike in that the respondent is asked to report the extent to which she or he consciously evaluates the end-state as positive, appealing, and desirable.

How would an automatic attitude toward a goal differ from these more explicit measures? One difference lies in the implicit nature of the former. Compared with more explicit measures, the implicit measurement of a construct can yield more accurate information about the influence of that construct on behavior (e.g., Greenwald & Banaji, 1995; Roediger, 1990). Even if respondents are able to consciously access the construct of interest during explicit measurement (Nisbett & Wilson, 1977), they may still be susceptible to demand effects and presentational norms (e.g., Crosby, Bromley, & Saxe, 1980; Crowne & Marlowe, 1960; Fazio et al., 1995). An implicit measure of goal positivity may therefore prove more predictive of goal pursuit compared with asking someone to deliberately introspect on and report the desirability of the goal.

Automatic attitudes toward a goal might also be well suited to predict certain aspects of goal pursuit. Given the spontaneous and

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[3] Although the perspective on the approach–avoidance significance of evaluative information seems straightforward, it should be noted that not all theories of motivation and emotion concur. Self-regulatory theories that are based on cybernetic-control systems assume that emotional states serve as indications of the person's progress toward reducing a discrepancy between the actual state and a desired state. Positive affect is assumed to result when the person is excelling relative to the desired standard, and negative affect is expected to occur when the person is underperforming relative to the desired standard (e.g., Carver & Scheier, 1981, 2004). This suggests that positive affect should serve as a signal for the person to relax efforts to reach the standard (see Carver & Scheier, 2004). Although it is not clear that self-regulatory theory on emotion and self-regulation can be applied to brief evaluative reactions to objects, it nevertheless suggests different predictions than the standard pleasure-principle maxim of approaching positivity and avoiding negativity. In fact, from this perspective a person who has a strong positive reaction to a stimulus might be expected to display less approach behavior toward the object than would someone with a mild positive reaction.

unintentional nature of such attitudes, they may be especially predictive of those elements of goal pursuit that are themselves spontaneous and unintentional (e.g., Dovidio et al., 1997; Dovidio, Kawakami, & Gaertner, 2002; Fazio, 1990; Wilson et al., 2000; cf. Fazio et al., 1995). Researchers have shown that whereas explicit attitudes toward graspable objects predict behaviors during which the person is intentionally evaluating those objects, automatic attitudes toward graspable objects tend to predict those behaviors during which the person is *not* doing so (e.g., Dovidio et al., 1997). And, just as automatic attitudes toward graspable objects seem to best predict spontaneous and difficult-to-control behaviors, automatic attitudes toward goals may also capture such behaviors.

Invisible Versus Graspable Attitude Objects

Do people automatically evaluate the "invisible" goals and values that are relevant to a situation? At first glance, it may seem as though goals do not qualify as attitude objects, thereby rendering the previous question moot. It is true that researchers typically define attitude objects as people (e.g., the elderly), inanimate objects (e.g., apple), and issues (e.g., abortion) rather than as abstract goals and values. However, attitude objects are not limited to the physical targets of one's behavior, such as other persons and items, but rather include any "psychological object" (Thurstone, 1931), including the abstract goals that might guide our behavior across various targets (see Allport, 1961; Bem, 1970; Eagly & Chaiken, 1993; Fazio, 1986).

And yet, even though goals indeed qualify as attitude objects, how does one know that they routinely become activated, and then evaluated, in a given situation? Whereas people are essentially forced to perceive (and automatically evaluate) the graspable, physical objects they encounter while navigating their environment, they would seem to be under no such duress to construe an event or stimulus in terms of applicable goals. However, it turns out that goals are frequently active and influential across situations (e.g., Bandura, 1986; Carver & Scheier, 1998; Deci & Ryan, 1985) and can be activated even when people are not consciously thinking about them (e.g., Aarts, Gollwitzer, & Hassin, 2004; Bargh et al., 2001; Cesario, Plaks, & Higgins, 2006). Such findings imply that people typically and spontaneously construe situations in terms of goals, and whenever goals are activated in memory, either consciously or nonconsciously, the evaluative information associated with those goals (i.e., attitudes toward them) should be activated as well.[4]

It is interesting that people may even tend to construe events and behaviors in terms of relevant, abstract goals rather than in terms of more concrete object details. Research on action identification suggests that people usually identify actions (e.g., climbing a tree) in terms of abstract ("having fun") rather than concrete ("holding onto the tree branches") descriptions (e.g., Vallacher & Wegner, 1987; Wegner, Vallacher, Kiersted, & Dizadji, 1986).[5] Given that end-states are often abstract and decontextualized compared with means, strategies, and the physical objects related to the goal (e.g., Carver & Scheier, 1998; Hasselmo & McClelland, 1999; Powers, 1973; Rosenbaum, 1991; Schank & Abelson, 1977), end-states might tend to be more accessible in memory compared with lower level concrete information also relevant to the goal.[6] If so, then the attitudes associated with abstract (vs. concrete) information should also be more accessible. This would mean that the attitudes asso-

ciated with goals should at times be more influential on people's behavior compared with (less accessible) attitudes toward more concrete stimuli. This area of research suggests one explanation for why automatic attitudes toward goals may prove more predictive of behavior compared with automatic attitudes toward more concrete, graspable objects.

The Present Research

In sum, there is a theoretical precedent for expecting automatic attitudes toward goals to be reliably predictive of goal pursuit. People's goals seem to be activated on the basis of very little information, and the evaluative information associated with such goals should be activated along with them. The evaluative information associated with a goal should, in turn, be predictive of the influence of that goal on behavior. The more positive the evaluation, the more the person should pursue the corresponding goal. The main objective in the current article was to test this hypothesis, and this is done in each of the studies reported below.

There are also reasons to expect that because of their implicit nature, automatic attitudes toward goals might uniquely explain goal pursuit compared with more explicit measures. This second hypothesis is tested by comparing automatic attitudes toward goals with both explicit attitudes toward goals and a traditional, explicit measure of goal motivation. The third hypothesis was that automatic attitudes toward goals also capture a unique portion of behavior compared with automatic attitudes toward more graspable objects, as explained earlier. To examine this, some of the studies measure automatic attitudes toward the two types of referents.

Because automatic attitudes usually predict behaviors that are difficult to control (e.g., Asendorpf et al., 2002; Dovidio et al., 1997; Egloff & Schmukle, 2002; Fazio, 1990; Wilson et al., 2000), the present studies focused on such behavior. The first three studies examined the difficult behavior of resisting tempting foods, and the fourth study compared judgments that are difficult versus

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[4] It should be noted that automatic attitudes toward goals should predict any goal-relevant behaviors during which the attitude toward the goal is spontaneously (vs. deliberately) activated, regardless of whether the person is consciously thinking about the goal itself or not. In most of the research, on the predictive validity of automatic attitudes toward group members it is assumed that the participants are conscious of the group members themselves but are simply unable or disinclined to consciously and intentionally evaluate those group members.

[5] Vallacher and Wegner (1987) have argued that whereas actions that are familiar and easy are construed in abstract, high-level ways, actions that are novel or difficult are more likely to be construed in concrete, low-level ways. The importance of moderators is considered in the General Discussion section.

[6] Strategies, means, and physical objects relevant to the goal can also vary considerably in their abstractness. A physical object related to the end-state of being thin might be more abstract (e.g., vegetables) or less abstract (e.g., carrots). Still, the research by Vallacher and Wegner and colleagues (Vallacher & Wegner, 1987; Wegner et al., 1984, 1986) suggests that those abstract representations related to means and physical objects would tend to be more accessible in memory than more concrete representations. This implies that automatic attitudes toward more abstract objects in general (whether end-states or means) might at times be more predictive of behavior than are automatic attitudes toward relatively more concrete objects.

easy to monitor (i.e., subtle vs. blatant prejudice, respectively).[7] Study 1 tested whether automatic attitudes toward being thin predicted reported goal pursuit and behavioral intentions, and it compared such attitudes with explicit measures of motivation. Studies 2 and 3 focused on reported and actual pursuit of being thin, and they examined automatic attitudes toward the goal versus concrete objects. Study 4 tested the impact of automatic versus explicit attitudes toward being egalitarian, as well as automatic versus explicit attitudes toward stigmatized group members, on judgments that are difficult versus easy to monitor.

Study 1

Participants' automatic and explicit attitudes toward the thinness goal and their explicit motivation to be thin were collected in the first of two study phases. In the second phase, conducted a week later, participants were asked both to report their goal-relevant behaviors over the past week and to make predictions for their behavior over the upcoming week. The main hypothesis was that participants' automatic attitudes toward thinness would predict their goal pursuit and possess unique predictive validity compared with the explicit measures.

Method

Participants. Forty-eight undergraduates (35 women, 13 men) at Cornell University participated in the experiment in exchange for course credit.

Materials. In the automatic attitude measure (see below), the word *thin* was selected to signify the goal of being thin. The control primes included the words *table, chair, color, listen, hear, window, scissors, serious, weather, cross, sight, under, inside,* and *sideways.* The control words were selected to be unrelated to the thinness goal and included both verbs and nouns. Pilot data from previous studies established that the control words are automatically evaluated in a relatively neutral fashion. The target words were strongly valenced adjectives (e.g., *excellent, disgusting*) that have been used in previous studies (e.g., Bargh et al., 1992; Fazio et al., 1986). There were 24 adjectives, and these were rotated through the trials (see below).

Procedure. Participants arrived at the lab and were asked to complete a computer task, which constituted the automatic attitude measure (Fazio et al., 1995; Ferguson & Bargh, 2004; Wittenbrink et al., 2001). Each trial consisted of a prime presented in the center of the screen for 150 ms, followed by a blank screen for 150 ms, followed by the target adjective. The target remained on the screen until the participant classified it as "GOOD" or "BAD" by pressing one of the correspondingly labeled keys. Participants were told that they would see a pair of words on each trial and that they should evaluate the second word that appeared as quickly and as accurately as possible. The goal prime was presented twice with a positive target and twice with a negative target. Each control prime was presented once with a positive target and once with a negative target. The trials were randomly presented to each participant, and the intertrial interval was 2,000 ms. Participants completed four practice trials at the beginning of the task.

Participants then completed an explicit attitude measure in which they were asked to indicate the degree to which each of a series of words was positive or negative using an 11-point scale

(1 = *very negative*, 11 = *very positive*). Among filler words that were unrelated to the thinness goal (e.g., *trees, laugh, short*) was the word *thin*. Participants then indicated the degree to which they agreed with statements concerning their motivations in a number of domains (e.g., school, social life), including how much they want to be thin, using an 11-point scale (1 = *strongly disagree*, 11 = *strongly agree*). At the end of the session, participants were told that they would be contacted in a week via e-mail and would be sent a short survey. They were then given a funneled debriefing questionnaire (Bargh & Chartrand, 2000), in which they speculated on the purpose of the study and whether they thought their responses to the targets in the computer task were influenced by the preceding words. They were then thanked and dismissed.

Between 7 and 9 days after the lab session, the experimenter e-mailed participants a survey about their behaviors over the previous week and their behavioral intentions for the upcoming week. Participants were asked to indicate how often (between 0 and 5) they engaged in various behaviors (e.g., called a friend, went to the library). Among these was the behavior of resisting eating tempting foods. (According to pilot data, such resistance was rated as the most effective strategy for becoming or staying thin.) Participants then were asked to indicate their intentions for engaging in the same behaviors over the upcoming week. After they had returned the survey, they were sent a full and detailed debriefing and were thanked for their participation.

Results

None of the participants reported that the primes affected the speed of their responses to the targets, and none of the participants suspected that the study concerned the goal to be thin. Three participants did not return their survey after 4 weeks, and so the debriefing was e-mailed to them and their data (from the initial session) were excluded.

Computing automatic positivity. Analyses were conducted on correct responses only (the error rate was 2%). Response times (RTs) that were slower than 3,000 ms or faster than 250 ms were excluded. RTs were submitted to a log transformation.

Scores were first computed to reflect participants' automatic positivity toward the goal prime and the control primes. Participants' RTs to the positive targets that followed the goal prime were subtracted from their RTs to the negative targets that followed the goal prime. The same computation was done for the control primes. Thus, for the goal and control primes, the larger the score, the more positivity toward the primes. In order to create an index that reflected relative positivity toward the goal prime controlling for baseline positivity toward the control primes, I subtracted the positivity scores for the control primes from the positivity scores for the goal prime. These scores indicate automatic positivity

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[7] Pilot data were collected concerning college students' most pressing goals, and one of the most important daily goals for college students was to avoid eating fattening food in order to lose weight (for 36 participants, the average importance of this goal was 7.35 on an 11-point scale, on which 1 = *not at all important* and 11 = *extremely important*; 74% of this sample rated this daily goal as 7 or higher in importance). Given the apparent normative importance of the dieting goal in college samples (see also Fishbach et al., 2003; Lowry et al., 2000), the hypotheses were initially tested using this goal.

toward the goal prime above and beyond any baseline automatic positivity toward neutral words.

Computing goal pursuit. Participants' reported goal pursuit over the past week and their intentions for goal pursuit over the upcoming week were significantly correlated, $r(45) = .61$, $p < .001$, and so were combined into a single index of reported goal pursuit.

Relation between automatic attitudes toward goals, explicit measures, and goal pursuit. Bivariate correlations among all variables are presented in Table 1. The two explicit measures were significantly and positively correlated, $r(45) = .40$, $p = .006$, suggesting that they tap the positivity that participants experience and report when thinking intentionally about the end-state. Whereas participants' automatic attitudes toward thinness were nearly significantly correlated with their explicit motivation to be thin, $r(45) = .29$, $p = .054$, they were unrelated to their explicit attitudes toward thinness, $p > .8$. This suggests that automatic attitudes toward the goal may be related to, but are not redundant with, one's explicit positivity toward the end-state. As predicted, automatic attitudes toward thinness were significantly correlated with goal pursuit. Whereas explicit motivation was also significantly correlated with goal pursuit, explicit attitudes toward thinness were not.

Predicting goal pursuit. Participants reported a moderate degree of resistance ($M = 1.89$, $SD = 1.6$). Reported resistance was regressed onto automatic attitudes toward the goal, explicit attitudes toward the goal, and explicit motivation to attain the goal. As summarized in Table 2, participants' automatic attitudes toward the goal significantly predicted their goal pursuit, $B = 6.07$, $p = .003$. Neither their explicit attitudes toward thinness nor their explicit motivation were significant, both $ps > .31$.

Discussion

The findings from the present study support the first hypothesis that the evaluative information that is activated automatically on perception of a goal construct reflects the perceiver's tendency to approach the goal. Participants' automatic attitudes toward thinness significantly predicted, at least a week later, their reported past and intended successful resistance of tempting foods. In support of the second hypothesis, automatic attitudes toward the goal possessed unique predictive validity when compared with traditional measures of motivation. In fact, in this study such attitudes possessed greater predictive validity than explicit attitudes toward the goal as well as the explicit motivation to attain the goal.

Table 1
Bivariate Correlations Among Subscales, Study 1

Subscale	1	2	3	4
1. Automatic Attitude Toward Thinness	—	−.002	.29†	.50**
2. Explicit Attitude Toward Thinness		—	.41**	.11
3. Explicit Motivation to Be Thin			—	.33*
4. Times Resisting Temptations[a]				—

[a] Reported past and intended future number of times over a week of resisting temptation.
† $p < .06$.   * $p < .05$.   ** $p < .01$.

One possible explanation for these results is that implicit measures tend to be less reactive than explicit ones (see Greenwald & Banaji, 1995). For instance, participants might have engaged in various presentational strategies when reporting the desirability of being thin, and these same processes may not have occurred during the implicit measure. Moreover, measures of automatic positivity may be especially predictive of goal-relevant behavior that is difficult to control, such as self-regulation. However, is the benefit of automatic attitudes toward goals because of their implicit nature only? Or is it also because they are referencing abstract goals in particular (vs. more physical objects, e.g.)? This leads to the third hypothesis concerning how automatic attitudes toward goals compare with automatic attitudes toward the more graspable objects that have traditionally been examined in research.

Study 2

This study examined how well automatic attitudes toward a goal, versus physical objects relevant to the goal, would predict reported goal pursuit. In one session, participants reported their typical amount of goal pursuit (regulation of eating). In a different session 3–5 weeks later, participants' automatic attitudes toward thinness as well as toward tempting food items were measured. The prediction was that the more participants' automatic attitudes toward thinness are positive, the more they should report regulating their intake of fattening foods. In line with the literature on automatic attitudes (see Fazio & Olson, 2003), the more participants' automatic attitudes toward fattening foods are positive, the less they should refrain from eating them.

Method

Participants. Sixty-three undergraduates (45 women, 18 men) at Cornell University participated in the experiment in exchange for course credit.

Materials. The words *thin, skinny, small,* and *diet* were selected to signify the thinness goal in the automatic attitude measure. The control primes included the words *table, chair, listen, watch, green, sofa, city, shelf, swimming,* and *blender*. To choose the words that would represent fattening food items (i.e., the physical objects), a pilot study was conducted in which 16 participants who were on a diet rated the extent to which food items are fattening. The items that were rated on average as above 7 on an 11-point scale (1 = *not at all fattening*, 11 = *very fattening*) were selected. On this basis, the fattening food items consisted of the words *cake*, *chocolate, candy, chips*, and *cookies*. The target adjectives were the same as those used in Study 1. Goal-relevant behavior was measured by asking participants to indicate on an 11-point scale the extent to which they regulate their consumption of fattening foods in order to be thin (1 = *never*, 11 = *all the time*). To ensure that this behavior was considered an important strategy for meeting the goal, participants were also asked to indicate the degree to which it is important to them to regulate their eating, using an 11-point scale (1 = *not at all*, 11 = *very much*).

Procedure. Participants first completed a questionnaire packet during a battery session. Among the questionnaires (all unrelated to the present study) was a series of questions about their behavior (e.g., studying), including the questions about regulating one's eating. After a period of between 3 and 5 weeks, participants

Table 2
Results From a Multiple Regression Analysis in Study 1

Dependent variable	R^2	Automatic Attitude Toward Thinness (B)	Explicit Attitude Toward Thinness (B)	Explicit Motivation to Be Thin (B)
Times resisted eating tempting foods (reported and planned)	.29	6.07**	−0.01	0.08

** $p < .01$.

arrived at the lab and completed the automatic attitude measure; they received the same instructions regarding the paradigm as participants in Study 1. Each of the goal, physical object, and control primes was presented once with a positive target and once with a negative target. The timing and other paradigm constraints were identical to those from the first study. After they had completed the task, participants were given a debriefing questionnaire and then were fully debriefed and thanked for their participation.

Results

None of the participants reported that the primes affected the speed of their responses to the target adjectives.

Computing automatic positivity. Analyses were conducted on correct responses only (the error rate was 1.7%). RTs that were slower than 3,000 ms or faster than 250 ms were excluded (.49% of remaining trials after errors were excluded). RTs were submitted to a log transformation. Automatic positivity (for both the goal and physical objects) was computed in the same way as in Study 1. Thus, larger scores indicate greater automatic positivity for the goal or physical objects above and beyond any baseline positivity toward control primes.

Computing goal pursuit. I first ensured that regulation of eating fattening foods was considered an important strategy to achieve or maintain thinness. The tendency to regulate one's eating of fattening food was highly correlated with the importance of that strategy, $r(63) = .69, p < .001$, and so the two were combined into one index of goal pursuit.

Relation between goal pursuit and automatic attitudes toward goals and graspable objects. Bivariate correlations among all variables are presented in Table 3. Participants' automatic attitudes toward thinness were positively correlated with their automatic attitudes toward tempting foods, $r(63) = .28, p = .03$, suggesting that the more one cares (implicitly) about being thin, the more he or she is pulled (implicitly) toward the very foods that would undermine that objective. As predicted, participants' implicit positivity toward the goal was significantly correlated with goal pursuit, whereas implicit positivity toward the physical objects was not.

Table 3
Bivariate Correlations Among Measures in Study 2

Subscale	1	2	3
1. Automatic Attitude Toward Thinness	—	.28*	.33**
2. Automatic Attitude Toward Temptations		—	−.01
3. Tendency to Resist Temptations			—

* $p < .05$.   ** $p < .01$.

Predicting goal pursuit. Amount of goal pursuit was then regressed onto automatic attitudes toward the goal and automatic attitudes toward the physical objects. As summarized in Table 4, participants' automatic attitudes toward the goal was a significant predictor ($B = 8.07, p = .002$), such that the more positive their automatic attitudes toward the goal, the more goal relevant behavior they reported. Automatic attitudes toward the physical objects did not predict reported behavior ($p > .4$).

Discussion

These findings support the first hypothesis that automatic attitudes toward goals predict goal-relevant behavior. The predictive validity of automatic attitudes toward the goal emerged even though the automatic attitudes and reported behavior were measured 3 to 5 weeks apart. These results also support the third hypothesis that such attitudes provide unique information about goal-relevant behavior above and beyond what automatic attitudes toward physical objects provide. In this case, automatic attitudes toward the goal were more informative than automatic attitudes toward the actual items that people were behaving toward (i.e., tempting foods).

One question that arises is whether automatic attitudes toward thinness would predict all eating behavior or just that which is most relevant to the goal of being thin. That is, how specific are such attitudes in terms of their predictive validity? If automatic attitudes toward a goal reflect the importance of that goal on goal-relevant behavior only, automatic attitudes toward thinness should predict consumption of foods that are tempting but not of foods that are irrelevant to the goal. The next study examines this prediction.

Another consideration is that even though the physical objects in the present study were rated in a pilot study as highly tempting, it is possible that they are not the tempting foods that people typically encounter (and try to resist) in daily life. Thus, automatic attitudes toward physical targets of behavior might fare better in a

Table 4
Results From a Multiple Regression Analysis in Study 2

Dependent variable	R^2	Automatic Attitude Toward Thinness (B)	Automatic Attitudes Toward Tempting Foods (B)
Tendency to resist eating tempting foods	.15	8.07**	−2.55

** $p < .01$.

situation in which a physical object is specified and present. To address this, the next study tested resistance to a particular tempting snack—cookies—and thus examined how automatic attitudes toward the goal compare with automatic attitudes toward the specific physical target of behavior (in this case, cookies). This next study also examined people's actual, online behavior rather than their reported behavior.

Study 3

This study tested whether automatic attitudes toward thinness predict consumption of goal-relevant versus goal-irrelevant food. Participants were asked to taste and sample either fattening (cookies) or nonfattening (mints) food. It was expected that participants' automatic attitudes toward thinness would predict eating behavior toward the cookies but not the mints. The study also compared the predictive validity of automatic attitudes toward the goal versus a physical object relevant to the goal. Given the findings from the previous study, it was expected that participants' automatic attitudes toward thinness would better predict their cookie consumption compared with their automatic attitudes toward cookies.

Method

Participants. Forty-nine undergraduates (33 women, 16 men) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

Materials. The goal primes consisted of the words *thin, small,* and *diet*. The physical object prime was the word *cookie*. The control primes were selected to be unrelated to the goal and included the words *chair, table*, *quiet, phone, listen, watch, city*, and *morning*. The 24 targets were the same as those used in previous studies and were rotated through the trials.

Procedure. On arrival to the lab in groups of up to 4, each participant was directed to a cubicle that contained a computer and desk area. They were told they would be taking part in a marketing study in which they would sample various food products and then comment on the taste and packaging of the product. Pilot testing demonstrated that whereas cookies are perceived as food that should be avoided in order to be thin, mints are perceived as a food that does not undermine the goal of being thin. Each session of participants was randomly assigned to a condition in which participants were asked to sample cookies (one snack package each of peanut butter, chocolate, and chocolate chip cookies) or a control condition in which they were asked to sample mints (one box of spearmint mints, six peppermint life-savers, and six wintergreen life-savers).[8] The experimenter passed out the products, which were left on the table in front of the participants while they completed a judgment task on the computer (i.e., the attitude measure). They were told that the task would provide baseline information on their judgment speed.

In the automatic attitude measure, the goal primes *thin* and *small* were each presented twice with a positive adjective and twice with a negative adjective. The goal prime *diet* was presented once with a positive adjective and once with a negative adjective. The *cookie* prime was presented three times with a positive adjective and three times with a negative adjective. The control primes *chair* and *table* were each presented three times with a positive adjective and three times with a negative adjective. The control primes *listen* and

morning were each presented twice with a positive adjective and twice with a negative adjective, and the rest of the control objects were each presented once with a positive adjective and once with a negative adjective. The trials were randomly presented.

After the computer task, participants were asked to sample the products and answer questions about each concerning its taste and packaging.[9] They were told to take their time and sample as much of each product as they wanted. After the sampling task, they were given a debriefing questionnaire in which they were first asked to speculate about the general purpose of the study and then whether they thought their responses to the adjectives and their eating behavior and opinions were influenced by the words that preceded the adjectives in the judgment task or any other part of the study. They were then fully debriefed and thanked for their participation. After the last participant of the session left, the experimenter weighed the food with a digital scale and recorded how much of each product the participant consumed.

Results

None of the participants reported that the primes affected their responses to the targets, and no one reported that their eating behavior was influenced by any part of the study.

Computing automatic positivity. Only correct responses were used in the analyses. There was a 2% error rate across participants. RTs that were faster than 250 ms and slower by more than 3 standard deviations from each individual's mean were excluded (.9% of trials). RTs were submitted to a log transformation. Automatic positivity toward the goal primes and the physical object prime was computed in the same way as in previous studies. Larger numbers indicate greater automatic positivity toward the (goal or physical object) prime relative to any baseline positivity toward the control primes. Regression variables were centered.

Relation between consumption behavior and automatic attitudes toward the goal versus graspable object. Bivariate correlations and means are summarized in Table 5. Participants' automatic attitudes toward thinness were unrelated to their automatic attitudes toward the cookies in both the cookie condition ($p > .3$) and the mints condition ($p > .5$). There were no significant differences as a function of condition in participants' automatic attitudes toward thinness and their automatic attitudes toward cookies (both ps $> .27$). Those in the mints condition ate a significantly higher percentage of the snacks overall ($M = 45\%$) compared with those in the cookies condition ($M = 33\%$), $t(47) = 5.11$, $p < .001$.

Automatic attitudes and goal-relevant versus goal-irrelevant behavior. The percentage of the snacks that each participant consumed was computed. The main prediction was that participants' automatic attitudes toward thinness would predict consumption of the cookies but not of the mints. Furthermore, based on the results from the previous study, it was predicted that automatic attitudes toward cookies would not significantly predict consumption of the cookies. These hypotheses were tested by submitting condition (coded 0 for the mint condition, 1 for the cookie condi-

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[8] There were no significant differences across sessions in consumption of the snacks.

[9] Although the cubicle areas were all in the same large lab space, participants could not see each other, and they thus could not monitor how much others ate.

Table 5
Bivariate Correlations and Means Among Measures in Study 3

Subscale	1	2	3	Condition (M) Mint	Condition (M) Cookie
1. Automatic Attitude Toward Thinness	—	.12	.13	34 ms	12 ms
2. Automatic Attitude Toward Cookies	.21	—	.06	67 ms	6 ms
3. Percentage of consumption	−.44*	−.08	—	45.37%	33.31%

Note. Correlations in the upper right half of the correlation matrix reflect data from those in the mint condition, whereas those in the lower left reflect data from the cookie condition. There was a significant main effect of condition on amount of consumption, $t(47) = 5.11$, $p < .001$. There were no significant differences across conditions in automatic attitudes toward the goal ($p > .4$) or physical object ($p > .27$).
* $p < .05$.

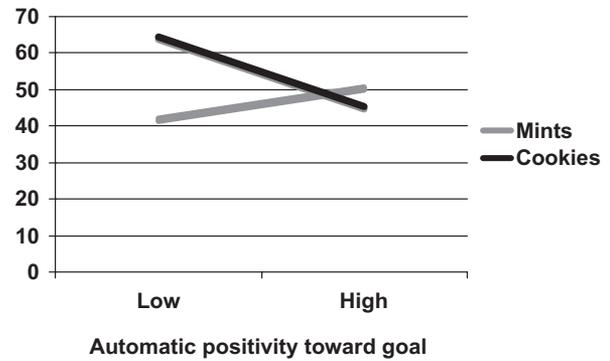*Figure 1.* Percentage consumption as a function of type of snack and automatic attitudes toward thinness.

tion), automatic attitudes toward thinness, automatic attitudes toward cookies, the interaction between condition and automatic attitudes toward thinness, and the interaction between condition and automatic attitudes toward cookies to a multiple regression analysis predicting percent consumption.

As presented in Table 6, the interaction between condition and participants' automatic attitudes toward the goal was significant ($B = −78.65$, $p < .04$). As predicted, the interaction suggests that greater automatic positivity toward thinness predicted less consumption for those in the cookie condition but not for those in the mint condition. The correlation between consumption and automatic positivity toward the goal was significant in the cookie condition, $r(27) = −.44$, $p = .02$, but not in the mint condition ($p > .8$). The predicted values for the regression line in each of the two conditions are illustrated in Figure 1, using the minimum and maximum scores of automatic positivity toward thinness (Aiken & West, 1991). Neither automatic attitudes toward cookies nor the interaction between such attitudes and condition were significant (both $ps > .6$).

Discussion

Participants' automatic attitudes toward thinness predicted their consumption of the cookies but not of the mints. This suggests that the impact of automatic attitudes toward a goal on behavior is domain specific—they only predict behavior that is relevant to the goal. Automatic attitudes toward the goal also predicted cookie consumption better than did automatic attitudes toward cookies,

suggesting that automatic attitudes toward goals uniquely capture regulatory behavior related to those goals.

The present results also speak to the role of automatic attitudes during goal pursuit. Previous research showed that people in active goal pursuit automatically evaluate as positive those objects that can help them achieve the goal (Ferguson & Bargh, 2004; Sherman et al., 2003). How do the current results line up with this previous work? Given the regulatory challenges posed by a tempting snack, one might expect the thinness goal to have been most active in the cookie condition (e.g., see Fishbach, Friedman, & Kruglanski, 2003). Yet, in the present study, those in the cookies (vs. mints) condition did not, on average, automatically evaluate the goal as more positive. Recent research (Ferguson, 2006) has provided an explanation for this by demonstrating that the effect of goal activation on automatic attitudes depends on the person's skill at the goal. When the goal is uniformly easy to attain, such as sating thirst or playing an easy word game (Ferguson & Bargh, 2004) or smoking a cigarette (Sherman et al., 2003), most participants should be skilled at the goal and thus should, on average, automatically generate positivity toward objects related to the goal. However, when the goal is more difficult, such as achieving in the academic domain, ability and skill are more variable, and only those who are skilled generate more positive automatic attitudes toward goal-relevant objects (Ferguson, 2006). Given that dieting is a difficult regulatory domain, the current results are in line with this latest research. That is, the activation of this goal does not lead to more positive automatic attitudes toward goal-relevant objects across all participants; rather, it only happens for those who are skilled at the goal. This is indicated by the significant correlation between participants' successful goal pursuit (restrained eating) and their automatic positivity toward the goal.

Table 6
Results From a Multiple Regression Analysis in Study 3

Dependent variable	Adjusted R^2	Condition	Automatic Attitude Toward Thinness	Automatic Attitude Toward Cookies	Condition × Automatic Attitude Toward Thinness	Condition × Automatic Attitude Toward Cookies
Percentage of snacks consumed	.39	−11.82***	23.64	−0.61	−78.65*	14.62

* $p < .05$.   *** $p < .001$.

An important question is why the automatic attitudes toward the goal fared so much better than those toward the graspable object in the current and previous study. In both studies, the graspable object and goal are different in ways other than their abstractness. Namely, the graspable objects (tempting foods) are inherently in opposition with the abstract goal (thinness). Also, whereas the goal to be thin likely (and directly) invoked the long-term, chronic goal of losing weight, cookies may have (indirectly) invoked the short-term goal of hedonism or hunger (though see Fishbach et al., 2003). The difference in predictive validity of automatic attitudes toward the goal versus graspable objects may have resulted from either of these aspects. The next study examines a goal and graspable object that do not differ in these ways.

Study 4

The objective of Study 4 was fourfold. First, the predictive validity of automatic attitudes toward goals was examined in a different domain than in previous studies. This study focused on a domain typical of the automatic attitudes literature: prejudicial judgments concerning a stigmatized group. Second, this study compared automatic attitudes toward the goal with automatic attitudes toward physical objects (group members), explicit attitudes toward the goal, and explicit attitudes toward physical objects. None of the previous studies simultaneously compared automatic attitudes toward goals with these other constructs. Third, this study examined a goal and graspable object that do not differ with respect to being short-term versus long-term and are not inherently opposed to one another.

Fourth, whereas the previous studies focused on difficult-to-control behavior only (regulation of eating), the current study compares judgments that are easy versus difficult to control (blatant vs. subtle prejudice, respectively). Automatic attitudes have typically best predicted subtle expressions of prejudice, whereas explicit attitudes have best predicted more blatant prejudice (e.g., Asendorpf et al., 2002; Devine, 1989; Dovidio, Kawakami, & Gaertner, 2002; Dovidio et al., 1997; Egloff & Schmukle, 2002; Fazio, 1990; Wilson et al., 2000). Based on this literature, I expected automatic attitudes toward the goal to better predict the subtle rather than blatant judgments. Furthermore, I predicted that automatic attitudes toward the goal would be uniquely predictive of subtle behavior compared with automatic attitudes toward the relevant group members. Beyond the expectation that explicit attitudes might best predict the blatant prejudice, there was no a priori notion of whether explicit attitudes toward the goal or group members would fare better.

Given the preponderance of negativity and prejudice directed toward elderly people in the United States and elsewhere, the current study examines subtle and blatant prejudicial judgments concerning this group (e.g., Aaronson, 1966; Brewer, Dull, & Lui, 1981; Butler, 1969, 1980; Hummert, 1990; Levy, 1996, 2000; Levy & Banaji, 2002; Palmore, 1999; Perdue & Gurtman, 1990; Schmidt & Boland, 1986). What might constitute subtle prejudice toward the elderly? Research suggests that modern and subtle prejudice can manifest as support for government policies that involve the stigmatized group of interest (e.g., Dovidio, Glick, & Rudman, 2005; McConahay, 1983, 1986; Swim, Aikin, Hall, & Hunter, 1995). In support of this notion, recent research has shown that prejudice toward the elderly significantly predicted support for

Medicare, the federal program that provides financial assistance to the elderly (Levy & Schlesinger, 2005). The more participants demonstrated (indirect) negativity toward the elderly, the less they supported Medicare. It is important to note that such negativity did not predict support for nonelderly-related governmental programs (e.g., welfare). The influence of prejudice on this kind of criterion is subtle because people do not realize that their negativity toward a group might influence their support of a policy involving that group. Thus, subtle prejudice was operationalized in the present study as support for Medicare (vs. other federal programs unrelated to the elderly).[10]

What might constitute blatant prejudice toward the elderly? One way in which people can blatantly (i.e., knowingly, obviously) express negativity toward a group is to overtly ascribe negative, stereotypical personality traits to group members (e.g., McConahay, 1983, 1986; Swim et al., 1995). Research shows that rigidity (i.e., inflexibility, narrow-mindedness) is widely regarded as a negative trait that stereotypically describes the elderly (e.g., Hummert, 1990; Levy, 1996, 2000; Perdue & Gurtman, 1990; Schmidt & Boland, 1986). Thus, the explicit ascription of this trait to the elderly was used as the criterion of (blatant) prejudicial judgment.

Method

Participants. Thirty-nine undergraduates (30 women, 9 men) at Cornell University participated in the experiment in exchange for course credit or monetary compensation.

Materials. The word *equal* was selected to signify the egalitarianism goal in both the automatic attitude measure and the explicit attitude measure.[11] The word *elderly* was selected to signify the group members in both the automatic attitude measure and the explicit attitude measure. The control primes included neutral verbs and nouns similar to those used in previous studies (e.g., *table, chair*) and were unrelated to both the egalitarianism goal and the elderly. The target words were those used in previous studies, and they were rotated through the trials. Participants were asked to indicate their support for cutting the budget for Medicare to measure subtle prejudice toward the elderly. They were asked to indicate the percentage of elderly people who possess the negative stereotypical trait of rigidity to measure blatant prejudice.

Procedure. Participants were first asked to complete a computer task (the attitude measure; instructions and timing parameters were the same as in previous studies). Each goal and group prime was paired twice with a positive target and twice with a negative target. Each of the control primes was paired once with a positive target and once with a negative target.

Participants were then informed that the experimenter was interested in how people rate the valence of different parts of speech, and so they were asked to rate the degree to which they liked or disliked a series of words on an 11-point scale (1 = *dislike*, 11 =

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[10] In order to ensure that participants from this sample realize that Medicare is a program targeting the elderly, a pilot test was conducted. Out of 25 participants, 21 (96%) correctly identified Medicare as a federal program that helps the elderly.

[11] Given the length and potentially low familiarity of the word *egalitarian*, a shorter, more familiar synonym, *equal*, was selected for the goal prime. Merriam-Webster's Online Dictionary defines *egalitarianism* as "a belief in human equality, especially with respect to social, political, and economic rights and privileges."

like). Participants were given 20 nouns, 20 adjectives, and 20 verbs; *elderly* and *equal* were 2 of the adjectives. The rest of the words were unrelated to egalitarianism and the elderly. Participants were then asked to indicate their opinions about various policy issues (e.g., balancing the budget) on an 11-point scale (1 = *not at all*, 11 = *very much*), including one on support for cutting the budget for Medicare. Higher numbers on the Medicare question thus are consistent with subtle prejudice. At the end of the policy questionnaire, they were asked to indicate whether they identified as a Democrat or as a Republican on 4-point scales (0 = *not at all*, 1 = *mild*, 2 = *moderate*, 3 = *strong*). Finally, they were asked to give their opinions about the likely personality traits of groups of people. The groups were generally not stigmatized (e.g., babysitters, children, mathematicians), except for the elderly. Participants were asked to estimate the percentage of each group that would likely possess a given trait. The trait "rigid" was chosen for the elderly, as it is highly negative in connotation and strongly stereotypical of that group (e.g., Hummert, 1990; Levy, 1996, 2000; Perdue & Gurtman, 1990; Schmidt & Boland, 1986). After completing the task, participants completed a debriefing questionnaire (Bargh & Chartrand, 2000) on their opinions about the study. They were then debriefed, thanked, and dismissed.

Results

None of the participants reported that the primes affected the speed of their responses to the targets or that any of the tasks were related in any fashion. No participant mentioned anything related to prejudice, the elderly, or egalitarianism.

Computing automatic positivity and political affiliation. Analyses were conducted on correct responses only (the error rate was 6%). RTs that were slower than 3,000 ms or faster than 250 ms were excluded. Automatic attitudes toward the goal prime and the group prime were computed in the same way as in previous studies. Thus, scores for both the goal and the group reflect automatic positivity above and beyond any baseline positivity to control words. RTs were subjected to a log transformation. Participants' political affiliation was computed by subtracting their Republican identification from their Democratic identification, such that larger numbers reflect greater overall Democratic affiliation.

Relations between automatic and explicit attitudes, subtle and blatant prejudice, and Democratic affiliation. Bivariate correlations among all variables are presented in Table 7. Participants' automatic attitudes toward the goal were unrelated to their automatic attitudes toward the elderly ($p > .5$) and their explicit

attitudes toward the goal and the elderly (both $ps > .18$). Participants' automatic attitudes toward the elderly were unrelated to their explicit attitudes (both $ps > .4$). Participants' explicit attitudes toward the goal were unrelated to their explicit attitudes toward the elderly, $r(39) = .26$, $p = .12$. As predicted, automatic positivity toward the goal was significantly (and negatively) correlated with the subtle expression of prejudice (the Medicare question), but it was not correlated with the blatant expression of prejudice (negative stereotype ascription). On the other hand, explicit attitudes toward the elderly were correlated with blatant prejudice but not with subtle prejudice. Finally, Democratic affiliation was correlated with subtle prejudice.

Predicting subtle prejudice. Subtle prejudice (support for cutting the Medicare budget) was regressed onto automatic attitudes toward the goal, automatic attitudes toward the group, explicit attitudes toward the goal, and explicit attitudes toward the group. Only participants' automatic attitudes toward the goal predicted their support of cutting the budget ($B = -8.98$, $p = .025$). The other three predictors were nonsignificant, all $ps > .5$ (see the summary in Table 8). Their automatic attitudes toward the goal did not predict their positions on any of the other political issues (all $ps > .2$), suggesting that automatic attitudes toward equality only predict those issues that are potentially related to prejudice or discrimination toward stigmatized groups.

How might participants' automatic attitudes toward equality compare with their explicit political affiliation? Subtle prejudice was regressed onto automatic attitudes toward equality and Democratic affiliation. Their automatic attitude toward the goal was still a significant predictor ($B = -6.6$, $p = .05$). Their Democratic affiliation neared significance as a predictor ($B = -.34$, $p = .077$). This demonstrates that participants' automatic attitudes toward equality possessed unique predictive validity for support of cutting Medicare, a program for the elderly, even when compared with explicit political affiliation.

Predicting blatant prejudice. Blatant prejudice (negative stereotype ascription) was regressed onto automatic attitudes toward the goal, automatic attitudes toward the group, explicit attitudes toward the goal, and explicit attitudes toward the group. Only participants' explicit attitudes toward the elderly were significant ($B = -5.67$, $p = .041$; see summary in Table 8). The more participants explicitly expressed positivity toward the elderly, the less they assigned the negative, stereotypical trait of rigidity to the group. Neither type of automatic attitude nor the explicit attitude toward the goal were significant (all $ps > .4$).

Table 7

Bivariate Correlations Among Measures in Study 4

Subscale	1	2	3	4	5	6	7
1. Automatic Attitude Toward Equality	—	.10	−.07	−.25	.30	−.41*	.16
2. Automatic Attitude Toward Elderly		—	−.17	−.22	−.09	−.06	.18
3. Explicit Attitude Toward Equality			—	.26	.25	−.05	−.10
4. Explicit Attitude Toward Elderly				—	.01	.04	−.46*
5. Democratic Affiliation					—	−.37	.11
6. Support for Medicare						—	.03
7. Judgment of Elderly as Rigid							—

* $p < .05$.

Table 8
Results From a Multiple Regression Analysis of Measures in Study 4

Dependent variable	Adjusted R^2	Automatic attitudes		Explicit attitudes	
		Goal (B)	Group (B)	Goal (B)	Group (B)
Support for cutting Medicare budget	.16	−8.98[*]	0.91	−0.21	−0.04
Estimate of rigidity in elderly persons	.17	2.89	23.31	0.28	−5.67[*]

[*] $p < .05$

Discussion

Findings from previous research suggest that automatic attitudes are more likely to predict behavior that is difficult versus easy to control. The current results are consistent with this in that whereas they predicted judgment that is difficult to control (i.e., subtle prejudice), they did not predict judgment that is easy to control (relatively more blatant prejudice). Automatic attitudes toward goals may therefore be similar to automatic attitudes toward grasp-able objects in that they best predict behaviors that are difficult to monitor or control. This seems reasonable given that attitudes that are activated spontaneously are most likely to reflect evaluative information that is activated spontaneously (vs. intentionally) during the enactment of behavior.

However, the current results expand on previous research by demonstrating that automatic attitudes toward a goal that is relevant to the judgment outpredicted automatic attitudes toward physical objects also relevant to the judgment. This suggests the potential uniqueness of automatic attitudes toward more abstract, higher level constructs over lower level, concrete physical objects, at least under some circumstances. Why would participants' automatic attitudes toward the group members fail to predict their subtle judgments, whereas their automatic attitudes toward an overarching goal did? One speculative explanation for this is that when people are considering their support of policies, their abstract goals such as egalitarianism may simply be more accessible in memory than information about the potential targets of those policies. Several potential reasons for the difference in predictive validity of automatic attitudes toward goals versus concrete objects are considered in the General Discussion section.

In terms of explicit attitudes, only explicit attitudes toward the group members predicted blatant prejudice. With explicit attitudes, the referent might have to be specifically and obviously tied to the behavior in order for the attitude to predict the behavior (Ajzen & Fishbein, 1977, 1980; Davidson & Jaccard, 1979; Kraus, 1995; Zanna & Fazio, 1982). It may be that when people are intentionally evaluating a more general construct (e.g., equal), they rely on information or theories that do not match up with what is activated when they are intentionally thinking about whether to ascribe a negative, stereotypical trait to the elderly. This could be because the attitude that is activated when one is intentionally evaluating "equal" is just not active in memory when one is thinking about whether the elderly are rigid, or it could be that the attitudes associated with other goals (related to presentational norms or accuracy) may just override the attitude associated with equality. These results present preliminary evidence that attitude–behavior relations

might depend more generally on the specificity of the attitude object and the behavior as well as on the implicit versus explicit nature of each.

General Discussion

Across four studies, automatic attitudes toward goals significantly predicted goal pursuit. In Study 1, participants' automatic attitudes toward thinness predicted their reported behavior and intentions and did so above and beyond two explicit measures of motivation. In Study 2, participants' automatic attitudes toward thinness predicted their reported tendency to regulate their intake of tempting foods and again did so beyond their automatic attitudes toward tempting foods. In Study 3, participants' automatic attitudes toward thinness significantly predicted their consumption of cookies (a tempting food) but not mints (a nontempting food). Finally, in Study 4, participants' automatic attitudes toward egalitarianism predicted their subtle (but not blatant) prejudice toward the elderly.

Together, these findings support the first hypothesis that automatic attitudes toward goals meaningfully predict goal pursuit. They also support the second and third hypotheses that such attitudes possess unique predictive validity compared with more explicit measures of goals and automatic attitudes toward more graspable objects. This pattern of results shows that an automatic attitude toward a goal can serve as an implicit index of the influence of that goal on behavior. The results also suggest the influence of people's immediate evaluative reactions toward not only the physical objects they encounter in their paths but also the invisible objects relevant to the current situation. The implications of the findings are considered below.

What Predicts the Influence of an End-State on Behavior?

Automatic attitudes toward goals versus explicit measures. What are the circumstances under which automatic attitudes toward a goal might prove more reliable than explicit measures of the centrality, importance, and strength of goals and values (e.g., see Markman & Brendl, 2000)? Automatic attitudes toward a goal may prove more predictive when the goal itself is difficult to access or is associated with presentational or situational norms. People may be able to indicate with great accuracy whether an end-state is positive or negative but have considerably more difficulty in saying just how positive the end-state is (see Nisbett & Wilson, 1977; Wilson, 2002; Wilson & Dunn, 2004; Wilson & Schooler, 1991). Also, when presentational or normative pressures exist concerning the goal, people may edit their answers in line with perceived norms (e.g., Crosby et al., 1980; Crowne & Marlowe, 1960; Dovidio et al., 1997; Fazio et al., 1995). In such cases,

implicitly measured attitudes toward goals should best capture the type and intensity of evaluative information that is activated in goal-relevant situations.

Automatic attitudes toward goals may also best predict those goal pursuits that are difficult to monitor or control, just as automatic attitudes toward graspable objects best predict such behaviors toward the objects (e.g., Asendorpf et al., 2002; Dovidio et al., 1997; Fazio, 1990; Wilson et al., 2000). The current research provides some support for this: Automatic attitudes toward goals predicted behaviors that are difficult to control (avoiding temptation) and difficult to monitor (subtle prejudice), but they did not predict judgments that are easy to control and monitor (blatant prejudice). Future researchers can more thoroughly examine which types of goal pursuits are likely to depend on spontaneous versus deliberate evaluations of the goal.

Automatic attitudes toward goals versus construct accessibility. In addition to the traditional notion that the influence of a goal depends on one's explicit estimate of its desirability, there is also a long history of the idea that it depends on the accessibility of that goal in memory (e.g., Aarts, Dijksterhuis, & De Vries, 2001; Anderson, 1983; Bruner, 1957; Goschke & Kuhl, 1993; Higgins & King, 1981; Kuhl, 1983, 1987). In line with this notion, Förster, Liberman, and Higgins (2005) showed that the accessibility of knowledge related to an item increased when people had a goal concerning that item and decreased when the goal was fulfilled (see also Aarts et al., 2001; Moskowitz, 2002). It follows from this work that one way of measuring the impact of a goal is to gauge its accessibility (see Higgins & King, 1981). The present research expands on this notion by suggesting that the influence of a goal on one's behavior may depend more specifically on the accessibility of positive versus negative knowledge.

The idea that a goal's influence on behavior is contingent on the accessibility of positivity related to that goal is consistent with recent work by Custers and Aarts (2005). They argued that the amount of positivity in a goal representation determines whether that goal is nonconsciously selected. However, whereas Custers and Aarts argued that positivity is essential for nonconscious goal pursuit, the present work suggests that positivity should be influential for both conscious and nonconscious goal pursuit. In particular, implicit positivity toward a goal should predict goal pursuit whenever the person is not intentionally evaluating the goal, regardless of whether they are consciously thinking of the goal itself. In addition, Custers and Aarts examined the positivity of words (e.g., *puzzle*) that were directly and specifically related to the goal pursuit (playing a puzzle). The current work, in contrast, implies that goal pursuit might at times be guided by the positivity toward an abstract end-state rather than specific, goal-relevant objects.

Implicit mechanisms of goal pursuit. The present findings suggest that people's self-regulatory abilities in the domains of dieting and egalitarianism depend on the degree to which positive goal memories became automatically accessible on perception of words related to the goal. This could represent one of two possibilities (which are not mutually exclusive). One is that those who are skilled at the domain have more positive, successful memories associated with that end-state compared with someone who is less successful, suggesting that automatic attitudes toward goals predict behavior because they reflect the person's skill level. Another possibility is that the implicit links between the goal and positivity represent the person's commitment or motivation to attain the end-state, suggesting that automatic attitudes toward goals predict behavior because they reflect how much the person is motivated to reach the goal (which can be independent of skill level). In the future, researchers could investigate the ways in which skill, experience, and motivation independently (and interdependently) foster the development of implicit links between the respective goal and positivity.

The present findings also qualify research on the role of automatic attitudes during goal pursuit. Whereas previous work has suggested that the activation of a goal leads to more positive automatic attitudes toward stimuli that can help the goal on average (Ferguson & Bargh, 2004; Sherman et al., 2003), the findings from Study 3 along with recent research (Ferguson, 2006) suggest that this effect emerges only for those who are skilled at the goal. When the goal is easy, and thus when most participants can accomplish or attain it, the activation of that goal leads to positive automatic attitudes toward relevant stimuli, on average, across participants. However, when the goal is difficult, as in the present case as well as in recent work on academic achievement (Ferguson, 2006), only those who are skilled at the goal automatically evaluate relevant stimuli as more positive. In considering the interface between automatic attitudes and goals, it seems necessary to address the factors of regulatory skill, the relation of the attitude objects to the goal, the abstractness of the attitude objects, and the intentional versus spontaneous nature of the pursuit.

Automatic Attitudes Toward Invisible Versus Graspable Objects

The present findings show a potential benefit of automatic attitudes toward goals—they predicted goal pursuit better than did automatic attitudes toward graspable objects (in Studies 2, 3, and 4). When should automatic attitudes toward goals outpredict automatic attitudes toward graspable objects? Research has shown that when people are performing familiar actions, those actions tend to be identified in an abstract versus concrete manner (Vallacher & Wegner, 1987). This means that the attitudes associated with that abstract information, including goal states, should be relatively more influential on behavior compared with attitudes toward more concrete, goal-relevant objects. Assuming that the goals examined in this research—avoidance of tempting behaviors and egalitarianism—were familiar to participants, this may explain the greater predictive validity of automatic attitudes toward goals.

And yet, concrete information may at times be more accessible in memory than abstract information. Concrete information may become more accessible when the action becomes difficult in a novel fashion (e.g., when coffee drinkers pick up an unusually unwieldy mug; Wegner, Vallacher, Macomber, Wood & Arps, 1984).[12] From this perspective, when regulatory behaviors and

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[12] Recent research has revealed multiple other factors that influence the likelihood of abstract versus concrete construals (e.g., Förster, Friedman, Özelsel, & Denzler, 2006; P. K. Smith & Trope, 2006). For example, P. K. Smith and Trope (2006) showed that those in positions of power are more likely to exhibit abstract information processing than those in less powerful roles. Factors such as power status should determine those situations in which automatic attitudes toward abstract versus concrete stimuli in general predict behavior.

situations are familiar, people's behavior may be best predicted by their attitudes toward the abstract end-states that led them to regulate their behavior in the first place, rather than by their attitudes toward the lower level targets of control (e.g., cigarettes, sex, food). However, when people encounter unexpected and unfamiliar opportunities to secure a temptation, more concrete representations of the situation might become accessible, and thus the attitudes associated with those concrete objects might best predict how they respond to the temptation.

It is also possible that attitudes that are more accessible and less ambivalent are more likely to predict behavior than are attitudes that are less accessible and more ambivalent (e.g., Armitage, 2003; Fabrigar, MacDonald, & Wegener, 2005; Fazio, 1990; Fazio & Williams, 1986; Krosnick & Petty, 1995; Petty & Krosnick, 1995). In the current research, peoples' automatic attitudes toward the goal may have been more accessible or less ambivalent than their attitudes toward the graspable objects. It should be noted however that research has shown the predictive validity of automatic attitudes toward ambivalent graspable objects. Namely, even though members of a stigmatized group often provoke ambivalence in perceivers (e.g., from the stigma and egalitarian goals), automatic attitudes toward them nevertheless predict an array of behaviors and judgments (e.g., see Fazio & Olson, 2003; Poehlman et al., 2005). Thus, the ambivalence of automatic attitudes toward (some) graspable objects may suffice as only a partial explanation for an occasional lack of predictive validity.

Self-Regulation and Abstract Information Processing

The present research connects with recent work investigating the relation between self-control and abstract processing (e.g., Fishbach et al., 2003; Fujita, Trope, Liberman, & Levin-Sagi, 2006). Fishbach et al. (2003) found that for those who are skilled in a domain (e.g., school), the perception of a temptation that would undermine that goal (e.g., TV) automatically activates the longer term goal. When temptations are physical objects, Fishbach et al.'s work suggests that the longer term goals associated with those objects might end up being more accessible than the physical objects themselves. If so, this would imply that the attitudes associated with those longer term goals should also be more accessible and thus more predictive of the person's self-regulatory behavior, compared with their attitudes toward the graspable temptations. This would imply that the predictive validity of an automatic attitude toward a goal is particularly strong for those who are skilled at that goal, especially when faced with a temptation, such as in the present Study 3.

Recent work by Fujita et al. (2006) implies that people exert more self-control when they are thinking in a broad and abstract versus concrete and contextualized manner. They argued that when people encounter a temptation, thinking abstractly makes the longer term goal related to that temptation more accessible and thus more influential on their regulatory behavior. This suggests that the influence of people's automatic attitudes toward goals versus temptations on self-regulation might depend on whether that person is thinking broadly or concretely. Presumably, automatic attitudes toward goals would be most influential for those who are in an abstract mind-set, and automatic attitudes toward graspable objects would be most predictive for those in a concrete state of mind.

Beyond Desirable End-States

Given the contemporary definition of an attitude as a concept associated with evaluative information (Fazio, Chen, McDonel, & Sherman, 1982), it may be useful to examine automatic attitudes toward other "invisible" objects, such as norms, beliefs, traits, and emotions. Such conceptual objects are obviously represented in memory and should be associated with evaluative information. Whenever such representations are activated, the evaluative information associated with them should be activated as well. Automatic attitudes toward any of these referents would presumably predict behavior toward them, perhaps especially those behaviors during which the perceiver is not intentionally thinking about the evaluative connotation of the referent. This raises the possibility that automatic attitudes can serve as an implicit index for the power of any concept (e.g., graspable object, end-state, situational norm, behavior, trait) to influence behavior related to that concept. It may also be useful to think about how automatic attitudes toward multiple elements of a given situation together predict behavior in that situation rather than focus on an evaluative reaction to a single (visible or invisible) element.

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