

The Silence of the Library: Environment, Situational Norm, and Social Behavior

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On the basis of the idea that situational norms are mentally represented as associations between environments and normative behavior, it was proposed that an environment can automatically direct normative behavior. More specifically, when situational norms are well-established (e.g., when entering the library, one should be silent), an environment is capable of automatically activating mental representations of normative behavior and the behavior itself. In these experiments, participants were exposed to pictures of environments, and effects on accessibility of representations of normative behavior and on actual behavior were assessed. Results indicated that representations of behavior and actual behavior itself are activated automatically when (a) goals to visit the environment are active and (b) strong associations between environment and normative behavior are established.

Because humans are social animals, human behavior is strongly influenced by behavior of other humans. This influence is often very direct. When we interact with others, these others provide direct input for our own thinking and doing. However, direct influence may not reflect the essence of the success of humans as social animals. After all, animals that are decidedly less social, such as cats, are directly influenced by behavior of other cats. Instead, being a successful social animal is largely dependent on more indirect forms of social influence. When we are standing behind a bookshelf in a library, there is often no direct influence of others. Still, our behavior is affected by others (albeit indirectly): We keep the level of noise down as much as possible. In such cases, our behavior is guided by social norms. It is controlled by the activation of behavior that we believe other people expect from us (Cialdini & Trost, 1998). Such social norms are pervasive and form an essential mechanism by which human social behavior is directed (Birenbaum & Sagarin, 1976; Dewey, 1922; Pepitone, 1976; Sherif, 1936).

Most research on social norms has hitherto concentrated mainly on why and how norms are learned and whether norms predict behavior, whereas the question of how social norms become active in directing everyday behavior has received only little theoretical

analysis and empirical attention. The present study attempts to push this important issue forward by focusing on *situational norms*. Situational norms represent generally accepted beliefs about how to behave in particular situations and are learned by associating normative behavior to these situations. Behaving silently when visiting a library or church are examples of such well-established norms. Thus, situational norms refer to knowledge or mental representations of appropriate behavior that guide behavior in a certain situation or environment.

The present research examines the processes underlying the role of situational norms in guiding social behavior. More specifically, stimulated by recent work on automaticity in social behavior (Aarts & Dijksterhuis, 2000; Bargh & Chartrand, 1999; Dijksterhuis & Bargh, 2001), we will test whether, and under which circumstances, environments are capable of activating (mental representations of) normative behavior automatically. In other words, is it possible that normative behavior is elicited by environments, without a consciously expressed fiat or mandate?

SOCIAL INFLUENCE: THE DEVELOPMENT AND ENACTMENT OF SITUATIONAL NORMS

How do we learn to behave in a socially expected way in a given environment? Research on social influence suggests that there are two ways by which we learn situational norms (Cialdini & Trost, 1998; Deutsch & Gerard, 1955; Kelley, 1952). First, people learn how to behave in ways they believe other people approve of, and avoid those behaviors they think others disapprove of. This *normative social influence* is based on the fundamental need to be accepted by others. Such beliefs about what others think we should or should not do are also known as subjective norms (Fishbein & Ajzen, 1975) or injunctive norms (Cialdini, Kallgren, & Reno, 1991).

Sometimes people consult the behavior of those around them to find out what to do. That is, people can also learn situational norms through *informational social influence*. They see others' behavior as a source of information to help them define social reality and

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maximize the effectiveness of their social behavior. These beliefs about what the majority of people do in specified environments are also referred to as descriptive norms (Cialdini et al., 1991). Apart from influence through observing behavior of others, descriptive norms can also be verbally communicated (Latané, 1996; Miller & Prentice, 1996).

Several researchers have incorporated the concept of social norms in behavior models to optimize the prediction and explanation of human action (Fishbein & Ajzen, 1975; Schwartz & Tessler, 1972; Triandis, 1980; Zuckerman & Reis, 1978). There is an abundance of findings demonstrating that self-reported measures of social norms (and especially subjective norms) correlate with, and independently predict, a variety of behaviors over and above attitudes, especially when the behavior occurs in social settings (for reviews, see Ajzen, 1991; Armitage & Conner, 2001; Eagly & Chaiken, 1993).

Of importance, although the observed correlations between measured constructs provide valuable information about proximal determinants of behavior, the research designs and measurement procedures commonly used in these studies (i.e., correlational data obtained by self-reports in a questionnaire setting) do not allow one to draw firm conclusions about the processes underlying these relations. For instance, when confronted by questionnaires probing the relevant constructs, people are fully aware of, and capable of retrieving, the reasons that underlie their behavioral acts. This deliberate or reflective mode of responding necessarily leads to an emphasis on conscious processes as determining normative behavior. Indeed, the influence of explicitly expressed social norms on behavior is often found to be mediated by behavioral intentions, thereby suggesting that normative behavior occurs intentionally and consciously. But is this always the case?

ENVIRONMENT, NORM, AND BEHAVIOR

In a series of experiments relevant to this question, Cialdini, Reno, and Kallgren (1990; see also Reno, Cialdini, & Kallgren, 1993) studied under which environmental conditions students will act on the situational norm of behaving orderly in public spaces. They stuffed handbills into students' mailboxes located in a mailroom and observed what students would do with them. When the floor was already covered with many handbills, students dropped handbills on the floor themselves. Conversely, under conditions of a spotless mailroom, students behaved more orderly and dropped fewer handbills on the floor. Of interest, the condition under which students littered least was a condition in which the mailroom was spotless except for one very salient exception: An almost finished piece of watermelon. Thus, people behaved in an orderly way when the situation in the environment vividly reminded them of the norm that everybody behaved orderly except for "the pig that spoiled the place." Once the norm is activated, virtually all students behave in line with it by putting the handbills in their bag.

One could assume that people were aware of the norm to engage in normative behavior in the "watermelon condition." It represents the violation of a norm and it is likely that such effects of norm violation on behavior are mediated by conscious awareness of the norm. However, the difference between the conditions in which nobody littered (the spotless mailroom) and the one in which many people littered is more ambiguous. Were people in these conditions aware of the norm? Perhaps, perhaps not. In any event, we would

like to argue that awareness of a norm is not necessary for evoking normative behavior.

AUTOMATICITY IN NORMATIVE BEHAVIOR

Instead, we would like to argue that situational norms can guide social behavior automatically. As argued earlier, situational norms are knowledge-based beliefs about how to behave in particular situations that are shaped by social influence. Insights into human development suggest that these norms evolve in a stepwise manner (Craig, 1996; Hetherington & Baltes, 1988). First, in the course of socialization, individuals learn and practice common ways of conduct that are characteristic for the society. This way, people develop mental representations of how to execute generally accepted or normative behaviors (e.g., being quiet by lowering one's voice or behaving orderly by cleaning up a table or room). These hierarchically ordered behavior representations or "action concepts" (according to the terminology suggested by Hommel, 1998) form part of our behavioral repertoire, and can be readily accessed to guide and adjust behavior when required (see also Jeannerod, 1997; Powers, 1973). Later, the social environment (e.g., parents, grandparents, friends, teachers, and the media) recurrently communicates and enforces beliefs about which normative behaviors should be exhibited in which situation. This way, situational norms become socially shared and well-established (Cialdini & Trost, 1998). It is also, and at the same time, likely that normative behaviors become mentally associated with the specific situation to which they apply (Harvey & Enzle, 1981). Consequently, the situation can activate mental representations of normative behaviors automatically. And once activated, these representations provide the knowledge necessary for guiding one's own situationally appropriate behavior. The idea that situational norms are behavioral guides that we apply effortlessly and automatically in producing behavior is noncontroversial (Barker & Wright, 1955; Schank & Abelson, 1977).

Our reasoning about the activation of normative behavior bears similarity to recent findings of behavioral effects on the perception of social stimuli. This research shows that the presence of stereotyped groups (e.g., elderly) not only leads to activation of semantically associated behavioral traits (e.g., slow), but also to subsequent behavior in line with these traits (Bargh, Chen & Burrows, 1996; Chen & Bargh, 1997; Dijksterhuis & van Knippenberg, 1998; Macrae et al., 1998; for a review, see Dijksterhuis & Bargh, 2001). The theoretical basis for predicting these effects is the overlap between perceptual and behavioral representations for the same type of behavior. Behavioral traits (e.g., moving slow) thus provide the knowledge and the mechanisms for producing the behavior oneself. Accordingly, the mere activation or perception of behavioral traits (either primed by stereotypical information or members of a social group) is capable of tuning behavior one is already engaging, and thus causes one to adjust ongoing behaviors without a consciously expressed intent to do so. We believe that, like traits about groups, our knowledge about situational norms can affect our behavior along the same lines.

But do physical environments always activate normative behavior? That is, do we keep the level of noise down automatically on the mere activation of the symbolic representation of a library? The behavioral effects discussed above occur because of direct activation of behavioral traits. This direct activation is possible as

people develop strong and chronic associations between social targets and traits (Devine, 1989; Hamilton & Sherman, 1994; Stangor & Lange, 1994). These associations streamline the social perception process, and help us to understand other people's behavior in order to respond with an appropriate action of one's own (Macrae & Bodenhausen, 2000). In other words, social stimuli have direct behavioral implications.

In the case of physical (or built) environments, however, a different picture may emerge. Contrary to social stimuli, physical environments do not comprise behavioral implications per se, that is, they do neither display nor call for normative behavior directly. Therefore, there is no necessity to access behavior representations on the mere perception of physical environments to select a proper social response. For example, imagine a person passing (and seeing) the library on his or her way to the cafeteria. Under such circumstances, there would be little point in reducing the volume of one's voice because this normative behavior is not relevant to the person's current goal. Whether library primes (representations of) normative behaviors is likely to depend on whether the environment is of immediate behavioral relevance (Barker, 1968; Leff, 1978). That is, as situational norms refer to socially expected ways of behaving when being in an environment, these norms are readily accessed to direct ongoing actions when visiting the environment (Bargh, 1990). Accordingly, normative behavior is more likely to be materialized when being behaviorally involved in, or having a goal to visit the environment. Central to our process-oriented approach toward normative behavior, then, is the idea that well-established situational norms are put into operation automatically on the goal to visit environments.

THE PRESENT RESEARCH

We report three experiments that were designed to investigate the processes underlying the role of situational norms in guiding behavior. The following questions are addressed. First, is the mere activation of a symbolic representation of an environment (e.g., a picture of a library) sufficient to activate mental representations of normative behavior or does it require the goal to visit the library (Experiment 1)? Second, does automatic activation of these behavior representations elicit overt behavior (Experiment 2)? Third, are these effects dependent on the associative strength between environment and normative behavior (Experiment 3). In the first two experiments we focused on the norm of behaving silently in libraries, and in the third experiment we used the social norm of behaving mannerly in exclusive restaurants.

Before presenting these experiments, we first present two pilot studies demonstrating that the specific behaviors examined in our experiments are indeed normative. To the extent that they are normative, the behaviors should uniquely correlate with subjective norms or descriptive norms toward the behaviors. Accordingly, we conducted two survey studies in which several potential determinants of the behavior under investigation were measured and scrutinized for interrelations.

Pilot Studies 1 and 2

Method

Two different samples of undergraduates participated in a survey study. They were first exposed to a picture of a library ($n = 66$) or exclusive

restaurant ($n = 62$), and then asked to respond to several questions related to the environment displayed on the picture. In line with previous research on the role of social norms in attitude-behavior models (e.g., Schaalma, Kok, & Peters, 1993; Sheeran & Orbell, 1999, see also Fishbein & Ajzen, 1975), the following constructs were measured: *Self-reported frequency of past visits* to libraries (or exclusive restaurants) was assessed by asking participants to indicate how often they had visited the respective environment in the last 2 weeks. Participants responded on a 10-point scale, varying from *never* (1) to *very often* (10). *Attitude* toward being silent in libraries (or being well-mannered in exclusive restaurants) was measured by one bipolar 10-point item ranging from *very bad* (1) to *very good* (10). *Subjective norm* was operationalized as the extent to which one believes important others think that one should perform the given behavior in the respective environment. *Descriptive norm* was assessed by asking participants to what extent they believe the majority of other people are silent in libraries (or behave well-mannered in exclusive restaurants). *Mere belief* was operationalized as the extent to which one believes that libraries (or exclusive restaurants) are silent (or well-mannered) places. These three items were accompanied by a 10-point scale, varying from *not at all* (1) to *absolutely* (10). As a measure of *behavior*, participants indicated to what extent they are silent when visiting libraries (or well-mannered when visiting exclusive restaurants) on a 10-point scale, varying from *never* (1) to *always* (10).

Results and Discussion

Table 1 presents means and intercorrelations of the measured constructs for the act of behaving silently in libraries and behaving well-mannered in exclusive restaurants separately. As the means show, our respondents are regular visitors of the library but less frequent visitors of an exclusive restaurant. In addition, attitudes, beliefs, subjective norms, descriptive norms, and experiences are quite in favor of displaying the two actions in the environments, and considering the low variance, there is much consensus about this. By and large, then, our students exhibit the behaviors when visiting the environments. Of more importance, however, both the subjective norm and descriptive norm correlated significantly with the behavioral measures.

To test which constructs were most predictive of behavior, two separate stepwise multiple regression analyses were performed, in which behavior was predicted by the measured constructs. First, for the act of being silent in libraries, the analyses showed that the behavior was significantly predicted by subjective norms, β -subjective norm = 0.373, $t(60) = 3.21$, $p < .01$, whereas the contribution of the other variables was nonsignificant, β -past frequency = 0.165, $t(60) = 1.43$, *ns*; β -attitude = 0.031, $t(60) = 0.26$, *ns*; β -mere belief = 0.065, $t(60) = 1.34$, *ns*; β -descriptive norm = 0.155, $t(60) = 0.50$, *ns*. In other words, only subjective norms shared unique variance with the behavioral measure. A similar pattern of results emerged for the act of behaving well-mannered in exclusive restaurants: Behavior was significantly predicted by subjective norms, β -subjective norm = 0.456, $t(56) = 3.96$, $p < .001$, whereas the contribution of the other variables was nonsignificant, β -past frequency = -0.062, $t(56) = -0.53$, *ns*; β -attitude = 0.111, $t(56) = 0.86$, *ns*; β -mere belief = -0.033, $t(56) = -0.57$, *ns*; β -descriptive norm = 0.096, $t(56) = -0.27$, *ns*.

In short, our regression analysis approach suggests that our sample population (i.e., undergraduates) conceive of their act of behaving silently in libraries and well-mannered in exclusive restaurants as being largely normative. That is, when asked to indicate

Table 1
Means, Standard Deviations, and Intercorrelations of Past Frequency of Visits, Attitude, Subjective Norm, Descriptive Norm, Mere Belief, and Behavior in Pilot Studies

Measure	<i>M</i>	<i>SD</i>	2	3	4	5	6
Behavior: Behaving silent in libraries (<i>n</i> = 66)							
1. Past frequency of visits	6.30	1.70	.027	-.015	.103	.003	.202
2. Attitude	8.81	1.40		.157	.302*	.053	.141
3. Mere belief	8.70	1.12			.434***	.431***	.214
4. Subjective norm	9.02	0.90				.291*	.373**
5. Descriptive norm	8.06	1.30					.257*
6. Behavior	7.72	1.35					
Behavior: Well-mannered in exclusive restaurants (<i>n</i> = 62)							
1. Past frequency of visits	2.63	0.96	.015	-.012	.190	.032	.027
2. Attitude	8.26	1.04		.163	.459***	.384**	.297*
3. Mere belief	7.95	1.53			.286*	.300*	.107
4. Subjective norm	8.68	1.04				.730***	.456***
5. Descriptive norm	8.08	1.51					.377**
6. Behavior	7.76	1.53					

* $p < .05$. ** $p < .01$. *** $p < .001$.

whether one performs the two behaviors, participants tend to base their responses on situational norms.

Experiment 1

In the first experiment, we tested the hypothesis pertaining to our key assumption that situational norms can be conceived of as mental associations between an environment and normative behavior, and hence, that the goal to go to a library automatically enhances the accessibility of the normative behavior. Participants were exposed to a picture of one of two environments (a library or railway station). After being exposed to the picture, a lexical decision task was assessed to tap the accessibility of action concepts representing the norm of being silent. Following previous work of this kind, it was assumed that the time taken to recognize the behavioral concepts in this task would reflect relative accessibility of representations of normative behavior (Aarts & Dijksterhuis, 2000; Macrae, Bodenhausen, & Milne, 1995; Neely, 1991). Thus, response latencies on these concepts served as a measure for the activation of the situational norm. If the accessibility of appropriate behavior representations is conditional on the presence of a behavioral goal, as we hypothesize, priming of library would decrease the speed of responding to behavioral concepts referring to the situational norm only when being instigated with the goal to go to the library. However, if the mere exposure to library suffices to affect the responses, priming of library should enhance the accessibility, irrespective of goal activation.

Method

Participants and Design

Fifty undergraduates participated in the experiment, receiving 6 Dutch Guilders (approximately \$2.50) in return. They were randomly assigned to either a goal-control prime, no-goal-library prime, or goal-library prime condition.

Experimental Task and Procedure

On arrival at the laboratory, participants were told that they would take part in research conducted by different research teams, and that they had to perform tasks on a computer. The computer program provided the instructions. Participants worked in separate cubicles and were provided with two consecutive tasks.

The first task was announced as the "Picture Task." Participants learned that they were going to be briefly exposed to a picture of a certain environment for 30 s. As a cover story, all participants were told that they had to examine the picture and to answer some questions about it later. Furthermore, two thirds of the participants also learned they had to visit the environment after the experiment. Some participants were exposed to a picture of a library, showing the interior design of it (hence, this condition is referred to as the *goal-library prime* condition). The other participants were shown a picture of a railway station, showing an empty platform. Because the latter group of participants was not primed with an environment typically associated with the norm of behaving silently, this condition can be treated as a *goal-control prime* condition. Apart from the goal-control prime and goal-library prime condition we added a no-goal condition: One third of the participants were also exposed to the library picture. However, instead of anticipating a visit to the environment, these participants were merely asked to carefully scrutinize the picture. Because these participants were not instigated with the goal to visit the library, this condition is referred to as the *no-goal-library prime* condition. None of the pictures displayed people in the environment. Furthermore, the names of the respective environments were not mentioned.

Next, participants were confronted with the lexical decision task in which they had to respond to 24 words. Twelve of the words were existing words and 12 were nonsense words. For every word appearing on the screen, they were asked to decide as fast and as accurately as possible whether the word was a meaningful word or not. Participants pressed keys on the computer's keyboard marked *yes* or *no*. All words appeared at the same location on the screen, preceded by a fixation point, for 500 ms. Response latencies were measured in milliseconds from the onset of the words to the time participants pressed a key. The time interval between word trials was 2 s. The words were presented in random order, and were preceded by 4 practice trials. Among the existing words, 4 target words represented the normative behavior (i.e., being silent) of interest: *silent*,

quiet, still, whisper. The other 8 existing words were neither relevant for the concept of being silent nor related to the two environments (*large, small, middle, begin, weak, strong, proceed, little*). The length of the words was controlled for. That is, the mean length of the silence and control words was equal ($M = 6.0$ letters).¹

After the task, participants were thoroughly debriefed. The debriefing indicated that participants were unaware of the hypotheses under investigation. Moreover, they did not perceive any connection between the different tasks. Not surprisingly, some participants spontaneously asked when they were supposed to visit the environment on the picture, revealing that we succeeded in the instigation of actual behavioral goals. Of course, we told all participants that these instructions were only given to test our hypotheses.

Results and Discussion

The average response latency on the 4 silence words and 8 control words were subjected to a 3 (prime: goal-control vs. no-goal-library vs. goal-library) between-participants \times 2 (type of word: silence vs. control) within-participants analysis of variance (ANOVA). Incorrect (“no”) responses across these words were excluded from the analyses (3% out of all responses). The analysis yielded a significant Prime \times Type of Word interaction, $F(2, 47) = 3.52, p < .04$. No other effects were reliable ($F_s < 1$). Simple effect analysis showed that response latencies differed between prime conditions for silence words, $F(2, 47) = 4.38, p < .02$, but not for control words ($F < 1$). Planned comparison further revealed that participants’ responses to silence words were faster in the goal-library condition than in the goal-control condition, $F(1, 47) = 7.60, p < .01$, and in the no-goal-library condition, $F(1, 47) = 5.18, p < .03$. There was no significant difference between the control and no-goal-library conditions ($F < 1$). Means are presented in Table 2.

The results of Experiment 1 support our predictions. The activation of a library enhanced the speed of responding to concepts related to normative behavior displayed in that environment. However, these effects only emerged when participants had the goal to visit that environment. The speed of responding to concepts related to normative behavior was equivalent across the control and no-goal-library conditions. These results indicate that the goal of doing things in a library heightens the accessibility of the behavior representation of the social norm of being silent.

Experiment 2

So far, the results of Experiment 1 showed that the instigation of the goal to visit a certain physical environment facilitates access to behavior representations that are associated with the situational norm pertaining to the environment. In Experiment 2, our aim was

Table 2
Response Latencies (in Milliseconds) as a Function of Goal Prime and Type of Word in Experiment 1

Type of words	Goal-control prime	No-goal-library prime	Goal-library
Silence words	578 (39)	568 (79)	524 (35)
Control words	562 (49)	566 (76)	553 (66)

Note. Standard deviations are shown in parentheses.

to investigate whether the priming effects indeed lead to changes in overt behavior.²

To assess changes in behavior, we measured the sound pressure level (i.e., intensity) of participants’ voices while speaking. On the basis of the results of the previous experiment, we expected priming of library to decrease the intensity of participants’ voice, but this decrease will be most pronounced for participants that are instigated with the goal to go to the library.

Experiment 2 served two further purposes. First, we included mediator variables to rule out alternative accounts for the observed behavioral priming effects. For instance, going to the library may affect participants’ mood or modify their level of arousal. Effects of priming on behavior (i.e., voice intensity) may be attributable to variances in these variables. Hence, for the present purpose, two potential variables seemed relevant to test for mediator effects: mood and arousal.

Furthermore, earlier we argued that situational norms are socially shared beliefs that are the result of socialization and associative learning. Generally accepted behaviors that are characteristic of a society are well-learned and subsequently linked to specific situations. Although it is likely that the establishment of situational norms (and mental associations between situations and normative behavior) does not require much direct practice or regular experience, it may be questioned whether this logic also pertains to the automatic activation of the normative behavior itself. That is, do situational norms automatically become active in guiding behavior on the goal to visit an environment without regular experiences with the environment and associated normative action? To explore this important question, we assessed participants’ frequency of past behavior to test whether regular direct experiences with the library enhance the effects of environmental priming on behavior.

Method

Participants and Design

Sixty-nine undergraduates participated in the experiment, receiving 6 Dutch Guilders in return. They were randomly assigned to one of the conditions described in Experiment 1.

¹ In the lexical decision task, Dutch words were used. Here, we report the English translations of the original words.

² Obviously, activation of a behavior representation is not yet the same as actual behavioral change. Recent neurophysiological evidence however demonstrates that activation of a behavior representation (e.g., a gesture) leads to the same activation in the anterior cingulate cortex as actually performing this same behavior (Decety, Jeannerod, Germain, & Pastene, 1991; Jeannerod, 1997; Paus, Petrides, Evans, & Meyer, 1993; see also Dijksterhuis & Bargh, 2001). That is, performing an action and merely activating the representation of this action results in activation of the same so-called “motor programs.” These motor programs are ultimately responsible for actual behavior. According to these findings, activation of a behavior representation should—all else being equal—lead to corresponding changes in overt behavior. Hence, on the basis of the findings of Experiment 1 in which we obtained evidence for activated behavior representations, we can expect actual behavioral changes to occur in Experiment 2.

Experimental Task and Procedure

On arrival at the lab, participants were told that they would take part in research conducted by different research teams, and that they had to perform tasks on a computer. The computer program provided the instructions. Participants worked in cubicles and were tested individually. They were provided with four consecutive tasks: a priming task, a word pronunciation task, the Affect–Arousal Scale, and a measure of past direct experiences with the library.

First, participants were exposed to the picture task used in Experiment 1. Next, participants were confronted with the word pronunciation task assessing the sound pressure level of their voice in dB(A). For this task they were instructed to read aloud 10 words that were presented on the computer screen. This information was allegedly helpful for the purpose of designing new communication systems. No explanation or instructions were given regarding the way participants should pronounce the words. Each word remained on the screen for 2 s. The time interval between words was 3 s. To reduce noise in the sound pressure level score, 10 short words were chosen that only comprise “soft” phonemes (see Fletcher, 1953), that is, they did not contain letters like *t* or *s*. Participants were provided with a microphone attached to a headset. To keep the distance fixed, the microphone was placed 10 cm away from the mouth of the participants. Data of each spoken word was filed by the computer, and subsequently converted into dB(A) using audio software (GIPOS; Gigi & Vogten, 1998). The microphone-recording system was calibrated to a 70 dB audio source (white noise) reference tone (see Baken, 1987, for a more elaborate discussion on the measurement of voice intensity). The dependent variable was the mean dB(A) across the 10 words, representing a measure of voice intensity.

Immediately after the word pronunciation task, a modified version of the Affect–Arousal Scale (Salovey & Birnbaum, 1989) was administered. The questionnaire contained six items differentiating feelings of mood and arousal on 10-point scales. The mood items were *bad–good*, *sad–happy*, and *displeased–pleased*. The arousal items were *calm–excited*, *tired–energetic*, and *sedate–aroused*.³ Participants responded to each item in terms of how they felt at that moment.

Furthermore, as part of a larger questionnaire on activities in daily life, participants were asked to indicate how often they had visited the library in the past month. To attenuate possible influences of the previous tasks on the frequency estimates of past direct experiences, participants were explicitly instructed to be as accurate as possible in their recall (Aarts & Dijksterhuis, 1999). The frequency estimates served as a measure of past behavior.

At the end of the experiment, participants were debriefed. As usual, debriefing revealed that participants were not aware of a possible effect of the priming task on later performance.

Results and Discussion

Effects on Behavior: Voice Intensity Scores

Voice intensity has been found to differ between males and females (e.g., Coleman, Mabis, & Hinson, 1977; Huber, Stathopoulos, Curione, Ash, & Johnson, 1999). Hence, to control for gender differences, the voice intensity scores [dB(A)] were subjected to a 3 (prime: goal-control vs. no-goal-library vs. goal-library) \times 2 (gender: male vs. female) between-participants ANOVA. The main effect of gender was highly significant, $F(1, 63) = 25.96$, $p < .001$. Males produced a louder voice ($M = 85.21$) than females ($M = 81.99$). However, the analysis further showed that the effect of prime was significant, $F(2,63) = 3.46$, $p < .04$. The Prime \times Gender interaction was not significant ($F < 1$). Planned comparison revealed that participants’ voices in the goal-library condition ($M = 83.16$) were reliably less

loud than participants’ voices in the goal-control condition ($M = 84.48$), $F(1, 63) = 4.98$, $p < .03$, and in the no-goal-library condition ($M = 84.62$), $F(1, 63) = 5.83$, $p < .02$. There was no significant difference between the control and no-goal-library conditions ($F < 1$).

Controlling for Mood and Arousal Effects

With the assessment of the mood and arousal scales, we wanted to rule out potential mediators. We first conducted a multivariate analysis of variance using priming condition and gender as the independent variable and the average of the three mood items ($\alpha = 0.81$) and the average of the three arousal items ($\alpha = 0.50$) as the dependent variable. Next, we performed 3 (prime: goal-control vs. no-goal-library vs. goal-library) \times 2 (gender: male vs. female) between-participants analyses of covariance (ANCOVAs), with the mood and arousal measures as covariates.

ANOVAs revealed no significant main effect of priming on the two dependent variables ($F_s < 1$), indicating that mood and arousal were not affected by the prime conditions. ANCOVAs yielded the same pattern of significant results for gender, prime, and the interaction effect after controlling for mood— $F(1, 62) = 25.70$, $p < .001$; $F(2, 62) = 3.72$, $p < .04$; and $F(2, 62) < 1$, respectively—and after controlling for arousal— $F(1, 62) = 27.35$, $p < .001$; $F(2, 62) = 3.37$, $p < .05$; and $F(2, 62) < 1$, respectively. Taken together, then, these analyses indicate that the observed pattern of results is neither attributable to changes in mood nor to variations in arousal.

The role of past behavior. The mean frequency of past visits to the library was 3.17 ($SD = 2.28$), and all participants had at least visited the library once in the last month. To test whether the library prime effects on vocal performance are conditional on the number of direct experiences with the library and associated normative behavior, we subjected the behavioral measure (voice intensity) to a moderated hierarchical multiple regression analysis (Baron & Kenny, 1986), in which the behavior is predicted by gender (coded as male = 1, female = 2), prime (coded as goal-control prime = 1, no-goal-library prime = 2, goal-library prime = 3), past behavior, and the Prime \times Past Behavior interaction term. To reduce multicollinearity bias, all variables were standardized before the cross-product was computed (Dunlap & Kemery, 1987). This analysis showed that the prediction of behavior by gender and prime was significant, β -gender = -0.518 , $t(64) = -4.93$, $p < .01$; β -prime = -0.238 , $t(64) = -2.27$, $p < .03$ (these effects are similar to the ones resulting from the original ANOVAs). However, including the main effect of past behavior and the interaction term did not significantly add to the prediction of behavior, β -past behavior = 0.075 , $t(64) = 0.72$, *ns*; β -interaction = -0.056 , $t(64) = -0.60$, *ns*. The nonsignificant interaction effect indicates that the library prime effects on vocal behavior are unconditional on the number of direct experiences.

In sum, the results of Experiment 2 showed that the priming of representations of behaviors by physical environments extends to

³ These items are from “Influence of Mood on Health-Relevant Cognitions,” by P. Salovey and D. Birnbaum, 1989, *Journal of Personality and Social Psychology*, 57, pp. 539–551. Copyright 1989 by the American Psychological Association. Reprinted with permission of the author.

overt behavior. Participants' voice intensity decreased when they were exposed to a picture of a library, indicating that they behaved in line with the primed behavior of being silent. However, this effect was qualified by the presence of the goal to go to the library: The library only affected the intensity of the voice under conditions of processing the environment in behavioral term. Controlling for differences in mood and arousal did not modify the pattern of results. Furthermore, the priming effects did not interact with frequency of past behavior, suggesting that normative behavior can be automatically activated without regular direct experiences with the situational norm.

Experiment 3

The reasons behind conducting Experiment 3 were three-fold. First, we tried to replicate the priming effects on normative behavior in a different domain, namely behavior associated with the situational norm of behaving well-mannered in exclusive restaurants. Second, we attempted to provide more direct support for the mediating role of the mental representations producing the priming effects. According to the present conceptualization of situational norms, effects of environmental priming on overt behavior should depend on the strength of the association between environment and normative behavior. Assuming that differences in associative strength exist, it follows that the stronger the association, the stronger the automatic effects of an environment on behavior will be (for a similar logic, see, e.g., Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000; Fazio, Jackson, Dunton, & Williams, 1995). Third, in Experiment 2 we found no evidence for the idea that frequency of direct experiences with the environment (and the associated normative behavior) moderates the priming effects. It should be noted, however, that our research sample consisted of participants that had all direct experiences with the environment. Thus, the sensitivity of the measure might have been insufficient to detect reliable moderating effects of direct experiences. Therefore, we again assessed the frequency of direct experiences with an exclusive restaurant (which is probably not visited by all participants on a regular basis; see also the pilot studies) to explore moderating role of practice in behavioral priming effects.

In Experiment 3, associative strength was first measured by means of a response latency paradigm in which participants were briefly exposed to a picture of an environment (e.g., an exclusive restaurant) and subsequently indicated as fast as possible whether a presented action concept (e.g., well-mannered) described the way one should behave in that environment. The speed of responding thus represents an indirect measure of the ease of activating the normative behavior by the environment. Next, effects of environmental prime on behavior were observed during eating. We anticipated that priming of an exclusive restaurant leads to well-mannered behavior. However, the size of this effect should be dependent on the associative strength between environment and socially expected behavior. People who strongly associate an exclusive restaurant with behaving mannerly will show stronger behavioral effects than those with relatively weak associations. In the control condition, however, associative strength should have no effect, as the behavioral norm of behaving well-mannered is not activated.

Method

Participants and Design

Forty-two undergraduates participated in the experiment, receiving 12 Dutch Guilders (approximately \$6) in return. They were randomly assigned to either the goal-control prime or goal-restaurant prime condition.

Experimental Task and Procedure

The experiment was conducted in the lab and consisted of two parts. First, the associative strength between environment and normative behavior was measured. One month later the effects of environmental priming were tested on behavior.

Associative strength. After participants entered the lab, they were told that they would take part in several studies. Participants were seated in cubicles containing a computer. First, we measured how strongly the action concept of "behaving mannerly" was associated with an exclusive restaurant. This was done with an association task. Participants were told that pictures would be briefly (400 ms) presented on the screen, designating a variety of environments. Furthermore, they learned that after each picture, an action concept would be presented on the screen, and that their task was to indicate as fast as possible whether the given action describes the appropriate way of behaving in the environment on the picture. Some pictures were succeeded with action concepts that are socially not expected to be displayed in the environment (e.g., park-litter), and some pictures were followed by action concepts that are socially expected to be exhibited in the environment (e.g., exclusive restaurant-well-mannered). It should be noted that we did not ask participants to indicate what one can do, but how one should behave in the respective environments, that is, the situational norm. In total, 80 pictures (20 different environments) appeared on the screen, and 4 comprised a picture of the same exclusive restaurant (identical to the one used in the experimental prime condition later on). The 4 words succeeding this picture were related to the norm of mannerly behavior (*well-mannered, decent, orderly, tidy*).

An association trial consisted of the following sequence of events: (a) presentation of a (12 cm × 8 cm) gray rectangle for 500 ms, (b) presentation of a picture (color photograph of the same size) for 400 ms, (c) presentation of a gray rectangle for 100 ms, and (d) presentation of the action concept in the middle of the rectangle. The action concept remained on the screen until the participant responded. Everything appeared at the same location on the screen. Responses were collected from the computer keyboard—participants pressed a key marked *yes* or *no*. Response latencies were measured in milliseconds from the onset of the action concepts to the time participants pressed a button. The time interval between trials was 2 s. The trials were presented in random order, and preceded by four practice trials. The mean reaction time on the four "restaurant" trials is indicative for the associative strength. All participants responded with *yes* to the four trials, indicating that they shared the norm of behaving mannerly in the environment (see also the earlier presented pilot study).

Environmental priming manipulations. After 1 month, all participants were contacted again with the request to participate in several tests that were designed by different research teams. We were able to recruit 42 persons who also participated in the first part. Thus, we could relate their associative strength between the exclusive restaurant and behaving mannerly with the data obtained later. Participants worked in a cubicle on computers and were tested individually. After participants were seated in the cubicle, they were exposed to the picture task. All participants first received the goal to visit the environment on the picture. Next, they were exposed to either the prime control (railway station) condition or the exclusive restaurant prime condition.

Assessing behavioral effects. Immediately after the picture task, participants were confronted with the "execution of mundane actions task." Participants were told that a team of researchers was pilot-testing a set of mundane tasks for upcoming research, which lasted for about 3 min.

Hence, participants were requested to perform short tasks, and to answer some questions afterwards. They were seated at a table that was cleaned before each session. For one of the tasks, participants were required to eat a round-shaped biscuit that usually gives crumbs when one bites into it. A hidden video camera recorded participants while they ate. The video allowed a clear view of participants' hand movements at the table while consuming the biscuit. The dependent measure we assessed was the extent to which participants kept their table clean and tidy. Accordingly, two raters blind to experimental conditions and hypotheses rated the videotapes on frequency of cleaning the table during the consumption of the biscuit. Concretely, they counted the number of times participants removed crumbs from the table during the task. The correlation between the two raters was .94, and by averaging their ratings for each participant, we obtained a measure representing well-mannered behavior.

Furthermore, participants were asked to indicate how often they had visited an exclusive restaurant in the last month. This frequency estimate served as a measure of past behavior. Finally, participants were thoroughly debriefed. The debriefing indicated that participants did not perceive any connection between the tasks. Thus, as in the previous experiments they were not aware of any influence of the priming task on their later performance. However, 2 participants did not complete the biscuit task. Hence, these participants were excluded from further analyses.

Results and Discussion

Effects on Behavior

The measure of mannerly behavior was subjected to a 2 (prime: control vs. restaurant) between-participants ANOVA. In line with our prediction, the effect of prime was significant, $F(1, 38) = 5.85$, $p < .03$. Participants removed the crumbs substantially more often in the restaurant condition ($M = 1.79$) than in the control condition ($M = 0.60$), thereby replicating the behavioral priming effect of Experiment 2.

The Mediating Role of Environment–Behavior Associative Strength

According to our hypothesis, the priming effects should be dependent on associative strength: After activation of an exclusive restaurant, people who strongly associate that restaurant with behaving mannerly will show stronger behavior effects than those who weakly associate that restaurant with behaving mannerly. Thus, the prime is supposed to moderate the relation between associative strength and actual performance. To test this effect, we subjected the behavioral measure to a moderated hierarchical multiple regression analysis, in which the behavior is predicted by prime (coded as goal-control prime = 1, goal-restaurant prime = 2), associative strength, and the Prime \times Associative Strength interaction term. To reduce multicollinearity bias, all variables were standardized before the cross-product was computed. This analysis showed that the prediction of behavior by prime, β -prime = 0.366, $t(36) = 2.67$, $p < .02$, and associative strength, β -associative strength = -0.417 , $t(36) = -3.05$, $p < .01$, was significantly improved by including the interaction term, β -interaction = -0.372 , $t(36) = -2.99$, $p < .01$.

The nature of the interaction effect is revealed when computing Pearson correlations between the associative strength measure and behavior under restaurant priming condition and under control condition. First, there was no relation between associative strength and behavior in the control prime condition ($r = -.10$, *ns*), which

of course is due to the fact that the behavioral norm of behaving well-mannered was not activated. Of more importance, the predicted relation between the associative strength measure and normative behavior in the restaurant prime condition was highly significant ($r = -.65$, $p < .01$): As the speed of responding to appropriate behavior increases (i.e., when accessibility is higher), so does the frequency of displaying normative actions. In other words, the effect of the goal to visit an exclusive restaurant on behaving well-mannered is mediated by the ease of accessing representations of normative behavior.

The Role of Past Behavior

The mean frequency of past visits to an exclusive restaurant was 1.43 ($SD = 1.15$). Ten participants (25%) had not visited an exclusive restaurant in past month. As in Experiment 2, we again sought to test whether the effects of restaurant activation on behavioral effects are conditional on the frequency of past behavior. Accordingly, the behavioral measure (behaving well-mannered) was subjected to a moderated hierarchical multiple regression analysis, in which the behavior is predicted by the prime conditions (coded as control prime = 1, restaurant prime = 2), past behavior measure, and the Prime \times Past Behavior interaction term. As in the previous analyses, all variables were standardized before the cross-product was computed. The regression analysis showed that the prediction of behavior by prime was significant, β -prime = 0.361, $t(36) = 2.37$, $p < .03$. However, the main effect of past behavior and the interaction term did not share significant variances with behavior, β -past behavior = -0.081 , $t(36) = -0.53$, *ns*; β -interaction = -0.140 , $t(36) = -0.92$, *ns*. These results indicate that the restaurant prime affected actual performance regardless of the number of direct experiences with the environment and associated normative behavior in the past.

General Discussion

The present research adopted a process-oriented approach to investigate how situational norms guide social behavior. It was posited that situational norms can be seen as associations between environment and normative behavior in memory that are shaped by social influence. Because of these associations, it is possible to automatically elicit the (mental representations of) behavior by activating the goal to visit the environment. Three experiments provided support for these ideas.

In the first two experiments, we established that library only enhanced the accessibility of mental representations of being silent and made participants talk less loud when they had a goal to visit the library. These findings indicate that mere exposure to library does not guide normative behavior directly. The present results thus differ from findings obtained in inquiries on behavioral priming effects of social stimuli. This research establishes that mere perception of social targets suffices to activate representations of behavior traits and corresponding behavior, demonstrating the strong and direct behavioral implications of social stimuli (Dijksterhuis & Bargh, 2001). Physical (or built) environments, however, seem to impinge on social behavior in a different way. In appreciating a functional view on human behavior, we believe that people do not access representations of the norm of being silent automatically on the mere perception of a library. It takes an

additional step to prime the normative behavior and, as the present results show, this happens when having the goal to visit the environment.

Another way to interpret the effects of goals is to posit that instructions to visit the environment simply prime more nodes in memory, and thus renders representations of normative behavior more accessible. However, it should be noted that our data indicate that mere perception of environments (i.e., when participants only scrutinized the interior features within the same amount of time) does not suffice to facilitate normative behavior directly (compared with controls). This effect resembles recent findings on the role of processing goals in trait activation on the perception of social targets (Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997). Macrae et al. (1997) did not find the typical trait activation effect after mere exposure to a picture of a woman or when participants processed the picture in socially meaningless terms (if they had to indicate whether there was a dot on the picture). A picture of a woman only activated these traits if participants had the goal to process the picture in socially relevant terms (e.g., "Is the object on the picture a living thing?"). In line with this research, we believe that the goal to visit the library renders the environment of immediate behavioral relevance, and as a result, facilitates access to representations of normative behavior (cf. Bargh, 1990). That is, the goal to visit an environment activates (albeit implicitly) thoughts about how one should behave in a socially accepted way, thus triggering the normative behavior associated with the environment automatically. In fact, given our experimental procedures, the conditional role of goals in normative behavior activation effect can be classified as an instance of unintended goal-dependent automaticity (Bargh, 1989)—unintended in the sense that it occurs as a result of the intentional instigation of another goal (e.g., visiting the library).

Furthermore, we obtained evidence for the idea that the environmental priming effects on behavior are conditional on the associative strength between the representations of the environment and normative behavior. In Experiment 3, participants indicated as fast as possible whether specific action concepts (well-mannered) represent the normative way of behaving in a certain environment briefly presented on a picture (an exclusive restaurant). Results showed that the priming effects of an exclusive restaurant on well-mannered behavior were more pronounced for participants with strong associations than for those who possessed weak associations. This pattern of data concurs with other research showing that accessibility of concepts after priming depends on the associative strength between the concept and prime (Higgins, 1996). These results thus provide crucial information, as they show that the respective normative behavior was more accessible for some than for others, and moreover, that the priming effects of physical environment were mediated by these variances in mental accessibility.

Situational Norms Versus Personal Habits

The present conceptualization on the role of situational norms in directing behavior bears similarity with recent treatments about habitual social behavior (Aarts & Dijksterhuis, 2000; Bargh & Gollwitzer, 1994; Ouellette & Wood, 1998). In both cases, goals automatically prime behavior according to an "if-then" rule. However, situational norms and habits differ in how these automatic

effects originate. Habits are conceived of as idiosyncratically learned goal-mean links in memory that gain strength by extensive direct practice. These links emanate from a selection process in which an action is regularly selected and performed that is perceived to be most effective in obtaining a goal (e.g., taking the bicycle instead of a bus to go to the university). Thus, Aarts and Dijksterhuis (2000) found that cycling was automatically activated by the goal to travel to the university, but only for those persons that regularly use the bicycle for this trip.

Situational norms are socially shared beliefs representing links between specific situations and normative behaviors. These norms are also known as customs or social conventions that are the product of socialization and cultural construal (e.g., Camic, 1986; Durkheim, 1893/1964), and do not require much direct practice to become well-established (Sperber, 1990). Direct practice may be essential to learn how to execute the behavioral part (e.g., lower one's voice to be quiet) of situational norms, but not to associate normative behavior to a given situation. Such associations can easily be established by indirect experiences (Lieberman, 2000). Situational norms thus are able to automatically become active in a situation without much direct experience with that situation (cf. Cohen, 1997). Indeed, the present data show that past behavior did not enhance the priming effects. Of course, socialization may cause people to differ in how well situational norms establish (Cialdini & Trost, 1998). For example, some people grow up in an environment in which the importance of well-mannered behavior in exclusive establishments is more stressed, and therefore develop stronger links between that situation and behavior. Hence, differences in associative strength are likely to occur because of differences in culture and social background.

Situational Norms and Control Over Social Behavior Revisited

The most important theoretical significance of the present research lies in demonstrating that situational norms are able to guide social behavior directly, an observation that diverges from findings in correlational survey studies on attitude-behavior models. As the present studies show, however, not all situational norms guide social behavior directly. Only situational norms that are well-established, in the sense of strong associations between environment and normative behavior, are automatically put in operation on the goal to visit the environment. For those who weakly (or not at all) associate the environment with normative behavior, the behavior representation is not spontaneously facilitated, and hence, does not become accessible in guiding overt behavior. Presumably, these people have to be consciously reminded (or prompted) to the situational norm to enact the normative behavior (e.g., Cialdini et al., 1990; see also Zimbardo & Leippe, 1991). For example, it may have been the case that participants in the Cialdini et al. studies (1991) did not have such strong links between public spaces and behaving orderly after all, and thus the additional piece of watermelon made them more aware of the normative behavior. In other words, under conditions of weak situational norms, individuals are more prone to intentional control, as they have to rely on conscious intents to assimilate their ongoing behavior to the norm pertaining to the situation at hand. However, because this general perspective to automatic and intentional control of normative behavior as a function of associative strength is not directly

tested in the current experiments, it still awaits further empirical scrutiny.

Situational norms are rules and standards that are understood by members of a group or society, and that guide behavior without the force of laws. Although some norms may be rather local and transient, this “lawless” force makes the concept of norms of particular interest to social psychology. Recently, Cialdini and Trost (1998) stated that “There has been some debate about the usefulness of norms as an explanatory concept, . . . and in fact, the variety of conceptualizations may have contributed to the confusion concerning the actual role of social norms in directing our behavior” (p. 152). One may argue that the present analysis may further confuse the matter by conceptualizing situational norms as associations between environment and normative behavior. However, our findings that were predicted from this conceptualization may be quite instructive. That is, the idea that normative behavior is directly evoked by environments when (a) goals are active that render environments behaviorally relevant, and (b) behavior representations become accessible as a result of socially shaped associations between environment and normative behavior suggests that automatic normative behavior follows similar principles that are postulated in contemporary social cognition research to account for the emergence of other automatic social behavior. In so doing, we feel that we have become closer to capture the mechanism that tells us how, when, and where normative behavior may be expected.

References

- Aarts, H., & Dijksterhuis, A. (1999). How often did I do it: Experienced ease of retrieval and frequency estimates of past behavior. *Acta Psychologica, 103*, 77–89.
- Aarts, H., & Dijksterhuis, A. (2000). Habits as knowledge structures: Automaticity in goal-directed behavior. *Journal of Personality and Social Psychology, 78*, 53–63.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytical review. *British Journal of Social Psychology, 40*, 471–499.
- Baken, R. J. (1987). *Clinical measurement of speech and voice*. London: Taylor & Francis.
- Bargh, J. A. (1989). Conditional automaticity: Varieties of automatic influence in social perception and cognition. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 3–51). New York: Guilford Press.
- Bargh, J. A. (1990). Auto-motives: Preconscious determinants of social interaction. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 93–130). New York: Guilford Press.
- Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist, 54*, 462–476.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). The automaticity of social behavior: Direct effects of trait concept and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230–244.
- Bargh, J. A., & Gollwitzer, P. M. (1994). Environmental control of goal-directed action: Automatic and strategic contingencies between situations and behavior. In W. D. Spaulding (Ed.), *Nebraska symposium on motivation*, (Vol. 41, pp. 71–124). Lincoln: University of Nebraska Press.
- Barker, R. G. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. Stanford, CA: Stanford University Press.
- Barker, R. G., & Wright, H. F. (1955). *Midwest and its children: The psychological ecology of an American town*. New York: Row, Peterson.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Birenbaum, A., & Sagarin, E. (1976). *Norms and human behavior*. New York: Praeger Publishers.
- Camic, C. (1986). The matter of habit. *American Journal of Sociology, 91*, 1039–1087.
- Chen, M., & Bargh, J. A. (1997). Nonconscious behavioral confirmation processes: The self-fulfilling nature of automatically-activated stereotypes. *Journal of Experimental Social Psychology, 33*, 541–560.
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 201–234). San Diego, CA: Academic Press.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58*, 1015–1026.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 151–192). Boston: McGraw-Hill.
- Cohen, D. (1997). Ifs and thens in cultural psychology. In R. S. Wyer Jr. (Ed.), *Advances in social cognition* (Vol. 10, pp. 121–131). Mahwah, NJ: Erlbaum.
- Coleman, R. F., Mabis, J. H., & Hinson, J. K. (1977). Fundamental frequency-sound pressure level profiles of adult male and female voices. *Journal of Speech, Language and Hearing Research, 20*, 197–204.
- Craig, G. J. (1996). *Human development*. Upper Saddle River, NJ: Prentice-Hall.
- Decety, J., Jeannerod, M., Germain, M., & Pastene, J. (1991). Vegetative response during imagined movement is proportional to mental effort. *Behavioural Brain Research, 42*, 1–5.
- Deutsch, M., & Gerard, H. G. (1955). A study of normative and informational social influence upon individual judgment. *Journal of Abnormal and Social Psychology, 51*, 629–636.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5–18.
- Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Holt.
- Dijksterhuis, A., Aarts, H., Bargh, J. A., & van Knippenberg, A. (2000). Past contact, stereotype strength, and automatic behavior. *Journal of Experimental Social Psychology, 36*, 531–544.
- Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: The automatic effects of social perception on social behavior. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 33, pp. 1–40). San Diego, CA: Academic Press.
- Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology, 74*, 865–877.
- Dunlap, W. P., & Kemery, E. R. (1987). Failures to detect moderating effects: Is multicollinearity the problem? *Psychological Bulletin, 102*, 418–420.
- Durkheim, E. (1964). *The division of labor in society* (G. Simpson, Trans.). Original work published 1893.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial

- attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, 69, 1013–1027.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison Wesley.
- Fletcher, H. (1953). *Speech and hearing in communication*. New York: van Nostrand.
- Gigi, E. F., & Vogten, L. L. M. (1998). GIPOS. *IPO Annual Progress Report*, 32, 105–110.
- Hamilton, D. L., & Sherman, J. W. (1994). Stereotypes. In R. S. Wyer Jr. & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 2, pp. 1–68). Hillsdale NJ: Erlbaum.
- Harvey, M. D., & Enzle, M. E. (1981). A cognitive model of social norms for understanding the transgression-helping effect. *Journal of Personality and Social Psychology*, 41, 866–875.
- Hetherington, E. M., & Baltes, P. B. (1988). Child psychology and life-span development. In E. M. Hetherington, R. Lerner, & M. Perlmutter (Eds.), *Child development in life-span perspective* (pp. 1–20). Hillsdale, NJ: Erlbaum.
- Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York: Guilford Press.
- Hommel, B. (1998). Perceiving one's own action—and what it leads to. In J. S. Jordan (Ed.), *Systems theories and a priori aspects of perception* (pp. 143–179). Amsterdam: Elsevier Science.
- Huber, J. E., Stathopoulos, E. T., Curione, G. M., Ash, T. A., & Johnson, K. (1999). Formants of children, women, and men: The effects of vocal intensity variation. *Journal of Acoustical Society of America*, 106, 1532–1542.
- Jeannerod, M. (1997). *The cognitive neuroscience of action*. Malden, MA: Blackwell Publishers.
- Kelley, H. H. (1952). Two functions of reference groups. In G. E. Swanson, T. M. Newcomb, & E. L. Hartley (Eds.), *Readings in social psychology* (pp. 410–414). New York: Holt.
- Latané, B. (1996). Dynamic social impact: The creation of culture by communication. *Journal of Communication*, 46, 13–25.
- Leff, H. L. (1978). *Experience, environment, and human potential*. New York: Oxford University Press.
- Lieberman, D. A. (2000). *Learning: Behavior and cognition*. Belmont, CA: Wadsworth.
- Macrae, C. N., & Bodenhausen (2000). Social cognition: Thinking categorically about others. *Annual Review of Psychology*, 51, 93–120.
- Macrae, C. N., Bodenhausen, G. V., & Milne, A. B. (1995). The dissection of selection in person perception: Inhibitory processes in social stereotyping. *Journal of Personality and Social Psychology*, 69, 397–407.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., Thorn, T. M. J., Castelli, L., Schloerscheidt, A. M., & Greco, S. (1998). On activating exemplars. *Journal of Experimental Social Psychology*, 34, 330–354.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., Thorn, T. M. J., & Castelli, L. (1997). On the activation of social stereotypes: The moderating role of processing objectives. *Journal of Experimental Social Psychology*, 33, 471–489.
- Miller, D. T., & Prentice, D. A. (1996). The construction of social norms and standards. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 799–829). New York: Guilford Press.
- Neely, J. (1991). Semantic priming effects in visual word recognition: A selective review of current findings and theories. In D. Besner & G. Humpreys (Eds.), *Basic processes in reading: Visual word recognition* (pp. 264–336). Hillsdale, NJ: Erlbaum.
- Ouellette, J., & Wood, W. (1998). Habit and intention in everyday life. The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, 124, 54–74.
- Paus, T., Petrides, M., Evans, A. C., & Meyer, E. (1993). Role of human anterior cingulate cortex in the control of oculomotor, manual and speech response: A positron emission tomography study. *Journal of Neurophysiology*, 70, 453–469.
- Powers, W. T. (1973). *Behavior: The control of perception*. Chicago: Aldine.
- Pepitone, A. (1976). Toward a normative and comparative biocultural social psychology. *Journal of Personality and Social Psychology*, 34, 641–653.
- Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, 64, 104–112.
- Salovey, P., & Birnbaum, D. (1989). Influence of mood on health-relevant cognitions. *Journal of Personality and Social Psychology*, 57, 539–551.
- Schaalma, H. P., Kok, G. J., & Peters, L. (1993). Determinants of consistent condom use by adolescents: The impact of experience with sexual intercourse. *Health Education Research*, 8, 255–269.
- Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals, and understanding*. Hillsdale, NJ: Erlbaum.
- Schwartz, S. H., & Tessler, R. C. (1972). A test of a model for reducing attitude-behavior discrepancies. *Journal of Personality and Social Psychology*, 24, 225–236.
- Sheeran, P., & Orbell, S. (1999). Augmenting the theory of planned behavior: Roles for anticipated regret and descriptive norms. *Journal of Applied Social Psychology*, 29, 2107–2142.
- Sherif, M. (1936). *The psychology of social norms*. New York: Harper.
- Sperber, D. (1990). The epidemiology of beliefs. In C. Fraser & G. Gaskell (Eds.), *The social psychological study of widespread beliefs* (pp. 25–44). New York: Clarendon Press/Oxford University Press.
- Stangor, C., & Lange, J. E. (1994). Mental representations of social groups: Advances in understanding stereotypes and stereotyping. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 26, pp. 357–416). San Diego, CA: Academic Press.
- Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In H. E. Howe Jr. & M. Page (Eds.), *Nebraska Symposium on Motivation* (Vol. 27, pp. 195–259). Lincoln: University of Nebraska Press.
- Zimbardo P. G., & Leippe, M. R. (1991). *The psychology of attitude change and social influence*. New York, NY: McGraw-Hill.
- Zuckerman, M., & Reis, H. T. (1978). Comparisons of three models for predicting altruistic behavior. *Journal of Personality and Social Psychology*, 46, 498–528.

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