THE INFLUENCE OF SEX BIAS UPON COMPLIANCE WITH EXPERT POWER

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ABSTRACT

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The present study evolved from the belief that sex bias creates distortions in perceptions of expertise and, thus, influences the degree of expert power which the expert has in relation to the perceiver. Therefore, the influence of level of expertise, sex of the expert, sex of the influencee, and sex-domination of the expert's occupation upon compliance was examined. Separate experiments were conducted for the male and female-dominated occupations. Subjects' degree of compliance was measured by their responses to three recommendations contained in an in-basket. With the exception of a significant three-way interaction for one of the three dependent measures for the female-dominated occupation, a MANOVA revealed that only expertise significantly affected subjects' degree of compliance. While it is possible that there are no sex biases, the results could also be explained in terms of the presence of outside recognition of competence and legitimate power.

ACKNOWLEDGMENTS

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THE INFLUENCE OF SEX BIAS UPON COMPLIANCE WITH EXPERT POWER

> That some people have more power than others is one of the most palpable facts of human existence. Because of this, the concept of power is as ancient and ubiquitous as any that social theory can boast (Dahl, 1957, p. 201).

Due to its immense importance, many theorists have directed their efforts toward defining and operationalizing the concept of power. More importantly, many professionals associated with the social aspects of existence have attempted to delineate the sources or bases of power. One such power base has received much attention because of its hypothesized relationship to leadership, professionalism, decision making, and because of its postulated effects upon subordinates engaged in a hierarchically structured organization. This particular power base reflects certain attributes of the influencer and has been called expert power because of its reliance upon the expert skill and knowledge of the influencer (French & Raven, 1966). More specifically, French and Raven (1966) state that A's expert power is based on B's perception that A has some special knowledge, ability, experience, or expertness.

The essential hypothesis deriving from the acceptance of expertise as a power base is that those who are more

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expert gain more compliance from the targets of their influence attempts than those who are less expert. Although this hypothesis appears to be rather straightforward, it needs clarification. The important point is that compliance does not depend upon whether or not the influencer is an expert, but rather upon whether or not the influencer is perceived by the influencee to be an expert. One is now confronted with the problem of determining what variables lead an individual to perceive someone as an expert. It has become apparent through the emergence of the women's liberation movement that perceived expertise depends not only upon the individual's purported skills, but also upon the individual's sex. More specifically, some of the literature on sex bias has indicated that women are not perceived as being as competent as men (Broverman, Vogel, Broverman, Clarkson, & Rosenkranz, 1972; Deaux & Emswiller, 1974; Feather & Simon, 1975; Fernsberger, 1948; Goldberg, 1968; O'Leary, 1974; Pheterson, Kiesler, & Goldberg, 1971; Rosen & Jerdee, 1973, 1974; Scheinfeld, 1944; Schmitt, 1973; Sherriffs & Jarrett, 1953; Sheriffs & McKee, 1957; Taynor & Deaux, 1973; Terborg & Ilgen, 1975; Williams, 1946). Therefore, it can be hypothesized that a male and a female of equal expertise do not evoke the same amount of compliance from others.

Some of the literature from which the latter hypothesis was borne has considered the possible effects arising from the area or subject matter in which expertise has been

claimed (Deaux & Emswiller, 1974; Feather & Simon, 1975; Goldberg, 1968; Mischel, 1974). In other words, some studies have made an effort to look at the effects of sex bias upon perceived expertise when expertise has been claimed within a female-dominated field, as well as, when expertise has been claimed within a male-dominated field. A male-dominated field is one in which the vast majority of the members are males, while a female-dominated field is one in which the vast majority of the members are females. The results of such studies have been contradictory. Moreover, no studies exist which have rigorously considered how the sex-domination of the field affects a male or female expert's ability to gain compliance in response to expert power. In order to remedy this situation, this study did not just look at the effects upon compliance associated with different levels of expertise and those effects associated with being a male or a female expert, but looked at the main effects and the interaction effects of these variables within the context of a male-dominated field, as well as, within the context of a female-dominated field.

One other variable which could affect the degree of compliance gained is the sex of the influencee. Some of the sex-role stereotype literature has indicated that females are perceived as being more submissive than males and that males do not like to comply to a female boss (Bass, Krusell, & Alexander, 1971; Bowman, Worthy, & Greyser, 1965;

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Broverman et al., 1972, Fernsberger, 1948). Thus, one can hypothesize that, in general, females comply more than males in order to conform to the sex role behavior perceived as being appropriate. However, whether females comply more than males in response to expert power has not been investigated. Many studies have shown that females, as well as males, devalue other females' competence (Broverman et al., 1972; Deaux & Emswiller, 1974; Deaux & Taynor, 1973; Feather & Simon, 1975; Fernsberger, 1948; Goldberg, 1968; Mischel, 1974; Pheterson et al., 1971; Rosen & Jerdee, 1973, 1974; Schmitt, 1973; Sherriffs & Jarrett, 1953; Sherriffs & McKee, 1957; Taynor & Deaux, 1973; Terborg & Ilgen, 1975; Williams, 1946). Therefore, it seems possible that females would comply more than males in response to male experts, but not to female experts. It is also plausible that sex-domination of the field might differentially affect the amount of compliance obtained from males and females. Therefore, in attempting to delineate those variables which affect the amount of compliance gained by an influencer who relies upon expert power, this study looked at the sex of the influencee in relation to the level of expertise, the sex of the expert, and the sex-dominance of the field.

Expert Power in Relation to Compliance

According to Talcott Parsons (1963), "The same statement will carry more 'weight' if made by someone with

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a high reputation for competence, for reliability, for good judgment, etc., than by someone without this reputation or with a reputation for unreliability (p. 50)." An interpretation of Parson's statement might be that compliance increases as one's level of expertise increases. Intuitively, one expects that an individual of high expertise would exact more compliance than an individual of low expertise. This common sense evaluation was formally recognized by French (1956) who theorized that the greater the strength of A's base of power over B, the greater the influence of A over B. Similarly, French and Raven (1966) stated that the strength of the expert power of A over B varies with the extent of the knowledge or perception which B attributes to A within a given area. Furthermore, French and Raven (1966) hypothesized that B's evaluation of the strength of A's expertise is based upon a comparison of A's knowledge with his own or a comparison between A's knowledge and an absolute standard.

One must necessarily ask whether the use of expert power leads to attitudinal or behavioral conformity, or both? In one study, which addressed this question, expert power was not significantly correlated with behavioral conformity, but was positively and significantly correlated with attitudinal conformity (Warren, 1968). It also appears that expert power may be associated with internalization of the beliefs of the influencer, as opposed to compliance

or identification. Compliance occurs when an individual accepts influence because "he expects to gain specific rewards or approval and avoid specific punishments or disapproval by conforming (Kelman, 1958, p. 53)." Identification occurs when "an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or a group (Kelman, 1958, p. 53)." Internalization occurs when an individual accepts influence because he believes in the content of the induced behavior (Kelman, 1958). Kelman (1958) specifically addressed himself to the topic of credibility (expert power and trustworthiness) of the source as an antecedent to internalization of the source's beliefs. In manipulating the base of power of various communicators, Kelman found support for his hypothesis that the extent to which power is based upon expertise and trustworthiness, conformity will take the form of internalization.

Experimentalists have approached the study of the relationship between expert power and compliance in various ways. For example, one study attempted to determine whether or not one's willingness to place an individual in a position of authority over him was positively related to the latter's level of expertise (Hollander, 1964). Hollander asked subjects to imagine themselves as a part of a group and presented them with a description of an individual who was characterized as being either an

"extremely capable performer in group's activity," "capable performer in group's activity," "average performer in group's activity," or "poor performer in group's activity." Subjects were then asked "how willing they would be to have this person in a position of authority in the group." Results indicated that subjects' willingness to place the individual in a position of authority was an increasing function of the latter's perceived level of expertise. Although this study can be interpreted as indicating that individuals are willing to comply to a perceived expert, it is questionable whether or not one's willingness to place an individual in a position of authority over oneself can be equated with one's willingness to comply.

In another study by Hollander and Willis (1964), subjects were placed in a two-person group and were asked to arrive at a group concensus as to the prize-winning quality of certain pictures. Due to experimental manipulation, each subject was led to believe that either he was more competent than his partner, less competent than his partner, or as equally competent as his partner. When the task was completed each subject indicated on a five-point scale how influenced he felt he had been by his co-worker. Contrary to the hypotheses that different levels of expertise yield different amounts of compliance, perceived influence did not seem to be affected by different levels of perceived expertise. However, this study suffered from a severe methodological problem. More specifically, each

subject expressed his opinion on each picture prior to learning the opinion of his co-worker and was not given an opportunity to change his opinion after receiving his partner's judgment. Thus, the opportunity to be influenced was not present. In response to this problem, Hollander suggested that each subject could be influenced by reacting to the pattern of responses (demonstrated in the co-worker's judgment of previous pictures) of his co-worker in judging subsequent pictures. Such an explanation rests on the supposition that subjects are capable of perceiving a particular pattern of responses of someone else or are capable of perceiving the likes and dislikes of someone else. Attributing the ability to a subject to predict someone else's response on a judgmental task seems to be highly presumptious and probably invalid. Therefore, the results of this study must be interpreted cautiously.

Since experimental manipulations similar to that used in both of the Hollander studies are not possible in field studies, experimentalists conducting field studies have had to develop other methodologies for studying the relationship of compliance to other variables. For example, in order to determine why project personnel of an electronics company complied with the requests of project managers, Thamhain and Gemmill (1974) had project personnel rank order various reasons which could be used to explain this compliance. The results of this ranking procedure signified

that project personnel viewed expertise of the project manager as the third most important reason for complying with the manager's requests. It should be noted that there were eight reasons to be ranked. Thus, expertise appeared to be a fairly important base of power in this organization. Similarly, Backman (1968), and Backman, Smith, and Slesinger (1966) conducted field studies in which a ranking procedure was used. In the former study, faculty members of liberal arts colleges ranked five reasons according to their importance in explaining why they comply to the dean. Analysis of the data revealed that expertise of the dean was considered to be the most important reason for compliance. Using an identical ranking procedure, Backman et al. (1966) found that expert power was the second most important reason for compliance of salesmen to their branch managers. Furthermore, they found that the use of expert power by the branch managers correlated .58 with total control or the overall amount of influence in the organization. However, this obtained correlation should not be accepted at face value since in ranking, one base of power is placed in a higher position at the expense of the others; i.e., ipsative measurement. These field studies also only studied expert power in relation to the other power bases but did not compare the power of people with different levels of expertise.

The problem with all the studies previously cited in this section is that they did not include an objective

measure of compliance. Instead of having an observable measure of compliance in response to the use of expert power, these studies depended upon subjects' objectively unverified statements that they would place someone in authority and the subjects' evaluations of the reasons for compliance in order to collect data and support hypotheses. Such a procedure allows for too much subjectivity and, thus, too much distortion in perception by the subjects. Fortunately, other studies which included actual measures of compliance have been conducted (Busch & Wilson, 1976; Crisci & Kassinove, 1973; Evan & Zelditch, 1961; Frankel & Kassinove, 1974; Horai, Naccari, & Fatoullah, 1974; Moore, 1921; Mulder & Wilke, 1970).

As discussed earlier, expert power has been found to be associated with attitudinal compliance (Warren, 1968). Therefore, it is not hard to understand why much of the social psychology literature has dealt with the extent of attitude change induced in members of an audience as a function of the credibility of an influencer (Aronson & Golden, 1962; Aronson, Turner, & Carlsmith, 1963; Bergin, 1962; Horai et al., 1974; Hovland & Weiss, 1951; Kelman & Hovland, 1953). More specifically, these studies have compared the amount of attitudinal compliance gained by a highly credible source or communicator presenting a persuasive communication to the amount of attitudinal compliance gained by a low credibility source delivering

the same communication. The perceived credibility of a communicator is a function of his expertise and/or his trustworthiness (Hovland, Janis, & Kelly, 1953). The communicator is perceived to have expert power to the extent that he is considered to be an expert in the subject matter of the communication, while he is perceived to be trustworthy to the extent that the message he delivers is not viewed by the audience as a means of obtaining personal gains (Hovland et al., 1953).

The procedures of these studies have been essentially identical in that they progressed according to the following format:

1. Subjects' pre-experimental opinions of a particular topic were discerned.
2. A persuasive communication on the topic of discussion was presented to the subjects and was attributed in some cases to a source of high credibility and, in other cases, to a source of low or medium credibility.
3. The opinion of the subjects on the topic was obtained after delivery of the communication.
4. The pre-experimental opinions of the subjects were compared to their post-experimental opinions in order to determine whether or not any change of opinion in the direction of agreeing with the communicator had taken place.

5. The change of opinion obtained under the high credible communicator condition was compared to the change of opinion obtained under the low credible communicator condition in order to determine whether or not one of these conditions was associated with more attitude change in the direction of the communicator than the other.

For all of the source credibility studies mentioned earlier, highly credible communicators, as compared to low credible communicators, were associated with more attitude change on the part of the audience in the direction of agreeing with the communicator. Thus, it appears that an individual with a great degree of expertise and/or trustworthiness had more power in inducing attitudinal compliance than a person low on either or both of these qualities. However, in determining the extent of attitude change a few weeks after the communication, some experimenters found that there was a decrease in the agreement of subjects with the position advocated by the communicator in the highly credible condition, while there was an increase in the agreement of subjects with the communicator in the low credible condition (Hovland & Weiss, 1951; Kelman & Hovland, 1953). The explanation propounded for this result was that subjects dissociated the source of the communication from the content of the communication over an extended period of time, whereby the positive or negative effects associated

with the source no longer affected subjects' opinions (Hovland et al., 1953; Hovland & Weiss, 1951; Kelman & Hovland, 1953). Kelman & Hovland (1953) supported this contention in an experiment in which they reintroduced the source of the communication to some subjects prior to allowing them to complete the opinion survey distributed a few weeks after the communication. For those subjects in the "reinstatement of the communicator condition," the original result of higher credibility being associated with greater agreement with the communicator's position was obtained. In view of these findings, it appears that credibility of the source may have effects on immediate attitudinal compliance but not upon prolonged attitudinal compliance. One can postulate that a change in one's attitudinal position would endure if its validity were reinforced through association with practical experiences.

The difficulty with the majority of the source credibility studies is that source credibility is composed of two components, expertise and trustworthiness, and, therefore, one cannot determine to which of these components the effects are related. It should be noted that the studies by Bergin (1962), Aronson et al., (1963) and Horai et al., (1974) were intended to only manipulate the expertise of the communicator.

Other studies which are not considered to be part of the source credibility literature have attempted to

look at expertise and relate it to attitudinal compliance (Busch & Wilson, 1976; Moore, 1921; Mulder & Wilke, 1970). In one such study, Moore (1921) studied the influence of expert opinion and majority opinion upon individuals in three subject areas: speech, morals, and music. Moore found that the opinions of an expert in his respective field were related to change in the opinions of the subjects, resulting in agreement with the expert, in all three areas. Interestingly, majority opinion, as compared to expert opinion, was associated with more attitude change in the area of speech. Unfortunately, Moore did not manipulate the level of expertise in this study.

In Mulder and Wilke's study on participative decision making (1970), they evaluated the effects of different levels of expertise. They paired each subject with either a perceived high expert or a perceived low expert, and instructed each subject to discuss a particular problem with his partner and propose a solution. Significantly more of those subjects paired with a perceived high expert, as compared to those associated with a low expert, changed their original solution and accepted the solution propounded by the expert. Thus, as in the source credibility literature, high expert power of the influencer appears to lead to greater compliance on the part of the influencee than does low expert power.

Busch & Wilson (1976) also conducted an experiment specifically designed to compare the effects of different levels of expertise. In this experiment, subjects listened to a videotaped communication attributed to either a high expert insurance salesman or a low expert insurance salesman. The communication concerned life insurance and was basically informational rather than persuasive. However, it did specify that people should consider buying insurance. Following the communication, subjects expressed their attitudes toward life insurance in general ("global attitude") and their attitudes about the specific statements made in the communication ("message specific attitudes"). Those subjects in the high expert power condition had a significantly more positive attitude toward the specific statements made in the communication than did those in the low expert condition. However, no significant difference was found between these two groups in their "global attitude." As Busch and Wilson (1976) explained, life insurance is a familiar topic to most people, and thus, general attitudes toward it are not likely to be affected by one communication.

Although Bergin (1962), Aronson et al. (1963), Horai et al. (1974), Moore (1921), Mulder and Wilke (1970), and Busch and Wilson (1976) only attempted to experimentally manipulate and/or study expert power, it is quite plausible that the subjects subjectively evaluated the communicator's

trustworthiness. Thus, the compliance attributed to expert power could have been partly due to the expert's perceived trustworthiness. Evidence for this confounding effect was obtained from the Busch and Wilson study (1976) in that high expertise was associated with significantly more trust in the expert than was low expertise. Furthermore, all of these studies dealt with measures of attitudinal compliance. Presumably, attitudinal compliance results in behavioral compliance since individuals appear to strive for consistency between their attitudes and overt behavior. However, most of the studies cited did not include a measure of behavioral compliance. Therefore, it becomes necessary to look outside of the source credibility literature in order to see how expert power relates to behavioral compliance.

The study by Busch and Wilson (1976) is the one study which included both an attitudinal and a behavioral measure of compliance. As previously mentioned, subjects listened to a communication which concerned life insurance and which was attributed to an insurance salesman of either high or low expertise. Two measures of behavioral compliance to the speech were obtained. For the first measure, subjects were to imagine that they wanted to buy life insurance and, then, to indicate whether or not they were willing to meet with the salesman, whose communication they heard, in order to discuss life insurance (behavioral intention measure). For the second measure, each subject was asked to place his name, address, telephone number, and

an indication of his interest in desiring more information or a meeting with a salesman on a post card ("behavioroid measure"). Analysis of the data showed that high expertise was associated with significantly greater behavioral intention than low expertise. However, there was no significant difference in the behavioroid measure for high and low expertise. In explaining the latter result, Busch and Wilson postulated that "the behavioroid measure was much more involving and required the subjects to make a behavioral commitment by providing their names, addresses, and telephone numbers to the life insurance salesman (p. 9)." The behavioral intention measure was based on a hypothetical situation and, therefore, was probably not as involving.

Evan and Zelditch (1961) also obtained a measure of behavioral compliance in a study in which subjects were employed as coders and were supervised by either a highly competent person, an individual having about equal competence with the subject, or a low competent individual. The coding task was manipulated in order that subjects would be forced to seek help on the task. Results indicated that there was no significant difference between subjects in these conditions in the number of times they called the supervisor for help. However, subjects in the high expert condition complied significantly more to the direction of the supervisor than did those in the low expert condition.

An unanticipated result was evoked in an experiment by Frankel & Kassinove (1974). They attempted to manipulate the expertise of school psychologists by introducing them to teachers as "Dr. ___" (high expert) or "Mr., Mrs., or Miss ____" (low expert). The researchers found that these two levels of expertise did not result in a significant difference in compliance on the part of the teachers. As suggested by Frankel and Kassinove, it is quite possible that the teachers did not perceive a difference in the level of expertise because, within both conditions, the individual was introduced as a school psychologist. Moreover, introducing both individuals as school psychologists may have given both of them legitimate power. However, in a very similar study by Crisci and Kassinove (1973) the "Dr." gained more compliance from mothers than the "Mr.".

In conclusion, most of the literature concerned with attitudinal compliance supported the hypothesis that a high expert can gain a greater degree of compliance from influencees than a low expert. On the other hand, there appears to be a paucity of experiments dealing with the relationship between expert power and behavioral compliance. More importantly, those studies which do exist exhibit some contradictory results. Therefore, in order to aid in clarifying the relationship between differential levels of expertise and behavioral compliance, this study used a measure of behavioral compliance. In view of the

attitudinal compliance studies, including the source credibility literature, and most of the results obtained in the behavioral compliance literature, it was predicted that high expert power would result in a greater degree of compliance than would low expert power.

Sex Bias in Relation to Expert Power

As has been explicitly stated, one's expert power is an increasing function of one's perceived knowledge and competence. Unfortunately, an individual's perception is not always based upon objective qualities of the object of perception but is susceptible to the subjectively determined biases and prejudices of the perceiver. Recently, much interest has been shown in "sex bias" because of its potential to distort perception. A major purpose of this study, therefore, was to determine the effects of sex bias upon one's perception of another's expertise and, thus, indirectly, upon the ability of an expert to gain compliance. In fully determining the effects of sex bias upon expert power, one must consider such variables as the sex of the influencer, sex of the influencee, and the area in which the influencer claims expertise. In reference to the latter factor, one may ask whether a male and a female are able to gain the same amount of compliance in response to expert power when expertise is claimed within a traditionally male or female-dominated field.

In reviewing the literature pertaining to the effects of sex bias upon competence, O'Leary (1974) provided the following observation:

> The findings cited above may be regarded as evidence for the existence of a societal bias against the recognition of female competence. This bias may stem from the belief that females are not endowed with the masculine attributes which make success more likely (p. 812).

According to Terborg and Ilgen (1975), males are stereotyped as being independent, objective, and able to handle management and scientific responsibilities, while women are stereotyped as being gentle, passive, and sensitive. Terborg and Ilgen's contention has found support in many studies whose purpose was to assess the sex-role stereotypes held by females and males (Broverman et al., 1972; Fernsberger, 1948; Sherriffs & Jarrett, 1953; Sherriffs & McKee, 1957). O'Leary (1974) and Broverman et al. (1972) best described the male and female stereotypes emerging from these studies when they suggested that attributes valued highly in men constitute a competency cluster, while those valued in women constitute a warmth-expressiveness cluster. Furthermore, O'Leary's suggestion that women "share men's bias against the recognition of competence in women (1974, p. 814)" also found much support in these studies since females also propounded these stereotypes. However, it must be noted that some studies indicated a deviation from the tendency to perceive males as being more competent than females (Bass et al., 1971; Kitay, 1940; Schein, 1973).

For example, the results of a study by Kitay (1940) showed that women attributed more mental ability to their own sex than males did. Women's positive feelings toward females' competency was demonstrated by the fact that 54.6 percent of the women, while only 21.6 percent of the men, agreed with the statement, "I have just as much confidence in women doctors as in men doctors." Bass et al. (1971) also obtained results which were in disparity with the trend to ascribe more competency to males than to females. They found that a sample of male managers and staff personnel disagreed with the statement that "women don't make good scientists or engineers because they inherently lack the mathematical and mechanical skills required." Furthermore, a factor analysis on all of the items on Bass and his associates' questionnaire showed that managers discriminated the least between men and women on the factor pertaining to capabilities, aptitudes and worth to business. Finally, Schein (1973) had male middle line managers rate descriptive terms as to how well they characterized males and females. She found no significant difference between the mean ratings for women and for men on expertise factors (intelligence, competence, and creativity). It can be hypothesized that the contradictory findings of the studies on sex-role stereotypes are a result of the fact that most of these studies used different items to evaluate stereotypes concerning competency. Thus, it is quite plausible

that each of these items tapped slightly different qualities. Furthermore, competency may have been defined in various ways by different subjects or may have been subjectively associated with various areas of competence, and, thus, may have resulted in different perceptions of this quality for both sexes.

Denial of women's competence was not only evidenced in the sex-role stereotypic literature but also in studies pertaining to attribution theory. According to this theory, performance can be attributed to such factors as luck, effort, ability, and/or task difficulty (Terborg and Ilgen, 1975). In relating attribution theory to sex bias, it appears that successful performance by women on traditionally male-oriented tasks is not attributed to the expertise of the female but to luck (Terborg and Ilgen, 1975). Terborg and Ilgen (1975) found support for their belief that sex bias influences the reasons individuals give for explaining successful performance. They had males assess the overall performance of male and female engineers and had them determine whether or not the engineers' performance was due to ability, effort, or luck. A mean group comparison between those males confronted by a female engineer and those confronted by a male engineer indicated that there was no significant difference in the degree to which performance was attributed to ability or effort. However, the performance of female engineers was attributed to luck

significantly more than was the performance of male engineers. This finding can be construed as an indication that, within a male-dominated field, a male and a female having equal qualifications are perceived as having different levels of expertise. Unfortunately, this study did not deal with attribution theory within the context of a female-dominated field. Furthermore, it should be remembered that all the assessors of performance were males. Perhaps evaluations obtained from female assessors would have produced different results.

Taynor and Deaux (1973) conducted an attribution theory study in which, both male and female subjects were used as assessors of performance. Each subject was presented with a story of how a male or female performed in an emergency situation and was instructed to rate the stimulus person according to how much effort and ability were involved in the performance. The stories of the male and female stimulus people were exactly the same. Analysis of the data showed that females were rated significantly higher than males on effort but no significant difference was found between male and female stimulus people on the ability dimension. However, it should be noted that when the story described the male or female stimulus person as being accompanied by an opposite sex non-acting person, the male nonactor was rated as having significantly more ability than the female nonactor. There was no significant main effect

for sex of the subject nor was there a significant interaction effect for sex of subject x sex of stimulus person. Taynor and Deaux's study falls victim to the same criticism as Terborg and Ilgen's experiment (1975) in that the emergency situation was considered to be male-oriented, and, therefore, nothing can be deduced about how subjects would react to males and females executing a female-oriented task.

The problem of lack of data concerning the relationship between sex bias and attribution theory within the context of a female-dominated field was remedied by Feather and Simon (1975) and Deaux and Emswiller (1974). Feather and Simon (1975) presented female subjects with a story in which either a female or a male was found to fail or succeed in a class associated with one of the following professions: medicine, teaching, or nursing. These fields were considered to be male-dominated, mixed, and female-dominated, respectively. The subjects employed a rating scale to indicate the degree to which they felt that the performance was caused by ability, effort, luck, easiness of course, cheating, and examiner's error. Analysis of the data showed that subjects attributed male success to ability more than they attributed female success to ability, while lack of ability was considered to be a more important cause of female failure than of male failure. These findings were particularly salient when the occupation was medicine. In general, sex-domination of the occupation did not appear to

significantly affect subjects' responses. In attempting to explain the latter result, Feather and Simon (1975) suggested that subjects may have been focusing their attention upon success or failure of the individual in his course work, and may not have been fully considering the sex-domination of the field. Another explanation which they advanced was that perhaps achievement was seen to be inappropriate for a female, regardless of the occupation, and, thus, females were perceived as having less ability than the males even when the field was female-dominated. It can also be postulated that male subjects would have rated particular causes of performance differently than females.

An attribution theory study by Deaux and Emswiller (1974) is the most extensive study, as compared to the studies previously mentioned, in that the experimenters attempted to evaluate the effects of all three of the independent variables, sex of subject, sex of performer, and sex-domination of the task. The subjects evaluated performance on a thirteen-point scale ranging from luck to ability. In performing an analysis of variance, a main effect was found for sex of the performer in that males were perceived to have more ability than females. Furthermore, a significant sex of performer x sex of task interaction effect was found. More specifically, males were considered to have significantly more ability than females when performing a traditionally male task, while males and

females were considered to be of approximately equal ability when engaged in a female-oriented task. Therefore, for the masculine task, the females' performance was attributed to luck significantly more than the males' performance. There were no significant interaction effects involving sex of the subject which supports O'Leary's belief (1974) that males and females are equally biased against recognizing competence in females.

For the most part, the results of the attribution theory studies were congruent with the prediction that a female's success in performing a task is perceived by both males and females to be caused by different factors than a male's success in performing the same task. More specifically, a female's success was seen by both males and females to be more often the result of luck while a male's success was seen more often to be the result of ability, especially when the task was traditionally male-oriented. One can hypothesize that if a woman's success on a task is attributed to luck, rather than ability, she may not be able to exercise expert power since expert power is based on perceived ability, while a male performing equally well on the same task may have a certain degree of expert power because his performance is perceived to be the result of ability.

Although the results of the attribution theory studies provided insight into the effects of sex bias upon expert power, more conclusive information can be gained from those studies in which the performance of an expert or

the expert, himself (or herself), was evaluated, rather than the cause of the performance. Furthermore, the former studies are enlightening because they ascribed competence to an individual on the basis of his or her professional status and/or previous education rather than on the basis of his or her successful completion of one task, as is the case in the attribution theory studies. It seems plausible that expertise would be more readily attributed to the individual whose professional status indicates a mastery of certain knowledge over a period of time rather than to an individual who successfully completed one particular task at one particular time. Therefore, it becomes necessary to review those articles in which the performance of a professional, or established expert, and/or the expert himself (or herself) was evaluated.

In studying the effects of sex bias upon the perceived expertise of a professional or an established expert in a particular field, many studies have focused upon the reaction of female subjects to experts of their own sex as compared to their reactions to experts of the opposite sex (Goldberg, 1968; Pheterson et al., 1971; Williams, 1946). The major purpose of these studies was to determine whether or not females are biased against experts of their own sex, as O'Leary (1974) and Scheinfeld (1944) contend. In addressing this matter, Scheinfeld (1944) stated that women themselves have internalized the same attitudes males have concerning women.

> Women may be the first to mistrust a doctor of their own sex and where everything else is equal usually prefer a male doctor. Women lawyers also report that men clients come to them much more readily than do women, and show more confidence in them (Scheinfeld, 1944, p. 329).

Support for Scheinfeld's observations was found in a study in which urban middle-class women indicated that they would greatly prefer being treated by an experienced male doctor, as opposed to a comparable experienced female doctor (Williams, 1946). Furthermore, in judging the objections which patients raised against being treated by a particular doctor, the majority of the female subjects concluded that protesting against a female doctor was legitimate and natural. Thus, it appears that females do devalue the competence of female professionals, at least when these professionals are engaged in a traditionally male-oriented field.

More information pertaining to Scheinfeld's remarks was obtained in a study by Pheterson et al. (1971). In this study, female college students viewed eight paintings and then judged the technical competence, creativity, and artistic future of each painter, as well as the overall quality and emotional impact of each painting. For each painting, half of the subjects thought it was the work of a male artist, while the other subjects thought it was created by a female artist. Pheterson et al. also manipulated the status of each painting in that half of the subjects thought it was a prize-winning painting, while the others believed the painting was an entry in an art show. Analysis

of the judgments of the female subjects revealed that male artists were perceived to be significantly more technically competent and to have a significantly better artistic future than female artists. A very interesting finding was that male artists were judged significantly superior to female artists when the painting was perceived to be an entry in a show, but no significant difference was found between evaluations of male and female artists when the painting was assumed by the subjects to be a prize winner. In explaining the latter result, Pheterson and his associates suggested that a female's competence is not accepted until she has been officially recognized by outsiders as an expert. However, due to sex bias, this outside recognition is not easily obtained. Finally, there were no significant effects for the dependent variables of creativity, emotional impact, and overall quality of the painting. In view of the lack of effects for the latter two dependent variables, it appears that sex bias was directed at the painter, rather than at the painter's performance.

Although the articles by Williams (1946) and Pheterson et al. (1971) substantiated the hypothesis that females perceive a male as being more expert than an equally competent female, they did not indicate whether this hypothesis is upheld when expertise is claimed within a female-dominated field, as well as, within a male-dominated field. The field used in William's study (1946)

was medicine, which is obviously a male-dominated field. However, the sex-domination of the field of painting, which was the profession used by Pheterson et al. (1971), is not very obvious. The results of the latter study may have had more impact if the experimenters would have ascertained whether the subjects perceived painting to be a male or a female-dominated field. Fortunately, the interaction between sex bias of a female and sex-domination of a particular profession in which expertise is claimed was thoroughly investigated by Goldberg (1968). Goldberg had female college students read six professional articles. For some subjects, the articles were attributed to a male author, while for others, the same articles were attributed to a female author within the profession. Each article dealt with either the field of law, city planning, elementary-school teaching, dietetics, linguistics, or art history. Goldberg chose these professions on the basis of prior testing of the subjects' perceptions of sex-domination of various fields. Law and city planning were perceived to be male-dominated; elementary school teaching and dietetics were considered to be female-dominated; linguistics and art history were not perceived to be strongly associated with one sex more than the other. Subjects rated each article on its value, persuasiveness, and profundity, while they rated the author of each article on the dimensions of writing style, professional competence, professional status, and

ability to sway the reader. The latter dimension can be interpreted as the ability of the author to gain compliance in response to his or her expert power. The results showed a tendency on the part of the females to evaluate the male authors and their articles better on every dimension, as compared to the female authors and their articles. This trend was obtained for all the occupations except art history. Thus, it appeared that females downgraded female competence when expertise was claimed in a female-dominated field, as well as, when it was claimed in a male-dominated field. The latter result did not coincide with Deaux and Emswiller's finding (1974) that the successful performance of both males and females on a female-oriented task was attributed to ability.

The stereotypic literature and the attribution theory literature lead one to expect that males also devalue a female expert's performance, and/or the expert, herself. Although far from being conclusive, evidence of males' bias against recognizing female competence was acquired from an experiment performed by Rosen and Jerdee (1973). Male and female subjects were asked to evaluate each of four supervisory styles as to their effectiveness when used by a male or a female supervisor. In this manner, Rosen and Jerdee attempted to unobtrusively discover whether or not both males and females perceived a male supervisor as being more effective than a female supervisor. The results of the

study indicated a trend toward higher evaluation of the male supervisors, as compared to the female supervisors, but this difference was not significant. Moreover, there was no significant main effect for sex of subject nor was there a significant sex of subject x sex of supervisor interaction effect. In interpreting these results, one can say that both men and women shared in the trend to devalue women's effectiveness as supervisors. However, a methodological inadequacy must be taken into account in evaluating these results. The difficulty was that the supervisors were not evaluated, but rather their styles were evaluated. In other words, subjects were actually concerned with assessing the appropriate behavior of a male or a female supervisor rather than the overall effectiveness of the supervisor.

A much more elucidative study was conducted by Mischel (1974). He employed Goldberg's technique (1968) in that he had subjects evaluate professional articles from various sex-dominated fields, as well as, their authors, on several dimensions such as the professional competence and status of the author, the impact of the article, etc. As in Goldberg's study, the same articles were attributed to a male in some cases and to a female in other cases. Mischel's study differed from Goldberg's research in that Mischel used both male and female high school and college students, as opposed to only female college students, and Mischel only used four occupations, as opposed to Goldberg's six occupations. The male-dominated fields in

Mischel's study were law and city planning, while the female-dominated fields were primary education and dietetics. In performing an analysis of variance on the data, Mischel found a significant sex of author x sex-domination of field interaction effect. More specifically, male authors were evaluated better than female authors for the male-dominated fields of law and city planning, while female authors were considered to be superior to male authors for the female-dominated fields of primary education and dietetics. There were no significant effects associated with the sex of the subject. Therefore, in agreement with Rosen and Jerdee's study (1973), it appeared the males in Mischel's study exhibited the same biases as the females. It should be noted that the tendency of females in this study to rate female professionals better than male professionals across the female-dominated fields is contrary to Goldberg's findings that females devalue a female professional even when her expertise is in a female-dominated field. However, in analyzing each of the occupations in Mischel's study separately, it appeared that both male and female high school students preferred a male author to a female author in the female-dominated field of dietetics, while female and male college students did not exhibit a preference. This latter finding does agree with Goldberg's results.

All of the experiments already mentioned have dealt with the effects of one or more of the variables, sex

of subject, sex of expert, and sex-domination of field, upon perceived competence. One very important aspect of the relationship between sex bias and perceived expertise is missing from the literature. More specifically, none of the previously mentioned literature dealt with a manipulation of the level of expertise. The question which has been overlooked is, "Does sex bias affect the perception of different levels of expertise in the same manner?" Fortunately a tentative answer to this question can be deduced from the results of two studies which dealt with various levels of expertise (Deaux & Taynor, 1973; Schmitt, 1973). In one such study, Deaux and Taynor (1973) had male and female college students evaluate other students who were applying for a study-abroad scholarship program. Each subject was confronted with either a high competent male, a high competent female, a low competent male, or a low competent female. In evaluating each applicant on the dimension of competence, a significant sex of applicant x level of competence interaction effect occurred. Highly competent males were evaluated more positively than highly competent females, while low competent males were rated more unfavorably than low competent females. Furthermore, this evaluation trend was more evident among male subjects, but there were no significant main or interaction effects concerning sex of the subject. It would have been interesting to know if the subjects considered studying abroad to be a male or female-appropriate behavior.

Schmitt (1973) investigated the relationship between sex of subject, sex of expert, and level of competence within a male-dominated field. Male and female subjects rated their willingness to be treated by a doctor for each of four different situations: common cold, appendectomy, physical examination, and heart defect. The doctor was characterized as being either a highly competent male, a highly competent female, a male of mediocre competence, or a female of mediocre competence. The results indicated a significant three-way interaction effect for the common cold situation in that males preferred the mediocre doctor, while females preferred the competent male doctor. For appendectomy, there was a significant main effect for competence and for sex of doctor in that a highly competent doctor was preferred to a mediocre doctor, while a male doctor was preferred to a female doctor. Moreover, there was a significant competence x sex of subject interaction effect in that females greatly preferred the competent male doctor. For a physical examination, competent doctors were again preferred significantly more than mediocre doctors. There was also a significant sex of subject x competence interaction effect due to the fact that males preferred a mediocre female doctor over a competent female doctor. Finally, in considering a heart defect, a competent doctor was preferred significantly more than a mediocre doctor, and a male doctor was preferred significantly more than a female doctor. A significant sex of doctor x competence

interaction effect was also evident and was due to the fact that females were neutral in their reactions to the male mediocre doctor but severely negative toward the female mediocre doctor. In general, the results of this study indicated that females reacted more negatively than males toward female experts in a male-dominated profession.

As noted continually, different perceived levels of competence lead to varying amounts of expert power. Thus, the next logical step in studying sex bias in its relation to perceived expertise is to study its effects upon expert power, or the ability of an expert to gain compliance from an individual as a result of the former's perceived expertise. As a matter-of-fact, using amount of compliance as a criterion measure, rather than using evaluations of an expert or an expert's performance may be more critical in determining the effects of sex bias. The reason for suggesting compliance, rather than evaluation, as a good criterion is that in evaluation, the evaluator is detached from the act, while in compliance, the subject is personally involved. Therefore, in using compliance one might obtain stronger personal reactions.

In a study by Rosen and Jerdee (1974), compliance of male subjects was used as the criterion in response to advice emanating from a male supervisor or a female supervisor of equal competence. The researchers employed an in-basket technique in which male subjects received a memo, recommending termination of a subordinate due to performance

problems, from either a male supervisor or a female supervisor. The results indicated that males tended to comply with the recommendation of the male supervisor more than they complied with the advice of the female supervisor.

It is obvious that Rosen and Jerdee (1974) did not attempt to manipulate level of competence. However, Frankel and Kassinove (1974) did study the effects of level of competence and sex of the expert upon ability to gain compliance. As noted previously, Frankel and Kassinove manipulated the level of expertise, as well as the sex of the expert (a school psychologist) by introducing them either as "Dr. ____" or as "Miss, Mr., or Mrs. ____." It should be remembered that they found no significant differences between the levels of expertise in the amount of compliance gained from teachers. The analysis of the data also revealed that there were no main effects for the sex of the psychologist and no level of competence x sex of expert interaction effect. A possible explanation for the finding of Frankel and Kassinove is that the profession of school psychologist is considered to be a female-dominated field, and, therefore, a female psychologist's expertise would not be brought into question. Furthermore, if school psychology is considered to be a female-oriented field, this study indicates that males can gain as much compliance as females in response to their expertise within a female-dominated field. This latter possibility agrees with the finding of

Deaux and Emswiller (1974) in that the performances of males and females were attributed to ability when the task was female-oriented. However, it does not coincide with the finding of Goldberg (1968) that females devalued other females' competence even when competence was claimed within a female-dominated field, nor does it concur with Mischel's finding that females were evaluated higher than males in a female-dominated field.

Based upon the literature, the author concludes that expert power is a viable source of social power, since some studies show it to be cited as a reason for compliance. As expected, the results of most of the studies support French's belief (1956) that an individual of perceived high expertise gains more compliance than an individual of perceived low expertise. However, most of the studies cited have focused upon attitudinal conformity. These studies have supported Warren's finding (1968) of a significant positive correlation between expert power and attitudinal conformity. Unfortunately, there are not very many experiments which deal with the relationship between expert power and behavioral compliance. Moreover, those experiments which do exist have exhibited some contradictory results. Consequently, a behavioral measure of compliance was used in this study.

The literature cited also seems to indicate that the perception of expertise and, thus, expert power, is affected by sex bias. Both the sex stereotypic literature and the attribution theory literature indicate a tendency

on the part of both males and females to deny female competence. The devaluation of female competence is especially salient in traditionally male-dominated professions. There also exists a great deal of literature dealing with the relationship between sex bias and evaluation of an expert or his (her) performance. Generally, the results of these studies have indicated that both males and females devalue a female's competence in a traditionally male-dominated field. Furthermore, females devalued other females' competence in a female-dominated field. The results concerning males' evaluation of a female whose expertise is in a female-dominated field are inconclusive. The deficiency in most of these studies has been a lack of manipulation of the level of expertise. It is also evident that there is a paucity of literature concerned with the effects of sex bias on the ability of an expert to gain compliance in response to his or her perceived expertise (expert power). The two studies which deal with the effects of sex bias upon compliance to expert power indicate that males comply more to male experts than to female experts within a male-dominated field. It was also indicated that male and female experts gain the same amount of compliance from influencees in a field whose dominance was not determined but which could very likely have been perceived as a female-dominated field. Unfortunately, no one has conducted a study in which the effects due to sex of the subject, sex of the expert, level of expertise, and sex-domination of the

area of expertise have all been studied in relation to expert power. Therefore, this study was an attempt to look at all these variables in order to determine if and under what conditions sex bias augments expert power, and under what conditions sex bias abates expert power.

In view of the findings cited in the preceding literature, the following hypotheses seem reasonable:

A. Male-dominated occupation

1. An individual of high expertise will gain a greater degree of compliance than an individual of low expertise.

2. Of two people with equal expertise, a male expert will gain a greater degree of compliance than a female expert.

3. In order to conform to the sex-role behavior perceived to be appropriate, a female will comply to a greater degree than will a male.

4. Based upon the tendency of both males and females to devalue a female's competence, as well as, the reluctance of men to comply to a female, level of expertise and the sex of the expert were predicted to interact in the manner shown in Figure 1. It should be noted that this prediction does not coincide with the findings of Deaux and Taynor (1973) and Frankel and Kassinove (1974). In the former stance, low expert males were evaluated lower than equally low expert females. However, the authors did not determine the sex-domination of the area in which expertise was claimed and compliance was not used as the criterion. The Frankel and Kassinove study, in which no interaction effect was found, was the only study in this group that used compliance as the dependent variable. However, the sex-domination of the field was again not determined and it seems plausible that the occupation studied could have been perceived as being female-dominated.

5. Not much literature exists on the interaction between level of expertise and sex of the influencee upon compliance. However, based upon the stereotypic view that females should be more compliant, dependent, and incompetent than males, the author

felt that the females' degree of compliance when confronted by a high level expert would be exaggerated upward. According to French and Raven (1966), the less one knows in relation to another, the greater the power of the latter over the former. Given the male-dominance of the field, females may stereotypically feel very inferior in their knowledge and, thus, allow the high level expert to exert more influence than males would. The hypothesized interaction is depicted in Figure 2. Contrary to this prediction, Deaux and Taynor (1973) found no significant interaction between level of competence and sex of the subject. However, their dependent variable was evaluation of the expert's competence rather than compliance to expert power. Moreover, the sex-domination of the area of competence was not determined.

6. Various studies have demonstrated that both females and males devalue a female's competence especially when it is claimed within a male-dominated field, but attribute ability to a competent male (Deaux and Emswiller, 1974; Mischel, 1974; Taynor & Deaux, 1973). Therefore, one may predict that males and females would demonstrate equally high degrees of compliance to a male and equally low degrees of compliance to a female of equal expertise. However, based upon the stereotypic belief that females should be more compliant and upon the arguments presented in hypothesis 5 concerning the female's feeling of inferiority within a male-dominated field, the author hypothesized that females would allow the male expert to exert more influence than the males would. Figure 3 displays the hypothesized interaction. Schmitt (1973) found that females reacted more negatively to a female expert in a male-dominated field than did males. However, since the dependent variable in the present study is compliance, it was predicted that males would react with as little compliance as the females.

B. Female-dominated occupation

7. An individual of high expertise will gain a greater degree of compliance than an individual of low expertise.

8. A female will gain the same degree of compliance as a male of equal expertise. This hypothesis was based upon the findings of Deaux and Emswiller (1974) and Frankel and Kassinove (1974).

9. A female will comply to a greater degree than will a male.

10. Based upon Frankel and Kassinove's finding of no interaction effect of level of expertise and sex of the expert upon compliance, as well as, Deaux and Emswiller's finding (1974) that males and females within a female-dominated field are attributed with the same level of ability, it was hypothesized that a female and a male of equal levels of expertise will elicit the same degree of compliance. It should be noted that this prediction is not congruent with the findings of Goldberg (1968), nor those of Mischel (1974). In the former case, female subjects evaluated the competence of female experts lower than that of equally competent male experts in a female-dominated field, while the opposite occurred in the Mischel study where both sexes served as subjects.

11. Not much research exists on the combined effects of level of expertise and sex of the influencee upon compliance in a female-dominated field. Based upon the stereotype of the compliant female, the author hypothesized that a female influencee would conform to this stereotype by reacting with a substantially higher degree of compliance than a male when confronted by a high level expert whereas the difference in compliance between the two sexes when confronted by a low level expert would not be as great. The hypothesized effect is shown in Figure 2. This prediction is tenuous because females may not be as stereotypically compliant when faced with a situation in which it is appropriate for a female to be competent. Deaux and Taynor (1973) found no significant interaction between level of competence and sex of the subject. It should be remembered, however, that they did not determine the sex-dominance of the field and they used evaluation, rather than compliance, as the dependent variable.

12. No hypothesis was made concerning the combined effects of the sex of the expert and the sex of the influencee upon compliance due to the lack of a theoretical base for an hypothesis concerning the relationship of these two variables within a female-dominated field.

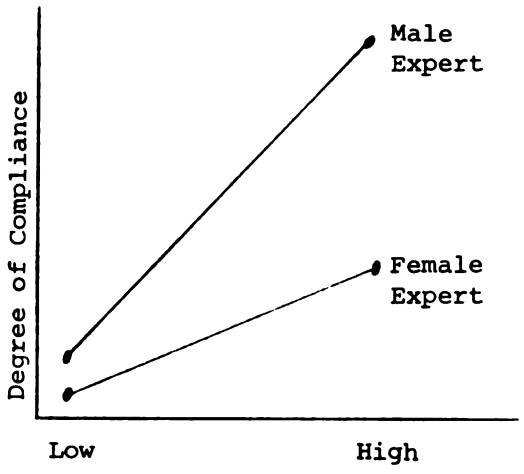


Figure 1. Hypothesized Interaction Between Level of Expertise and Sex of the Expert in the Male-Dominated Occupation Experiment.

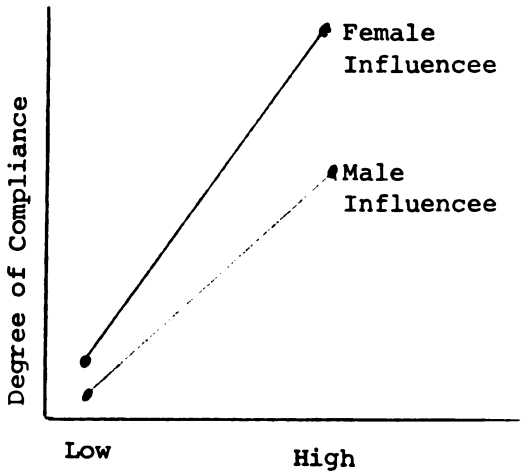


Figure 2. Hypothesized Interaction Between Level of Expertise and Sex of the Influencee in Both Experiments.

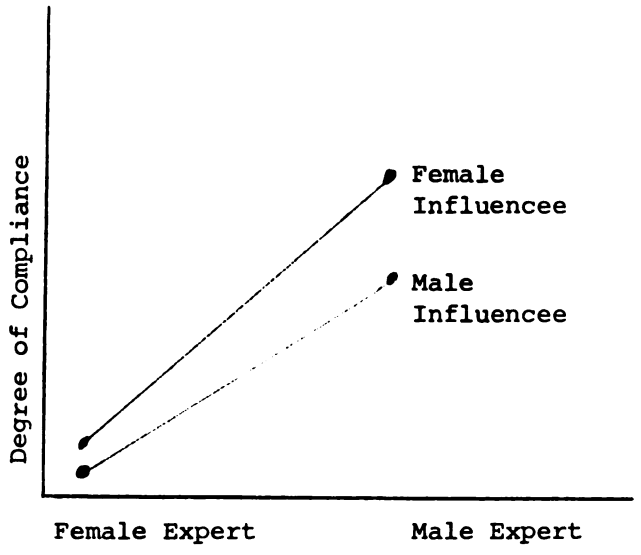


Figure 3. Hypothesized Interaction Between Sex of the Expert and Sex of the Subject in the Male-Dominated Occupation Experiment.

METHOD

Subjects and Design

A power analysis on pilot data was performed in order to determine the number of subjects needed to obtain a difference between two groups with power of .90 and an alpha equal to .05. A difference of .5 standard deviations was considered to be practically significant. The power analysis revealed that a total of 240 subjects was needed; 120 for each of the two experiments to be described.

The subject sample consisted of 120 male and 120 female Michigan State University undergraduates. An equal number of subjects and an equal number of males and females were randomly assigned to one of two experiments: (1) one dealing with a female-dominated profession, and (2) one dealing with a male-dominated profession. Thus, there were 60 males and 60 females in each experiment. The independent variables within each experiment were sex of subject (influencee), sex of expert, and level of expertise of the expert (high or low). Therefore, each experiment had a 2x2x2 design with 15 subjects within each cell.

A female-dominated field was defined as being one in which the vast majority of the members is female, while a

male-dominated field was defined as being one in which the vast majority of the members is male. On the basis of these definitions, the occupations of nursing and industrial engineering were used in this study as the female-dominated and the male-dominated field, respectively.

Male-dominated Occupation

Procedure. Each subject was informed that the purpose of the experiment was to evaluate the use of the in-basket technique as a selection device for managerial positions. The experimenter also provided a brief description of the in-basket technique and told each subject that he or she would take part in this procedure during the experiment. Subjects were then asked to take the role of a business executive in charge of production in a large industrial organization which manufactures automobiles. Each subject was told that the in-basket included information concerning the performance and experience of various employees, letters, and memos which required some sort of response or decision on his or her part. In further describing the position in which each subject was to assume he or she was placed, the experimenter told each subject to assume that it was one hour before quitting time on Friday, and, therefore, it would be possible to plan what to do about each problem, but impossible to carry out all his or her plans before closing. Therefore, each subject was asked to write his or her plans for dealing with each situation if such plans were requested

on the memo. Finally, each subject was instructed to continue with the task for one hour, and to read and work on the material in the order in which it was placed in the in-basket.

The critical information and memos for the experiment consisted of a staff list, a memo from the personnel director, a performance evaluation for each of the engineers concerned with production problems, and three memos from one of the engineers. These critical materials were interspersed among other memos which were irrelevant to the purpose of the experiment. The information was ordered in the basket so that the subjects would view the staff list, the memo from the personnel director, and the performance evaluations prior to reading the memos from the engineer. The memos from the engineer were not presented consecutively, but were interspersed among the irrelevant memos. The list of engineers contained both males and females in order to manipulate the sex of the expert. Manipulation of the level of expertise was accomplished through the performance evaluation of the engineers. The performance evaluation consisted of ratings of each of the engineers on three dimensions: knowledge, skill, and experience. For the following performance evaluation, the knowledge and skill scales were adopted from two graphic rating scales (Paterson, 1962).

1. Knowledge
("Consider present knowledge of job and of work related to it (Paterson, 1962, p. 146))."

Complete	Well Informed	Moderate	Meagre	Lacking

2. Skill
("Consider his or her success in doing things in new and better ways and in adapting improved methods to his or her own work (Paterson, 1962, p. 148))."

Highly Constructive	Resourceful	Fairly Progressive	Routine Worker

3. Experience
(Consider past job experience in your company and in other similar situations).

3 or more years with this organization and 3 or more years with a similar organization	1-3 years with this organization and 3 or more years with a similar organization	3 or more years with a similar organization	Less than 3 years with a similar organization	No experience

The high level expert was rated as having complete knowledge, as being highly constructive, and as having one to three years of experience with this organization and three or more years of experience with a similar organization. The engineer who was to be perceived as being of a low level of expertise was rated as having a moderate degree of knowledge, as being a routine worker, and as having no previous experience. At the bottom of each performance

evaluation was a multiple-choice question which required that the subject rate the engineer's overall competence as either 1-high, 2-average, 3-fair, or 4-poor. This question served as a manipulation check of the engineer's perceived level of expertise.

The purpose of the memo from the personnel director was to emphasize the level of expertise of one of the engineers. If the subject was in the high level condition, the memo stated that the particular engineer was to receive a bonus for his or her invention of a device resulting in increased production. If the subject was in the low level condition, the memo stated that a request for a raise by the particular engineer was being denied until the engineer showed some improvement in performance. These memos required no action on the part of the subjects.

Dependent variables. Each of the three critical memos from the engineer contained a recommendation. The recommendations were concerned with a new spatial arrangement of the production line, the speed of the assembly line, and the purchase of new punch press machines. A copy of the three memos can be found in Appendix A. For each subject, all three of the memos were attributed to the engineer who was the subject of the personnel director's memo, and who was one of four types of engineers: (1) female-high expert, (2) female-low expert, (3) male-high expert, (4) male-low

expert. Subjects were randomly assigned to one of these conditions.

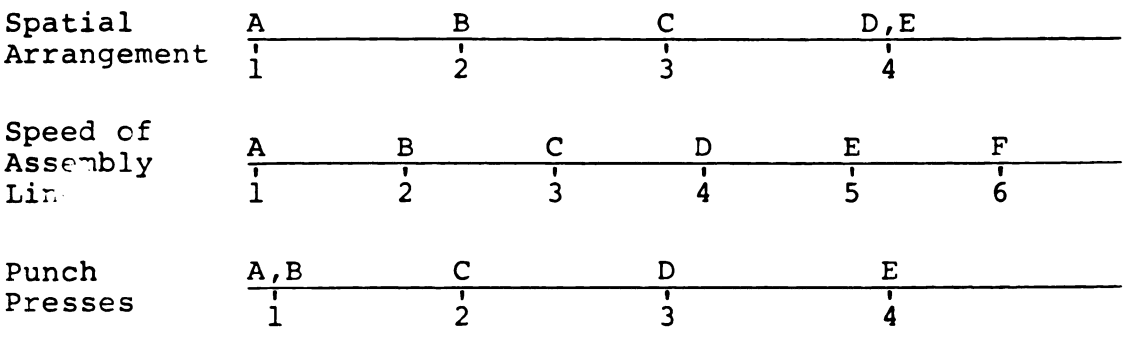
At the bottom of each memo, the subject was asked to react to the recommendation by choosing among the five or six possible responses listed. The subject's choice of response served as the indication of his or her degree of compliance to the recommendation in that the responses were considered to be parts of a continuum extending from low compliance to high compliance. This continuum was formed by having between 26 and 29 subjects in a pilot study rank order the alternatives for each recommendation from 1 to n (n = number of alternatives) with 1 being the alternative which indicated the least compliance with the engineer's recommendation and n being the alternative which represented the most compliance. The means and standard deviations of the rankings for each alternative can be found in Table 1.

As can be seen in Table 1, the means generally increase moving from alternative A to alternative E or F and, thus, indicate increasing degrees of compliance. However, the means for alternatives D and E in the spatial arrangement recommendation indicated that they probably measured the same degree of compliance. This circumstance was also found to be true for alternatives A and B in the punch press recommendation. On the basis of these results, three continua were formed by associating the alternatives for each recommendation with an integer value representing

Table 1.--Means and Standard Deviations of Compliance Rankings of Alternatives for Each Engineer Recommendation.

Recommendations	Alternatives					
	A	B	C	D	E	F
Spatial Arrangement	$\bar{x}$ = 2	$\bar{x}$ = 2.62	$\bar{x}$ = 3.31	$\bar{x}$ = 3.59	$\bar{x}$ = 3.48	
	s = 1.41	s = 1.08	s = 1.14	s = 1.09	s = 1.68	
Speed of Assembly Line	$\bar{x}$ = 1.73	$\bar{x}$ = 2.35	$\bar{x}$ = 2.96	$\bar{x}$ = 4.15	$\bar{x}$ = 4.58	$\bar{x}$ = 5.19
	s = 1.15	s = 1.35	s = 1.17	s = 1.46	s = .95	s = 1.06
Purchase of Punch Presses	$\bar{x}$ = 2.44	$\bar{x}$ = 2.41	$\bar{x}$ = 2.7	$\bar{x}$ = 3.37	$\bar{x}$ = 4.07	
	s = 1.58	s = 1.37	s = .99	s = 1.47	s = .87	

the alternative's degree of compliance. The following continua resulted:



Thus, there were three dependent variables corresponding to the three recommendations, which were used to measure the degree of compliance.

Female-dominated Occupation

Procedure. The procedure within the female-dominated field was similar to the procedure used within the male-dominated field. Subjects were told that they were to assume the role of a hospital administrator in charge of patient care. Correspondingly, each subject received a staff list, a memo from the personnel director, performance evaluations of several head nurses, and three recommendations from one of the head nurses. The level of expertise was manipulated by the performance evaluations in the same manner as that previously discussed. Each performance evaluation included a multiple-choice question to assess the subject's perception of the level of expertise of the head nurse.

For subjects in the high expert condition, the memo from the personnel director stated that a particular head nurse was going to receive a salary increase due to his or her excellent performance in the unit. For subjects in the low expert condition, the memo stated that the raise requested by a particular head nurse was being denied until his or her performance improved.

Dependent variables. Each of the three memos from a particular head nurse concerned one of three recommendations: (1) a change in the criterion for assigning nurses to a unit; (2) purchase of throw-away needles due to improper sterilization; (3) a change in the scheduling of bathing the patients. A copy of the three memos can be found in Appendix B.

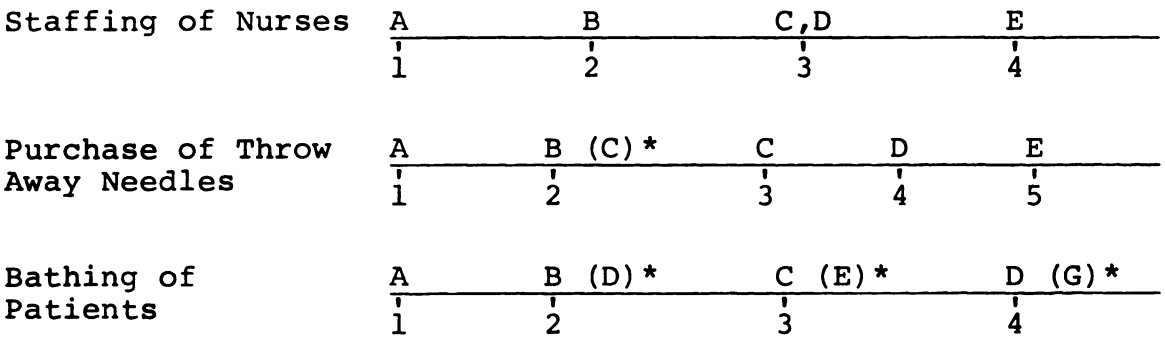
At the bottom of each memo, the subject was asked to react to the recommendation by choosing among four or five possible responses listed. As before, these responses were considered to be parts of a compliance continuum formed in the same manner as those used in the previously described experiment, except that the number of subjects who ranked the alternatives for each recommendation ranged between 23 and 28. For each of the three recommendations, the means and standard deviations of the rankings for each alternative can be found in Table 2.

Generally the data in Table 2 indicate that the means increase as one moves from alternative A to the last

Table 2.--Means and Standard Deviations of Compliance Rankings of Alternatives for Each Head Nurse Recommendation.

Recommendations	Alternatives						
	A	B	C	D	E	F	G
Staffing of Nurses	$\bar{x}$ = 1.5	$\bar{x}$ = 2.75	$\bar{x}$ = 3.46	$\bar{x}$ = 3.5	$\bar{x}$ = 3.79		
	s = 1.14	s = 1.21	s = 1.00	s = 1.23	s = 1.26		
Purchase of Throw-Away Needles	$\bar{x}$ = 2.79	$\bar{x}$ = 2.42	$\bar{x}$ = 3.38	$\bar{x}$ = 3.67	$\bar{x}$ = 4.08	$\bar{x}$ = 4.67	
	s = 1.25	s = 1.64	s = 1.76	s = 1.13	s = 1.84	s = 1.63	
Bathing of Patients	$\bar{x}$ = 2.26	$\bar{x}$ = 1.96	$\bar{x}$ = 3.87	$\bar{x}$ = 4.0	$\bar{x}$ = 4.87	$\bar{x}$ = 5.48	$\bar{x}$ = 5.57
	s = 1.39	s = 1.58	s = 1.69	s = 1.41	s = 1.39	s = 1.59	s = 1.53

alternative on each memo and, thus, indicate increasing degrees of compliance. Based on this data and the frequency distribution of the rankings for each alternative, alternative B of the throw-away needles recommendation and alternative B of the bathing of patients recommendation were eliminated from the final forms because they did not conform to the pattern of increasing means. Alternatives C and F of the bathing of patients recommendation were eliminated from the final form because, on the basis of their mean rankings, they appeared to reflect the same degrees of compliance as alternatives D and G respectively and had higher standard deviations than D and G. Finally, the mean rankings of alternatives C and D of the staffing of nurses recommendation indicated that they represented the same degree of compliance and, thus, were considered to lie at the same point on the compliance continuum. As previously, a continuum was constructed for each recommendation by assigning to each alternative an integer value representing the alternative's degree of compliance as determined in the pilot study. The following continua resulted:



The responses to these three recommendations served as three separate dependent variables used to measure compliance.

*The letter in parentheses symbolizes the alternative in the pilot study which was retained but was associated with a new letter in the recommendations used in this study (See Appendix B). The reassignment of letters to the alternatives was due to the elimination of various alternatives for reasons previously discussed.

DATA ANALYSIS

Since there were three dependent variables within each experiment, a multivariate analysis of variance was performed for each experiment separately, using level of expertise, sex of the expert, and sex of the subject (influencee) as the independent variables. Since there was no criterion such as complexity, importance, time, etc., upon which to order the dependent variables, the univariate F statistics were used in determining the significance of an independent variable's effect upon each dependent variable rather than the step-down tests, since the latter presupposes a logical ordering of the dependent variables. Three simple contrasts were constructed to test the main effects and were shown to have the property of orthogonality. Simple contrasts were also used in constructing four other contrasts which represented the three two-way interactions and the three-way interaction effect. As is the practice in multivariate analyses, the three-way interaction effect was ordered last in the analysis, followed by the three two-way interaction effects, in order that they could be tested independently of the main effects

and eliminated from consideration if they proved to be nonsignificant. Due to the orthogonality of the contrasts and the existence of an equal number of subjects in each cell, each main effect contrast was independent of the other main effect contrasts and, as a result, the order in which they were placed in the analysis was irrelevant.

RESULTS

Experiment 1: Male-dominated occupation

Experimental manipulation. In order to assess whether or not the memo from the personnel director and the performance evaluations successfully manipulated the perceived level of expertise of the engineers, a t-test was performed on the subjects' rating of the overall competence of the engineer who represented the particular subject's experimental condition, i.e., high expertise-female engineer, high expertise-male engineer, low expertise-female engineer, low expertise-male engineer. The independent variable was level of expertise. The analysis revealed that subjects in the high expert condition rated the overall competence of their particular high expert engineer significantly higher than the subjects in the low expert condition rated the overall competence of their relevant low expert engineer, $t(118) = 22.998$, $p < .001$. The mean rating of competence in the high expert condition was 1.07 while the mean rating in the medium expert condition was 3.38. Thus, it appears that the subjects' perceptions of the level of expertise of the engineer who represented

the subject's particular experimental condition were successfully manipulated.

Characteristics of dependent variables. The means and standard deviations of each of the three recommendations are reported in Table 3. Table 3 also includes the intercorrelations of the three recommendations. As can be seen, correlations among the three variables ranged from about .25 to about .36.

Table 3.--Means, Standard Deviations, and Intercorrelations of the Engineer Recommendations.

Recommendations	Means	Standard Deviations	Intercorrelations		
			Spatial Arrangement	Speed of Assembly Line	Purchase of Punch Presses
Spatial Arrangement	2.78	1.10	1.00		
Speed of Assembly Line	4.35	1.35	.25	1.00	
Purchase of Punch Presses	2.29	1.18	.28	.36	1.00

Due to the moderate level of intercorrelation of these dependent variables, the use of a multivariate analysis of variance to assess the effects of the independent variables seemed appropriate.

Effects of level of expertise, sex of the expert, and sex of the subject upon compliance. The observed cell means upon which the multivariate analysis of variance was based are reported in Table 4 for each dependent variable. Table 4 also includes the cell standard deviations. Table 5 presents the results of the multivariate analysis of variance for each main effect contrast and the two-way and three-way interaction effects. In each case, the degrees of freedom associated with the hypothesis sum of squares was three and the degrees of freedom for the error term was 110.

The multivariate tests indicated that neither the three-way interaction effect, nor any of the two-way interaction effects reached significance. Furthermore, no significant multivariate main effects were found for sex of the expert and sex of the subject. However, the multivariate F for level of expertise did reach an acceptable level of significance ($p < .01$) indicating that the high and the low levels of expertise had differential effects upon degree of compliance for at least one of the recommendations. In determining upon which of the dependent variables compliance was differentially affected by level of expertise, it became necessary to look at the univariate F test for each recommendation with level of expertise as the independent variable. The results of the one-way analysis of variance for each dependent variable are also presented in Table 5.

Table 4.--Observed Cell Means and Standard Deviations for Male-Dominated Occupation Experiment.

Level of Expertise	Sex of Expert	Sex of Subject	Spatial Arrangement		Speed of Assembly Line		Purchase of Punch Presses	
			$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
Low	Male	Male	2.13	1.06	3.6	1.12	2.27	1.28
Low	Male	Female	1.93	1.16	4.2	1.26	2.0	1.20
Low	Female	Male	2.33	.98	3.93	1.22	2.27	1.22
Low	Female	Female	2.33	1.18	4.0	.76	1.93	.96
High	Male	Male	3.53	.52	4.8	1.37	2.73	1.10
High	Male	Female	3.33	.90	4.93	1.10	2.13	1.30
High	Female	Male	3.13	.92	4.6	1.64	2.53	1.13
High	Female	Female	3.47	.64	4.73	1.75	2.47	1.30

Table 5.--Three-Way Multivariate and Univariate Analyses of Variance for Compliance in Response to Engineer Recommendations.

Effects	Multivariate Analysis		Univariate Analysis[a]			
	df	F	df	F_{DV1}	F_{DV2}	F_{DV3}
Level of expertise (A)	3	18.27*	1	47.11*	12.10*	2.59
Sex of expert (B)	3	.11	1	.23	.08	.01
Sex of subject (C)	3	1.53	1	.01	.95	2.12
A x B	3	.75	1	1.58	.31	.05
A x C	3	.15	1	.23	.17	.01
B x C	3	.62	1	1.13	.31	.29
A x B x C	3	.23	1	.23	.31	.48
Error	110		112	(.89)	(1.72)	(1.42)

Note. Numbers in parentheses indicate the mean square error.

[a] DV1, DV2, DV3 equals the spatial arrangement recommendation, the speed of assembly line recommendation, and the purchase of punch presses recommendation, respectively.

*$p < .01$

The univariate Fs suggested that there was no significant difference in the degrees of compliance exhibited by those in the high level condition and those in the low level condition for the recommendation dealing with the purchase of punch presses. However, significant differences in the degree of compliance for the two groups were found in response to the recommendation concerning the spatial arrangement of the assembly line ($p < .01$) and the recommendation concerning the speed of the assembly line ($p < .01$). In the former instance, the mean degree of compliance in the high expert condition was 3.37 and the mean of the low expert group was 2.18. For the speed of the line recommendation, the mean degree of compliance for the high and low expert groups were 4.77 and 3.93 respectively. It should be noted that in using the univariate Fs as the determinants of significant effects for each dependent variable, the results found for one of the dependent variables may not have been independent of the results found for the other dependent variables but instead may have been confounded by the effects of the other dependent variables since the correlation matrix indicated that these variables were correlated.

An omega squared was computed in order to determine the strength of association between level of expertise and each of the two dependent variables for which significant main effects were found. The omega squared associated with

the spatial arrangement recommendation was equal to .29, while it was equal to .09 for the speed of the assembly line recommendation. Thus, level of expertise accounted for approximately 29 percent of the variance in degree of compliance on the spatial arrangement recommendation and approximately 9 percent of the variance on the speed of the line recommendation.

Experiment 2: Female-dominated occupation

Experimental manipulation. An independent sample t-test was again performed on the subjects' rating of the overall competence of the engineer representing the subject's experimental condition. The results indicated that the manipulation of the level of expertise did produce a significant effect, $t(118) = 19.87$, $p < .001$. The mean rating of competence in the high expert condition was 1.00, while the mean rating in the low expert condition was 3.28. Therefore, it appears that the subjects' perceptions of the level of expertise were successfully manipulated, i.e., subjects in the high expert condition rated the overall competence of their male or female high expert engineer significantly higher than the subjects in the low expert condition rated the overall competence of their relevant male or female low expert engineer.

Characteristics of dependent variables. The means, standard deviations, and intercorrelations of the three recommendations are presented in Table 6.

Table 6.--Means, Standard Deviations, and Intercorrelations of the Head Nurse Recommendations.

Recommendations	Means	Standard Deviations	Intercorrelations		
			Staffing of Nurses	Purchase of Throw-Away Needles	Bathing of Patients
Staffing of Nurses	3.11	.58	1.0		
Purchase of Throw-Away Needles	2.61	1.45	.27	1.0	
Bathing of Patients	2.06	1.15	.18	.30	1.0

As Table indicates, the correlations ranged from about .18 to about .30. As previously, these intercorrelations indicated that a multivariate analysis of variance was appropriate.

Effects of level of expertise, sex of the expert, and sex of the subject upon compliance. The observed cell means and standard deviations are reported in Table 7 for each dependent variable. Table 8 reports the results of the multivariate analysis of variance for each main effect contrast, each two-way interaction effect, and the three-way interaction effect. In testing each effect, the degrees of freedom associated with the hypothesis sum of squares was three and the degrees of freedom for the error term was 110.

The multivariate F tests showed that all of the two-way interaction effects and two of the main effects, sex of the expert and sex of the subject, did not reach an acceptable level of significance ($p < .05$). However, a significant result ($p < .01$) was found for the multivariate three-way interaction contrast, expert level x sex of expert x sex of subject. The univariate Fs associated with the three-way interaction effect were referred to in order to ascertain the dependent variable(s) for which the three-way interaction effect was (were) significant. Table 8 also reports the results of the analysis of variance for each dependent variable.

Table 7.--Observed Cell Means and Standard Deviations for Female-Dominated Occupation Experiment.

Level of Expertise	Sex of Expert	Sex of Subject	Staffing of Nurses		Purchase of Throw-Away Needles		Bathing of Patients	
			$\bar{x}$	s	$\bar{x}$	s	$\bar{x}$	s
Low	Male	Male	2.87	.74	1.9	.89	2.21	1.36
Low	Male	Female	3.07	.46	2.07	1.39	1.27	.70
Low	Female	Male	2.87	.64	2.93	1.49	1.87	1.06
Low	Female	Female	2.8	.41	2.13	1.30	2.2	1.01
High	Male	Male	3.4	.51	3.5	1.61	2.23	1.22
High	Male	Female	3.2	.41	2.8	1.47	2.33	1.18
High	Female	Male	3.4	.51	2.23	1.29	2.07	1.32
High	Female	Female	3.27	.59	3.33	1.40	2.33	1.11

Table 8.--Three-Way Multivariate and Univariate Analyses of Variance for Compliance in Response to Head Nurse Recommendations.

Effects	Multivariate Analysis		Univariate Analysis[a]			
	df	F	df	F_{DV1}	F_{DV2}	F_{DV3}
Level of expertise(A)	3	7.04*	1	17.5*	8.01*	2.95
Sex of expert(B)	3	.25	1	.25	.13	.28
Sex of subject(C)	3	.10	1	.25	.05	.08
A x B	3	1.73	1	.70	3.36	.81
A x C	3	1.42	1	1.37	1.07	1.37
B x C	3	1.27	1	.25	.69	2.95
A x B x C	3	4.25*	1	.70	7.64*	1.82
Error	110		112	(.30)	(1.88)	(1.29)

Note. Numbers in parentheses indicate the mean square error.

[a]DV1, DV2, DV3 equals the staffing of nurses recommendation, the purchase of throw-away needles recommendation, and the bathing of patients recommendation, respectively.

*$p < .01$

According to the univariate F tests, the three-way interaction effect was not significant for the recommendation pertaining to the staffing of nurses nor for the one discussing the bathing of patients. However, a significant result ($p < .01$) was evidenced for the recommendation suggesting the purchase of throw-away needles. An omega squared was computed between the significant three-way interaction effect and degree of compliance on the needle recommendation in order to estimate the strength of this association. It was found to be equal to .05. In other words, the three-way interaction effect accounted for approximately 5 percent of the variance in degree of compliance on the needle recommendation.

The mere fact that a significant three-way interaction effect existed for the needle recommendation did not provide any descriptive information about how the levels of the independent variables interacted to produce this significant effect. To provide an understanding of this effect, the three-way interaction effect for the needle recommendation was subjected to further analyses. Based upon one of the independent variables, sex of the subject, the subject sample was divided into two groups, one consisting of the female subjects and the other one comprised of the male subjects. Within each of these groups, an analysis of variance was performed using level of expertise and sex of the expert as the independent variables. The results of the

2x2 analysis of variance for the female subjects and the male subjects can be found in Table 9.

In comparing the results for the female subjects to those of the male subjects, it can be seen that the expert level x sex of expert interaction effect was not significant for the former group but was significant ($p < .01$) for the males. The fact that the expert level x sex of expert effect reached significance in one category of the third independent variable but not in the other category accounted for the significance of the three-way interaction effect for the needle recommendation.

Table 9.--Analysis of Variance for Effects of Level of Expertise and Sex of the Expert Upon Female and Male Subjects' Compliance to the Purchase of Throw-Away Needles Recommendation.

Effects		Female S's		Male S's	
	df	MS	F	MS	F
Level of Expertise (A)	1	14.02	7.24*	3.04	1.67
Sex of Expert (B)	1	1.35	.70	.20	.11
A x B	1	.82	.42	19.84	10.90*
Error	56	1.94		1.82	
Total	59	2.11		2.12	

*$p < .01$

Figure 4 consists of plots of the mean degree of compliance in each cell and, thus, provides a pictorial representation of the two-way interaction effects for female and male subjects. In congruence with the 2 x 2 analysis of variance results, the graph for the female subjects suggests no significant interaction effect has occurred, while the graph for the male subjects strongly suggests the presence of a disordinal interaction. In the former instance, it appeared that female subjects responded with a greater degree of compliance to high level experts as compared to low level experts regardless of the sex of the expert, and that sex of the expert, in and of itself, had no differential effects upon compliance. Table 9 substantiates this graphic interpretation by reporting a significant main effect for level of expertise ($p < .01$) and no significant main effect for sex of the expert.

The graph representing the mean degree of compliance in each expert level x sex of expert condition for the males presents a totally different picture. In this case, it appeared that male high level experts elicited a greater degree of compliance than female high level experts. However, when the experts were of low expertise, female experts derived more compliance from male subjects than did male experts. Independent sample t-tests were conducted to discover whether or not these differences were statistically significant. The results supported the proposition that males in the high level male expert group exhibited a

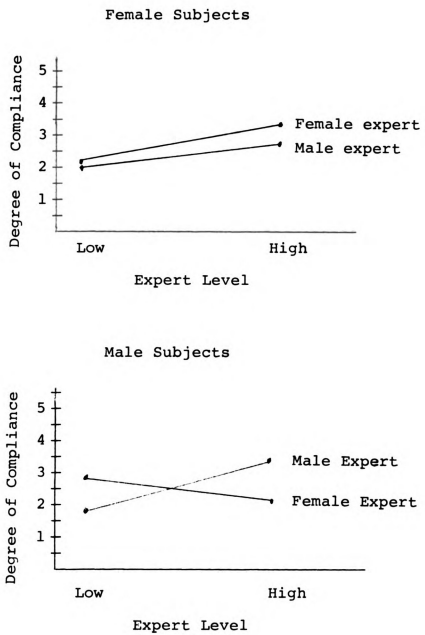


Figure 4. Mean Degree of Compliance to Purchase of Throw-Away Needle Recommendation for Females and Males Separately.

significantly greater degree of compliance than male subjects in the high level female expert group, $t(28) = 2.371$, $p < .05$. Similarly, the evidence suggested that the needle recommendation emanating from a female of low expertise elicited a significantly higher degree of compliance from male influencees than the needle recommendation received from a male of low expertise, $t(28) = 2.31$, $p < .05$.

In analyzing further the nature of the two-way interaction, independent sample t-tests were performed for the following comparisons: high male expert-low female expert, high female expert-low male expert, high male expert-low male expert, high female expert-low female expert. The only result which reached significance occurred in the comparison of the high male expert condition with the low male expert condition. The mean degree of compliance of those subjects in the former group was 3.5, while the mean degree of compliance of those in the latter group was 1.9. It appeared that male subjects complied to a significantly greater degree to a recommendation emanating from a male of high expertise than to the same recommendation originated by a male of low expertise, $t(28) = 3.361$, $p < .01$. Two other interesting findings were that a high expert level female did not elicit a significantly greater degree of compliance than either a low expert level male or a low expert level female. As a matter-of-fact, there was a tendency for the female of low expertise to

elicit a greater degree of compliance from males than a female of high expertise.

Table 8 not only shows that there was a significant multivariate three-way interaction effect but also that there was a significant multivariate main effect for level of expertise ($p < .01$). The latter result indicated that the high and low levels of expertise were responded to with different degrees of compliance for at least one of the dependent variables. To resolve the issue of which dependent variable(s) was (were) differentially affected by level of expertise, the univariate F tests using level of expertise as the independent variable were again consulted. The results of the one-way analysis of variance for each dependent variable are also shown in Table 8.

Based upon the significance tests of these univariate Fs, it appeared that there was no difference in the degree of compliance exhibited by those in the high level condition and those in the low level condition for the recommendation pertaining to the bathing of patients. However, subjects in these two groups did react with significantly different degrees of compliance in response to the recommendation concerning the staffing of nurses ($p < .01$), as well as, in response to the one proposing the purchase of throw-away needles ($p < .01$). In the former case, the mean degree of compliance in the high expert condition was 3.32, while it was equal to 2.9 in the low expert condition. For the needle recommendation, the mean degrees of

compliance for the high level and low level expert conditions were 2.97 and 2.26, respectively. The strength of association between level of expertise and degree of compliance was again determined by computing an omega squared. For the staff recommendation, the omega squared was equal to .12, while it was equal to .05 for the needle recommendation. Thus, level of expertise accounted for approximately 12 percent and 5 percent of the variance in degree of compliance on the staff recommendation and the needle recommendation, respectively.

It should again be mentioned that the univariate F test for one dependent variable was not independent of the univariate F tests for the other dependent variables since the correlation matrix suggested some degree of correlation among the dependent variables. This possibility existed for the univariate F tests called upon to further analyze the significant multivariate three-way interaction effect, as well as, those used to analyze the significant level of expertise main effect.

A summary of the multivariate results for both experiments is presented in Table 10.

Table 10.--Summary of the Significance of the Multivariate Effects for Both Experiments.

Effects	Male-Dominated Occupation	Female-Dominated Occupation
Level of Expertise (A)	significant	significant
Sex of Expert (B)	not significant	not significant
Sex of Subject (C)	not significant	not significant
A x B	not significant	not significant
A x C	not significant	not significant
B x C	not significant	not significant
A x B x C	not significant	significant

DISCUSSION

As can be seen in Table 10, the multivariate results for both the male-dominated occupation and the female-dominated occupation supported hypothesis 1 and hypothesis 7, respectively. Those individuals who were rated higher on overall competence elicited much more compliance in response to one or more of their recommendations than those who the subjects rated as having a lower degree of overall competence. These results corroborated the findings of many of the source credibility studies (Aronson & Golden, 1962; Aronson et al., 1963; Bergin, 1962; Horai et al., 1974; Hovland & Weiss, 1951; Kelman & Hovland, 1953), as well as, other studies which have examined the relationship between level of expertise and attitudinal compliance (Busch & Wilson, 1976; Mulder & Wilke, 1970). As proposed by French and Raven (1966), these findings suggested that expert power is a direct function of perceived level of expertise, i.e., those with a higher perceived level of expertise have more expert power than those who are perceived as having a low level of expertise.

Although the two experiments reported herein provided some support for the attitudinal compliance

literature, the measures used in the two experiments were intended to ascertain the degree of behavioral compliance. As noted previously, the results of other experiments which have focused upon the relationship between level of expertise and behavioral compliance have been inconsistent. The findings of Evan and Zelditch (1961) and Crisci and Kassinove (1973) are congruent with the present studies' findings in that a high level of expertise was associated with significantly more behavioral compliance than was a lower level of expertise. Busch and Wilson (1976) found similar results except that the dependent variable was a behavioral intention rather than a behavioral compliance measure. However, these researchers also used another measure, called a "behavioroid" measure, which according to Busch and Wilson required a greater behavioral commitment on the part of the subjects. Whether or not either of these two measures can be used to support or question the results found in the engineering and the nursing experiment is debatable, since it is difficult to determine if they actually measured behavioral compliance in response to an influence attempt. As stated previously, Busch and Wilson intended the communication presented to the subjects to be informational rather than persuasive. Thus, from the information provided in the study, one was not able to discern whether or not the communicator was actually trying to exert influence. Moreover, it was difficult to determine what behavior was supposed to be elicited in response to the influence

attempt, if it did exist. In responding to the behavioral intention measure, the subjects were to assume that they were interested in purchasing life insurance and to indicate how likely they would be to discuss life insurance with the salesman who delivered the communication. On the other hand, the behavioroid measure was used to determine the subjects' level of interest in insurance. Therefore, these indices did not appear to be measuring the same dimension. In short, the ambiguity regarding the existence of an influence attempt, as well as, its intended consequence, leads one to question if the behavioral intention and the behavioroid measures were actually indices of the degree of behavioral compliance elicited by an influence attempt.

Frankel and Kassinove (1974) also found that level of expertise had no differential effects upon behavioral compliance. As previously described, Frankel and Kassinove attempted to manipulate the level of expertise, and consequently the expert power, of school psychologists by introducing them to teachers as Dr. _____ (high expert) or Mr., Miss, or Mrs. ____ (low expert). The researchers offered a plausible explanation for the lack of an expert power main effect by stating that their manipulation of expertise may have been inadequate and may also have been confounded by the presence of legitimate power. Both of these problems were hypothesized to have occurred because in both the high expert power and low expert conditions, the individual was

introduced as being a school psychologist. This title may have granted the individuals equal levels of perceived expertise regardless of whether or not the psychologist was a Ph.D. Furthermore, the position of school psychologist probably has a certain amount of legitimate power accruing to it, and the teachers may have been partially reacting to this power source. If legitimate power, rather than expert power, was the factor in determining the teachers' compliance, both psychologists would have been expected to have elicited the same amount of compliance from the teachers since they would have had an equal amount of legitimacy. The two experiments reported herein did not suffer from these methodological problems. As indicated by the subjects' overall competence ratings, the manipulation of the level of expertise was successful in that the high expert engineer and nurse were perceived as having a greater degree of expertise than the low expert engineer and nurse, respectively. Furthermore, the expert power manipulation was not confounded by the presence of legitimate power since the experts were trying to elicit compliance from someone whose position in the hierarchy was higher than the position of the experts. Therefore, neither the engineers nor the nurses had any legitimate power with respect to the influencee.

At first glance, the results of both experiments appear to contradict Warren's findings (1968) that the

presence of expert power was not related to behavioral conformity, but was positively and significantly related to the presence of attitudinal conformity. Actually, the supposed difference in results found between the engineering and nursing experiments and those reported by Warren can be reconciled quite easily. Both attitudinal and behavioral conformity manifest themselves through behavioral compliance. The way to distinguish between these two types of conformity is not only to measure behavioral compliance but also to establish whether or not a change in attitude has accompanied the behavioral compliance. In the engineering and nursing experiments, no measure of attitude change was performed and, thus, it was impossible to establish whether the observed behavioral compliance was simply the result of behavioral conformity or a manifestation of attitudinal conformity. If one accepts Warren's results, one would be inclined to espouse the latter stance.

Although the results indicated that level of expertise had an effect upon the degree of compliance elicited from an influencee, these findings must be interpreted cautiously. This result could have been due to an idiosyncracy of the memo used in this in-basket. More specifically, subjects in the low expert condition may have felt that their engineer or nurse had an ulterior motive in making the recommendations. As stated in a memo from the personnel director, the low level expert had been denied a salary increase until his or her performance improved. The

subjects may have felt that by making three recommendations the low level experts were merely trying to obtain a raise and, as a result, may have reacted negatively. One other reason for caution stems from Busch and Wilson's finding (1976) that a high level of expertise resulted in a significantly greater degree of trust in the expert than did a lower level of expertise. This result suggests that these variables may be positively related to each other. Generally, the source credibility studies have not attempted to separate these variables from each other in order to determine their independent effects upon compliance. Theoretically, it is feasible that level of expertise does not impact upon compliance directly but, instead, influences the expert's perceived trustworthiness, which then affects the amount of compliance obtained, i.e., trust is an intervening variable in the relationship between level of expertise and compliance. Until the relationship between level of expertise and trust is fully elucidated, one must question whether or not the results of the male-dominated and female-dominated experiments indicate that level of expertise directly influences the degree of compliance obtained.

The omega squared calculated for the relationship between level of expertise and each of the recommendations for which this independent variable was significant indicated that it accounted for 29 percent, 9 percent, 12

percent, and 5 percent of the variance on the spatial arrangement recommendation, the speed of the assembly line recommendation, the staffing recommendation, and the needle recommendation, respectively. According to Cohen's criterion (1969) the omega squared of 29 percent is representative of a large size effect, while an omega squared of 9 percent and one of 12 percent are indicative of a medium size effect. In other words, as compared to the size of the correlations found in the behavioral sciences, these results represented a relatively strong relationship between level of expertise and compliance as measured on the spatial arrangement, speed of the assembly line, and staffing recommendations. Cohen associates a small size effect with an r^2 equal to .01 and a medium size effect with an r^2 of .09. Therefore, when 5 percent of the variance is accounted for, as is the case in the needle recommendation, one would probably classify this result as a small size effect and would certainly consider it to be practically significant.

In the male-dominated occupation experiment, hypothesis 2, which postulated that a male expert would have more expert power, i.e., gain a greater degree of compliance, than a female of equal expertise was not supported. This result was puzzling since much of the evidence accumulated over a series of studies concerning sex bias showed a tendency on the part of males, as well as, females,

to avoid attributing competency to a female, especially when her expertise was claimed in a male-dominated field (Broverman et al., 1972; Deaux & Emswiller, 1974; Feather & Simon, 1975; Fernsberger, 1948; Goldberg, 1968; Sherriffs & Jarrett, 1953; Sherriffs & McKee, 1957; Taynor & Deaux, 1973). Furthermore, Rosen and Jerdee (1974) found that males complied to the recommendation of a male supervisor to a greater extent than to a female supervisor when they recommended that an employee be terminated due to performance problems.

Hypothesis 4 which predicted the occurrence of a significant interaction effect between level of expertise and sex of the expert was also disconfirmed. This hypothesis was prompted by the expectation that the perception of the expertise of a very competent engineer would be exaggerated upward by the fact that the engineer was a male, while the perception of the expertise of a competent female engineer would be downgraded. These expectations were particularly compelling because they served to reinforce the stereotypic view that males are competent and females are incompetent, especially in a male-dominated field. Some support for these beliefs was derived from an attribution theory study in which ability was considered to be a more important cause of male success than female success, while lack of ability was cited as a more important cause of female failure than of male failure (Feather & Simon, 1975).

A possible explanation for the failure of hypothesis 2 and hypothesis 4 to gain support can be found in the results and discussion presented by Pheterson et al. (1971). They found that when female subjects were presented with paintings which were entered in a contest, the females judged the male painters to have more technical competence than the female painters. However, those subjects who were told that the paintings had been winners in a contest judged the technical competence of the male and female painters to be equivalent. The explanation proposed by Pheterson and his associates was that females will be judged to be as competent as men only when the females receive special distinction. As stated in a previous section, it would appear that people, or at least women, are more prone to acknowledge a woman's expertise when the existence of that expertise has been established by an outside source. In relating Pheterson et al.'s findings to the present experiment, it should be recalled that the in-basket used in the present experiment contained supervisory performance evaluations of the engineers and a memo from the personnel director concerning the engineer's performance. In manipulating the level of expertise in this manner, the female engineers received outside recognition of their competence. On the basis of Pheterson et al.'s findings concerning the effects of outside recognition, one would expect the male and female engineers to have been perceived as being of equal competence and, therefore, as having the same amount

of expert power. Under such conditions, one would anticipate the nonsignificance of the sex of expert effect and the level of expertise by sex of expert effect found in this study.

Hypothesis 3 which postulated that females would comply more than males and hypothesis 5 which predicted a level of expertise x sex of subject interaction effect also found no support in the data. Both hypotheses were borne out of the sex-role stereotypic belief that females should behave more submissively than males. In 1972, Broverman et al. (1972) found that this belief was still a part of the sex-role norms held by both men and women. The lack of significant effects with respect to hypotheses 3 and 5 can possibly be understood if one considers the role which the subjects were asked to assume. By asking the male and female subjects to assume that they were production managers, they were placed in a position of power and, more importantly, they were automatically given legitimate power with respect to the engineers. More specifically, the female subjects, as well as, the male subjects were given the impression that they were not expected to play a submissive role but were expected to take charge of their department. Assuming that the subjects adopted the normative behavior accruing to the role of production manager, one would not expect the females to comply more than the males in this context.

Hypothesis 6, which suggested that there would be a significant interaction effect between sex of the influencee and sex of the expert was not confirmed. The anticipation of an interaction effect was based on the belief that females would comply more than males in response to a male expert but that they would display the same degree of non-compliance in response to a female expert. The former premise was based on the stereotypic belief that it is appropriate for females to be more submissive than males, while the belief that males and females would be equally noncompliant to a female expert was based on the previously cited literature indicating that both males and females devalue the competence of women. However, as previously discussed, the stereotypic notion pertaining to the greater submissiveness of females as compared to males and the devaluation of a female's competence may not have had the opportunity to operate in this study. In the absence of these variables, one would not expect a significant sex of influencee x sex of expert interaction effect.

Although no hypotheses concerning a multivariate three-way interaction effect were formed, this analysis was performed. The results proved to be nonsignificant.

Within the female-dominated field, the verification of hypothesis 7 was already discussed. The multivariate results also supported hypothesis 8 in that there was no significant difference in the compliance gained by a male

and a female of equal expertise. This hypothesis was derived from and is congruent with the findings of Deaux and Emswiller (1974), and Frankel and Kassinove (1974). In the former study, subjects attributed the same degree of ability to a male and a female who had performed a feminine task. Frankel and Kassinove found no difference in the amount of behavioral compliance gained by female and male school psychologists. However, the interpretation of these results is more tenuous than those of Deaux and Emswiller because Frankel and Kassinove did not determine whether school psychology was perceived to be a male or a female-dominated field. The results of the present study as well as those of Deaux and Emswiller lead one to conclude that the sex of the expert within a female-dominated field does not have any effect upon the expert power of the individual. However, within a male-dominated field, it appears that a male has more expert power than a female unless the female obtains outside recognition.

The interpretation of the findings concerning sex of the expert in the female-dominated field must be viewed with caution since the findings of Goldberg (1968) and Mischel (1974) contradict those of the present study, as well as, those of Deaux and Emswiller (1974) and Frankel and Kassinove (1974). Goldberg found a trend for females to judge males as being more competent than females in a female-dominated field, while Mischel found the opposite to be true to some degree. None of Goldberg's results

for the female-dominated occupations were significant. Apparently, different conclusions can be drawn from the results of each of these studies. One possible explanation, which deserves further analysis, is that those experts in the present study, the Deaux and Emswiller study, and the Frankel and Kassinove experiment received more objective indications or outside recognition of their expertise as compared to the experts in the Goldberg and Mischel studies. If this possibility existed, the lack of a significant effect may have been due to the presence of outside recognition as in the male-dominated field, rather than to a tendency of people to view males and females as being equally competent in a female-dominated field.

Hypothesis 10 which stated that there would be no significant interaction between level of expertise and sex of the expert was also confirmed by the multivariate analysis. The prediction was based on the assumption that sex of the expert would not have different effects upon the perception of high and low levels of expertise within a female-dominated field. The findings were congruent with those obtained by Frankel and Kassinove (1974). As in the experiment pertaining to the male-dominated occupation, these results could have been due to the presence of outside recognition of the competence of both male and female nurses.

Hypotheses 9 and 11 which postulated a main effect for sex of the subject and a significant level of expertise

x sex of influencee effect, respectively, were unsubstantiated. As in the male-dominated occupation experiment, both of these hypotheses evolved from the sex-role stereotypic literature which indicated that females are perceived as being more submissive than males. These predictions may not have been verified for the same reasons that they were not supported in the study of the male-dominated occupation (see page 86). On the other hand, the results could indicate that within a female-dominated field, women do not feel obligated to conform to the sex-role norm of being more compliant than males, and are confident in their own opinions.

No prediction was made concerning the interaction between sex of the expert and sex of the subject. In the present study, the interaction effect was nonsignificant. Based upon this study, it appears that within a female-dominated field, the relative degrees of compliance of men and women do not differ with respect to the sex of the expert.

A multivariate test of the three-way interaction effect was also performed on the data from the nursing recommendations. Contrary to the findings in the engineering experiment, the three-way interaction effect was found to be significant. The univariate F tests indicated that this interaction effect reached significance only for the recommendation pertaining to the purchase of throw-away needles. The omega squared indicated that the three-way

interaction effect accounted for approximately 5 percent of the variance in the responses to the needle recommendation. In applying Cohen's criterion (1969) to this result, one would be inclined to classify the finding as a small size effect and would consider it to be practically significant.

The nature of this effect seems to decry most of the theories proposed to explain the results of the main and two-way interaction effects presented earlier in this discussion. It appeared that for this one recommendation, a significant level of expertise x sex of expert interaction was found for male subjects but not for female subjects. The female subjects reacted as predicted, i.e., sex of the expert within a female-dominated field did not affect one's perceived level of expertise and, thus, one's expert power. On the other hand, males displayed a significantly greater degree of compliance in response to a highly expert male as compared to a highly expert female. However, when the experts were perceived to have lower levels of expertise, the males complied significantly more to a female than to a male expert. Apparently, the proposition that outside recognition of both the male's and female's competence would result in the sexes being perceived as having equal levels of expertise was not operating in this case. Furthermore, the author's contention that sex of the expert within a female-dominated field has no effect upon the perceived level of expertise of the individual (see explanation of

Hypothesis 8) must be questioned in light of the findings for the male subjects. The results found for the male subjects in this study coincide with those found by Deaux and Taynor (1973) for both male and female subjects. It is plausible that the low expert male elicited less compliance than the low expert female because the former's lack of competence did not correspond to the male stereotype. If male subjects considered the field of nursing to be one in which not much expertise was required to perform well, especially since females can perform it well, the male subjects may have found it particularly degrading that a male could not excel in the field. This attitude could have led the male subjects to devalue the low expert male more than the low expert female. The occurrence of more compliance in response to a high expert male than in response to a high expert female could possibly have been due to the content of the recommendation. The content of the needle recommendation as compared to the other head nurse recommendations implied more of a supervisor-subordinate relationship between the head nurse and the other nurses on the floor in that the head nurse was looking over and evaluating the nurses' performance. Perhaps the male subjects viewed this supervisory role as being more appropriate for the male head nurse of high expertise rather than the female head nurse of high expertise. Moreover, if the perception of a supervisor-subordinate relationship existed,

the males subjects may have been more inclined to comply to a male supervisor than a female supervisor (Rosen & Jerdee, 1974).

A few other unanticipated and interesting relationships emerged from the interaction effect found within the male subject group. For example, a female of high expertise did not elicit significantly more compliance from male subjects than did a male or a female of low expertise. To further complicate the issue, a male head nurse of high expertise did not obtain a significantly greater degree of compliance than did the low expert level female. The author could not offer any solid foundation for these results but suggests that the presence of intervening variables be investigated. Apparently, more research is needed to unravel these findings.

From the overall results obtained in the two experiments, it appeared that with only one exception, one's expert power was not affected by one's sex nor the sex of the influencee. Moreover, sex bias did not appear to be operative in a traditionally male field nor, for the most part, in a traditionally female field. These results were not congruent with many of those found in the attribution theory literature nor with those found in the studies which required a subject to evaluate the competence of a male and/or a female. Several variables, such as the presence of outside recognition, have been discussed in the

previous paragraphs to account for these discrepancies. Unless these variables are controlled in future studies, one will not be able to conclusively prove whether or not sex bias exists in determining one's expert power. Furthermore, until these variables are controlled, one cannot ascertain if sex bias exists more strongly in relation to determining one's expert power than in relation to evaluation of one's perceived level of expertise.

The adequacy of the in-basket technique to assess the existence and influence of sex bias upon expert power is also debatable. Perhaps it should only be applied to the situation in which either the influencee or the expert is first entering the organization. In such a situation, the influencee has not had personal contact with and is not personally aware of the expert's competence and may, therefore, fall back on sex-role stereotypes to make a decision (Rosen & Jerdee, 1974). This lack of contact and personal knowledge of the expert was representative of the situation in the in-basket experiment. It can be postulated that as the influencee gains first hand experience with the performance of an expert, sex bias would not play any role in determining the latter's expert power in relation to the influencee.

The final question which must be posed is, "What are the implications of this study?" An optimist might interpret the results as a sign that the societal modes concerning sex-role stereotyping of jobs are becoming

obsolete. The door would appear to be open for both men and women to enter an occupation not traditionally associated with their sex and have their suggestions judged on the basis of merit rather than upon the originator's sex. The author, although not a pessimist, is not willing to conclude that sex bias is well on its way to being eliminated in the occupational world. After all, many of the studies reporting the existence of sex bias in relation to various occupations were not performed too long ago and society's beliefs and prejudices do not change that rapidly. Still, the fact remains that sex bias was found to exist in only one instance in this study. The author contends, as did Pheterson et al. (1971), that an expert engaged in solving a problem will experience sex bias in the evaluation of his or her ideas unless a third party is available to testify to the expert's competence. In other words, the establishment of an individual's competence does not lie in his or her own hands but is dependent upon one's finding an outside source, who is credible, not sexually biased, and willing to publicly deny societal mores in stating that a particular individual working in a non-traditional sex-role is competent. In view of the pervasiveness of sex bias, as found in previous studies, such individuals would be difficult to find.

Perhaps, as stated in an earlier paragraph, sex bias would not play a dominant role in determining one's

expert power if the influencee is in a position to view physical, objective evidence of an expert's success. Certainly, such an occurrence would cause cognitive dissonance. However, the resolution of such dissonance may not result in the abolition of one's sex bias but instead may come about by attributing the expert's performance to luck. A possible research project would be to determine how long an individual would be inclined to attribute one's performance to luck in the face of continuing successful performance on the part of the expert and to determine how dissonance would be resolved if the attribution of luck to explain performance no longer seemed feasible.

Finally, even if an expert's competence is somehow proven to another individual, the latter may be inclined to privately admit to an expert's competence when that competence is claimed within an occupation not congruent with the expert's sex, but will the individual be willing to publicly conform to the expert's advice? It seems plausible that if one's peers were sex-biased, one would not comply in order to conform to the group's norms. In the in-basket technique used in this study, public compliance was not necessary. Perhaps a laboratory experiment of this nature affords an influencee the opportunity to be idealistic in his or her responses whereas the outside world has at its disposal more negative consequences for such compliance and is, thus, able to perpetuate the existence of sex bias in the occupational world.

APPENDICES

APPENDIX A

APPENDIX A

THE EASTFIELD COMPANY

November 19, 1976

Dear _____:

In response to the need to locate a means for increasing our production, I have come to the conclusion that the present spatial arrangement of the production line is inadequate and a deterrent to obtaining a satisfactory level of production. My data indicates that production is 110 units per day. Based upon my knowledge, I have devised a new spatial arrangement of the production line which, according to my calculations, will lead to a 20% increase in production flow and will result in a production of 150 units per day. Many of the employees may not be very satisfied with this new arrangement since it may separate them from their friends. However, my data indicates that the company will lose $10,000.00 for each day in which it operates under the present spatial arrangement. Therefore, in my opinion, any delay in implementing this change will be costly to the company. The implementation of this plan is waiting for your go ahead.

Sincerely,

Based upon your opinion of this engineer's knowledge and experience, as well as the nature of the problem, what action would you take in deciding whether or not to go along with this engineer's suggestion?

A. In questioning whether or not the engineer's data is accurate and in questioning the validity of this person's argument, I would postpone any action or decision for a few weeks in order that another study could be conducted and more data collected.

B. Based upon the data and the opinion of this engineer, I would present this engineer's plan at the regularly scheduled monthly meeting of the engineers and obtain everyone's opinion before I would take this engineer's advice.

C. In considering this engineer's estimation of a $10,000.00 per day loss to be accurate, I would not wait until the monthly meeting but would call a special meeting of the engineers on Wednesday to obtain their opinions before I would take this engineer's advice.

D. With the intention of taking this engineer's advice to implement the new spatial arrangement, I would ask this person to set up an appointment on Monday morning to discuss his or her data and to answer several questions.

E. In accepting the engineer's estimation of a $10,000.00 per day loss and in considering this engineer to be totally competent, I would call him or her before closing today to say that I approve of the recommendation and give the engineer my full support in implementing his or her spatial arrangement as soon as possible.

THE EASTFIELD COMPANY

November 19, 1976

Dear _____:

As I am sure you are aware, the speed at which the assembly line operates is based upon the results of our time-motion studies, and results in the production of 8 cars per minute. Although these studies show that an assembly line worker is physically capable of performing his job at the present speed at which the line is moving, it has become apparent that the quality of the work has deteriorated to the point where the number of rejects has increased to 25%. Based upon my knowledge of these matters, I believe that the poor quality is due to the resentment of the workers toward the present speed of the line. From my viewpoint and my own interpretation of data reported in various journals, attempting to motivate these employees to produce better quality products by offering bonuses or more time-off will not work. Therefore, I recommend a 15% decrease in the speed of the line. According to my data this decrease would lead to a decrease in the quantity of the work to 6.5 cars per minute, but I believe it would lead to an increase in the quality of the work, a decrease in the rejection rate to 7%, and an increase in employee morale. It is my belief that the company cannot tolerate the present rate of rejects for a very long time and, therefore, I recommend that a decision be made as soon as

possible. I realize that this change requires the approval of the board and that the monthly board meeting is on Thursday. Therefore, I am presenting you with the following data which I collected and interpreted to present at the board meeting. You will find that this data supports my recommendation.

Sincerely,

Present Speed	Production Dollar Value
6 cars/minute	$35,000.00/minute
25% rejects (2 cars/minute)	-$ 8,750.00/minute
	$26,250.00/minute

New Speed	Production Dollar Value
6.5 cars/minute	$28,438.00/minute
7% rejects (.46 cars/minute)	-$ 2,012.00/minute
	$26,426.00/minute
employee morale	+ unknown quantity

Based upon your opinion of this engineer's knowledge and experience, as well as the fact that the board meeting is on Thursday, what action would you take in deciding whether or not to go along with this engineer's suggestion?

A. Since the results of our previous time-motion studies indicated that a worker is physically capable of working at the present speed, I would not consider this engineer's evaluation of the situation to be correct nor would I go along with his or her recommendation to change the speed of the line.

B. I would seriously consider the possibility that the engineer's data upon which the above figures are based may be incorrect and would therefore not mention it at this monthly board meeting but would wait for a few weeks until another study could be conducted.

C. In accepting the engineer's conclusion that a high rate of rejects does exist and that it is due to the resentment of the workers, I would attempt to motivate the employees rather than accept the engineer's opinion that this method will not work and that we should reduce the speed of the line.

D. In accepting the engineer's evaluation of the problem and in considering the recommendation that the speed of the line be reduced, I would call a meeting of the other engineers and obtain their opinions concerning a change in the speed of the line before I would take this person's advice. Only if they unanimously agreed, would I mention the recommendation at the board meeting.

E. I would have the engineer who obtained this data make an appointment for Monday morning in order to discuss the data. Based on this person's suggestion, I would mention this recommendation at the board meeting but would not take a strong position.

F. I would have the engineer make an appointment for Monday morning in order to discuss the data. It is likely that based on this engineer's data and suggestion, I would strongly recommend to the board that they vote to implement the suggested 15% decrease in the speed of the line.

THE EASTFIELD COMPANY

November 19, 1976

Dear _____:

In attempting to determine the causes of decreasing efficiency, I have concluded that our punch presses are a major source of inefficiency. According to my calculations, they result in a loss to the company of $5,000.00 weekly in waste and amount of production. It has come to my attention that there exists a way in which slight and relatively inexpensive modifications of these machines will decrease this inefficiency to $2,000.00 weekly. I have also become aware of the fact that a new punch press has been developed. I have reviewed the literature pertaining to the mechanical structure and operation of these machines and have concluded that they are far more efficient than our present punch presses. The cost of each machine is $15,000.00. However, in my opinion, this machine will result in an 8% gain in production, and thus gains in profits, which will far outweigh the cost of purchasing and installing the machines. Therefore, I strongly recommend that we purchase the new machines rather than modifying the old machines. Delaying action will only result in continued inefficiency and loss of money. It should also be noted that these machines are in limited supply

and, thus, action is needed on this recommendation as soon as possible.

Sincerely,

Based upon your opinion of this engineer's knowledge and experience, as well as the nature of the problem, what action would you take in deciding whether or not to go along with this engineer's suggestion?

A. In questioning whether or not the engineer's data and conclusion that our present punch presses are inefficient are actually accurate, I would have another study conducted to determine whether these punch presses are a problem.

B. On the basis of the engineer's conclusion that the punch presses are inefficient, I would decide to have the old machines modified rather than purchase new machines.

C. In accepting the engineer's conclusion that the punch presses are inefficient, I would delay my decision in order that I could hire someone else to conduct a study and review these new punch presses before I would take this person's suggestion or obtain the other engineer's opinions upon it.

D. Based solely upon the data and opinion of this engineer, I would present the suggestion to purchase new punch presses to the other engineers to see if they agree before I would act on this person's recommendation.

E. In intending to go along with this person's suggestion, I would ask the engineer to set up an appointment on Monday to discuss the data and answer several questions.

APPENDIX B

APPENDIX B

THE EASTFIELD HOSPITAL

November 19, 1976

As I am sure you are aware, staffing of nurses on each floor has been based for years upon the number of beds in each unit. However, many times some of the beds are empty, and, therefore, the unit is overstaffed. I would like to recommend that the nurses be assigned to each unit according to the particular needs of the patients on each unit each day rather than according to how many beds there are on the floor. I realize that this system would require a great deal of planning, time, and daily rescheduling of nurses, but I do think it would be a better utilization of human resources.

Sincerely,

Based upon your opinion of this head nurse's knowledge and experience, as well as the nature of the problem, what action would you take in deciding whether or not to go along with this employee's suggestion?

A. Since other hospitals in the area also assign nurses to each unit according to the number of beds and have felt no need to change this system, I would not take this employee's advice and would continue to assign nurses according to the number of beds.

B. Although it would take some time and money, I would hire an outside consultant to conduct a study and collect data pertaining to this problem before I would take this person's advice.

C. In accepting this head nurse's observations that the staffing of nurses on each floor is inadequate, I would present this suggestion to all the nurses at the regularly scheduled Thursday meeting and obtain their opinions before I would take this person's advice.

D. I would begin on a small basis to take this person's suggestion by daily reassigning and exchanging nurses according to the needs of the patients among a few small units of the hospital to determine whether or not this daily rescheduling is a better method of assigning nurses.

E. With the intention of taking this person's recommendation to reschedule nurses daily, I would have the head nurse who made the suggestion come in on Monday morning to discuss his or her observations and the implementation of this recommendation.

THE EASTFIELD HOSPITAL

November 19, 1976

Dear _____:

I wish to bring to your attention my concern that needles are not being properly sterilized and could, therefore, lead to infection. Based upon my knowledge of the subject, I do not think the nurses have been trained in the appropriate procedures for the sterilization process. Due to this fact, I recommend that the hospital purchase needles which are presterilized and which are used once and then thrown away. I am aware of the fact that this innovation would cost the hospital approximately $8,000.00 a year. However, I believe that throw-away needles would prevent improper sterilization and would save the nurses a lot of time since the sterilization process would not be necessary. In reference to the latter point, the nurses would have more time to attend to the other needs of the patients. The longer any decision is delayed on this matter, the greater the chances of infection.

Sincerely,

Based upon your opinion of this head nurse's knowledge and experience, as well as the nature of the problem, what action would you take in deciding whether or not to go along with this employee's suggestion?

A. In questioning the head nurse's knowledge concerning proper needle sterilization, I would conduct a 3 week study in order to see whether or not the sterilization procedure actually is inadequate.

B. I would conduct a survey of the other area hospitals to see which ones have switched to disposable needles and to see whether or not these needles have improved the functioning of the hospital before going ahead with this employee's suggestion.

C. I would present this suggestion to all the nurses at the regularly scheduled Thursday meeting and obtain their opinions on this idea before I would go ahead with this employee's suggestion.

D. I would begin on a small basis to take this person's suggestion by using throw-away needles on one small unit of the hospital to determine whether or not their usage is more effective.

E. With the intention of taking this person's recommendation to purchase throw-away needles, I would have the head nurse who made the suggestion come in on Monday morning to discuss his or her observations and the immediate hospital-wide implementation of this recommendation.

THE EASTFIELD HOSPITAL

November 19, 1976

Dear _____:

As I am sure you are aware, patients are bathed in the morning after breakfast. Unfortunately, bathing time normally overlaps with the time in which medicine is administered. In attempting to complete both tasks at the same time, the nurse is forced to rush. This situation could very easily lead to errors or an inadequate job. Furthermore, the completion of both of these tasks requires the efforts of every nurse on the unit at that particular time. Therefore, we are inadequately staffed to respond quickly to an emergency that could occur at this time of the day. One possible solution to this problem is to change the time of one of these activities. Although I can only speak on the basis of my own knowledge and experience, I would find such a change in scheduling to lead to objections by the patients since any other possible time would interfere with visitation hours. In my opinion, the most reasonable solution to this problem is to place more nurses on the morning shift. Although the hiring of more nurses will cost the hospital more money, these extra nurses may help us avoid serious mistakes and may possibly be the difference between someone's living or dying.

Sincerely,

Based on your opinion of this nurse's knowledge and experience, as well as the nature of the problem, what action would you take in deciding whether or not to go along with this employee's suggestion?

A. I would be inclined to believe that the source of the problem is not a lack of enough nurses on the floor but the inability of the head nurse to organize and coordinate the duties of the nurses on the floor. Therefore, I would not consider going along with the nurse's recommendation but would look into the head nurse's ability to manage the floor.

B. Before going ahead with this person's suggestion, I would have an outside consultant look at the problem and obtain data over a period of two weeks. Based mostly upon the consultant's data and opinion, I would obtain the other nurses' opinions and then I would make my decision as to hiring more nurses.

C. Based upon the opinion and data of this head nurse, I would present the suggestion of the head nurse to hire more nurses at the regularly scheduled Thursday meeting, and obtain the other nurses' opinions before I would take this person's advice.

D. In intending to go along with this person's advice, I would have the nurse who made the suggestion come in on Monday morning to present his or her observations formally and to answer several questions.

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