The Effect of Implicit Theories on Progress Or Proficiency in Self-Learning

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The marketplace has seen a proliferation of products (fitness trackers, smartphone applications) that encourage consumers to engage in self-learning behaviors. These products provide two types of feedback: progress or proficiency cues. Three studies found that consumer learning is guided by implicit theories guiding attention to progress versus proficiency cues.

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Willing and Wanting versus Impervious and Resisting: When Consumers Filter In and Out Motivational Cues

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Paper #1: Motivated Construals: How Goals Implicitly Change Object Meaning
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Paper #2: The Effect of Implicit Theories on Progress or Proficiency in Self-Learning
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Paper #4: When Less is More: Counter-Attitudinal Appeals are More Effective When They Are Ignored
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Gavan J. Fitzsimons, Duke University, USA

SESSION OVERVIEW
Consumers often are actively voracious in their attention to cues fitting their momentary goals, sucking in relevant information. Yet, just as common is the contrasting situation, when external influences (such as by change agents) attempt to make inroads with consumers who have little motivation to comply. This session’s papers present cutting-edge research aimed at identifying when, why, and how goal-directed efforts by consumers and external agents alike meet with success.

Two talks (Huang, Lteif) focus on features of goal-relevant environments that are differentially effective as a function of people’s goals. Huang and colleagues took a fine-grained approach. They found that when consumers have an active goal, their basic perceptual processes change. Consumers are sensitive to features of goal-relevant objects that are particularly suited for their goal, thereby transforming the very meaning of objects to enhance the odds of goal attainment. Lteif and colleagues explored an increasingly common consumer goal setting — attempts to gain new skills or knowledge via self-learning. Using features of common smartphone applications (e.g., Duolingo, Luminosity), they found that consumers’ entity versus incremental theories of self-change alter the effectiveness of learning cues. Consumers holding a chronic or temporary entity theory are motivated to learn and actually learn more when feedback details progress (e.g., number of tasks completed) than when providing proficiency feedback (e.g., skilled learned). Incremental theorists are motivated by and learn more when given proficiency cues.

The latter two talks (Trendel, Dallas) discuss persuasive attempts that prior literatures suggest would run the risk of being ineffectual at best or counterproductive at worst. Each finds how these approaches can in fact be successful. Trendel and colleagues studied corrective advertising and warnings about fraudulent brands as a vehicle to understand how to change implicit attitudes. In these cases, consumers lack intrinsic drives to change their attitudes about a brand; rather, a third-party (e.g., U.S.’s Federal Trade Commission) seeks to make that change. They found that most common route of conveying information verbally (e.g., press releases) changes only explicit attitudes while leaving the implicit attitude unchanged — and thus positive. Images, though, are successful in changing both explicit and implicit attitudes, thereby making imagery the most powerful route to changing attitudes. Last, Dallas and Fitzsimons detail a surprising new route to getting through to recalcitrant consumers. Tightly-controlled experiments studying adults and a naturalistic field study of teens showed that allowing people to habituate to a message that would otherwise resist not only diffuses it of its reactance power — but can flip the typical effect and produce the desired behavior.

These talks will be of interest to scholars interested in changing consumer behavior, from goals scholars to those concerned with policy efforts. Together, they raise questions concerning how marketers can identify, ex-ante, when consumers possess relevant goals and when they do not, and how to create settings, applications, and messages that are efficient and effective at changing consumer behavior.

EXTENDED ABSTRACT
The last two decades of work in social and cognitive psychology suggests that the meaning of an object is extremely fluid and context-based (e.g., Aarts, Dijskterhuis, and DeVries 2001; Baicletic and Dunning 2006; Bruner 1957; Forster, Liberman, and Higgins 2005). Any given object has myriad features and memories associated with it, and people’s understanding—or construal—of the object depends on which are most accessible in memory at the moment. Water, for example, can be construed in terms of swimming, bathing, drinking, or farming features. The particular features that end up populating a given construal then influence behavior toward the object. When people’s construal of water happens to be based on its bathing features, for example, they should be less likely to use it to quench their thirst.

This fluidity in object construal has important implications for consumers’ self-regulation. Our research shows that an individual’s currently active goal implicitly constrains the meaning of objects in a way that makes him/her more likely to attain this goal. We also found that those with goal-driven construals showed more goal-facilitative behaviors. Together, our findings reveal a new route of motivated cognition: goals change the implicit construal of objects to be more goal-facilitative, which then increases goal-facilitative behavior toward those objects. In this way, what consumers want subtly transforms their mental assessment of the environment in a way that nudges behavior toward attaining their goal.

In Study 1, we tested whether activating a goal of fitness would change the implicit construal of tempting foods. We first manipulated the activation of the fitness goal between subjects using a scrambled sentence task. Participants then moved on to the second task—a lexical decision task, through which we measured the kinds of features most accessible for each of a series of tempting foods to capture participants’ implicit construal of temptations. Specifically, the prime stimuli consisted of 5 temptation foods (chocolate, burger, chips, cake, and steak) or a nonsense stimulus (“zxcvbnm”). The targets consisted of features that were specific to each primed temptation.
and were either typical and thus eating-related (e.g., for burger: juicy, hot, grilled) or atypical and thus eating-irrelevant (for burger: disk, round, and brown). We measured the time it took participants to categorize each target word as a real or non-word.

We submitted reaction times to a repeated-measures ANOVA with Prime (temptation, nonsense) and Target (eating-relevant, eating-irrelevant) as the within-subject variables, Goal Condition (fitness, control) as the between-subject variable, and reaction times to neutral target trials as a covariate to control for individual differences in responding. We found the hypothesized 3-way interaction between Goal Condition, Prime, and Target, \( F(1, 69) = 8.77, \ p = .004, \eta^2 = .113 \). Decomposing this 3-way interaction, we found a significant 2-way interaction between Target and Goal Condition for temptation primes, \( F(1, 69) = 8.30, \ p = .005, \eta^2 = .107 \), but not for nonsense primes. Specifically, for eating-irrelevant target words, participants were faster to respond in the fitness (\( M = 519 \) ms, \( SE = 13.6 \)) versus control condition (\( M = 567 \) ms, \( SE = 16.62 \)), \( F(1, 69) = 4.88, \ p = .03, \eta^2 = .066 \). For eating-relevant targets, however, participants responded directionally slower in the fitness (\( M = 541 \) ms, \( SE = 8.34 \)) versus control (\( M = 522 \) ms, \( SE = 10.1 \)) condition, \( F(1, 69) = 2.15, \ p = .15, \eta^2 = .030 \). As predicted, when participants’ fitness goal was activated, they responded significantly faster on trials where temptations were followed by “eating-irrelevant” features, e.g., construing a burger as something round and brown instead of juicy.

We hypothesized that this motivated construal is goal-facilitative, which would discourage the consumption of unhealthy food. We tested this possibility in Study 2. We used the same 5 tempting foods as in Study 1, and directly manipulated whether those temptations were associated with eating-irrelevant features (or not) using a lexical decision task. For those in the “Eating-Irrelevant” condition, the 5 temptation primes were always paired with the eating-irrelevant targets in the 15 trials (e.g., burger-round), and the nonsense prime stimulus was always paired with the neutral targets. For those in the “Control” condition, the temptation primes were always paired with the nonsense targets, and the nonsense prime stimulus was always paired with the eating-relevant targets. We then measured participants’ desire to consume these temptations. We found that for those who believed that these temptations were unhealthy (and thus wanted to reduce their consumption), they reported significantly lower likelihood of consuming the temptations in the eating-irrelevant condition (\( M = 6.65 \)) than in the control condition (\( M = 7.74 \)), \( B = -1.10, \phi(109) = -2.92, \ p = .004 \); associating temptations with eating-irrelevant features thus reduced their intent to consume these items. We did not find this effect among participants who believed that these temptations were healthy.

Study 3 used a similar paradigm as Study 2 but with a different goal—drinking water to quench thirst. Based on our hypothesis, when people think of water in terms of drinking-irrelevance such as bathing, farming, and swimming, they should be less likely to drink water. We first made half of the participants thirsty (by eating pretzels) and another half not thirsty (by eating cherry-tomatoes) under the cover story of snack tasting. Then we experimentally manipulated participants’ construal of water by strengthening (vs. not strengthening) the association between water and drinking-irrelevant stimuli through a lexical decision task. We then measured participants’ intake of water. We found that participants whose thirst was experimentally increased (vs. not thirsty) responded more slowly to pairings of water and drinking-irrelevant words, but did not respond differently to the control pairings. This suggests that thirsty people are less likely to construe water in terms of “irrelevant associations” that would discourage them from drinking it. In addition, exposure to these drinking-irrelevant pairings decreased thirsty participants’ actual consumption of water, compared with the control conditions. Therefore, changing the construal of an object influences the consumption of that object.

The Effect of Implicit Theories on Progress or Proficiency in Self-Learning

EXTENDED ABSTRACT

The marketplace has seen a proliferation of products, such as websites, fitness trackers, and smartphone applications that encourage consumers to engage in self-learning behaviors. These products often provide feedback that informs users about the extent of their self-learning, highlighting the extent of completion on the learning task (i.e., task-progress cues), or emphasizing performance and proficiency (i.e., task-proficiency cues). Examples abound. Duolingo, a language learning application, tells given completion rates (e.g., language lessons per week), thus providing task-progress cues. Elevate, a cognitive training application, gives feedback on the specific skills users have learned, thus giving task-proficiency feedback. Still others, such as Lumosity, blend the two feedback cues. The two types of feedback seem to map onto differences in how consumers approach learning opportunities, namely differences in implicit theories of change.

We proposed that entity-theorists, who have performance-completion goals, view achievement situations as tests designed to evaluate their competence. Therefore, entity-theorists favor cues that allow them to document the adequacy of their abilities, and signal their positive traits. Incremental-theorists, in contrast, seek to improve their performance. They are driven by learning-goals, and view achievement situations as opportunities to increase their competence. Thus, we predicted that by enhancing their sense of accomplishment, task-progress cues help entity-theorists, while task-proficiency cues only help for incremental-theorists.

Study 1 investigated how learning behaviors of individuals with different implicit-theory orientations are impacted by task-progress cues. At the beginning of a semester, undergraduates (n=104) completed the Implicit-Theory Scale (Levy et al. 1998). As an extra credit self-learning task, students were asked to read four different marketing-related chapters and complete a brief assignment after each chapter. Students were allowed to submit quizzes at their convenience, but were given a recommended weekly schedule for submission dates. After submitting assignments, respondents received progress feedback stating how many assignments they had thus far completed. Number of assignments submitted on schedule served as a measure of their learning behavior. Results revealed that entity-theorists evaluated the extra credit assignment more favorably than incremental-theorists (\( M_{ET} = 5.98, M_{IT} = 5.38, p < .001 \)). Importantly, more incremental (vs. entity) theorists adhered to the recommended schedule (\( M_{IT} = 22.2\%, M_{ET} = 15.2\%, p < .05 \)) thereby demonstrating stronger learning behaviors.

Study 1 established that entity (vs. incremental) theorists possess a systematic preference for task-progress cues. Study 2 tested how self-learning behavior would be impacted by task-progress, task-proficiency, as well as mixed-cues. In a 2 (implicit-theory) x 3 (cue: progress vs. proficiency vs. mixed) between-subject computerized study (n=291), participants were induced with either an entity or incremental orientation (Poon and Koehler 2006), and then completed a (fictional) Morse code training course in four modules. After each module, respondents viewed task-progress cues (i.e., progress bar showing percent completed), task-proficiency cues (i.e., statements of skills learned), or mixed-cues (i.e., progress bars showing the skill learned). Participants then evaluated how much they liked.
the product, and answered questions about the Morse codes; the number of correct answers measured performance. Results revealed that entity-theorists evaluated the product less favorably when given task-proficiency cues as compared to task-progress or mixed-cues ($M_{ET-proficiency} = 4.34, M_{ET-mixed} = 4.21; p < .05; M_{ET-progress} = 5.37; p < .001$). Incremental-theorists evaluated the product more favorably when they encountered task-proficiency (vs. task-progress) cues ($M_{ET-proficiency} = 5.55, M_{ET-progress} = 5.03; p < .05$). As anticipated, entity-theorists’ product evaluations did not differ when they viewed task-progress or mixed-cues ($p = .09$). Incremental-theorists’ evaluations were similar when they encountered mixed and task-proficiency cues ($p > .30$). Performance measures indicated that incremental-theorists’ self-learning behavior was unaffected by any feedback forms, and entity-theorists’ performance declined when under task-progress cues.

The objective of Study 3 was to identify conditions for when an individual’s learning behaviors would be immune to the interactive effects of implicit-theory and feedback cues. In a 2 (implicit-theory) x 2 (task-progress cue: present vs. absent) x 2 (perceived task-difficulty: low vs. high) study, 220 participants were told that they would be learning to proofread. Implicit-theory was manipulated as in Study 2. After learning basic proofreading skills, participants in the difficult learning task proofread a chemistry article, whereas those in the low-difficulty task proofread a celebrity gossip article. Furthermore, half the respondents received feedback in the form of task-progress cues. Outcome measures were participants’ evaluations of the task, and performance measures computed as the difference between number of typographical errors identified by respondents and actual number of errors. Results revealed that for the demanding task, entity (vs. incremental) theorists were less accurate when progress cues were present ($M_{ET-Cue} = -26.70, M_{IT-Cue} = -19.61; p < .05$), but not when absent ($M_{ET-Cue} = -19.11, M_{IT-Cue} = -19.48; F < 1$), thus suggesting that their self-learning behavior was less effective in the presence of task-progress cues. In contrast, incremental-theorists’ performance was unaffected by the presence of task-progress cues ($F < 1$). A similar analysis on the task evaluation index revealed a three-way interaction among the predictor variables ($p < .05$), and a significant two-way interaction between implicit-theory and task-progress cues conditions ($p < .05$). In the presence (vs. absence) of task-progress cues, entity-theorists evaluated the task more favorably ($p < .001$), whereas incremental-theorists evaluated the task less favorably ($p < .07$). For the less demanding task, both theorists evaluated the task similarly regardless of the presence or absence of task-progress cues ($F < 1$).

In conclusion, the present research demonstrates that an individual’s implicit-theory orientation is a critical determinant of the kind of product feedback cues that are most effective. In demonstrating these effects in a self-learning setting, this work has the potential to contribute to self-motivation, learning, and goal pursuit literatures. 

**Images Change Implicit Attitudes More than Text: Evidence from Corrective Advertising Attempts**

**EXTENDED ABSTRACT**

The primary goal of marketing arguably is persuasion. Information aimed at changing attitudes is one of the most central and significant aims of marketing messages. Two basic routes by which marketers can convey their message are text or pictures, each of which have advantages and drawbacks. The current research compared the effectiveness of text versus image-based information in changing implicit (i.e., spontaneous, unintentional) attitudes using corrective advertising and product recall as contexts for our investigation.

Perhaps surprisingly, research on implicit attitude change has primarily examined responses to verbal information (see Gawronski and Srivastaran 2010 for a review). Yet, images are a central component of marketing promotions in print, television, and online formats.

Furthermore, to our knowledge, studies on the effectiveness of text versus image-based information to attitude change have been limited to explicit, self-reported attitudes (Wyer, Hung, and Jiang 2008). Explicit attitudes are evaluative judgments about a target, whereas implicit attitudes are evaluative reactions that are automatically activated upon exposure to the target. Given that both attitudes independently predict behavior (Perugini, Richetin, and Zogmeister 2010), neglecting predictors of implicit attitude change means missing a potentially powerful influence of consumer behavior.

Based on the characteristics of visual imagery as well as dual-process theories, we expected image-based information to be particularly effective in changing implicit attitudes (Epstein and Pacini 1999; Sloman 1996). The rationales undergirding expectations that pictures will alter implicit attitudes better than text are anchored in the characteristics of visual imagery as well as dual-process theories. Visual imagery involves image-based representations in long-term memory that can be evoked without the original stimulus (Kosslyn, Ganis, and Thompson 2001). Dual-process theories and empirical findings point to System 1 — which underlies implicit attitudes — as better able to comprehend concrete, as compared to abstract, information (Epstein and Pacini 1999; Sloman 1996). Imageability (i.e., imagery-evoking aspects) and concreteness ratings of words share up to 72% of variance (Kousta et al. 2011).

The main hypotheses were that even when pictures and text lead to the same change in explicit attitudes, pictures are more effective than text in changing implicit attitudes. Further, our work sought to establish that pictures are superior to text because they produce visual mental images (i.e., visual imagery) of counterattitudinal valence. That is, pictures have the power to produce a representative scene in people’s minds, replete with evaluative tags that can modify implicit evaluations. Furthermore, we aimed to show that text that can create visual imagery also can change implicit attitudes.

For all experiments, the counterattitudinal stimuli were extensively pretested to ensure equivalent levels of explicit persuasiveness (resulting in equivalent levels of explicit attitude change) between conditions. These tests were aimed at guarding against the concern that image-based information may be more influential in changing implicit attitudes because they are more persuasive as measured by explicit assessments. In all experiments, we also tested and found that text versus image-based information led to largely equivalent changes in explicit attitudes. A meta-analysis of all six experiments that compared imagery-based conditions to conditions that did not allow for visual imagery confirmed that there was not a significant difference in affecting explicit attitude change.

Six experiments tested the hypotheses. Experiments 1-4 used similar procedures. Participants first were given positive information (e.g., ads) about a novel brand, after which we assessed participants’ implicit and explicit brand attitudes. Participants then were assigned to one of the counterattitudinal conditions (i.e., unfavorable pictures, unfavorable text, unfavorable imagery-provoking text), after which we reassessed participants’ implicit and explicit attitudes toward the brand.

Experiment 1 tested and found support for the prediction that pictures and imagery-provoking text would change implicit attitudes better than would text, as well as that visual imagery valence would moderate the change in implicit attitudes. Experiment 1 also ensured that the order of the implicit and explicit measures did not influence the results. Experiment 2 replicated experiment 1’s finding that pic-
When Less is More: Counter-Attitudinal Appeals are More Effective When They Are Ignored

EXTENDED ABSTRACT

Changing behavior is no trivial task. From an early age, people learn that the world is filled with individuals and organizations that are interested in changing their behavior, be they family, friends, employers, advertisers, or governments. As a result, people become skeptical of persuasion attempts and develop a defensive machinery as children that is designed to actively resist such appeals (Friedstad and Wright 1994). What is a well-intentioned persuasion agent to do to counter the often potent defensive response to their attempts to change a person’s behavior, often in the best interests of that person? We suggest a novel and counter-intuitive path that can effectively “nudge” behavior change. We propose that when using a counter-attitudinal persuasion appeal, a subtle appeal that consumers are able to habituate to leads to greater behavior change. Accordingly, we suggest that the typical approach of using in-your-face, attention-grabbing persuasion appeals is less effective than more subtle appeals when the message is counter-attitudinal. This hypothesis builds on research demonstrating that habituation leads to decreased attention (Glanzer 1953), and that decreased attention can increase persuasion (Festinger and Maccoby 1964). We tested this hypothesis in three studies.

Study 1 tested whether habituation to a counter-attitudinal appeal increases its effectiveness. Undergraduate business students (N=37) were randomly assigned to either a habituation or non-habituation condition, and were exposed to a counter-attitudinal poster criticizing capitalism. Participants in the non-habituation condition, who were given no time to habituate to the counter-attitudinal appeal, responded to the dependent variable immediately after viewing the poster, which was whether they were willing to provide their email address to receive more information about volunteering at a soup kitchen. We predicted that the counter-attitudinal poster criticizing capitalism would make participants defensive and supportive of capitalism, which would make them resistant to helping others for no economic gain. In the habituation condition, participants only responded to the dependent variable after completing an hour of unrelated studies, which gave them plenty of time to habituate to the counter-attitudinal poster (which was constantly in their peripheral field of vision). As predicted, a chi-square test revealed that significantly more participants in the habituation condition (5.88%; $X^2(1) = 5.40, p = .020$). Accordingly, people who had habituated to the persuasive appeal were significantly more likely to behave consistently with the appeal—by volunteering to help the needy without any economic gain—than people who had not habituated to the persuasive message.

In Study 2, we sought to rule out repeated exposure (Zajonce 1968) as an alternative explanation for our results. Specifically, participants in the habituation condition were exposed to the counter-attitudinal poster for longer before responding to the dependent variable than participants in the non-habituation condition, so it is possible that they consciously exposed themselves to the poster multiple times before responding to the DV, and that this repeated exposure led to increased behavior change. Thus, in this study, participants (N=224) were exposed to a counter-attitudinal poster admonishing city life and encouraging people to spend more time in the country (this study was completed by students in New York City) at the beginning of the study, and, in both the habituation and non-habituation conditions, they did not respond to the dependent variable (their likelihood to sign up for an outdoor education program) until the end of the hour session. However, right before responding to the DV, participants in the non-habituation condition were asked to look at the poster again, whereas participants in the habituation condition were not. Thus, both conditions had similar levels of conscious exposure to the poster, but only the non-habituation condition experienced dishabituation prior to responding to the DV. As expected, participants in the habituation condition ($M=3.44$) were significantly more likely to indicate that they would participate in the outdoor education program than participants in the non-habituation condition ($M=3.85; t(210)=1.98, p=.049$).

In the third study, we wanted to demonstrate the impact of habituation to a counter-attitudinal appeal in the real world. Accordingly, we partnered with a high school and placed a sign in its student center that warned students to not be late to school, and we tracked when tardy students arrived at school over the course of several months. We predicted that the poster would have no effect initially but, after students habituated to it, it would lead to a meaningful decrease in students’ tardy behavior. We first tested whether the poster had an effect on lateness behavior and, as predicted, it did. Prior to the poster being hung, students who arrived late were, on average, over 33.63 minutes late to school whereas, when the poster was up, students who arrived late were only 14.85 minutes late for school, on average ($t(229)=2.64, p=.009$). A similar drop in lateness times did not occur for middle school students ($F(1, 301)=2.80, p=.096$) or for high school students the previous year ($F(1, 429)=3.91, p=.047$).

We next tested our main hypothesis—that the influence of the poster on lateness times increased over time as students habituated.
to it. A one-way ANOVA revealed a significant effect of week \((F(2, 45) = 3.89, p = .028)\), such that students who were late during the first week the poster was up \((M=26.60)\) were significantly later than students who were tardy during week 2 \((M=12.47; p=.022)\) or week 3 \((M = 14.29; p=.046)\). However, there was no significant difference in lateness times for weeks 2 and 3 \((p=.831)\). Once students habituated to the motivational poster (after week 1) and it faded into the background, it had a greater influence.

In summary, we have evidence that subtle counter-attitudinal persuasion appeals that consumers can habituate to may be an effective way to “nudge” behavior change among resistant consumers.

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