

THOSE WHO ARE NUMBER TWO TRY HARDER: THE EFFECT OF SEX ON ATTRIBUTIONS OF CAUSALITY¹

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Two experiments were conducted in order to ascertain the causal attributions made by male and female subjects for identical performance (including success and failure) of males and females. In both experiments, subjects made attributions along four dimensions: ability, motivation, task difficulty, and luck. Whether evaluating undergraduates on an intellectual task (Experiment 1) or successful physicians (Experiment 2), subjects attributed greater motivation to females than to males. In addition, males perceived the female physician as being less able and having an easier task than the male physician. However, female subjects perceived the female physician as having a harder task than the male physician. Implications for attribution theory and the perception of professional women in our society were discussed.

The purpose of this research was to investigate the effect of sex role stereotypes on the attribution process. In particular, two studies assessed the effect of prior expectations on causal attributions when these expectations were assumed to exist as a result of stereotypes about males and females. The studies have implications for both (a) the differential evaluation of male and female performance in our society and (b) the effect of confirmed and disconfirmed expectations upon causal attributions.

Expectations of Female Performance

Many of the stereotypes of women in our society are unfavorable (Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970; Kitay, 1940; McKee & Sherriffs, 1957; Sherriffs & McKee, 1957). Moreover, recent studies have reported that intellectual and artistic performance by women is evaluated less favorably than the same performance by men (Goldberg, 1968), specifically when experts have not already judged the work to be of high quality (Pheterson, Kiesler, & Goldberg, 1971). In view of the sex role expectations which are fostered during the socialization process, these findings

are probably not surprising (e.g., see Mischel, 1966).

Assuming that a tendency toward differential evaluation of male and female performance has been adequately documented, an important question arises concerning the cognitive processes by which these judged differences in performance are subjectively accounted for or explained. If male and female performance can be characterized as involving either confirmed or disconfirmed expectations, then it is possible that this question can be examined within the context of attribution theory.

Expectations and Attribution Theory

According to recent elaborations of Heider's (1958) theory, four types of attributions can be made to account for own or other's behavior. For example, Jones, Rock, Shaver, Goetals, and Ward (1968) and Feather and Simon (1971a) have suggested that causal explanations of performance refer to the individual's ability or motivation (his internal state) or the difficulty of the task or luck (the external state of the environment). Attributions can also be characterized as either variable or stable (Feather & Simon, 1971a; Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971). Variable attributions refer to characteristics or features of individuals or situations which may change over time, such as motivation or luck. In contrast, stable attributions refer to features of indi-

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viduals or situations which are relatively unchangeable over short periods of time, such as ability and task difficulty. Of the several studies that have explored the usefulness of this conceptual framework, those dealing with the effect of expectations of success and failure are particularly relevant to perceptions of male and female performance.

In a study in which the subjects used only dimensions of luck and ability, Feather and Simon (1971a) found that unexpected outcomes were attributed to luck more often than were expected outcomes. For example, when subjects experienced failure on a task and then later experienced success on a similar task, they attributed their success to luck. On the other hand, if the outcome was expected (e.g., success on the first task followed by success on the second), subjects attributed the outcome of the latter task to their own ability. The investigators suggested that unexpected outcomes are likely to be attributed to external causes, while expected outcomes are likely to lead to internal causal explanations. Weiner et al. (1971), however, hypothesized that these results could be explained in an alternative way. They proposed that unexpected outcomes are explained by variable attributions, that is, either motivation or luck, while expected outcomes are explained by stable attributions.

Because the Feather and Simon (1971a) study used dimensions of ability and luck only, it is not clear which interpretation is correct. A later study conducted by Frieze and Weiner (1971) enabled the subjects to make attributions along all four dimensions. They found that expected outcomes increased attributions to ability and task difficulty and decreased attributions to luck (and motivation, but not significantly). This effect can be seen as supporting the position that it is the variable-stable distinction, rather than the external-internal one, which explains unexpected versus expected outcomes. But Feather and Simon (1971b), using four attribution dimensions instead of two, found again that unexpected outcomes were attributed to luck, expected outcomes to ability, while task difficulty and effort were not significantly affected. It is therefore still unclear

what underlies different perceived causes for performance and whether factors such as the type of task differentially affect attributions. However, that unexpected outcomes are attributed to different causes than expected outcomes is apparent.

Inasmuch as experimentally created expectations of success substantially affect attributions of causality, then widely accepted expectations about women and men may also affect causal attributions. There is some limited evidence supporting this proposition. Crandall, Katkovsky, and Preston (1962) found that there were sex differences in self-explanations of failure. Female first-, second-, and third-grade students tended to take the blame for failure on intellectual tasks rather than projecting the blame onto others as was typical of the males. There was also some evidence that the males expected to perform substantially better on these tasks than did the females. In the context of attribution theory, the Crandall et al. results suggest that males (whose expectations of success were disconfirmed) made external attributions to explain their failure. Females (whose expectations of failure were confirmed) made internal attributions to explain their failure. Deaux and Emswiler (1974) found that attributions of causality were indeed affected by the sex of the person whose behavior was being explained. Using ability versus luck as the dependent measure, they found that a college girl's success on a perceptual task in which males were expected to do better than females was attributed by both male and female subjects to luck rather than ability. The reverse was true when a male succeeded. Again, this raises the question of what it is about luck that favors its choice for explaining unexpected outcomes—its external or variable property.

It can be argued that of the four dimensions on which attributions are typically made, ability is the least likely of the attributions to be used in explaining disconfirmed expectations simply because ability is typically seen as fairly enduring. That is, once having made a judgment about a person's ability, it is difficult to change that judgment even when the person's behavior is un-

expected. However, which of the other three attributions are used to explain an unexpected outcome is likely to depend on other available information. Certainly, the type of task should partly determine which cause is perceived as most applicable. For instance, performance on the fairly restricted, short-term tasks which subjects have encountered in the laboratory may be more frequently perceived as the result of luck than is performance in real-life tasks. When explaining the success of the president of General Motors, one is likely to infer that this person is very able rather than lucky. On the other hand, if this person had previously been judged as being only of moderate ability (and hence that person's success was unexpected), it is likely that the success would be attributed to motivation—unless, of course, the individual's father was once president of General Motors in which case success may be attributed to luck.

Because of the possibility that attributions may vary according to the nature of the task, we attempted in this research to use both nonlaboratory- and laboratory-type tasks. As a result, we could make only one firm prediction: success by men would be attributed more to their ability than success by women, and attribution for female success would rest relatively more on one or more of the other three dimensions, probably motivation.

In the two experiments reported here, male and female subjects were asked to make causal attributions concerning the performance of other males and females. In both experiments, subjects were given the opportunity to attribute causality along four dimensions: ability, motivation, task difficulty, and luck. In the first experiment, these attributions were made to others who had been highly successful, moderately successful, or unsuccessful on an academic, problem-solving task. In the second experiment, the task involved performance in a career and was experimentally varied. In both studies, expectations about male and female performance on the task were assessed through the use of a separate, but comparable, sample of subjects.

EXPERIMENT 1

Method

The subjects in this experiment reviewed the performance of six stimulus persons and indicated on

four separate scales the reasons for that performance. Systematically varied in this experiment were the sex of subject, sex of stimulus person, and three levels of success in a problem-solving task. The experiment, therefore, took the form of a 2 (Sex of Subject) $\times 2$ (Sex of Stimulus Person) $\times 3$ (Level of Success of the Stimulus Person) factorial design with repeated measures on the last two factors.

Subjects

Fifty-seven male and 57 female students at the University of Kansas served as subjects. Subjects were tested in six groups consisting of 9 or 10 subjects in a group. Groups 1 and 2 were predominately female classes on the subject of women. Group 3 was a graduate business class which was predominately male. Groups 4 and 5 were two sociology classes of males and females. Group 6 consisted of male and female undergraduates fulfilling part of an introductory psychology course requirement.

Procedure

Each subject received a booklet containing a set of 10 logical and mathematical problems described as having been used in a previous study. They also received a booklet of xeroxed copies of six answer sheets supposedly completed by a random sample of former subjects. The answer sheets had been completed in such a way as to show not only the answers but also the working out of the answers, that is, the worksheet of the former subject. Actually the answer sheets were fictitious and had been completed to fulfill the following conditions: Two were from highly successful subjects (9 problems correct), two were from moderately successful subjects (6 problems correct), and two were from very unsuccessful subjects (2 problems correct). The subjects were given a baseline from which to infer degree of success; that is, all were told that the average score across all subjects was 4.5 correct. For each success level, one answer sheet was identified with a female name (e.g., Joan Brehm), the other with a male name (e.g., Jack Brehm). The problems solved and the names used were counterbalanced as was the order and sequence of the answer sheets. Following each answer sheet was an evaluation page on which the subject was asked to make attributions about the problem solver. The subject was also required to write down the full name of the person being evaluated and the number of problems correctly solved by that person, in order to ensure that the subject attended to the sex of the problem solver and his degree of success. The subjects were told that their ratings would help determine which of these previous students would be in a follow-up study. After the questionnaires were completed, subjects were briefly interviewed by the experimenter. These interviews indicated that none of the subjects detected the true purpose of the study. Subjects were then thoroughly debriefed.

Dependent Measures

Each evaluation sheet contained seven 40-point rating scales. On four of these scales subjects rated the ability of the problem solver, the motivation of the problem solver, the difficulty of the problem solver's task, and the problem solver's luck. In addition, there were two rating scales which served as manipulation checks. On one scale, the subject rated the problem solver's level of success; on the other, he indicated the degree of surprise at the performance of the problem solver (i.e., whether the outcome was unexpected). On the seventh scale, the subject indicated how much he would like to work with the problem solver on a group problem-solving task.

Expectations of Success

A comparable sample of undergraduates was used to assess expectations regarding the probable success and failure of males and females on the problem set used in this study. Forty-two males and 42 females received a booklet containing the 10 problems and a booklet containing the answers to the problems. Accompanying each booklet was a rating sheet which asked the subject to rate the difficulty of each problem and to estimate the percentage of college students he expected would be able to answer that problem correctly in a future study. Half the subjects were told that female students would be in the future study; the other half were told that male students would be in the study. All subjects were told that their evaluations of the problems would help determine which problems would be used in the future study. Responses on the expectation measures were analyzed using a 2 (Sex of Subject) \times 2 (Sex of Future Sample \times 10 (Problem) analysis of variance with repeated measures on the last factor. Two analyses were performed: one on the presumed difficulty of each problem, the other on the percentage of students who were expected to solve each problem correctly.

Results

First, the expectation data were analyzed in order to determine whether or not this sample of undergraduates expected different levels of performance for males and females on the intellectual task. Second, the attribution data obtained from the experimental group were analyzed. The results of each analysis are reported in turn.

Expectation of Success

An analysis of variance of the difficulty ratings revealed no significant effects. That is, the perceived difficulty of each problem was not affected by the sex of the subjects or the sex of the future sample. Also, the problems themselves did not differ significantly

in perceived difficulty. However, the percentage of students in the future study who were expected to answer each problem correctly was affected by the sex of the future subjects. Both male and female subjects expected male subjects to perform better than female students ($F = 6.34$, $df = 1/164$, $p < .05$).

Attributions of Causality

A preliminary analysis of variance was used to determine whether responses varied systematically across the six groups of subjects asked to evaluate the problem solvers. There were no significant differences among the six groups nor did group membership interact with any other factors. Hence, data obtained from the six groups were pooled for all subsequent analyses.

Responses on each of the four attribution dimensions were analyzed using a 2 (Sex of Subject) \times 2 (Sex of Stimulus Person) \times 3 (Success Level) analysis of variance. Not surprisingly, there were highly significant effects ($p < .001$) for level of success. As the level of success of the problem solver increased, so did the attributions of ability ($F = 728.64$), motivation ($F = 815.10$), difficulty of the task ($F = 463.77$), and luck ($F = 30.55$).³ Furthermore, perceived success rose as the number of problems solved increased ($F = 1169.88$, $df = 2/224$, $p < .01$).⁴

A significant main effect for the sex of the problem solver was found on the motivation

³ That task difficulty varied according to level of success may seem counterintuitive inasmuch as the same problems were used in all success conditions. It should be noted, however, that this finding can be largely attributed to very low ratings of task difficulty in the low-success condition, that is, the condition in which the hypothetical subjects correctly answered only 2 of the 10 problems. If subjects assumed that one should correctly answer at least 4 of the problems (as suggested by the pretest), some distortion of task difficulty may have occurred in the low-success condition; that is, "it wasn't that hard."

⁴ The manipulation check on the expectations of the subjects was not significant. That the subjects themselves did not indicate more surprise at presumably unexpected outcomes could be attributable to their not wanting to admit surprise. The separate control group was originally planned in anticipation of this and also to avoid prior public commitment by subjects to their expectations.

dimension ($F = 4.75$, $df = 1/112$, $p < .05$). That is, subjects attributed more motivation to female problem solvers than to male problem solvers regardless of level of success. No other significant effects were obtained.

Discussion

Analysis of the expectation data confirmed that subjects comparable to those in the experimental conditions expected men to perform significantly better than women on an intellectual task similar to those employed in educational settings. However, the four attributions made by the subjects in the experimental group did not interact with level of success and sex of stimulus person. That is, contrary to the Feather and Simon (1971a, 1971b) studies and the Frieze and Weiner (1971) study, whether expectations were confirmed or disconfirmed did not affect the kinds of attributions which were made. Rather, subjects attributed greater motivation to the female stimulus person than to her male counterpart regardless of other factors.

This result may be interpreted in at least two ways. On the one hand, people may simply perceive women as being more motivated than men. That is, the significant main effect for motivation might not have been a result of causal attributions but simply a trait imputed to women irrespective of task performance. On the other hand, because all subjects were shown both male and female stimulus persons who performed equally well at each success level, it is possible that all success levels involved a "disconfirmation." That is, because the female stimulus person did *as well as* the male stimulus person at each level, it is possible that "doing as well as" may in itself have constituted a disconfirmation of expectations—hence, she must have tried harder. Taking these considerations into account, a second study was designed to explore some of the questions raised in the first experiment.

EXPERIMENT 2

The method and design, but not the purpose, of this experiment substantially differed from that of Experiment 1. The task was changed to increase the generalizability

of the data; the dependent measures were made more comparable to those used in previous studies; and the design was altered somewhat. Moreover, each subject evaluated only one stimulus person, which eliminated the direct comparisons possible in the first experiment.

Method

Male and female subjects read descriptions of a physician, who was either male or female. Each physician was presented as highly successful. The investigators attempted to manipulate expectations by varying the speciality of the physician. He or she was presented as either a pediatrician or a surgeon, since pretest data suggested that males were not expected to succeed more than females in pediatrics, but men were expected to be more successful than women in surgery. A third manipulation was employed to discover when unexpected female success would be attributed to enhanced motivation, as in Experiment 1, or to very good luck (as in the Deaux and Emswiller, 1974, study). To do so, half of the descriptions mentioned that the physician had a father whose practice he or she assumed. It was reasoned that it is ordinarily difficult for people to attribute success in a career or other long-term task to luck, but that luck might be perceived as a cause of success if some prior chance event (i.e., being the child of a physician) had occurred which had long-term consequences.

The experiment, therefore, took the form of a 2 (Sex of Subject) $\times 2$ (Sex of Stimulus Person) $\times 2$ (Medical Speciality) $\times 2$ (Father-No-Father) factorial design. After the subjects read the description, they attributed causality for the stimulus person's success to four factors, as in Experiment 1; but as in the Frieze and Weiner (1971) study, the subjects had to decide which of these factors contributed more or less to the physician's success. In other words, an attribution along one dimension necessarily affected an attribution along another dimension.

Subjects

Eighty male and 80 female undergraduates at the University of Kansas, each fulfilling an introductory psychology course requirement, served as the subjects. They were tested in same-sex groups of 6 to 10, and the descriptions were handed out in random order within each group.

Procedure

When the subjects reported for the experiment, they were asked to read about a person for a social judgment study. For example:

Mark Greer, M.D.
General Surgeon

After finishing medical school, Mark Greer went to New York University Hospital where

he completed both his internship and residency in general surgery. Though his obligations as a resident took up most of his time, Mark volunteered to work part time in a Harlem health clinic which was considerably understaffed. There he reorganized the surgery services to improve the post-operative care of the patients.

When his residency in surgery was completed, he returned to his hometown—Santa Clara, California.

After two years in Santa Clara, Dr. Greer has almost doubled the size of his practice, and is ready to hire another doctor as his partner. Mark's interest in good surgical care and his boundless energy have resulted in increased community activities to improve health care for the poor. This year he received an award naming him Santa Clara's Doctor of the Year. He is the youngest doctor to have received the award.

This description was changed appropriately in the other experimental conditions. That is, half of the subjects read about Marcia Greer rather than Mark Greer, and half of the subjects read that Mark or Marcia was a pediatrician rather than a surgeon (e.g., in the Harlem health clinic "he reorganized the children's ward"). In addition, the father condition was created by adding that the physician had returned to his (her) hometown to "take over his [her] father's pediatrics [surgery] practice. His [her] father, now retired, had a small practice in Santa Clara but was well respected and known in the community."

After the subjects had read the description, they were asked to make attributions to explain the physician's success. Specifically, they were presented with a four-inch circle and asked to divide it, as they would a pie, into four segments which would represent why they thought the physician had succeeded. Each segment was to be labeled with one of four causes—ability as a doctor, motivation to be successful as a doctor, the ease of the goal, or good luck—and the size of the segment was to vary depending upon the extent to which the cause it represented had contributed to the physician's success. Four additional questions served as checks on the expectation manipulations. One asked the subjects to rate whether they expected a male or female to be more successful in pediatrics; the second asked the subjects to rate whether they expected a male or female to be more successful in surgery. The remaining two questions asked the subjects to rate how successful they thought they themselves would be in pediatrics and surgery. When the evaluations were completed the subjects were carefully debriefed and asked not to discuss the study with others.

Expectations of Success

The attempt to manipulate expectations by varying the speciality of the physician was based upon the results of a pretest survey conducted with 37 male and 47 female undergraduates. Each subject was shown brief descriptions of fictitious persons and

was asked to indicate on a 40-point scale how successful he thought the person would be. The descriptions were of the following professionals: pediatrician, writer, child psychologist, surgeon, dancer, diagnostician, clinical psychologist, and biographer of famous women. Half of the persons were identified as female, and half as male (counterbalanced among subjects). Analyses of variance on these data indicated that in not one instance were women expected to be more successful than men. It being seemingly impossible to create a stronger expectation of female than male success, the field in which females were expected to be as successful as males—namely, pediatrics—was contrasted in the main experiment with the field in which females were expected to be considerably less successful than men, surgery. The main effect F for sex of stimulus person was .14 when the field was pediatrics, but 6.65 ($df = 1/180$, $p < .05$) when the field was surgery.

Results

Each attribution dimension was analyzed separately using a 2 (Sex of Subject) \times 2 (Sex of Stimulus Person) \times 2 (Professional Speciality) \times 2 (No-Father-Father) analysis of variance. When interactions were significant, simple main effect tests were employed for individual comparisons. A chi-square test was used to compare the subjects' expectations of success for females and males who entered pediatrics and surgery.

Expectations of Success in the Main Experiment

As in the pretest survey, subjects expected males and females to be equally successful as pediatricians; a large majority of the subjects (89%) expected males to be more successful as surgeons than females ($\chi^2 = 36.38$, $p < .001$). Although subjects expected other women to be as successful as men in pediatrics, female subjects expected *themselves* to be less successful in pediatrics than did male subjects. That is, a 2 (Sex of Subject) \times 2 (Pediatrics-Surgery) analysis (on how successful each of the subjects thought he or she would be in each of these professions) revealed that all subjects thought they would be more successful as pediatricians than surgeons ($F = 29.59$, $df = 1/158$, $p < .01$) and that female subjects expected to be less successful than male subjects, regardless of speciality ($F = 9.16$, $df = 1/158$, $p < .01$). These results indicate that even though pedi-

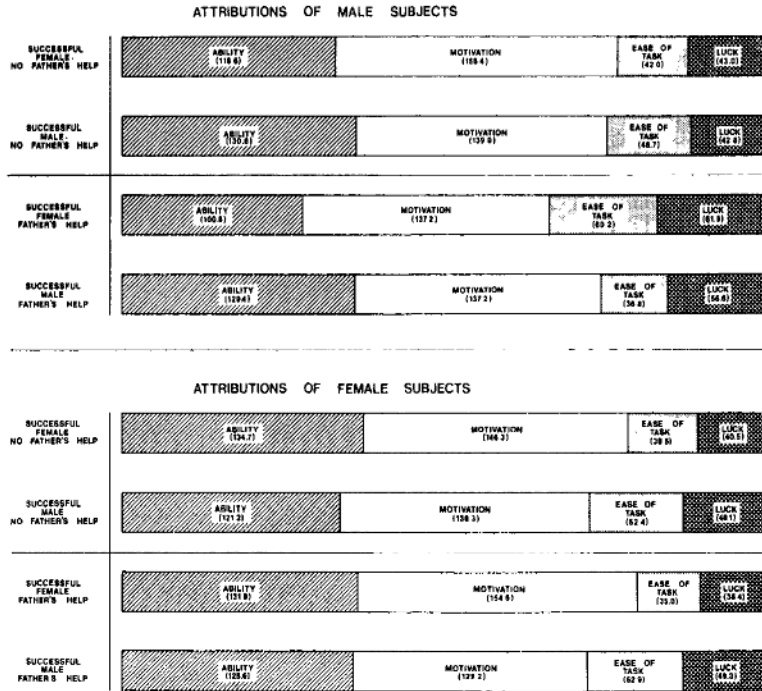


FIGURE 1. Attributions of causality by male and female subjects for success by male and female physicians.

atics is seen as being more female related than surgery, the ratings of own likelihood of success by females were lower than the ratings of own likelihood of success by males in that profession.

Attributions of Causality

With regard to the manipulations, more luck was attributed to physicians who had taken over their father's practice than to physicians who did not have a physician father ($F = 4.958$, $df = 1/144$, $p < .05$). Males, however, seemed to be more responsive to the career variations than females. That is, there was a significant interaction between the sex of the subject and the father-no-father conditions ($F = 5.572$, $df = 1/155$, $p < .05$). Female subjects did not significantly alter their attributions of luck when the physician had a physician father, while the male subjects did (simple main effect, $F = 10.621$, $df = 1/144$, $p < .01$). There was also a significant interaction between sex of subject and professional speciality on both the task difficulty dimension ($F = 6.062$, $df = 1/144$, $p < .025$)

and the motivation dimension ($F = 6.471$, $df = 1/144$, $p < .025$). Males thought the surgeon was more motivated than the pediatrician (simple main effect, $F = 4.345$, $df = 1/144$, $p < .05$) and thought the surgeon had a more difficult task than the pediatrician (simple main effect, $F = 9.099$, $df = 1/144$, $p < .01$). Again females did not alter their attributions on the basis of speciality.

There was only one significant main effect due to the sex of the stimulus person. As in the first experiment, more motivation was attributed to females than to males ($F = 8.402$, $df = 1/144$, $p < .01$). In addition, there were significant Sex of Subject \times Sex of Stimulus Person interactions for ability ($F = 7.953$, $df = 1/144$, $p < .01$) and for task difficulty ($F = 11.533$, $df = 1/144$, $p < .01$). The mean attributions by male and female subjects for male and female stimulus persons are illustrated in Figure 1. Because the speciality of the profession seemed to have little effect on differential attributions of successful males and females, the specialities are combined in the figure.

Male Subjects

In general, male subjects attributed more ability to the male physician than to the female physician (simple main effect, $F = 7.952$, $df = 1/144$, $p < .01$). At the same time, the male subjects thought the female's success was relatively more attributable to either her greater motivation or her having had an easier task. When the physician did not have a helpful father, these subjects perceived the female physician as more motivated than the male physician ($t = 1.92$, $df = 1/144$, $p = .06$). When the physician had taken over the father's practice, males perceived the female physician as having had an easier task than the male ($t = 3.16$, $df = 1/144$, $p < .01$). In the latter condition she was also perceived as being slightly, but not significantly, luckier than he.

Female Subjects

Female subjects also systematically varied attributions according to the sex of the stimulus person, but the pattern of attributions for causality was somewhat different from that of male subjects. Female subjects perceived the male physician as having had an easier task than the female physician (simple main effect, $F = 9.099$, $df = 1/144$, $p < .01$). Females also attributed greater motivation to the female physician than to the male physician (simple main effect, $F = 7.54$, $df = 1/144$, $p < .01$).

Discussion

In this experiment, as in Experiment 1, the woman's performance was attributed to different causes than was the man's. Across all subjects, the female physician was seen as having been more motivated than her male counterpart. However, unlike the earlier study, the other three attributions also varied with the sex of the stimulus person. Possibly this occurred because the measurement device was changed from four independent rating scales to a circle in which one attribution necessarily affected the others. When the female physician was as successful as the male physician, male subjects perceived her to be less able than her male counterpart and, when she had no father to help her, more

motivated. When she had had her father's help, a factor external to her—primarily the difficulty of the task—was perceived as more responsible for her success than it was for a man who also had his father's help. We interpret this latter attribution to be similar to a luck attribution in that the father could be described as providing the female physician with a lucky break—having made things easier for her. Some male subjects did rate the woman with the father as luckier than the male with the father, but most described her as having been helped with an easier task than the man. These results are consistent with those reported by Weiner et al. (1971).

Female subjects did not think males were more able than females. Instead, they attributed the male's success to his having had an easier task than the female. Female success was then explained in terms of the female physician's motivation to succeed being greater than the male's—regardless of the father-no-father or the pediatrician-surgeon manipulations.

Why the attributions made by males differed from those made by females cannot be answered with certainty. One possibility is that the women's liberation movement—highly visible on most large university campuses—may have had an influence on the female undergraduates. That is, the attitudes and beliefs promoted by the movement may have been at least partially responsible for the tendency of the female subjects to perceive task difficulty for females as greater than that for males. Such an effect may have also resulted in females making fewer distinctions than males in terms of the experimental manipulation; that is, they perceived the task as more difficult regardless of the circumstances and thus requiring greater motivation. If such an explanation is correct, a similar study conducted with nonuniversity females would probably result in less pronounced sex differences.

Although data were obtained which indicated that both males and females had different expectations of success for females depending upon the medical speciality they were in, the professional speciality (pediatrics versus surgery) did not interact with the sex

of the stimulus person in the attribution data. It is possible that this manipulation was ineffective because even in the female-related speciality, subjects did not expect females to be more successful than males; they expected them to be only as successful as males. In addition, male subjects thought they would be more successful in both specialities than female subjects. This evidence suggests that for both males and females, success is cognitively linked to "maleness." In that survey and in further work at a later time, the investigators have not been able to find a single occupation in which females are expected to be more successful than males. Even in the so-called female occupations of elementary school teaching and nursing, males who enter these occupations are expected to be more successful and competent than females (Sedgwick, 1972). For these reasons, we doubt that whether a profession is female related or not has any impact on expectations for the success of a woman in the real world. If, as we think, success in a job is tied to being male, then males are simply expected to be more successful than females. Thus, a female's success will be more or less unexpected and will be explained in different attributional terms than a male's success.

If successful women are perceived as having been especially motivated (so as to overcome stable deficiencies such as lack of ability and environmental difficulty), the next question is whether this inference is of any importance in real life. That is, if a man and woman are competing for a promotion, job, entrance into a training program, or an honor, do his good qualities appear more or less advantageous than hers? Our data does not address itself to this question, but we suspect that it depends on the job or task. If the job is very intellectually demanding, ability may be preferred over motivation. This is likely to be the case in professional occupations such as medicine or law. However, in jobs where only a minimum of ability is needed but the job calls for a hard worker (e.g., secretarial work), women may have the advantage over men.⁵ Further research which varies the char-

acteristics of the job is necessary to answer the question above.

The cause of a female's success is not necessarily perceived as luck, nor a male's success necessarily attributed to ability as suggested by the Deaux and Emswiler study. Our experiments, which allowed the subjects to make attributions along four dimensions, suggest that there may be a number of attributional patterns for expected and unexpected outcomes. What seems to be the case is that high ability, a stable internal attribution, and to a lesser extent, task ease (or environmental favorability), which is stable and external, are used to explain expected success, that is, success by males. Motivation, a variable internal attribution, and sometimes luck, are used to a greater degree in explaining unexpected—female—success. Why this attribution is variable, on the one hand, and internal on the other hand, is not entirely clear. However, it might be hypothesized that there is a tendency to perceive the unexpected as having been caused by *events* which can change—that is, variable attributions. In addition, it might be hypothesized that there is a tendency to perceive outcomes (expected or unexpected) as the result of internal factors—perhaps as a result of a Western ethic which stresses individual responsibility for one's acts. These two tendencies ought to lead, in real life, to the perception that those who are number two try harder.

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considering a candidate for graduate admission. A letter of recommendation for a female is quoted in an article by Lunneborg and Lillie (1973). The author of the letter described the graduate candidate in the following way: "She is quite conscientious and well-motivated, but I found her acting much more as a very competent secretary than as an independent scholar."

⁵ There is some anecdotal evidence that motivation is not the most desirable attribution when

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