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A componential model of situation effects, person effects, and situation-by-person interaction effects on social behavior

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ABSTRACT

Social and personality psychology seek to understand the regularities of human behavior in social context and to separate critical causal variables assumed to reside in the social situation, in the person, and in the interaction between the two. A componential model is presented, which assumes that the three types of effect are theoretically and conceptually independent, although they may be confounded in practice. A review of past theory and research suggests that many social and personality psychologists have misconstrued situation and person effects as competing for a limited pool of behavioral variance. A conceptual re-orientation may overcome the limitations of both radical situationism and defensive dispositionism.

1. Introduction

> "Every psychological event depends upon the state of the person and at the same time on the environment, although their relative importance is different in different cases (Lewin, 1936, p. 12)."

> "The question of whether individual differences or situations are more important is an empty one that has no general answer (Mischel, 1977, p. 340)."

Following Kurt Lewin's writings on the dual origins of human behavior, many social and personality psychologists assume that behavior depends on forces inherent in the situation and on forces residing within the person. It is also commonly assumed that there is a fixed amount of behavioral variance. If one type of effect is strong, the other would have been small. Representing this hydraulic view of behavioral causation, Bargh (2007) asserted that "a central focus of contemporary social psychology has been the relative influence of *external* (i.e., environmental, situational) versus *internal* (i.e., personality, attitudes) forces in determining social judgment and social behavior" (p. 555, emphasis in the original). This competitive construction of situation versus person effects ignores the possibility that they might interact, a notion that Lewin took seriously. "We seek the "cause" of events [...] in the relationship between an object and its surroundings" (Lewin, 1936, p. 11).

After Mischel's (1968) critique of trait psychology, many research programs in social and personality psychology dedicated themselves, respectively, to demonstrations of situation and person effects. This division of labor and the interdisciplinary competition it entailed hampered progress in psychology. In this article, I focus on traditional and modern forms of the situationist thesis as it appears social psychology, although my analysis extends to some limitations of theories championing an exclusive focus on personality traits and personal causation. To help reform current research practice, I sketch a componential model that separates situation effects, person effects and interaction effects. I revisit some classic research findings to highlight how research designs can both reveal and obscure causes of behavior. Then, I explore some implications of the model for a contemporary expression of the situationist paradigm, namely the project to detect the automatic genesis of all social behavior. I conclude with some ideas as to why the doctrine of situationism has proven so resilient to critique.

2. The pure componential model

Cronbach (1955) pioneered componential modeling when he decomposed global similarity scores (see also Cronbach & Gleser, 1953). For two sets of N observations a_i and b_i, the sum of the squared differences, $\sum(a_i - b_i)^2$, is an index of overall dissimilarity. This index may be large because there is a large mean difference, $M_a - M_b$, because there is a low correlation between the two sets, $r_{a,b}$, or because the two sets have different variances, $v_a/v_b \neq 1$. These three components of dissimilarity are differences in elevation, profile similarity and dispersion, respectively. Cronbach noted that the overall sum index conflates these components. Studies can yield similar dissimilarity indices, although the underlying data are entirely different.

Consider the implications of the componential analysis for the study of social behavior. Let 'N' designate a sample of individuals

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and '*a*' and '*b*' designate two situations, in which a critical behavior is observed. The first component, the difference in elevation, $M_a - M_b$, shows whether the target behavior is stronger in one situation than in the other. In social psychological research, the two-sample analysis of variance, ANOVA, is the canonical tool for the evaluation of mean differences. The successful detection of a significant difference affords the desired inference that the situation caused a change in the persons' average behavior.

The second component, profile similarity, $r_{a,b}$, shows whether the individual differences in behavior are consistent across situations. The correlation over respondents is thus an estimate of the person effect. In personality research practice, it is these correlations that legitimize trait theories and afford inferences about personal causation.

The third component is the variance differential, v_a/v_b, which shows whether situation and person effects interact. A difference in variance means that one situation homogenizes (or heterogenizes) behavior relative to another. Although both social and personality psychology recognize the conceptual importance of the variance differential as an indicator of the difference between strong (i.e., low variance) and weak (i.e., large variance) situations (Price & Bouffard, 1974), standard research practice treats a non-one variance ratio as a nuisance. ANOVA demands equal variances for the comparison of means, and Pearson's product-moment correlation coefficient corrects for—and thus hides—any variance inequality.[1]

The componential model accords equal theoretical significance to the three types of effect. With *S*, *P*, and $S \times P$ being theoretically independent, eight possible combinations of effects must be considered. They are listed in Table 1. The first four cases allow clear inferences. In Case 1, the mean behavior is the same in both situations, individual differences are uncorrelated, and the variances are the same. Such a study is difficult to publish. Case 2 represents a pure pattern supporting the situationist hypothesis. The mean behavior is different, individual differences are uncorrelated, and the variance ratio is near 1. Case 3 represents a pure pattern supporting the dispositionist hypothesis. The mean behavior is the same, individual differences are highly correlated, and the variance ratio is 1. Case 4 represents a pure interaction effect. The mean behavior is the same, individual differences are uncorrelated, but the variance ratio is skewed.

Now consider the next four cases, which involve more than one significant component. Case 5 shows that situation and person effects can co-exist. A difference in elevation can easily be paired with strong profile similarity. This case refutes the idea that the relationship between *S* and *P* effects is intrinsically hydraulic (Funder & Colvin, 1991). Case 6 is central for the re-evaluation of classic findings in social psychology. There is a main effect of *S*, no effect of *P*, and an interaction between *S* and *P*. This pattern is a common, even desired, outcome when a control condition is set up to yield a low level of behavior coupled with little variance, and an experimental condition is set up to yield both, a higher elevation and a greater variance of behavior. Case 7 appears to support the dispositionist hypothesis, although a focus on profile similarity would miss the fact that the situations contribute to behavior by moderating the magnitude of individual differences. Finally, Case 8 shows that all three effects can occur jointly.

Although they emphasize different sources of behavioral variance, social and personality psychologists share the view that situation effects be construed as mean differences and person effects as correlations. To represent these choices, the componential model has to take the form outlined above. Of course, research can be designed so that mean differences represent person effects and profile correlations represent situation effects. Brunswik (1955) advised that tasks (i.e., situations) be sampled representatively from a person's ecological niche (Dhami, Hertwig, & Hoffrage, 2004). In this approach, a difference in variance indicates that the behavior of one person is more variable over situations than the behavior of another (Fleeson, 2007). For reasons the present analysis aims to help illuminate, the ecological paradigm is underutilized in current research practice. Experimental social psychologists, whose epistemology tells them to detect subtle situation effects, will manipulate situations and sample persons rather than vice versa (Wells & Windschitl, 1999). Likewise, personologists, whose epistemology tells them to demonstrate the stability of differences over multiple individuals, will also prefer to sample many respondents and limit their analysis to few situations.

Table 1
The pure componential model.

Case	Situation	Person	Interaction
1. 'Wash-out'	–	–	–
2. 'Situation only'	+	–	–
3. 'Disposition only'	–	+	–
4. 'Interaction only'	–	–	+
5. 'Non-hydraulic'	+	+	–
6. 'Classic social'	+	–	+
7. 'Classic trait'	–	+	+
8. 'Complexity'	+	+	+

Note: the operator "+" indicates that the effect is present; the operator "–"indicates that the effect is absent.

3. The constrained model

Ordinary research practice imposes several constraints on the theoretical independence of effects. One type of constraint is scale-end effects. The total absence of a behavior imposes a floor effect, and organismic limitations set a ceiling for how often or how strongly a person can act. Therefore, a large situation effect reduces the variance across observations. If all observations are 1 and 7 on a Likert scale, respectively, for the control and the experimental condition, no person effect and no interaction can occur. Conversely, if individual scores vary across the entire range of the scale in both conditions, the person effect is large and no situation or interaction can occur. Yet, there is an asymmetry of constraint. A large person effect does not limit the other two effects as much as the situation effect does. It is possible to find $r_{a,b} = 1$ while $M_a - M_b > 0$ and while $v_a/v_b \neq 1$. In short, situation and person effect may appear to be compensatory because of the limitations of measurement.

A strong interaction effect has asymmetric implications for the two main effects. If the mean response in one condition is near one of the endpoints of the scale, and if variation around that mean is small, the mere increase in response variance in the other condition entails not only an interaction effect, but also a spurious main effect of the situation. Recall the significance of Case 6 for classic social psychological work and take Milgram's (1963) obedience study as an example. In the control condition, where no social influence was brought to bear, no one gave the maximum shock. Both the mean level of the critical behavior and its variance were zero. In contrast, participants under the experimenter's influence were more punitive on average and their behavior was more variable. Because an increase in the variance of behavior could occur only against the background of the floor effect in the control condition, the interaction effect also produced a main effect of situa-

[1] In a two-sample ANOVA an interaction term can be extracted by averaging each respondent's data over situations, sort them by median split, and compare the means obtained in the two situations separately for the high and the low scorers. This method reduces to the interaction specified by the componential model. If the situation effect is different in size, or even in direction, for the high scorers and the low scorers, the overall variance within the two situations is different.

tion. It is as legitimate to say that Milgram found an interaction effect as it is to say that he found a situation effect.[2] In contrast, if an interaction effect is observed because the variance of observations is particularly small in one condition, an overall person effect less likely. If differences in variance militate against high correlations, a significant person effect is more impressive in the presence of an interaction than in the absence of it. If all three effects are obtained (i.e., Case 8), and if the effect size of *S* and *P* are the same, the latter is more compelling than the former.

The asymmetric constraints the three effects impose on one another complicate the interpretation of empirical results. The arbitrariness of these constraints is further highlighted by the fact that the asymmetry is inverted in research using ecological sampling. When situations are sampled instead of respondents, a large person effect constrains the situation effect more strongly than vice versa, and a large interaction is more likely to entail a spurious person effect than a spurious situation effect.

The componential model is psychometric in origin but experimental in application. This discrepancy leads to an additional constraint. Whereas ANOVA assumes the same variance across conditions, the componential model identifies differences in variance as the reflection of interaction effects. Whereas ANOVA casts effects in standardized form, the componential model retains the raw form. Standardized situation effects are large to the extent that individual differences and error variance are small. Thus, standardization feeds into the assumption that situation and person effects are compensatory. If a significant situation effect is found, it must have overwhelmed the person effect. This conclusion has no merit in a within-subjects design. As the correlation between individual differences increases, tests of mean differences become more powerful, and standardized effects become *larger*. There is no comparable standardization of the person effect that provides a test of significance. Inasmuch as correlation coefficients between individual differences measure are corrected for unreliability, they only subtract error variance, but not situational variance.

The realities of behavioral measurement can obscure the conceptual independence of the causes of behavior. In research practice, situation and person effects can appear to be opposites. Nonetheless, the onus is on researchers to recognize and overcome these constraints; the onus is not on the model to reify measurement constraints as true phenomena. Current research practice has a long way to go to meet this goal. In social psychology, the standard between-respondent design does not even allow the simultaneous estimation of person and interaction effects. Whereas a full componential analysis requires a repeated-measures design, many social psychologists prefer between-respondent designs, perhaps because of the field's tradition of deceiving participants. If the purpose of an experiment must be concealed, participants cannot serve as their own controls.

Measures of individual differences are not integral to the design of the typical social psychological study; instead, they are tacked on. Respondents in each condition complete scales assessing individual differences in attitudes or traits that the investigators think may be associated with differences in the critical behavior (Snyder & Ickes, 1985). For example, some studies designed to test the effects of social influence on compliance also measure individual differences in, for instance, authoritarianism or self-monitoring. This is a weak strategy. It seeks to detect a correlation between a general trait and a specific behavior (Fishbein & Ajzen, 1975).

Another strategy is to infer person effects without even measuring them. Here, researchers evaluate the respondents' behavior against baseline assumptions. When social influence is designed to get people to do what they ordinarily would not do (i.e., to comply with a request that violates self-interest), participants in control conditions do as they please, namely nothing. Hence, their behavior (or rather lack thereof) is considered an expression of their disposition. Behavior in the experimental condition is not only attributed to the power of the situation, but also to the person's weakness to resist it (Sabini & Silver, 2005). In the spirit of this argument, Bargh (2007, p. 556) asserted that Milgram "demonstrated the power of a situational influence (i.e., the experimenter's authority) over the subject's behavior to override presumed internal influences (i.e., the subject's presumed personal values not to cause pain or harm another)".

4. Classic situationism: the alleged hydraulics of misbehavior

After decades of research that did not properly separate situation, person, and interaction effects, a strong situationist attitude prevails in social psychology. Bargh (2007, p. 555) concludes "many of the classic findings in the field—such as Milgram's obedience research, Asch's conformity studies, and Zimbardo's mock-prison experiment—seemed to indicate that the external forces swamped the internal forces when the chips were down". If so, any belief in personal causation must be a folk psychological superstition (Ross & Nisbett, 1991). Laypeople—and personality psychologists—who cleave to dispositional inferences must be committing a "fundamental attribution error". If they only understood the primacy of situations, their attributions would not only be more in line with scientific norms, but they would also be more "charitable" (Iyengar, Lepper, & Ross, 1999).

Un momento, por favor. As we have already seen, experimental research has its own biases and limitations. When participants are randomly assigned to conditions and significant statistical results are privileged, the evidence for situational causes accumulates faster than evidence for personal causes. Experimental research provides opportunities for large situation effects because the independent variables are specifically designed to change behavior. In contrast, extraneous individual differences have no advantage by design. Despite this tilted playing field, the empirical effect sizes of situations are no greater than the effect of persons ($.2 < r < .3$; Bowers, 1973; Funder & Ozer, 1983; Richard, Bond, & Stokes-Zoota, 2003). Nonetheless, situation effects garner more respect because they spring from "apparently minor but important details of the situation" (Ross & Nisbett, 1991, p. 10), or because "the preservation of objectivity in psychology depends upon the observability of truly causal variables" (Bowers, 1973, p. 308).

Experimental social psychology seeks to buttress the primacy of situational causes by exploiting its own charge against folk psychology and its footprint, the fundamental attribution error. Not only are the observed situation effects introduced as evidence, but also people's inability to foresee these effects. Milgram (1974, p. 205) suggested that "the disposition a person brings to the experiment is probably less important a cause of his behavior than most readers assume". To corroborate this rhetoric, one would have to show that experimental findings are more valid when they differ from folk beliefs than when they do not. Logically, there is no such relationship. Other sciences (e.g., astronomy, evolutionary biology) fought historic battles to rectify naïve beliefs, but their findings are not considered more valid because they differ from popular misconceptions. The inverse implication of anchoring the interpretation of experimental findings on their relationship to folk beliefs is also invalid. There is no reason to think that if scientific data conform to such beliefs, they have no value. Other disciplines do not endorse this vulgar form of Bayesianism. Indeed, personality researchers dedicated to the trait perspective, seem to want to confirm folk ideas of dispositionism.

[2] According to one school of thought, interaction effects supersede main effects in ANOVA when both are statistically significant (Keppel, 1991).

A related argument for the primacy of situational causes is that the situations that affect people's behavior in the laboratory—and in real-world settings that the experiments seek to model—are "strong" situations. Strong situations "prompt similar responses in almost everyone, whereas weak situations will evoke greater variation" (Suls & David, 1996, p. 1002; see alsoLissek, Pine, & Grillon, 2005).[3] My old sociology professor Heinz Harbach used to say, 'You can sing hymns in a bar, but you cannot drink beer in church.' Kenrick and Funder (1988) make the same point when they distinguish between picnics and funerals. The latter tightly regulate behavior by making salient social norms, customs, or rituals; the former make salient the individual's freedom to do as they please, and different individuals please differently.

According to the situationist interpretation, the difference in variance signals a situation effect, and thus a hydraulic depletion of the person effect. Even Mischel (1977, p. 347), otherwise known for his interactionist views, suggested that "strong situations shift the cause of behavior from a dispositional locus to a situational one". In contrast, the componential model casts the difference between low-variance and high-variance situations as a situation-by-person interaction. What matters according to the componential model is the variance in one situation relative to the variance in another. There is no absolute categorization of a situation as being either strong or weak.[4]

Consider Milgram's research. Intuition suggests that it is the presence of an insistent authority figure that constitutes the strength of the situation. It is the influence of the authority that steers participants away from doing what they want to do, namely nothing. By this logic, the control condition is weak because participants are on their own. Notice that this view is opposite to the statistical definition of a strong situation. It is the control condition that yields low behavioral variance and the experimental condition that yields high variance. The mind balks at the idea that Milgram's pressure on his participants to shock their fellow man to death was a weak situation. And yet, statistically it was.

Asch's (1956) conformity studies allow a similar interpretation. In the control condition, virtually no one offered an incorrect response when deciding which of three lines matched the target line in length. Hence, the control condition was strong by the variance criterion. The experimental conditions, in which three or more confederates offered unanimous but false decisions, about one third of the responses was conforming and false. These responses were more variable and less predictable, thus implying that the experimental condition was statistically weak.

Now consider the notorious Stanford Prison Experience (Haney, Banks, & Zimbardo, 1973). As there was no distinction between a control and an experimental condition, no relative distinction between strong and weak situations could be drawn. Yet, according to the master narrative, both guards and prisoners found themselves in a strong situation. Nonetheless, the study's architect reports considerable individual differences within both groups (Zimbardo, 2007). Some guards appeared to relish their power, whereas others attempted not to escalate the intergroup conflict; some prisoner's rebelled or got sick, whereas others submitted or withdrew psychologically (Carnahan & McFarland, 2007; Krueger, 2008). Inasmuch as the prison setting brought out these unexpected individual differences, the situation was weak.

A more complex picture emerges from Darley and Latané's (1968) study on the bystander effect. On the one hand, it was the control condition that was statistically strong. Knowing that the victim's welfare depended on them alone, most (85%) participants helped. When the group of potential helpers increased in size, the probability of helping decreased. With a group size of five, fewer participants (31%) intervened. Thus, a large group also homogenized behavior, though with a different outcome. With an intermediate group size of two, the behavior of the individual was least predictable (62% helped), and hence the situation was the weakest. In other words, a linear increase in the strength of the independent variable yielded a curvilinear trajectory in the statistical strength of the situation.

Whereas the situationist project pits strong situations against strawman dispositions, the componential model allows that situations activate multiple dispositions (Sabini, Siepmann, & Stein, 2001). In Milgram's (1963) study, the experimenter's behavior was designed to activate a norm to respect legitimate authority and a willingness to honor a contract demanding cooperation. At the same time, the victim's protests activated the norm to do no harm. As the experiment progressed, the activation of both norms grew stronger, resulting in pressure to resolve a "crisis of conscience". The experience of such a crisis is a fundamentally psychological phenomenon rather than an environmental one, and its resolution reveals the relative strength of distinctive personal dispositions.

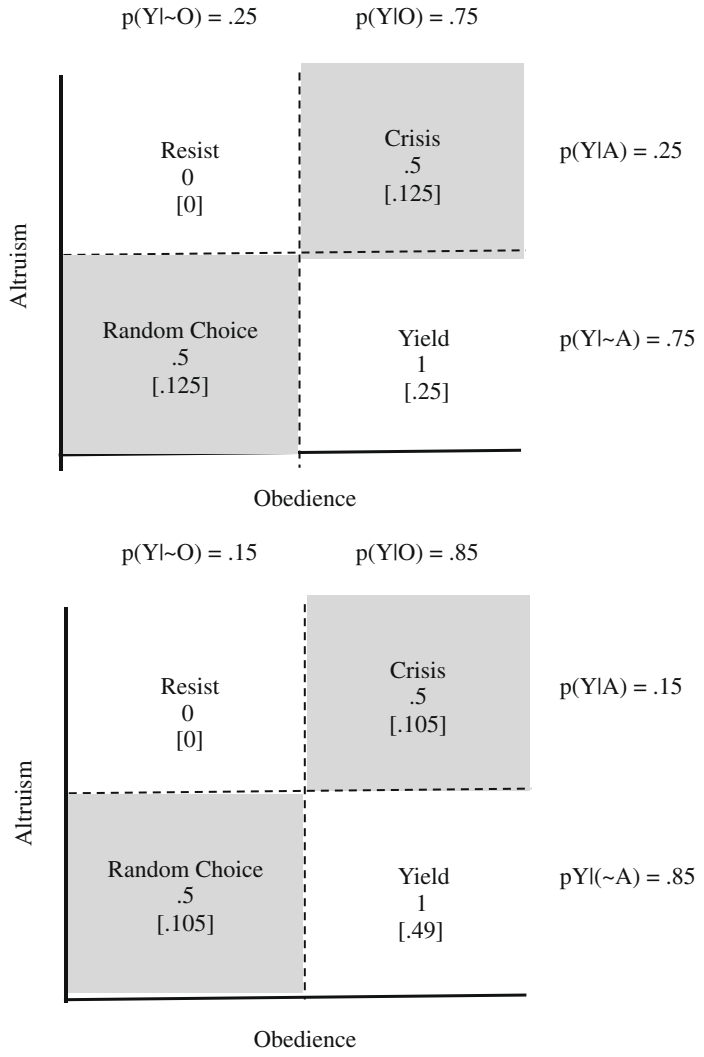
To illustrate, suppose there is a symmetrical bivariate distribution of independent individual differences in respect for the two norms. For each disposition, weak and strong norm endorsers are separated by median split, which yields four types of participant. The upper right quadrant of Fig. 1 (top) comprises individuals who experience the classic crisis of conscience because they endorse both norms. These participants cannot resolve the crisis without privileging one norm over the other. An individual's decision to yield may not be predictable (i.e., $p = .5$). The lower right quadrant comprises individuals who care about obedience but not about altruism (here, $p = 1$). These individuals yield without conflict. Participants in the lower left quadrant are complacent, not caring either way. These individuals may decide by tossing a mental coin, thus ending up with the same intermediate probability of yielding that characterizes individuals in conflict (again, $p = .5$). Finally, participants in the upper left quadrant are altruists who are immune to obedience pressures. They resist without conflict (now, $p = 0$). Each of these for probabilities of yielding is conditioned on the level of dispositional obedience (high or low) and the level of dispositional altruism (high or low).

The probabilities presented in the margins are conditioned on the level of only one disposition. The probability of yielding given a high disposition of obedience or given a low level of altruism is .75 ([.5 + 1]/2). Finally, as the four combinations of dispositions are assumed to be equiprobable, the unconditional probability of yielding for each is computed as the product of the dually conditional probability and the two base rates. These unconditional probabilities are presented in brackets. In this example, the situation effect is undefined because there is no comparison between situations. In contrast, the two independent and additive disposition effects account for some of the behavioral variance. The traits of obedience and altruism predict yielding, respectively, with $\Phi = .5$ and $-.5$.

To introduce a situation effect, a second scenario needs to be considered. Consider an experimental situation, in which the traits of obedience and altruism are activated independently and, respectively, in 70% and 30% of the respondents (Fig. 1, bottom). This arrangement gratifies the situationist because the overall probability of yielding is now .2 higher than in it was in the first scenario. Yet, the pattern does not defeat the dispositionist. The traits of obedience and altruism now predict yielding and resisting, respectively, with $\Phi = .7$. The simultaneous emergence of a situation effect and an increased disposition effect may seem paradoxical

[3] An ecological study yields distinctions between "strong" people who act very much the same across situations, and "weak" people who respond to varying situational demands.

[4] Fleeson's (2007, p. 829) proposal that "[Strong] situations are predictors of variability in personality states" is consistent with the present analysis.



The letters Y, O, ~O, A, and ~A, respectively refer to the behavior of yielding and to high and low scores on the traits of obedience and altruism. In the margins, the probability of Y is conditioned on one trait; in each quadrant, the probability of Y (above the brackets) is conditioned on both traits (e.g., p(Y|O ∩ A). The probability in brackets is the product of this conditional probability and the base rates of the traits.

Fig. 1. Behavior as a result of two dispositions.

if one expects the two to be negatively related. Yet, such a pattern not only corroborates the conceptual separation of situation and person effects, but it is also empirically plausible.

5. Contemporary situationism: l'insoutenable automaticité de l'être

Despite repeated challenges, situationism thrives in contemporary social psychology. Indeed, the influential automaticity paradigm takes situationism to its logical conclusion. Work in this paradigm seeks to demonstrate that behavior can be elicited without the involvement of higher mental processes on the part of the respondent. Automaticity effects are pure when people are unaware of the operative external stimuli, unaware of their own processing of these stimuli, and unaware of the changes in their own responses. The automaticity paradigm has its roots in the doctrine of suggestion (Kihlstrom, 2007). From the French *hypnotiseurs* Charcot, Bernheim, and Janet, to Freud and the psychoanalysts, to early social psychologists such as Lorge and Asch, the art and science of social influence was expressed by an agent's ability to overcome a target's critical faculties to change his or her perception, belief, affect, or behavior.

In the automaticity paradigm, subliminal primes are the vehicles of suggestion. And it works. When primes directly affect behavior, strategic mental processes are rendered irrelevant (as in studies on ideomotor action; Knuf, Aschersleben, & Prinz, 2001), or they are subjugated by the external stimuli (as in studies on "auto-motives", Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001). Bargh (2007, p. 557) reports that "even in the domain of self-regulation research [...] complex goal pursuit can be put into motion by situational features instead of exclusively by consciously made intentions and choices". According to this view, higher-order mental processes cease to make any genuine contribution to behavior if they can be engaged or disabled by external stimuli.

If the object of classic work on social influence was to slay a dispositionist folk psychology, the object of contemporary studies on the social unconscious is to slay a mentalistic folk psychology. The project begins by "assuming a central role of conscious (intentional, effortful, and aware) choice and monitoring processes. Re-

search then has the effect of discovering the extent and role of *nonconscious* components of the process or phenomenon" (Bargh, 2007, p. 556, emphasis in the original). By assuming compensatory causes of behavior, any positive evidence for the strength of one entails a reduction of the other. The success of such eliminative situationism is measured by the speed with which the black box is being emptied.

Proponents of the automaticity project have become increasingly assertive about their debt to behaviorism (Bargh & Chartrand, 1999; Bargh & Ferguson, 2000). There is, however, a difference. Behaviorists placed mental constructs outside of the scientific domain, postulating that "science ultimately explains behavior in terms of "causes" or conditions which lie beyond the individual himself" (Skinner, 1955–1956, p. 47). In contrast, automaticity researchers believe that "the social psychological study of nonconscious judgment and behavioral phenomena adds to our understanding of the purpose of conscious processes" (Bargh, 2007, p. 557). Much like the earlier students of social influence needed dispositional causes of behavior as foils for situationism, so do present-day students of automaticity need the hypothesis of conscious behavioral control as an idea to be refuted (Wegner, 2002). Ultimately, the doctrine of automaticity becomes the victim of its own success. It cannot afford to destroy the idea of consciousness because that would render any further demonstration of automaticity pointless. Given this paradox, Bargh's (2007) summation is predictably anticlimactic. "This is not to say that consciousness does not exist or is merely an epiphenomenon (but that) the purpose of consciousness (i.e., why it evolved) probably lies elsewhere (p. 565)." Presumably, consciousness allows people to cope with new situations until their behavior is routinized. Notice how well this logic applies to the classic studies on social influence. The crises of conscience, which Asch, Milgram, and others had so carefully orchestrated, forced many distressed participants into active and effortful mentation. Consciousness was called upon to solve an intellectual, emotional, and moral dilemma. Yet, proponents of the automaticity paradigm deny consciousness even this fire fighter role. In *The Handbook of Social Psychology* (4th ed.), Wegner and Bargh (1998) maintained that conformity and obedience are blind. Consciousness has been made a laughing-stock. "Where oh where, in all of these findings, was the internal, intentional, rational control of one's own behavior?" (Bargh, 2007, p. 556).

The self-satisfied glow of success of *l'automaticité est vraiement insoutenable*. Tests of automaticity are pronounced successful if a prime, or some other subtle manipulation, has a statistically significant effect on behavior (Krueger, 2001). From the rejection of the null hypothesis it is then inferred that conscious processes did little to counteract the automatic effect. This inference is illogical. Even if the hydraulic principle were granted, one would have to estimate how large the automatic effect would have been in the absence of counteracting effects before one could estimate how small the effect of consciousness was.

Bargh (2007) entertains the idea of unfettered situationism in his review of Lhermitte's (1986) neuro-psychological findings. Working at the Salpêtrière like Charcot before him, Lhermitte (1986) studied patients with ablated frontal lobes. Exposing them to various suggestive social settings, he found that these patients spontaneously behaved in ways that were consistent with the situations' affordances. When presented with a revolver, they would load and point it; when taken out to a garden, they would water the plants; when ushered into a bedroom, they would put on pajamas and go to sleep. Lhermitte coined the term "environmental dependency syndrome" to characterize this finding, saying that the patients' "decision for their actions was not one they made themselves" (Lhermitte, 1986, p. 342).

The environmental dependency syndrome is situationism writ large. With the math of subtraction, Bargh (2007, p. 564) concludes that "the behavior of these patients became continually driven by cues of the environment and by little else". Yet, two critical features of Lhermitte's findings suggest a different interpreation. First, the environmental dependency syndrome sets a ceiling for situation effects. The situation effects among normal participants are much smaller, and the question is what psychological mechanisms limit their size. Situation effects may be statistically significant, but how large are they compared with the ceiling of pure, unfettered situationism? In other words, Bargh performed the wrong kind of subtraction.

Second, and this point was not lost on Lhermitte, even the massive effects of environmental dependency did not nullify dispositional causes. As the componential model suggests, situation and person effects can co-occur. In some situations patients with different personal backgrounds responded to different affordances of the same situation. A patient with a privileged social background acted like a guest at a buffet, whereas another patient with a more humble background acted like a server. The former acted like a physician in the doctor's office, whereas the latter acted like a nurse. Lhermitte (1986, p. 342) concluded that "the patients' personality formed an integral part of their EDS (environmental dependency syndrome) and gave it an individual aspect". Social situations rarely make a single unambiguous demand on the person, but the person extracts or constructs meaning depending on his or her prior history. This is as true in social perception as it is in nonsocial perception (Helmholtz, 1867; Kersten, Mamassian, & Yuille, 2004; Rock, 1983), Lhermitte (1986, p. 335) understood that "the shifting balance between dependence and independence with relation to the environment is one of the basic components of personal autonomy" (p. 335).

6. Self-regulation and strategic behavior

In the hands of the situationists, the person becomes an incredible vanishing act (Krueger, 2007; Krueger & DiDonato, 2005). According to the componential model, this need not be so, but being a statistical device, the model does not supply a substantive defense of person and interactional effects. Suitable defenses can be found in psychological theory. Since the time of "It-is-not-the-situation-but-what-you-make-of-it" Epictetus, self-regulation theorists have maintained that individuals creatively contribute to their own behavior. Carver and Scheier (1998) suggest that self-regulation arises from a cybernetic interplay among an individuals' goals, the monitoring of goal-reality discrepancies, and corrective processes. Bandura (1997) regards situational and personal causes as embedded in a framework of reciprocal determinism. Higgins emphasizes regulatory fit of an individual's promotion versus prevention focus with situational affordances (Higgins & Spiegel, 2004). The interactionism espoused by these models is dynamic rather than mechanistic (Endler & Parker, 1992), and thus goes beyond how interactions are modeled by the componential model and the non-interactionist theories the componential model seeks to replace.

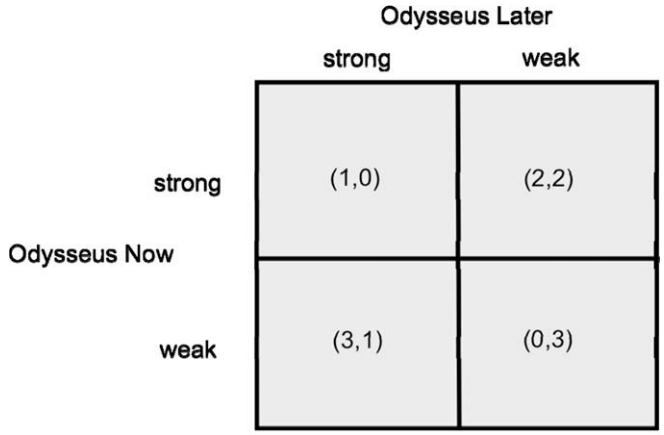
Strategic behavior is a compelling kind of self-regulation as it also involves the regulation of others (von Neumann & Morgenstern, 1944). Consider two examples of how strategic behavior can create situation-by-person interactions. The first example involves the deliberate generation of unpredictability. Nozick (2001) pointed out that it is often not in a person's best interest to be perfectly predictable (see also Dunbar, 2003). A perfectly predictable person is vulnerable to exploitation and unable to take advantage of others. A player with a low threshold for cooperation in prisoner's dilemma risks being suckered; a poker player who never bluffs, or who bluffs all the time, courts financial ruin. At minimum, a perfectly predictable person is boring. The optimum lies somewhere between perfect predictability and perfect unpre-

dictability, and no one will be bored trying to find where exactly that optimum lies. Self-regulation affords self-improvement, and Nozick (2001, p. 296) had an interactionist recommendation. "What a person might most want or benefit from is to be reliably predictable in situations in which his best action is to cooperate to mutual benefit, and to be largely unpredictable in situations of conflict of interest."

At its most sophisticated, strategic reasoning creates constraints and control. The oldest example is also the best. Odysseus instructed his shipmates to tie him to the mast so that he could hear the sirens' song and live. He knew that he would not be able to resist their call, and he knew that his mates would obey him if they heard him demanding to be untied. That is why he had them plug their ears—and to keep them from jumping overboard themselves. His foreknowledge of the power of the situation was perhaps determined by his wisdom, experience, or his genetic constitution. Yet, it was phenomenally strategic and rational (Elster, 2000; Schelling, 1978, 1984). From a game-theoretic perspective, Odysseus was divided against himself. Knowing that when hearing the sirens's song he would prefer to yield, choosing to be strong in the present ensured that both, his present and his future self, obtained their second-best outcome (see the combined preference matrix in Fig. 2). Being strong now was the best self-regulatory move given knowledge of his future weakness (Brams, 1994).

The emergence of conscious self-regulation was a major event in the evolution of mind. Jaynes (1976) provocatively suggested that there was a qualitative shift from the *bicameral* minds of the Illiad and the early books of the Hebrew Bible to the self-conscious and self-regulatory minds of the Odyssey and the later books of the Bible. Strict situationism and the automaticity paradigm suggest that this shift was, and indeed any kind of self-conscious strategic reasoning is, illusory.

As theories of self-regulation emphasize human agency, they touch on the issue of free will. Proponents of the automaticity paradigm claim that determinism is the only defensible scientific attitude, and that only their version of situationism is compatible with it. In contrast, I believe that there is enough evidence for the view that self-regulation can occur in a deterministic frame. The behavior of living things and other complex systems is often not fully predictable even when all external stimuli are known (Gleick, 1987). Self-organization may be chaotic and nonlinear rather than causal and linear (Prigogine, 1997); yet, it can be fully deterministic. Endorsement of determinism does not entail endorsement of situationism or even causality (Krueger, 2003; Krueger & Acevedo, 2005; Russell, 1913).



For Present Odysseus (rows) and Future Odysseus (columns), preferences are ranked from 3 to 0 in descending order (left numbers in parentheses). Present Odysseus believes that Future Odysseus prefers being weak over being strong, and also prefers Present Odysseus to be weak rather than strong (right numbers in parentheses). Present Odysseus's critical assumption is that if the behaviors of Present and Future Odysseus were to differ, Future Odysseus would prefer to be the weak one. As Present Odysseus needs to move first, his own preferences depend on his predictions. Naturally, he would rather be weak, but only if Future Odysseus were strong; he would most fear being weak if Future Odysseus were also weak. His intermediate preferences are being strong. As his present strength in the face of his future weakness saves his live, whereas it would be a waste when paired with future strength, he prefers the former.

Fig. 2. Odysseus as strategic self-regulator.

7. Misplaced causal schemas

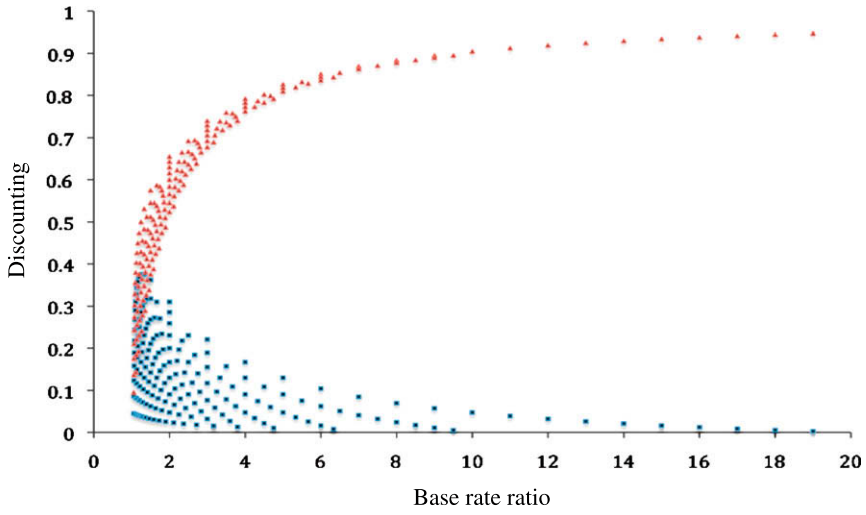
It is now time to return to the question of why many psychologists cling to the idea that situation and person effects compete for a fixed pool of behavioral variance. Perhaps they construe their work as part of a competition between social and personality psychology. I entertain a different view, one found in a prominent research area of social psychology itself, namely, the study of everyday causal reasoning. Heider (1958) and others (Jones & Davis, 1965; Kelley, 1967) observed that folk psychology is not concerned with the design of experiments and the prediction of behavior, but with the explanation of individual acts once they have occurred. These theorists identified the separation of person effects from situation effects as folk psychology's principal inference task (but see Malle, Knobe, & Nelson, 2007, for a revisionist account). Kelley (1972a) introduced the *discounting principle* as the cleaver that achieves this separation. According to the discounting principle a potential cause becomes less probable once another potential cause is introduced. The principle applies when causes are assumed to be multiply sufficient or, and this is true by definition, when they are assumed to be compensatory (Kelley, 1972b). The outcome of discounting can only be as valid as the schema to which it is applied (McClure, 1998).

Much as the quantitative constraints of the componential model can be examined in the context of prediction, so can the constraints on discounting be examined in the context of causal inference. Morris and Larrick (1995) showed that discounting is strong inasmuch as a cause's base rate is low relative to the base rate of an alternative cause, inasmuch as its power $\left(\frac{p(B|S)}{p(B|P)}\right)$ is low, or inasmuch as it is negatively correlated with an alternative cause. The assumption of prepotent situation effects and discountable person effects may therefore be correct inasmuch as these conditions are met.

To illustrate the effects of the base rate ratio, $\frac{p(S)}{p(P)}$, and the association between causes consider three scenarios. In the first scenario, S and P are independent, $p(S)$ ranges from .05 to .95, $p(P)$ ranges from .05 to $p(S)$ −.05, and thus $\frac{p(S)}{p(P)}$ ranges from 1.05 to 19. Both causes are singly sufficient (i.e., $p(B|S) = p(B|P) = 1$). Discounting is $1 - p(S|B)$ and $1 - p(P|B)$, respectively, for situation and person effects. Fig. 3 (top) shows the logarithmic increase in discounting P as the base rate ratio becomes more skewed against P. At the same time, the cause with the higher base rate, S, is discounted less. The center rows in the bottom panel show the average discounting effect and its predictability from the base rate ratio. The second scenario (top rows in bottom panel) assumes the most positive correlation between S and P for each base rate ratio, and the third scenario (bottom rows in panel) assumes the most negative correlation.[5] Discounting increases as the correlation between causes decreases, and the base rate ratio predicts discounting best when the causes are independent.

The most notable implication of this analysis is that the impact of causal non-independence is much smaller than the impact of the

[5] Data for the second scenario were constructed by setting $p(P \cap \sim S)$ to .001, and data for the third scenario were constructed by setting $p(\sim P \cap \sim S)$ to .001 if $p(P) \geqslant p(\sim S)$ and by otherwise setting $p(P \cap S)$ to .001. With one degree of freedom, the other three conjoint probabilities were constrained by the base rates.



Φ	M(1-p(S|B))	M(1-p(P|B))
> 0	.002	.5
0	.13	.58
< 0	.22	.63

Φ	$R^2\left(\frac{S}{P}, 1-p(S\mid B)\right)$	$R^2\left(\frac{S}{P}, 1-p(P\mid B)\right)$
> 0	.01	.89
0	.34	.85
< 0	.27	.77

Fig. 3. Discounting of independent causes (scatterplot) and discounting of positively correlated, independent, and negatively correlated causes (tables).

base rate ratio[6] Whenever researchers express high confidence in the idea that evidence for one cause permits radical discounting of the other, the base rates of these causes would already have to be highly asymmetric. If this is so, then empirical evidence for the presence of the alternative cause is not much of a discovery. It appears that research conducted from the situationist perspective has not emancipated itself from the very folk psychological ideas it seeks to refute. Ordinary perceivers are charged with "missing causal schemas" (Nisbett & Ross, 1980, p. 130), while researchers themselves do not know how to justify their own choices among available schemas. As a consequence, many researchers underestimate the rational grounds of their participants' responses and they overestimate what they have learned about the true causes of behavior (Krueger & Funder, 2004).

[6] The compensatory schema is a special case of the multiple-sufficient-causes schema, and the latter radically constrains the former. The compensatory schema assumes that the correlation between causes is −1 (or something close to it), but this $\Phi = -1$ depends on the base rates of S and B being the same. When base rates differ, ceilings for positive Φ range from -.09 to .9 and the floors for negative Φ range from .09 to −.9 (using base rate probabilities with two decimal points and making the smallest cell .001).

8. Conclusions

Cronbach (1957, p. 674) famously deplored the separation of and the antagonism between experimental and correlational psychology. "The correlational psychologist," he wrote, "is in love with just those variables the experimenter left home to forget [...]. Just as individual variation is a source of embarrassment to the experimenter, so treatment variation attenuates the results of the correlator". Reinforcing Cronbach's view, the present analysis suggests that strict situationism, like strict dispositionism, is an indefensible scientific stance. The idea that situation and person effects are compensatory, and that the strength of one effect can be estimated by subtracting the strength of the other is a heuristic that requires more justification than it typically receives. Investigators who are interested in situation effects should exercise caution before claiming that the situation overwhelms the person.

The answer to some of these problems lies again with Cronbach. The componential model, which I derived from his 1955 article on unpacking (dis)similarity scores, is one way of separating the scientific project of finding the causes of behavior from folk psychological contamination. The componential model calls for the study of multiple people who are observed in multiple situations.

The model reinforces what should be intuitively obvious. A particular situation accounts for behavior inasmuch as the rate of behavior is different in this situation than it is in others. A particular personality accounts for behavior inasmuch as the person's rate of behavior is different from the rate of others. Situations and persons interact in the generation of behavior in as much as the magnitude of the personal differences in one situation differs from those in others. The componential model seeks to overcome partisan situationism, dispositionism, and interactionism by showing that all three effects must be considered simultaneously.

A research agenda derived from the componential model faces significant challenges. Studying multiple people in multiple situations states, but does not solve, the two critical sampling issues. Sampling respondents is usually driven by convenience (i.e., easy access to college students). Hence, the reference population is ill defined. *A fortiori*, sampling of situations is complicated by a lack of a generally accepted taxonomy of situations. Yet, some progress is made when researchers settle on a fixed set of situations and conduct multiple studies with a known population of participants. Within such an admittedly non-exhaustive context, the interplay of the three component causes of behavior can then be studied (Fleeson, 2007; Letzring, Wells, & Funder, 2006; Wright, Lindgren, & Zakriski, 2001).

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