Inferences about Effort and Ability

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Perceivers received information about a target person's level of athletic performance (e.g., kicking a soccer ball) and the situational forces surrounding that performance. Perceivers' inferences about the effort and ability of the target depended on whether the situational forces involved psychological forces (a bribe offered for low performance) or physical forces (a wind that hindered performance). Replicating past research, psychological forces had a stronger impact on inferred ability given the presence of low performance, as opposed to high performance. Additional analyses indicated that this pattern was mediated by inferences about the effort of the target. In contrast, physical forces appeared to have a direct impact on inferences of ability and affected inferences based on both low and high performance. The results suggest that perceivers make inferences about multiple attributes within a target person and, in the process, attempt to reconcile those inferences.

> "Consider the example of a person rowing a boat across a lake. . . . The action . . . may . . . be dependent upon a combination of effective personal force (e.g., effort and ability) and effective environmental force (e.g., the strength of the wind)."
>
> —Fritz Heider, *The Psychology of Interpersonal Relations* (1958)

Heider's (1958) rowboat example hints at two important aspects of his attribution analysis. The first aspect concerns the manner in which dispositional inferences are adjusted for external causal forces; for example, perceivers' inferences about the rower's ability should depend on their assumptions about the wind. Given a wind favorable to the rower, inferences about the rower's level of ability should be discounted (or reduced). This trade-off between external causes and dispositional inference became a bedrock assumption of most theories of dispositional inference (Gilbert, 1998). But there is a second aspect of Heider's analysis that is less recognized by theories of dispositional inference. This part of the analysis concerns Heider's division of the effective personal force into components of effort and ability. Heider (1958) implied that perceivers view effort and ability as negatively related. In the words of George Carlin, "Hard work is for people short on talent." For instance, imagine a student who earned high marks by studying 80 hours a week. The student should be attributed less ability than someone who earned the same marks with less effort (Anderson & Butzin, 1974). In short, Heider suggested that inferences about ability tend to be adjusted for both external factors such as the wind and for internal factors such as effort (Weiner, 1986).

Past research indicates that inferences of ability are indeed adjusted when perceivers are told about effort directly (Anderson & Butzin 1974). But in everyday life, information about effort often is less salient and perceivers must infer it for themselves. The research in this article extends Heider's (1958) theorizing by considering how effort is inferred from performance cues and from information about the situational forces surrounding the performance. In addition, the research investigates how inferences of effort are integrated with inferences of ability. For example, imagine that perceivers are asked to form an impression of a soccer player who made a weak kick at a point in the game when a stronger kick was required. Imagine also, however, that

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perceivers are aware that the player earlier had been offered a bribe to "throw the game." Perceivers may suspect that the bribe prompted the player to withhold effort. If perceivers subsequently judge the player's level of ability, this inference about effort may be relevant: To the extent that low effort is inferred, greater ability may be inferred.

Similar to Heider's rowboat example, the example of the bribe illustrates how inferences about ability may be adjusted for situational forces. But there is a fundamental difference between the situational forces represented in these two examples. In Jones's (1990) terms, the wind in the rowboat example represents a physical constraint, whereas the bribe represents a psychological constraint. Physical constraints may be perceived as having a relatively direct and certain impact on behavior. Situational forces that manipulate task difficulty are of this type. As Gilbert (1998) noted, "Gale-force winds from center field do not allow batters to hit home runs" (p. 133). The impact of the wind on the batter's performance is direct in the sense that it is not mediated by an internal attribute within the target person (such as effort). In contrast to physical constraints, psychological constraints may be perceived as having an indirect impact on performance. Thus, the target person who was offered a bribe was not physically coerced by the situation. Rather, the bribe motivated the target to behave in a particular fashion (Jones, 1990, p. 122). In other words, the bribe prompted the target to withhold effort, which resulted in a poor level of performance.

Study 1 of this article examined inferences of effort and ability in scenarios where situational forces took the form of psychological constraints. Perceivers received information about a target person's level of performance and about the situational forces (social rewards) surrounding that performance. In line with the classic discounting principle, we expected that perceivers' inferences about ability would be adjusted to take account of situational forces (Kelley, 1973; Krull & Erickson, 1995; McClure, 1998; Morris & Larrick, 1995; Trope, 1998). In contrast to previous theory, however, our analysis suggested that the impact of situational forces would be mediated by an inference about effort. In essence, the analysis led us to predict that perceivers would draw inferences about two different internal characteristics—effort and ability—and that perceivers would attempt to reconcile the two inferences.

This analysis implies different predictions, depending on the level of performance observed and whether situational forces encouraged low performance or high performance. Consider what happens when perceivers witness a low level of performance. If situational forces encouraged high performance (as typically occurs in everyday life), perceivers may infer that the target exerted high effort but possesses low ability. On the other hand, if situational forces encouraged low performance (e.g., a bribe was offered), perceivers may infer that the target invested less effort and infer that the target possesses relatively greater ability. Given low performance, then, inferences about both effort and ability should be strongly influenced by situational forces. Moreover, in each of these situations, inferences about effort and ability should be "subtracted" from one another, producing a negative relationship between these variables.

Perceivers may begin with a different set of assumptions when they observe high performance. High performance is perceived as more informative about a person's level of ability (McClure, 1998; Reeder & Brewer, 1979; Skowronski & Carlston, 1989; Trafimow, 1997; Trafimow & Schneider, 1994). In a set of studies by Reeder and Fulks (1980), perceivers read about a target who performed at a high level in the presence of situational forces involving psychological constraints. Perceivers tended to infer high ability on the target's part, regardless of the situational forces. But what do perceivers infer about effort in this case? Heider (1958) implied that both effort and ability are necessary for high performance. In other words, high performance requires at least moderate levels of each attribute. This analysis implies two things about inferences based on high performance. First, inferences of both effort and ability should be relatively unaffected by situational forces; that is, following high performance, inferences of both effort and ability should remain relatively high across different situational forces. Second, the tendency for effort and ability to be negatively related should be attenuated.

In sum, Study 1 investigated inferences of effort and ability following low and high performance. Situational forces were operationalized in the form of psychological constraints that encouraged either low performance or high performance. In one scenario, for instance, the target person was offered a financial reward for performing at either a low or high level. We assumed that both the target's level of performance and the nature of the reward would each be important, but we predicted that these effects would operate differently at low and high performance. At low performance, we expected situational forces to have a relatively strong effect on inferences of effort and ability. Moreover, we expected that the relationship between effort and ability would be negative (higher inferences of effort should be associated with lower inferences of ability). At high performance, however, we predicted that inferences of effort and ability would remain relatively high across situational forces. In addition, we expected that the negative association between these variables would be attenuated. Finally, the

research investigated the role of effort as a mediator of inferences of ability.

STUDY 1

Method

PARTICIPANTS AND OVERVIEW

Participants were 93 male and female undergraduates from a midsize Midwestern university who received extra credit toward an undergraduate psychology course for taking part in the experiment. Participants watched a short videotape in which a target person was shown kicking a soccer ball either a relatively short distance or a relatively long distance. The kick was embedded within either a legal scenario or a fraternity scenario. Within each scenario, situational forces surrounding the behavior either facilitated high performance (e.g., a $200 reward for doing well) or inhibited high performance (a $200 reward for doing poorly). Participants then rated the target person along a variety of scales related to the target's ability to kick a soccer ball and the target's level of effort.

MATERIALS AND PROCEDURE

Each experimental session contained 3 to 10 participants. On arrival, participants were informed that they would be participating in a social perception exercise in which they would be asked to judge the level of ability possessed by a person who would be the focus of the study. The experimenter then randomly distributed the alternative versions of the stimulus booklets.

After instructing participants to turn past a blank cover page, the experimenter requested that participants study the second page in the booklet, which contained information on kicking norms. This information was included because pilot testing had revealed that many participants were unfamiliar with soccer. Lacking standards for judging the ability to kick a soccer ball, some participants expressed discomfort about judging the target person's level of ability in this domain. The kicking norms were designed to provide participants with a basis for making judgments. Participants read that a group of male college students at a local gym class had been asked to kick a soccer ball as far as they could. A table was included that displayed a series of kicking distances (in 10-yard intervals), each accompanied by a percentile score.

Participants were then shown one of two short videotapes (each approximately 10 sec). The target person was shown alone on each tape, preparing to kick the ball, and then kicking it. The tape then followed the trajectory of the ball. In the low performance condition, a short kick was depicted with an accompanying narration stating that the ball traveled 10 or 15 yards after he kicked it. In the high performance condition, a longer kick was depicted with an accompanying narration stating that the ball traveled 45 to 50 yards. The kicking norms that had been provided indicted that these two performances fell near the 25th percentile and 75th percentile, respectively, of the comparison group who had performed the same task. Our aim was to keep the performances within this moderate range so as to avoid potential scaling artifacts such as ceiling effects or floor effects. Because the tapes were of short duration, we were concerned that participants might not comprehend what had occurred on the tape. To guard against this possibility, the tape was shown twice. Immediately after watching the videotape, participants responded to a manipulation check regarding the distance of the kick shown on the videotape.

Participants were then instructed to read the next page of their stimulus booklet, which described the situational forces surrounding the videotaped soccer kick. To increase the generality of the findings, the situational forces were embedded within two different scenarios.[1]

The legal scenario described a lawyer named Brian who was approached by a coworker named Baker. Baker invited Brian to come out to the soccer field and "kick the ball around." Baker challenged Brian, "I've never seen you kick a soccer ball. I bet I could kick farther than you can." Brian accepted the bet. Participants read that word of the bet spread around the law firm and that Brian was approached by a second coworker who offered Brian a deal. In one case, this deal involved a reward for high performance (performance facilitating condition):

> Everybody in the firm is betting on this thing. I'm betting on you. I hate that SOB Baker. Tell you what, I'll give you $200 if you beat that guy. I want to see him go down.

In a second case, the deal called for low performance (performance inhibiting condition):

> Everybody in the firm is betting on this thing. I'm betting on Baker. I could clean up if you lose. Tell you what, I'll give you $200 if you lay down on this one. Just kick it short and I'll give you a cool $200.

The fraternity scenario described a student, Brian, who was asked to come to a soccer field. In the performance facilitating condition, Brian was described as eager to join a fraternity, but to do so, he needed to prove that he could contribute to the fraternity soccer team. He was told that the team needed a defensive player with a strong kick. The other players on the team were said to have watched him as he kicked the ball. In the performance inhibiting condition, Brian was described as a fra-

ternity member who was on academic probation because of low grades. His main goals for the semester were to do well in his classes and hold down a part-time job. The fraternity members, however, were said to be organizing a soccer team and putting pressure on him to try out for the team. Brian was described as worrying about not having enough time to play soccer. Once again, the other players were said to have watched him as he kicked the ball.

Inferences about ability and effort. After reading about the situational forces surrounding the target's kick, participants responded to the main dependent measures. Inferences of ability were measured by two 10-point scales, one of which asked for a rating of Brian's overall ability to kick a soccer ball a long distance, with endpoints labeled *extremely low ability* and *extremely high ability*. Another scale asked participants if they would describe Brian as someone who can kick only a short distance or as someone who can kick a long distance, with endpoints labeled *can only kick short* and *can kick very long*. Participants also rated how easy it was to determine Brian's level of ability on a scale with endpoints labeled *very easy* and *very difficult*. On a separate page, two additional scales assessed inferences of effort. The first scale asked how motivated Brian was to kick as far as he can, with endpoints *not motivated at all* and *very motivated*. The second scale asked how much effort Brian put into his kick, with endpoints *no effort* and *great effort*.[2]

Open-ended measure and causal attributions. An open-ended measure requested that participants write a paragraph describing why they thought that Brain kicked the ball as he did. On the same page, but below the open-ended measure, causal attribution to the situation was assessed by asking, "To what extent was the distance of Brian's kick due to the situation you read about (what other people said to him)?" Participants responded on a scale with endpoints *not at all due to the situation* and *very much due to the situation*. Causal attribution to ability was assessed by asking, "To what extent was Brian's kick due to his actual level of ability to kick a long distance?" Participants responded on a scale with endpoints *not at all* and *very much*.

The questions concerning inferred ability, inferred effort, and the open-ended measure (including causal attributions) appeared in one of three different random orders. In this scheme, approximately two thirds of the participants responded to the open-ended measure prior to responding to rating scales that assessed inferences of effort.

Results

Preliminary analyses revealed no significant effects involving the order of the dependent measures. Consequently, order was excluded from the main analyses. A 2 (performance: low vs. high) × 2 (situation: performance inhibiting vs. performance facilitating) × 2 (scenario: fraternity vs. legal) analysis of variance subsequently was performed on perceptions of kicking distance (a manipulation check) and on perceptions of the target person's ability and effort. Supporting the manipulation of performance level, ratings of kicking distance were greater following high performance (M = 45 yards) than low performance (M = 16 yards), $F(1, 85) = 645.75$, $p < .01$.

INFERENCES ABOUT ABILITY AND EFFORT

The two measures of inferred ability were averaged. The index of inferred ability revealed strong main effects of both performance and the situation, Fs(1, 85) = 13.55 and 16.48, ps < .01, respectively. As shown in Figure 1, ratings of ability were greater within the high performance condition than the low performance condition. Ratings were also greater when the situation called for low performance (performance inhibiting situation) than when the situation called for high performance (performance facilitating situation). In line with past research (Reeder, 1997), the interaction of performance and situation was also significant, $F(1, 85) = 6.90$, $p < .01$. When the target performed poorly, ratings were greater when the situation called for low performance (M = 6.90) than high performance (M = 4.79). But when the target performed well, ratings were relatively high across the two situations (Ms = 7.26 vs. 6.80).

Ratings on the two indices of inferred effort were averaged. Ratings were greater when the target performed at a high level (M = 7.79) than a low level (M = 5.01), $F(1, 85) = 49.33$, $p < .01$, and they were greater when the situation called for high performance (M = 8.04) rather than low performance (M = 4.70), $F(1, 85) = 70.51$, $p < .01$. The predicted interaction of performance and situation also was obtained, $F(1, 85) = 6.38$, $p = .01$. As shown in Figure 2, ratings of effort within the low performance condition were more strongly affected by the situation (Ms = 2.83 vs. 7.19) than ratings within the high performance condition (Ms = 6.65 vs. 8.98).

OPEN-ENDED MEASURE

Although perceptions of effort followed the predicted pattern, it is of interest to ask if perceivers spontaneously considered effort when forming their impression of the target person. Our multiple inference approach implies that in addition to paying attention to the situation, perceivers should spontaneously mention effort and other internal characteristics of the target person. To avoid "cuing" perceivers about our interest in effort, the data reported in this section were computed only for participants who received the open-ended measure prior to receiving structured questions about effort.

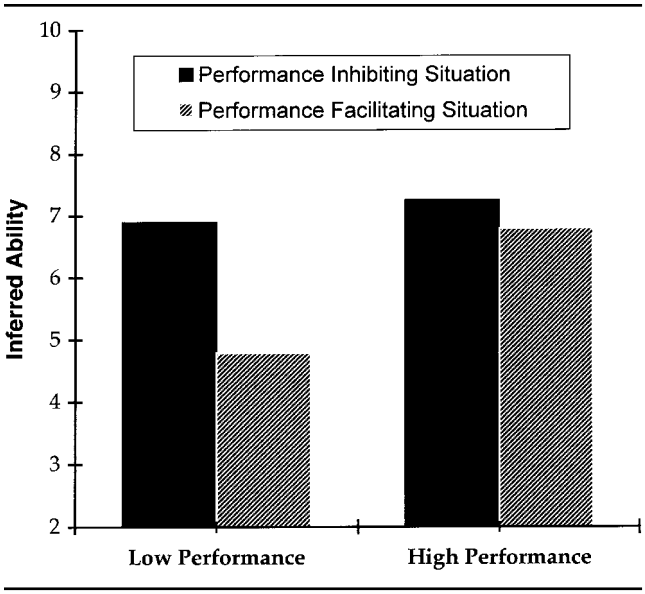

Figure 1 **Inferred ability as a function of level of performance and situational forces: Study 1.**

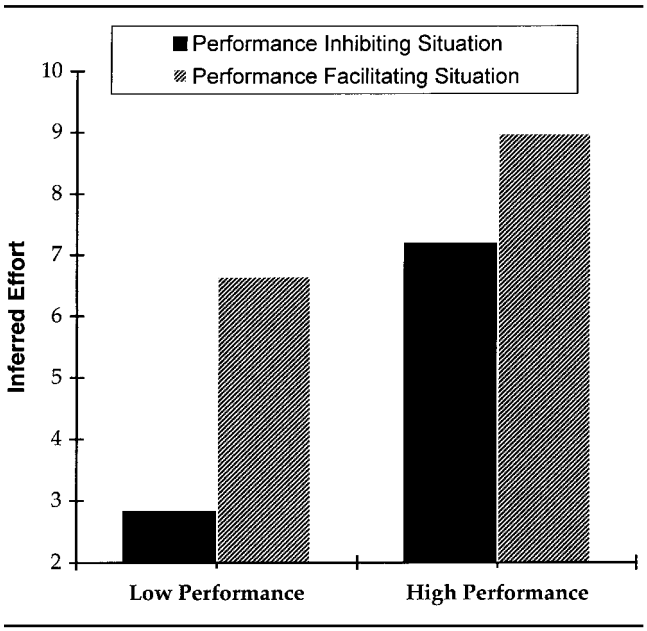

Figure 2 **Inferred effort as a function of level of performance and situational forces: Study 1.**

The open-ended responses were tabulated by a coder who was blind to the experimental hypotheses. The coder used a dichotomous coding scheme for each potential category of response (1 = referred to a factor vs. 0 = did not refer to that factor). Not surprisingly, a majority of the perceivers (72%) made some mention of the (external) situational forces. Effort was the most frequently mentioned characteristic of the target (45%), followed by ability (29%), concerns that the target was nervous or "choked" (20%), and concerns that the target ignored (or did not care about) the situational forces (10%). The latter two causal explanations tended to be focused within specific cells of the design. For example, when the target performed at a low level in response to a reward for high performance, fully 63% of the participants mentioned nervousness or "choking" as a causal factor. In contrast, explanations related to ignoring the situational rewards were most frequent (25%) when high performance occurred in response to rewards for low performance.

MEDIATIONAL ANALYSES

To provide a summary index of inferred effort, we created a linear composite of three different measures. These measures included structured ratings of effort, open-ended references to low effort, and open-ended references to high effort. We first standardized each of these measures. In the linear composite, references to low effort were subtracted from the sum of the other two measures. We proposed that inferences of effort play a mediating role between situational forces and inferences of ability. As described earlier, inferences of ability demonstrated an interaction of performance and situation: Inferences of ability based on low performance were more strongly influenced by the situation than were inferences based on high performance. The question of interest is whether inferences of effort played a role in this interaction. Inferences of ability were subjected to an analysis of variance that included the summary index of inferred effort as a continuous variable.[3] If inferred effort mediates the Performance × Situation interaction, the inclusion of effort within the analysis should reduce the statistical significance of this interaction. Indeed, this interaction was reduced to nonsignificance, $F < 1$. Moreover, the analysis revealed a significant Performance × Effort interaction, $F(1, 76) = 6.29$, $p = .01$. This interaction reflects the fact that, as predicted, inferences of effort were inversely associated with ability inferences in the low performance condition, $r = -.52$, $p < .05$, but not in the high performance condition, $r = -.09$, *ns*.

As a more fine-grained test of effort as a mediator, we performed a set of regression analyses (cf. Baron & Kenny, 1986) at each level of performance. Within the low performance condition, separate regressions revealed that the situational manipulation was predictive of both inferences of ability, $B = -.50$, $t(46) = -3.87$, $p < .01$, and inferences of effort, $B = .66$, $t(46) = 5.97$, $p < .01$, respectively. As shown in Figure 3, however, when the situation and effort were examined simultaneously as predictors of ability, the effect of effort remained significant, $B = -.35$, $t(45) = -2.13$, $p < .04$, whereas the effect of the situation was reduced to nonsignificance, $B = -.26$,

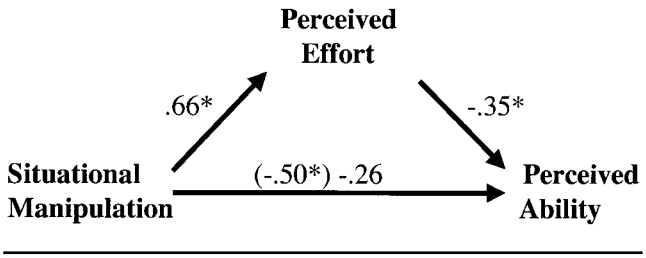

Figure 3 Inferred effort as a mediator of inferred ability.
NOTE: The coefficient in parentheses (–.50*) represents the direct effect of the situation on inferred ability, whereas the adjacent coefficient (–.26) was observed when perceived effort was controlled. Coefficients followed by an asterisk were statistically reliable.

$t(45) = 1.61$, $p < .15$. Following Baron and Kenny's (1986) recommendation, Sobel's test was computed to examine the statistical reliability of the indirect path from the situation (mediated by effort) to inferences of ability. This indirect path attained significance; unstandardized parameter estimate = .97, $SE = .48$, $z = 2.03$, $p < .05$. In sum, within the low performance condition, inferences of effort mediated the significant effect of the situational manipulation on ability inferences.

A similar set of analyses was attempted within the high performance condition. Separate regressions revealed that the situational manipulation was significantly related to the effort index, $B = .44$, $t(42) = 3.22$, $p < .01$, but the situation was not significantly related to the inference of ability, $B = –.20$, $t(43) = –1.37$, $p < .20$. This latter finding reflects the fact that inferences of ability tended to be relatively high across both levels of the situation. Because this nonsignificant relationship violates a basic prerequisite for testing mediation, the mediational analysis was terminated. In sum, we conducted mediational analyses separately at leach level of performance. These analyses suggest that to the extent situational forces predicted inferences of ability, this prediction was mediated by inferred effort.

ADDITIONAL ANALYSES

Difficulty of inferring ability. When perceivers rated the difficulty of inferring the target's level of ability, the only significant effect involved a Performance × Situation interaction, $F(1, 85) = 4.89$, $p < .05$. The interaction indicates that perceivers found it difficult to judge ability when the level of performance was consistent with the situational forces. In the low performance condition, participants tended to report more difficulty when the situation called for low performance ($M = 6.83$) rather than high performance ($M = 5.83$). In the high performance condition, however, participants tended to report more difficulty when the situation called for high performance ($M = 6.00$) rather than low performance ($M = 4.82$). It is worth noting that difficulty ratings were comparable for low and high performance and the effect of the situational manipulation was approximately equal at each level of performance.

Causal attributions to the situation. Not surprisingly, causal attribution to the situation was greater when the level of performance was consistent with the social rewards, as reflected by a Performance × Situation interaction, $F(1, 85)$ 4.91, $p < .05$. For low performance, causal attributions to the situation tended to be greater when the situation called for low performance ($M = 7.50$) rather than high performance ($M = 6.42$). For high performance, however, causal attributions to the situation tended to be greater when the situation called for high performance ($M = 7.59$) rather than low performance ($M = 6.43$). Thus, perceivers apparently recognized the relevance of situational forces within the high performance condition, despite their (previously noted) tendency to make correspondent inferences of ability (cf. Reeder, 1997; Vonk, 1999; Vonk & Van Knippenberg, 1994).

Causal attributions to ability. Causal attribution to ability was greater following high performance ($M = 7.40$) than low performance ($M = 4.96$), $F(1, 85) = 32.51$, $p < .01$. In addition, attribution to ability was greater when the situation called for high performance ($M = 6.89$) rather than low performance ($M = 5.40$), $F(1, 85) = 12.07$, $p < .01$. A marginally significant interaction between performance and situation also was observed, $F(1, 85) = 3.11$, $p = .08$. Causal attributions of ability tended to be more strongly affected by situational rewards in the low performance condition (Ms = 3.83 vs. 6.08) than in the high performance condition (M = 7.04 vs. 7.77). Compared to low performance, then, high performance was viewed as more informative about the target (Trafimow, 1997), and situational forces tended to have less of an impact in the presence of high performance (Reeder, 1997; Trafimow & Schneider, 1994).

Discussion

The findings of Study 1 suggest that when perceivers made inferences of ability, they also drew inferences about effort and attempted to reconcile those inferences into a coherent pattern. In line with past research, inferences of ability for low performance were strongly affected by situational forces, whereas inferences of ability for high performance were less affected by situational forces (Reeder, 1997; Reeder & Brewer, 1979). The present research contributes by investigating the role of inferred effort in this Performance × Situation interaction. First, after exposure to information about social rewards and performance, many perceivers spontaneously referred to effort. Second, inferences of effort followed a complementary pattern to that observed for

inferences of ability and tended to mediate inferences of ability. Also as expected, the relationship between inferred effort and ability took a different form for low and high performance. At low performance, effort and ability were negatively related, but at high performance, this relationship was attenuated. Although we can make no assumptions about the temporal sequence of these two types of inferences, it is apparent that perceivers were seeking a consistent fit between them.

One of the more interesting findings of this study is that inferences of effort were influenced by both the situational forces and the level of performance. Where situational forces are concerned, it may not be surprising that greater effort was inferred when high performance was encouraged by a $200 reward, but it is less obvious how the performance manipulation had its impact. We have assumed that perceivers simply inferred effort from the level of performance that they observed, such that they inferred greater effort following high performance than low performance.

An alternative interpretation of the effort data is that participants in Study 1 perceived effort in a more direct way—from the nonverbal behavior they observed on the videotape. The possibility that effort can be perceived "directly" in behavior has been noted by previous theorists (Fleming, 1994; McArthur & Baron, 1983). It is possible that the videotape of low performance was ambiguous in this regard, containing equivocal cues concerning the amount of effort that the target expended while kicking the ball. In contrast, it is possible that the videotape of high performance conveyed relatively clear nonverbal signals of high exertion (e.g., a look of determination, or quick and precise movement). A difference of this sort could lead to precisely the sort of effort ratings that we observed. Specifically, because nonverbal cues regarding effort may have been more ambiguous for low performance than high performance, inferences of effort based on the former might be more influenced by situational forces.

STUDY 1 REPLICATION

To distinguish between the two possibilities outlined above and to test the generality of our findings, we replicated Study 1 with two changes. First, participants read a written description of the target's level of kicking performance (rather than watched a videotape). Second, information about situational forces was presented before (rather than after) information about performance. If the interaction that we observed for inferences of effort in Study 1 depends on integrating evidence concerning performance and situational forces, we should replicate that interaction. But if the interaction depends on the direct perception of effort, or on the order of stimulus materials, a different pattern of data should be obtained.

The results of this replication study are straightforward. In line with Study 1, inferences of ability demonstrated a Performance × Situation interaction, $F(1, 103) = 9.64$, $p < .01$, such that inferences were strongly affected by situational forces within the low performance condition (Ms = 6.53 vs. 4.31) but not within the high performance condition (Ms = 7.63 vs. 7.26). The main issue is whether inferences of effort displayed the interaction observed in Study 1. Indeed, the Performance × Situation interaction was significant, $F(1, 103) = 12.90$, $p < .01$. As in the earlier study, inferences of effort were more strongly affected by situational forces in the low performance condition (Ms = 3.22 vs. 7.93) than in the high performance condition (Ms = 6.80 vs. 9.24).

This replication does not imply that perceivers are incapable of directly perceiving action cues such as effort, nor does it imply that perceivers are incapable of incorporating action cues into their impressions (Fleming, 1994; McArthur & Baron, 1983), but it does imply that perceivers are able to make systematic inferences about effort merely from abstract information about performance and the situational forces surrounding that performance.

STUDY 2

In Study 1, situational forces took the form of psychological constraints (Jones, 1990). The effect of these situational forces on inferred ability was mediated by inferred effort. But there may be circumstances in which the effect of situational forces on inferred ability is more direct. Physical constraints (Jones, 1990) may operate in this fashion. Recall Gilbert's (1998) example of batters who face gale-force winds from center field. The impact of the wind appears to be both direct and inescapable. If so, the wind's effect is likely to be equivalent for weak batters and strong batters. That is, the wind should be perceived as constraining the hitting performance of both those who hit short *and* those who hit long. This observation has important implications for the use of the discounting principle (Kelley, 1973). It implies that when physical constraints are present, perceivers should employ the discounting principle equally for low and high performance. At each level of performance, then, perceivers should attribute greater ability if the batter faced the wind (rather than batted with the wind at his back). Study 2 tested this prediction.

In addition to examining inferences of ability in the presence of physical constraints, Study 2 also examined inferences of effort. Following the example above, how should information about hitting distance and the direction of the wind combine to affect inferences of effort? The above analysis suggests that the wind has a direct

affect on performance, without increasing or decreasing the hitter's effort. If so, a simple inference process may be at work: Perceivers should infer that, for any given level of performance, greater effort was required if the batter faced the wind. Finally, this analysis does not imply a negative relationship between effort and ability. Rather, both inferences should increase (or decrease) together as a function of the wind.

Method

The study included 128 male and female college students who participated in the study as a means of obtaining extra credit in an undergraduate psychology course. Participants received information on performance norms and then read about a target person who was part of a college gym class. Two different scenarios were employed to explore the generality of the findings. In the soccer scenario, participants read that members of a gym class were instructed to kick a soccer ball as far as they could. Then, the wind conditions were described. The performance facilitating situation described "a steady wind, about 30 miles per hour, blowing at his back." The performance inhibiting situation described "a steady wind, about 30 miles per hour, blowing right in his face." In the swimming scenario, participants read that a gym class was instructed to swim 100 yards as fast as possible. A target person named Kate was described as either swimming with "the current pushing at her back" (performance facilitating situation) or with "the current pushing at her chest" (performance inhibiting situation). Participants then read about the target's level of kicking performance (kicked 10 to 15 yards vs. 45 to 50 yards) or swimming performance (swam in 1 min, 52 sec vs. 1 min 18 sec). According to the provided norms, these performances represented moderately low levels of performance (26th percentile) or moderately high levels of performance (74th percentile), respectively. Participants then responded to the dependent measures.

Results and Discussion

MANIPULATION CHECK ON THE SITUATIONAL FORCE

The manipulation of the situation (pertaining to direction of the wind or current) was highly successful. Participants were asked to indicate whether the situation *helped* (1) or *hurt* (10) performance. These ratings were subjected to a 2 (performance: low vs. high)× 2 (situation: performance inhibiting vs. performance facilitating) × 2 (scenario: kicking vs. swimming) × 2 (order of dependent measures) analysis of variance. A strong main effect of the situation was observed, $F(1, 112) = 125.45$, $p < .01$, such that perceivers thought the performance inhibiting situation (wind or current) hurt performance ($M = 8.61$) to a greater extent than the performance facilitating situation ($M = 4.19$). Not surprisingly, this analysis also revealed a significant effect of performance, $F(1, 112) = 10.28$, $p < .01$, such that situations were thought to have hurt performance more given low than high performance. No other significant effects were obtained.

INFERENCES ABOUT ABILITY AND EFFORT

Inferences of ability revealed significant effects of performance, $F(1, 111) = 27.97$, $p < .01$, and the situation, $F(1, 111) = 11.68$, $p < .01$, but no interaction, $F < 1$. The main finding concerns the significant effect of the situational manipulation. As displayed in Figure 4, perceivers attributed higher ability to the target when the wind (or current) appeared to inhibit performance rather than facilitate performance. As expected, and consistent with the nonsignificant interaction, the effect of the situation was significant at both low performance ($M = 6.24$ vs. 5.33), $F(1, 111) = 4.73$, $p < .05$, and high performance ($M = 7.91$ vs. 6.78), $F(1, 111) = 7.28$, $p < .05$.[4] Note that although the effect of the wind was statistically significant at both levels of performance, the effect was not particularly strong in either case: The main effect of the situational manipulation accounted for 7% of the total variance. In Study 1, the main effect of the situation accounted for 13% of the total variance. Thus, the significant effect of wind at both levels of performance in Study 2 cannot be attributed to a stronger manipulation of situational forces than that employed in Study 1. Finally, ratings of ability were generally higher in the swimming scenario than in the soccer scenario, $F(1, 111) = 10.44$, $p < .01$.

As depicted in Figure 5, inferences of effort also revealed significant effects of performance, $F(1, 111) = 16.98$, $p < .01$, and the situation, $F(1, 111) = 10.64$, $p < .01$, but no interaction, $F < 1$. As in Study 1, the target was attributed greater effort given high performance than low performance. The effect of the situation in Study 2, however, differed from that observed in Study 1. In Study 1, greater effort was attributed in the performance facilitating condition (which involved a reward for high performance) compared to the performance inhibiting condition (which involved a reward for low effort). In the current study, this pattern was reversed: Inferences of effort were greater in the performance inhibiting condition ($M = 7.33$) than in the performance facilitating condition ($M = 6.21$). Thus, greater effort was attributed when the wind was blowing directly in the face of the target as opposed to blowing at his back. Perceivers appear to have made the reasonable assumption that, for a given level of performance, greater effort was required when

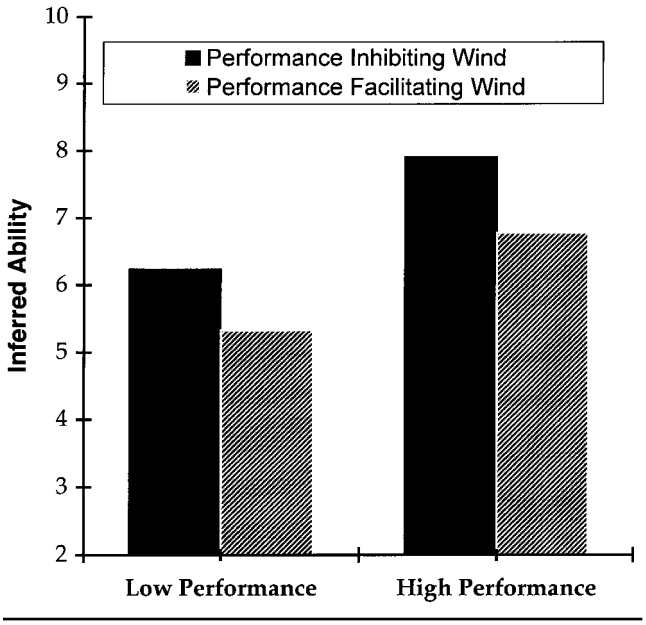

Figure 4 **Inferred ability as a function of level of performance and situational forces: Study 2.**

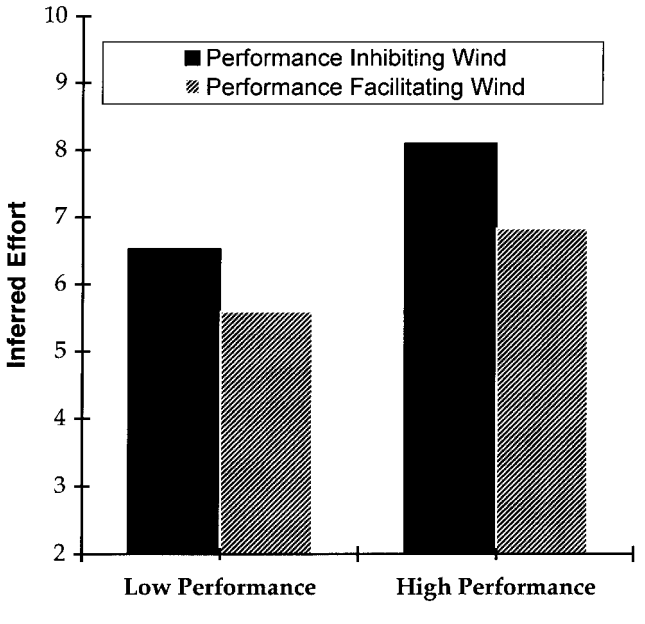

Figure 5 **Inferred effort as a function of level of performance and situational forces: Study 2.**

kicking against the wind. Finally, perceptions of effort revealed a difficult to interpret interaction involving performance, scenario, and order of dependent variables, $F(1, 111) = 4.98$, $p < .05$.

As expected, perceptions of effort and ability were positively correlated in both the low performance and high performance conditions, $rs = .60$ and $.60$, $ps < .01$, respectively. In general, then, attributions of ability and effort followed a very different pattern than that observed in Study 1.

GENERAL DISCUSSION

Jones (1990) decried the lack of research attention given to understanding how perceivers think about different situational forces. The present research validates this concern. Inferences of ability and effort took quite different forms depending on whether situational forces were operationalized in the form of psychological constraints or in the form of physical constraints. Study 1 operationalized situational forces as psychological constraints. Replicating past research, inferences of ability demonstrated an attributional asymmetry: Inferences of ability based on high performance tended to be less affected by situational forces than inferences based on low performance (Reeder & Brewer, 1979). Inferences of effort were shown to play a mediating role in this asymmetry. Study 2 manipulated situational forces in the form of physical constraints (wind or water current), which either inhibited or facilitated performance. In this study, the impact of situational forces on inferences of ability and effort was symmetrical for low and high performance. Thus, both types of inferences were affected by the situation at low *and* high performance.

The research strategy in this article is somewhat unique in emphasizing the interrelationships among different types of inferences about a target person. The founders of person perception research—Asch (1946) and Heider (1958)—maintained that our impression of a person involves the integration of multiple attributes. Subsequent models of casual attribution and dispositional inference focused on the discounting principle, according to which inferences about a focal trait should be adjusted to reflect situational forces (Jones & Davis, 1965; Kelley, 1973). Recent theoretical advances have tracked this discounting principle across automatic and controlled processing and demonstrated the influence of a variety of moderating influences (Krull & Erickson, 1995). But the original concern with integrating multiple attributes in the impression fell by the wayside. For the most part, models of dispositional inference focus on inferences about a single focal trait or attitude within the target person.

Although some previous attribution theories have implied the presence of multiple inferences (e.g., inferences about actions, situations, social desirability, and even intentionality), these models were not designed to account for multiple inferences about the attributes of an impression target and their interrelationships. Research in this article confirms the everyday observation that perceivers notice multiple attributes about a

person and seek to relate those attributes to one another in systematic ways (Asch & Zukier, 1984; Read & Miller, 1993; Trafimow, 1998; Vonk, 1999). In this respect, the present research has some commonality with connectionist models of person perception, which propose that a constraint-satisfaction process is brought to bear on a network of inferences about a target person (Kunda, 1998; Read & Marcus-Newhall, 1993).

This approach may allow researchers in the area of dispositional inference to take account of perceivers' interest in constructs related to reasons, motives, and goals (McClure & Hilton, 1998; Read, 1987). Malle and his colleagues (Malle, 1999; Malle, Knobe, O'Laughlin, Pearce, & Nelson, 2000) argue persuasively that people typically explain unintentional behavior in terms of causes, whereas they typically explain intentional behavior in terms of reasons. The distinction between causes and reasons can be applied to the present research. The physical constraints that were manipulated in Study 2 (wind and water current) appear to be causes. Their impact on the target's performance was probably perceived as unintentional, in the sense that the target could not prevent the impact. In contrast, psychological constraints appear to represent reasons for behavior. As such, psychological constraints may be perceived as operating in concert with the target's intentions or motives. After all, people are free to ignore financial incentives or bribes. Thus, if a target exerts low effort on a task in response to a bribe, it is because the target was motivated to obtain the bribe. Thus, inferences of effort in the present study reflect on the motives of the target person.

Future research might explore the role of perceived motives in other areas of dispositional inference. For example, there is another type of attributional asymmetry that involves inferences of morality (Reeder & Brewer, 1979; Reeder & Spores, 1983; Trafimow & Trafimow, 1999; Vonk & Van Knippenberg, 1994). Inferences of morality based on immoral behavior are relatively less affected by situational forces than are inferences based on moral behavior. For example, Reeder and Spores (1983) presented their participants with a vignette about a target person who either made a donation to a charity fund or stole from that fund. The situational force consisted of a suggestion from the target's date that he either donate or steal from the fund. When the target stole the money, he was rated relatively immoral regardless of his date's suggestion. But when he donated to the fund, he received higher ratings of morality when his date had urged him to steal, as opposed to donate. An application of the multiple inference approach in this context would focus on other attributes or motives in the target person that might be inferred. For example, a target who followed his date's suggestion might be perceived as motivated by conformity (wanting to please his date). When a target who performs immoral behavior is linked with the trait of conformity, impressions may remain negative (a conforming criminal is equally as immoral as a nonconforming one). But when a target who performs moral behavior is linked with conformity, the target may be perceived as less principled (and less moral) than one who is nonconforming. Thus, inferences about conformity could play a mediating role in the attributional asymmetry for inferred morality.

Coming to Terms With Constraint

The widely researched correspondence bias emphasizes that perceivers are insensitive to the situational forces that shape behavior (Gilbert & Malone, 1995). In contrast, the present studies shift the focus toward an understanding of how situations are construed (Fein, 1996; Gilbert, 1998; Jones, 1990). The difference between psychological constraints and physical constraints may be particularly important (Jones, 1990). Perceivers may think of psychological constraints as having implications for constructs related to the target person's effort, motives, and goals. In contrast, perceivers may think of a physical constraint (such as the wind) as having a more direct effect on performance.

The distinction between psychological constraints and physical constraints surely is more complicated than we have portrayed it in this article. Jones (1990) recognized a long list of different types of physical constraints, including capacity limitations and opportunity limitations. Jones provided a similarly diverse list of psychological constraints. At present, we know little about the similarities and differences among these constraints. A clear message of the present research, however, is that progress in the field of dispositional inference awaits a fuller understanding of situational forces.

NOTES

1. For exploratory purposes in Experiments 1 and 2, a neutral situation was included. Because the data from this condition are not germane to the main theoretical issues, the data from this condition are not reported.

2. According to Heider (1958), there are two aspects to the concept of effort (or trying). The first aspect concerns the intention or motive of the actor (Was the target motivated to kick a long distance?). The second aspect concerns exertion, or how much effort was exerted. In the context of this article, these aspects are related because if the target did not intend to kick a long distance, the target would be perceived as exerting minimal effort. Indeed, the measure of motive and effort were highly correlated ($r = +.86$). Consequently, the two measures were averaged.

3. Although the inclusion of a continuous variable within an ANOVA framework would suggest an ANCOVA, our framework had to be more general because of our interest in the Effort × Performance interaction that proved to be significant. In an ANCOVA, it is assumed that the covariate has an equal regression slope within each cell of the design. Our significant interaction between this covariate and perfor-

mance, though, would give evidence of a direct violation of this assumption. Given the general linear model as our analytic framework, it is unnecessary to distinguish between continuous variables (inferred effort, in this case) and dummy-coded discrete variables (cf. Neter, Wasserman, & Kutner, 1985).

4. The generality of these findings is supported by an additional study that we conducted. This study employed a videotaped performance (rather than a written vignette) and presented this performance prior to the situational information (rather than after situational information). Participants watched a silent videotape in which a target person was shown either kicking a soccer ball or throwing a football. The target on the tape performed at either a low level or a high level. Participants then read a vignette describing the situation surrounding the target's behavior. The vignette described a coach who instructed the target to practice the long kick in soccer (or the long pass in football). As in Study 2 of this article, situational forces surrounding the target's behavior described the direction of the wind at the time of the kick (or throw). Inferences of ability demonstrated significant effects of performance and situation, Fs = 80 and 8.73, ps < .01, respectively, but no interaction, $F < 1$. Thus, the effect of situational forces was similar at low and high performance.

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