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ABSTRACT

This paper presents a review of research on the processes involved in evaluating others, especially in the area of discrimination against women. The first section defines perceptual bias and presents research data which show that perception is not a faithful representation of reality, but a product of previous beliefs and values. Section II reviews research showing that sex stereotypes, although consciously disavowed, still function as tacit knowledge about men and women and are still represented empirically in contemporary social structure. The research reviewed in section III provides evidence that an intellectual product or process believed to be the work of a man is often evaluated as superior to the identical product or performance attributed to a woman. Section IV reports survey research on the career paths of large samples of men and women in academia and section V focuses on unconscious discriminatory evaluations. Section VI examines research on stereotyping and discrimination against black people, especially black women. The seventh section addresses the question of change toward equality of reward and offers five specific proposals for counteracting perceptual bias. Each section concludes with a summary. (MCF)

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Research on Seeing and Evaluating People

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A 20 page summary of the basic research is available in a pamphlet, *Seeing and Evaluating People*, which can be obtained from: The Office of Women's Affairs, University of Delaware, Newark, Delaware, 19711.

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RESEARCH ON SEEING AND EVALUATING PEOPLE: INTRODUCTION AND SUMMARY

This paper reviews the research summarized in Seeing and Evaluating People (Geis, Carter & Butler, 1982). This research shows that discrimination against women occurs, and explains how and why it occurs. The research suggests that discrimination against women is not the result of deep-seated attitudes of prejudice, as is often assumed. In contrast, it shows that discrimination is better understood as habits of perception and treatment of women. Perception of women depends as much on how they are treated as on how they behave. Women will be perceived as equals when they are treated as equals.

The first section defines "perceptual bias" and presents research data showing that perception is not a faithful representation of reality. Our experience of perception is actually an interpretation of reality in terms of meanings supplied by our own previous beliefs and values. The process of interpretation is unconscious. The product of interpretation is "perception." Many of the beliefs and values which shape perception are tacit--something we know but are not thinking about consciously at the time.

Section II reviews research showing that sex stereotypes, although consciously disavowed, still function as tacit knowledge about men and women. Traditional stereotypes of men focused on their occupational roles and on personal qualities of authority, dominance, and intellectual superiority. Stereotypes of women focused on family and subordinate roles and on personal qualities of deference, emotional responsiveness, nurturance, and accommodation. Women were considered unsuited by nature for positions of intellectual authority. The stereotypes have persisted because they were long considered desirable as well as natural, and because they are still represented empirically in contemporary social structure.

Sex stereotypes operate as tacit knowledge which biases our perception of men and women. Section III reviews research showing that an intellectual product or performance believed to be the work of a man is evaluated as superior to the identical product or performance attributed to a woman. Women's credentials for support or advancement are viewed as less convincing than identical credentials from a man. Although our conscious, sincere intentions are to be fair and objective, tacit stereotypes bias the meaning of the evidence perceived. The research evidence shows that women are accorded neither equal opportunity or equal reward for equal performance.

Section IV reports survey research on the career paths of large samples of men and women in academia. Bias against females begins at the pre-school level and continues to the top of the university status ladder. Later career achievement of undergraduate women is directly related to the percentage of female faculty on their college campus, but the percentage of female faculty decreased steadily until 1970. Women faculty and administrators are disadvantaged compared to equally qualified men in recruitment, hiring, promotion, tenure, and salary. Sex discrepancies increase with increasing academic rank and higher prestige institutions.

Since perceptual bias operates outside of conscious awareness, each particular evaluation is perceived as justified by the evidence, so discrimination in natural settings is invisible. Section V focuses on the problem of unconsciousness in discriminatory evaluations. (1) The idea of "tacit knowledge," introduced in the first section, is explained in more detail. Extensive recent research has shown how tacit knowledge operates unconsciously to influence conscious perceptions and evaluations. (2) Bias operates before the evaluation takes place. The meaning or import of one's reaction to trivial incidents remains long after the incidents themselves are forgotten. Bias influences the meaning of each reaction, so the effects accumulate and multiply. (3) Bias operates on the interpretation of evaluation rules and criteria as well as on interpretation of the evidence. Rules are more easily stretched for men than for women. (4) Consensus in a group, such as a promotion and tenure committee, subjectively defines the consensual opinion as "the truth." Since stereotypic bias is culture-wide, it is consensual and, therefore, perceived as objective and valid. (5) Tacit stereotypes create self-fulfilling prophecies. The stereotypes define women's products and performances as inferior, so they receive lower evaluations. Lower evaluations delay career progress. The resulting empirical fact that women do not "succeed" as well or as fast as men then appears to confirm the initial stereotypes.

Section VI points out that the processes and results of stereotyping are not specific to evaluations of women. The same processes and the same kinds of consequences apply to any stereotyped group. Extensive research has investigated stereotyping and discrimination against black people. Unfortunately, black women have been neglected in racial research as all women have been neglected in general behavioral research. The important point, from the perspective of the present paper, is that black women suffer the double disadvantages of both sex and race.

The seventh section addresses the question of change toward equality of opportunity and reward. Recent research suggests that visible authority legitimation and group support raise the perceived value of both men's and women's performances. Tacit stereotypes typically bestow such support on men automatically in natural settings, but not on women. Five specific proposals for counteracting perceptual bias are: (1) Increase individual awareness of bias and how it works and institute public reminders of commitment to equality. (2) Delete sex-identification from application credentials by having them retyped. (3) Quantify evaluation criteria by specifying the amount and quality of evidence which defines each distinguishable value of a given criterion. (4) Collect and make public the empirical data on the percentages of women at each status level in the institution from undergraduates up to top level administrators. Public data on individual achievements and evaluations within units would make inequities visible to both evaluators and those evaluated. (5) Adopt sex-representation goals with accountability. Women should be represented at each status level in a unit or group of units in proportion to their availability in the relevant supply pool.

No attempt has been made to present all of the relevant studies. Rather, studies which best or first documented the relevant points are described in enough detail to be understandable. Descriptions of strings of studies, all making the same point, have been avoided. Thus, the length of a section reflects the variety of relevant evidence, not the amount, importance, or validity of the evidence. In addition, the assertions and logic summarized in Seeing and Evaluating People (Geis, Carter, & Butler, 1982) are explained in greater detail, in the context of the relevant research. This paper is internally cross-referenced. The page numbers following the date of a referenced study are the pages in this paper on which that study is described. In general, the structure and sequence of this paper follow that of Seeing and Evaluating People.

I. PERCEPTUAL BIAS:

PERCEPTION IS AN INTERPRETATION OF REALITY

Perception Represents the Stimulus in Terms of Meaning

The experience we call "perception" gives meaning to a stimulus. The stimulus may be a person, object, or event which we are viewing, hearing, tasting, or feeling. However, what we see, hear, taste or feel depends upon what we know about the stimulus in that situation. For example, a man in a bank with a gun may be scarcely noticed if he is wearing a police uniform, but the meaning would be entirely different if he was wearing a ski mask and scruffy clothes. Campbell (1967) presented a general explanation of perception based on his own and others' previous experimental research.

Our experience is that we see the people and objects in the environment accurately, as they are, and that we hear the sounds that actually occur. That is, our experience is that our perception faithfully represents reality. Research shows that it does not. What we see and hear is partially shaped by what we are interested in and what we know, expect, want, need, like, or fear. These internal contributions of the perceiver to his or her own perceptions influence whether or not a stimulus is perceived, what aspects or characteristics of it are perceived, and which are unnoticed. They especially influence the meaning attached to the stimulus and what is later recalled. This shaping of perceptions occurs in the brain during neural processing of sensory input. Neural processing occurs very rapidly and wholly outside of conscious awareness. Characteristics of the stimulus also influence perception. A stimulus that is more intense (larger, brighter, louder, more distinctive) is more likely to be noticed and perceived than a less intense one.

Behavioral Evidence of Perceiver-Bias in Perception

Beliefs Influence Perception. Levine and Murphy (1943) showed that we learn and remember material which supports our existing beliefs better than material which contradicts them. Pro-communist and anti-communist students were given an anti-Soviet and a pro-Soviet passage to read and then were asked to reproduce the passages after fifteen minutes (when the study was done the

U.S. was allied with Russia). Students followed the same procedure once a week for four weeks (the learning period), then were tested for recall once during each of the following five weeks without further exposure to the paragraphs (the forgetting period). Subjects' recall of the paragraphs was scored for exact wording, ideation, error, and omission. Pro-communists learned more of the pro-Soviet selection and forgot less of it. Anti-communists learned more and forgot less of the anti-Soviet selection. The results showed that prior beliefs caused selective perception and recall. The same principle occurs in evaluating men and women. Since traditional social ideology defines men as more competent than women, evaluators will notice, learn, and recall more of the evidence supporting a man's candidacy than a woman's. Thus, when the evidence presented is of identical quality, the evidence recalled will favor the man.

Wyatt and Campbell (1951) showed that previous beliefs, even highly uncertain, speculative ones, influenced perception. The stimuli were a series of colored photographic slides of common objects and scenes (e.g., an old car in a junkyard). Each slide was shown initially far out of focus and gradually brought into focus. The subjects' task was guessing what the object was as soon as they could. Subjects who made an initial wrong guess (e.g., thinking the car scene was a close-up of a flower) required a sharper focus to correct their error than those who did not make an initial wrong guess.

Once having perceived a stimulus in terms of one meaning, it is harder to change that meaning than to form a meaning in the first place. This is an experimental demonstration of the principle illustrated by the "wife-mother-in-law" figure in Seeing and Evaluating People (Geis, et al, 1982). "Seeing" a stimulus in terms of one meaning makes it harder to see it in terms of another. The implications for perceiving the value of men's and women's professional work are clear. Both early-learned stereotypes and daily experience define authority and competence as provinces of men, and define women as suited for family and subordinate roles. These expectations make it harder to see women's performances in terms of authority and competence, and harder to see men's except in terms of authority and competence.

Bruner (1958) reviewed the early literature on social perception and attitudes. Social perception was defined as the manner in which one person perceives or infers the traits and intentions of another. Social attitudes were defined as a readiness to experience events in certain consistent and selective ways. The studies reviewed addressed the question of perceiver biases in perception, e.g. the influence on perception of the perceiver's needs, values, attitudes, stress, cultural background, etc., rather than stimulus determinants. A summary of the review follows:

Early studies looked at the nature of "distortion" in perception. For example, subjects shown a screen with an obscured food picture behind it reported more associations with food as hours of food deprivation increased up to ten to twelve hours. Further research indicated that it was not the amount of need, but the way in which a person learned to handle the need that determined the way in which motivation and selectivity in perception interacted.

Other studies showed that the more important a topic area (e.g., religion, aesthetics, politics, etc.) was to a person, the more rapidly the person recognized words representing it when the words were presented in a fast exposure apparatus (a tachistoscope).

Difficulty in recognizing a given word increased as the number of words presented together increased. The implication is that when the information processing system is overtaxed with many stimulus inputs, people limit the number of alternatives they consider. For example, evaluating academic candidates on the many relevant criteria, and especially a group of candidates, presents a highly complex set of stimulus inputs. Thus, information about a woman's competence that is harder to learn or recall because it contradicts tacit stereotypic assumptions is doubly likely to be disregarded when it is embedded in a mass of information about a whole group of candidates.

Bruner and Goodman (1947) found that children, given the task of adjusting a circular patch of light to match the size of a coin, overestimated the size of more valuable coins and underestimated the size of the less valuable. It was also found that poor children overestimated the coin sizes more than rich children, but were equally accurate in estimating the sizes of colored paper discs. It appears that even in the estimation of physical magnitude, "known values" influence judgmental processes. These studies showed that perception is not simply a representation of the objective stimulus, but also a "creation" of the perceiver. Bruner (1958) concluded that: (1) perceiving an object or event in the environment involves categorization; (2) categories are organized into systems or structures of meaning; (3) the salience of a category to a perceiver reflects the need and intention states of the perceiver as well as the characteristics of the stimulus.

In summary, behavioral research shows that perception is not a faithful representation of reality. Rather, it is an interpretation of external reality in terms of the meanings supplied by the perceiver's previous experience, beliefs, values, and needs.

The Physiological and Anatomical Bases of Perception

Research on brain structure and functioning shows how perception could be biased by previous beliefs and values. Kuffler and Nicholls (1976) summarized the physiology and neuroanatomy of human information processing. Incoming information is translated at the sensory receptors (e.g., eyes, ears) into electrical impulses, which then travel via nerve fibers (neurons) to a primary receptor site in the brain, and then on to other brain locations.

Nauta (1971) reviewed the major physiological and anatomical research on the brain relevant to the formation of conscious perceptions. According to Nauta, it is not clearly understood how or where in the brain our experience of conscious perception occurs, but there is converging evidence that it occurs in the frontal (cerebral) cortex, the part of the brain that is more developed in humans compared to other animals. The path of electro-chemical impulses in response to a visual stimulus goes first to the occipital cortex, the main visual center of the brain, and then to the frontal cortex. The path of the impulses toward the frontal cortex supports Campbell's (1967) explanation of perceptual bias (which was based on behavioral data). The brain's vision center initiates several trains of response impulses, but they do not go directly to the frontal cortex. Rather, they go to the major brain centers storing previous knowledge (memory, experience, beliefs) and to those controlling emotions (liking, fearing, valuing). These major cognitive and emotion centers then send impulses in two directions. Some impulse trains travel forward, on toward the frontal cortex, but others go back to the original reception site in the visual cortex. The impulses returning to the original receptor then modify the succeeding impulses leaving it. As a result, the impulses which encode the "pure visual impression" have already been reshaped by interpretation in the cognitive and emotion centers when enough of them finally reach the frontal cortex to create the conscious perception. For example, when you see a magazine on the table across the room the actual visual stimulus is

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trapezoidal, but you see it as rectangular because your brain "knows" that magazines are rectangular. In the same way, a woman's achievements can be "seen" as less impressive because stereotypic beliefs about the sexes operate as automatic "knowledge." Nauta concluded:

> "It must be emphasized that the various cortical and thalamic intermediaries in these sensory-frontal conduction routes cannot be viewed as mere 'relay stations' along the path to the frontal lobe. There can be little doubt that fundamental input-transformations take place at each step along the transcortical way, and there is thus reason to suspect that the information content of the impulse flow arriving at the frontal cortex can be little more than a remote derivation of the neural events taking place in the primary sensory areas."

Research by Hernandez-Péon, Scherrer, and Jouvet (1956) illustrates selective perception controlled by automatic neural processes in the brain. Recordings were taken from an electrode implanted on a neuron in the auditory system in a cat's brain. When the cat heard a sound, the electrical impulses in the neuron were recorded. A metronome was turned on and the cat's auditory neuron showed the corresponding rhythmic firing pattern, indicating the cat was hearing the metronome. With the metronome still running, a live mouse in a jar was brought within view of the cat. When the cat saw the mouse, its auditory neuron stopped firing, indicating the cat was no longer hearing the metronome. When the mouse was removed, the neuron resumed firing. The implication of these data is that one may fail completely to notice a stimulus that is actually present if one's attention is caught by other aspects of the environment. For example, one may fail to notice a woman's suggestion or accomplishment if one's attention is distracted by another person's accomplishments, by seeing women primarily in terms of sexual or family roles, or by early-learned stereotypes that "women are less competent." This "failure to notice" is completely unconscious and unintentional. It is caused by automatic brain processes.

The Role of Tacit Information in Conscious Perception

Most of the information which shapes and guides conscious perception is tacit information. Specifically, it is information about common qualities or characteristics of categories of objects, events, and persons. Examples are our tacit knowledge that a hamburger might be edible, but a chair is not. Much tacit information can be made conscious, but it is used unconsciously to shape conscious perceptions and guide the focus of conscious attention. Being offered a hamburger makes you think consciously about the possibility of eating it, but being offered a chair raises no conscious considerations of its edibility. Stereotypes of males and females, although consciously disavowed, provide a rich supply of tacit information which shapes and guides conscious perceptions of actual men and women. Since the tacit information of stereotypes is that authorities must be men, a man acting as an authority or presenting himself as a candidate for advancement is viewed as credible. However, a woman in such a position is not supported by the perceiver's tacit expectations, and therefore her claims and credentials will be viewed with more doubt and skepticism.

The existence and use of tacit assumptions has been demonstrated empirically (Smith & Miller, 1979). If people form conclusions about persons and events on the basis of the actual information available about them, then having more information, more specific details, should produce faster, more confident conclusions than having less information. On the other hand, if conclusions actually reflect the perceiver's tacit assumptions about that kind of person or event, then conclusions might be drawn as fast or faster when there is less factual information to "subtract" from the pre-existing assumption. Smith and Miller had 24 students read sentences stating the occurrence of an event (e.g., "John laughed at the comedian"). Some of the sentences were followed by additional information about the person or situation involved in the event (e.g., "John laughs at all comedians" or "Everyone laughed at the comedian"). The same stimulus sentences which were accompanied by additional information for some students were presented without further information to others. The results showed that perceivers formulated their explanations of the event faster without the additional information than after receiving it.

The implication of these results is that when perceivers are faced with partial or ambiguous evidence, their conclusions will reflect their tacit assumptions about the kind of person (e.g., male or female) being evaluated. Tacit stereotypes about men and women may cause a man's achievement to be perceived as evidence of ability and merit, but the same achievement by a woman to be unnoticed altogether, interpreted as less substantial, or attributed to luck or chance. Similarly, a failure by a man would be attributed to bad luck on this particular occasion, but the same failure by a woman would be perceived as the result of lack of ability or merit. In fact, exactly this pattern of different explanations for men's and women's successes and failures has been found in other, independent studies (Frieze. 1976). A common, conscious experience of evaluators is that a woman's credentials are just "not convincing."

For more detailed information on the cognitive processes by which tacit information shapes conscious perceptions, see pp. 39-64.

In summary, research shows that perception is not a faithful representation of external reality. Rather, perception is an interpretation of reality in terms of the meanings supplied by the perceiver's previous beliefs and values and present needs. The beliefs, values, and needs which create the meanings are stored in the form of tacit knowledge which is used automatically and unconsciously to shape the final product we call "perception." Sex stereotypes, although consciously disavowed, continue to operate as tacit knowledge. The research reviewed in the following sections documents the existence and content of the stereotypes and their biasing effects on perception and evaluation of men and women.

II. SEX STEREOTYPES AND THE PERCEPTION OF COMPETENCE, EXPERTISE, AND AUTHORITY

Sex stereotypes operate as tacit beliefs about men and women. These unconscious, automatic assumptions bias our perception of men's and women's actual performances, both in daily interaction and in the formal evaluations of recruitment, hiring, peer-review, promotion, and salary decisions.

Masculine and Feminine Stereotypes and Their Early Learning

Sex stereotypes are common, culture-wide beliefs about how men and women differ in personal qualities and characteristics. We were all born into a society in which sex stereotypes were assumed to be accurate. We took it for granted as a fact of reality that women were inherently different from men in their interests, abilities, and mentality. Indeed, these assumptions appeared to be verified by men's and women's behavior and choices throughout society.

Women were considered not only different from men, but distinctly and explicitly inferior. McKee and Sherriffs (1957) gave University of California men and women a questionnaire asking their views of the overall worth of men and women. (E.g., "Men are (greatly)(somewhat) (a trifle) superior to women; men and women are essentially the same.") Similar items inquired about women's possible superiority to men. Both sexes, but especially men, considered men superior. In a different procedure, the students were given a list of 200 adjectives and asked to indicate which were more characteristic of men and which of women. Men were regarded as more intelligent, brave, responsible, dominant, and ambitious than women. Women were regarded as more emotional, gentle, affectionate, dependent, and submissive than men. The authors concluded that although college students operated under a veneer of egalitarianism [sic], both sexes held males in higher esteem than females. The 40-and 50-year-old college faculty and administrators of the 1970's and '80's were members of the college population of the 1950's when McKee and Sherriffs conducted their study.

Masculine and feminine stereotypes are culture-wide. A decade later, at a different university, Rosenkrantz, Vogel, Bee, Broverman and Broverman (1968) found that college students still agreed on the characteristics of males and females. The students listed all the traits they could think of on which men and women differed. The 122 traits mentioned more than once were given to a second group of students in the form of 7-point scales, e.g.:

Not at all aggressive ___ ___ ___ ___ ___ ___ ___ Very aggressive
1 2 3 4 5 6 7

Students were asked to mark on each scale where an adult male would fall, where an adult female would fall, and where they themselves fell. A third group of subjects rated how desirable each trait was. Traits associated with men included being aggressive, independent, unemotional, objective, dominant, active, a leader, and ambitious. Traits attributed to women included being emotional, tactful, aware of others' feelings, gullible, and submissive. The male traits were again rated as more desirable. Twenty-nine of the masculine traits were independently rated as socially desirable but only 12 of the feminine traits. The women claimed the unfavorable traits for themselves as strongly as they attributed them to other women. These stereotypic traits are the tacit beliefs which bias perception of men's and women's intellectual performances.

Using sex stereotypes unconsciously as tacit knowledge is a problem of all evaluators, both men and women. Broverman, Broverman, Clarkson, Rosenkrantz and Vogel (1970) showed that cultural stereotypes of men and women are often taken as axiomatic. Clinical psychologists, psychiatrists, and social workers were asked to describe a "normal healthy adult" on an adjective check-list. Using the same adjectives, they then described a "healthy adult man" and "a healthy adult woman." Their descriptions of the man matched their descriptions of the healthy adult, but their descriptions of the woman did not. A "healthy woman" was seen as significantly less objective, less independent, and less assertive than a "healthy adult." The female clinicians were just as stereotyped in their ratings as the males were and in exactly the same way. These findings illustrate the pervasive and automatic nature of stereotypic assumptions.

Stereotypes Persisted Because They Were Normative as Well as Descriptive

The stereotypes persisted because they were considered not only accurate but also desirable. Since women were seen as more emotional than men, "emotionality" became a hallmark of "true femininity." Thus, expressing emotionality validated one's "true femininity" and avoiding emotionality validated "true masculinity." Men and women, boys and girls, tried hard to realize society's ideal images of their gender. For example, Jervis (1959) gave men and women college students a list of adjectives describing personality characteristics on which individuals could differ. The subjects were asked to check the adjectives that described themselves as they actually were. They then checked the list again describing their ideal self and finally describing the ideal member of their own sex from the opposite sex's point of view. Men described themselves and their ideals as more rational, independent, dominant, decisive, ambitious, and leaderlike than women. Women described themselves and their ideals as more emotional, dependent, submissive, sensitive, gullible, and unleaderlike than men. Women's self-descriptions were less favorable than men's and conformed more to the female stereotype than men's conformed to the male stereotype. The women perceived men's ideal woman as highly stereotypical, indicating social pressure to conform to the stereotype.

Since the stereotypes were considered desirable as well as natural, men and women tried hard to cultivate the traits considered appropriate for their sex. Equally important, they did not cultivate those considered inappropriate. A young man "proved" his masculinity as much by his inability to sew on a button as by his good grades in math. The social prescription for a young

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woman was the opposite.

Sex Differences in Personality and Behavior: Learned or Inherent?

Although the stereotypic traits and attitudes were traditionally assumed to be inherent, research shows that they are learned. We now recognize that different social expectations for boys and girls, men and women, determine more powerfully the sex role one learns than biological sex differences.

Based on a review of 9,000 empirical research studies, Maccoby and Jacklin (1974) concluded that the evidence supports a biological basis for only two areas of sex differences in behavior patterns: 1) Physical aggression and dominance in males appears to be pre-disposed by pre-natal hormones; 2) a female advantage in verbal skills emerges early; a male advantage in visual-spatial skills does not emerge until adolescence, but is reliable thereafter. Developmentally, however, both boys and girls improve their verbal and spatial skills throughout schooling. Early development in one does not preclude development in the other. And the range of individual differences is large--in hormone levels as well as in verbal and visual skills.

Many individuals differ more from the average members of their own sex than from the average members of the opposite sex. For example, middle and lower-class men presumably do not differ in hormonal predisposition to physical aggression or in adult testosterone levels. Yet they differ dramatically in gang killings and barroom brawls. Similarly, Dennenberg et al's (1966) research on aggressiveness in male mice showed that early social experience can modify this "biologically-inherent" behavioral trait even in such a relatively uncognitive creature as a mouse. Humans are more controlled by training and learning and less by biology than other animals. Money and Ehrhardt (1972) concluded that after the age of 17 months, it is easier to change a child's sex surgically than to reverse his or her gender-label. Expectation, training, and practice can substantially modify the effects of biological "givens" in homosapiens of both genders.

Hundreds of research studies have investigated how children learn, including how they learn their sex-role identities. Social learning researchers (e.g., Mischel, 1970) have concluded that girls become feminine and boys masculine because the social environment (e.g., parents, teachers, peers) rewards children (e.g., by attention, interest, and approval) for activities socially defined as sex-appropriate and punishes them (e.g., by shaming, deprecating, or ignoring them) for sex-inappropriate ones. For example, if five-year old Susie asked for an electric train for Christmas, a parent might reply, "But trains are for boys." The tacit, implicit meaning of the message to Susie is that girls can not—and should not—be interested in trains. Thus, out of initially random, trial-and-error behavior, "feminine" and "masculine" personalities are differentially created.

Kohlberg (1966) disagreed in one detail. Using the Piagetian cognitive-developmental model, he asserted that young children first learn their own gender-label and then actively seek out and perform attitudes and behaviors socially defined as appropriate for their gender. For example, a novel toy described or advertised as "a girl's toy" was requested and played with by girls but ignored by boys. The same toy described as "a boy's toy" was requested and played with by boys but ignored by girls. Such data explain why little girls seldom asked for trains in the past or boys for tea sets. In order to ask for something, one must know what it is. The initially-learned definition of "what it is" has typically included the gender code of "who it's for."

In both of these major learning theories, the major source of learning for all children is observing others. Until only a few years ago, the "appropriate" activities for males began with toy trains, planes, and erector sets and proceeded to mathematics, science, careers, authority, and expertise. The appropriate activities for females began with dolls and tea sets, proceeded to social and emotional skills and relationships, and to marriage and homemaking. Stereotypes and gender labels told us not only what we were, but also what we desired and aspired to be.

Sex Stereotypes, Contemporary Social Structure, and Daily Experience

If stereotypes are so malleable, why haven't they long since disappeared? The answer lies spread all around us. They are still empirically represented in contemporary social structure. The stereotypes not only define appropriate personality and behavioral characteristics for men and women, they also define an appropriate "place" in society. Most authority roles are held by men; most of the women we encounter are in family roles or subordinate positions. Just as the personality and behavioral characteristics of each sex were considered desirable as well as inherent, the unequal-status social roles were also considered desirable as well as "natural." Contemporary social structure reflects males' and females' expectations, opportunities, and choices over their entire lives. As a result, the superior-subordinate relationship between the sexes is still practiced and observed in others' interactions and in media portrayals. One has only to think of the millions of boss-secretary, doctor-nurse, and principal-teacher interactions each day (both live and observed on TV) to realize how often we practice and observe the familiar sex inequalities. Even the home is not immune. Although contemporary husbands and wives regard each other personally as equals, the husband and wife roles still carry the connotations of authority and subordinate status, with his personal needs, wishes, and preferences treated by both partners as more important than her's.

The Impression That "Everybody Does It" Makes It Seem Right. Seeing high status positions filled only by men, and women consistently occupying lower-status positions throughout most of our lives can, by itself, create and perpetuate the "masculine" and "feminine" personality stereotypes. These stereotypes are still heavily represented in our daily lives. They appear as unacknowledged, tacit assumptions throughout our culture--in movies, books, TV, magazines, even school textbooks from elementary school through college and graduate-professional publications. Research (Chulay & Frances, 1974; Dominick & Rauch, 1972; Komisar, 1971; McArthur & Eisen, 1971; Sternglanz & Serbin, 1974; and Women and Words and Images, 1972) has documented the automatic assumptions of inequality. In elementary school readers, 75% of the main characters were male. Adult women were rarely mentioned or pictured, but when they were, 90% of them were "mothers," usually shown wearing an apron. Boys were described as active, clever, and having adventures. Girls were shown as passive, standing around watching, being frightened, and being rescued by boys. Content analyses of TV commercials showed that 95% of the persons doing the laundry or scrubbing sinks, floors, or bathrooms were women. In these same commercials, 95% of the authoritative instructions and "expert advice" were given by males, often in an unseen "voice-over." All media show about three times as many different occupations for men as for women.

Social Status Inequality Can Create Personality Stereotypes. A common tacit assumption is that personal characteristics determine role status. We assume that rationality, dominance, and ambition are qualifications for high-status roles, and emotionality, submissiveness, and lack of ambition determine lower-status assignments. In contrast, research suggests that status is assigned arbitrarily on the basis of sex, and then role performance creates the personality characteristics implied by the role. Many TV commercials show brief social scenarios in which a man and woman play traditional roles. The man is the authority either by expertise or by virtue of the portrayed assumption that his opinions or preferences are "most important" to both partners.

Geis, Brown, Jennings, and Corrado-Taylor (1982) prepared replicas of three such commercials using pairs of amateur actors. At the same time, a second replica of each was also prepared using the same amateur pairs, but each playing the opposite role in the scenario. Viewers were then asked to describe the "personalities" of the scenario characters. The male actors in the authority roles were described as "rational, independent, dominant, ambitious leaders." They showed the traditional "masculine" stereotype. However, when these same men played the low status role normally portrayed by women in the scenarios, they appeared as "emotional, dependent, contented, submissive followers." Their personalities appeared to be changed entirely to the "feminine" stereotype simply by the role they were seen playing. The "personality" results for the women actors were exactly the same. Women playing the important-partner roles were seen as having the so-called "masculine" personality characteristics, playing the low status roles they were seen as traditionally "feminine."

The social authority structure of academic institutions is the same as that of traditional TV commercials and the rest of the culture: The higher-status positions are overwhelmingly occupied by males; most of the women visible on campus are students, secretaries, junior faculty, or service workers (Hornig, 1980). Thus, both our visual and factual information about status and authority in academia support the old stereotypes of male dominance.

Sex Stereotypes and Behavior, Perception, and Evaluation

Stereotypes Often Have "A Grain of Truth." Since the stereotypic traits were socially desirable and easily learned, males and females have actually differed, on the average, in the expected ways (Maccoby & Jacklin, 1974). The average behavioral differences themselves are less a problem than the evaluative connotations of the labels we apply to them. An example cited by Campbell (1967) of neighboring groups' behavior and perceptions illustrates this point. In one group (A), the behavioral norm was to share good fortune. If an individual or a family had a big yam harvest or inherited money, it was quickly shared among friends, relatives, and neighbors in the form of useful gifts, a day-long feast, and contributions to worthy charities. Not surprisingly, the members of group A saw themselves as "generous and giving" (see Figure 1). In neighboring group B the behavioral norm was to save extra resources carefully as a buffer against hard times. Group B members prided themselves on being "thrifty and provident." However, neither group A's nor group B's desirable characteristics were appreciated by the other. The B's saw the A's as "irresponsible spendthrifts." ("In hard times *they* have to go on welfare and sponge off of the county.") In the eyes of the A's, the B's were "stingy, selfish hoarders." ("*They* wouldn't give their own brother a yam if they had a cellarful.") The behavioral difference was real, but it was the stereotypic labels that made the difference negative. When one group is dominant, either in numbers or in social power, its labels come to define "the truth" for both groups (see pp. 57-60).

	Perception By	
	Own Group	Other Group
Group A	"generous and giving"	"irresponsible and spendthrift"
Group B	"thrifty and provident"	"stingy, selfish hoarders"

Figure 1. Self-perceptions and stereotypic labels of a real difference in behavior (from Campbell, 1967)

How Stereotypes Cause Perceptual Bias. According to Campbell (1967), stereotypes cause four major errors in perception and evaluation even when they refer to real differences in behavior.

1. Stereotypic Labels Bias Perception. The fact that a group difference is labeled makes a group member's behavior appear to fit the label, whether it actually fits or not. This is because the stereotypic label is part of the tacit knowledge which forms the meaning our brain uses to organize the stimulus into a conscious perception. For example, behavior called "leadership" in a man may be "arrogance" in a woman; what is "cooperative" in a man may be simply "intellectual spinelessness" in a woman. Research evidence documenting such bias is reviewed on pp. 24-27 and 42-45.

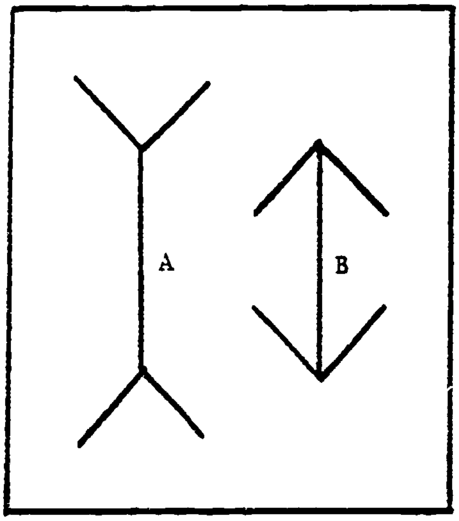

Figure 2. The Muller-Lyer Optical Illusion. Lines A and B are objectively equal in length.

An example of how tacit knowledge creates meanings which organize and shape perceptions is given in Figure 2. Although line A and line B are objectively the same length, A appears longer than B because the different feathering at the ends of the lines causes our brains to organize their apparent lengths in terms of different visual meanings. Most people are unaware of what specific tacit knowledge their brain used to create the meanings which finally produced the conscious perception. We may be aware that the feathering "made the difference," but what specific knowledge do we have about such feathering that created the different meanings? Tacit stereotypic labels organize conceptual meaning in the same way as the visual feathering organizes visual meaning. Thus, an intellectual performance by a man actually appears "better" than the objectively identical performance by a woman. The stereotypic labels serve the same kind of conceptual organizing function as the visual feathering in the figure.

2. Overgeneralization. The fact that sex differences are labeled leads perceivers to overestimate the amount of difference between men and women and

underestimate the amount of similarity between the sexes, and also underestimate the extent of individual differences between different members of the same sex. Every woman is expected to be less assertive and more sensitive and accommodating than every man. Empirical research (Maccoby & Jacklin, 1974) shows that the _average_ man differs from the _average_ woman less than the stereotypes would lead us to expect. In fact, both the so-called "masculine" and "feminine" traits are found in both sexes (Bem, 1974). One man differs from another and one woman from another more than the average man differs from the average woman. Typically,about a third of each sex will resemble the average member of the opposite sex more closely than the average of their own sex.

Objective (average) sex differences decrease even further with increasing education. It is not that men lose their "masculine" qualities, but rather that they gain the desirable "feminine" qualities associated with the cultivated interests and skills of our civilization and culture. Similarly, with increasing education,women acquire more and more of the desirable masculine traits. Thus, when we are considering men and women with post-graduate degrees, "perceived" sex differences are as likely to reflect the mind's eye of the beholder as the actual behavior of the stimulus person.

3. Assuming that Sex Differences in Personality and Behavior Have a Biological Basis. A person's sex is biological and inherent. Since the stereotypic personality and behavioral traits are associated in our minds with the biological categories of "male" and "female," it seems natural to assume that the traits are also biological in basis. In fact, as noted, very few of the trait differences have any biological basis (p. 13), and even the few which might have such a basis appear highly susceptible to alteration by training and social expectation. Most of the empirical trait differences appear to be learned. As Allport (1954) and Campbell (1967) pointed out, and Geis et al. (1982, p. 16) showed empirically, the stereotypic traits are as likely to be the _result_ of discrimination as the cause of it. Being seen and treated as an inferior in interpersonal relationships and role assignments, regardless of one's actual ability or performance,can create exactly the stereotypic traits which are then erroneously assumed as "inherent." An analogy would be arbitrarily assigning all blue-eyed men in the military to the Air Force and all brown-eyed men to the Navy, and then pointing to their differences in expertise as evidence of traits biologically caused by eye-color. In fact, the differences in expertise traits would be _correlated_ with eye-color, but _caused_ by assignment to different training experiences (See also, pp. 13-16, 31).

4. Stereotypes Serve as Rationalizations for Discriminatory Treatment. We perceive and believe that we did not hire or promote a woman because she was objectively incompetent or unqualified. In fact, research shows that we perceive a woman as incompetent or unqualified because we do not want to hire or promote her (see pp. 24-25 and 50-52). The stereotypic perceptual bias serves as an unconscious rationalization for a pre-existing outcome preference.

Summary

Although sex stereotypes are consciously disavowed, they continue to influence perceptions via their unconscious role as tacit assumptions about the nature of men and women. Men are seen in terms of intellectual competence and authority, women in terms of emotional responsiveness and accommodation. Stereotypes have persisted because they were considered desirable as well as natural, and because they are still empirically reinforced in contemporary social structure. The stereotypic traits are commonly assumed biological in basis and therefore inevitable and unalterable, but in fact, they are learned. It is commonly assumed that men's and women's unequal status in society is a result of their different behavioral traits, but in fact, it is a cause of them. Stereotypes bias perceptions by (1) making the evidence appear to fit the tacit belief whether it actually does or not, (2) making us overestimate sex differences and underestimate similarities and individual differences, (3) implying that behavioral differences are biologically determined, and (4) providing a rationalization for discriminatory actions.

III. STEREOTYPES CAUSE PERCEPTUAL BIAS AND DISCRIMINATION AGAINST WOMEN

The research reviewed so far has shown that beliefs and expectations influence perception and that sex stereotypes still operate unconsciously as tacit beliefs about men and women. Since evaluation depends upon perception, it is not surprising that stereotypes also bias evaluations. Egalitarianism requires two conditions: (1) equal opportunity and (2) equal reward for equal performance. In practice, evaluation decisions control both reward and opportunity simultaneously. In academia as in other organizations, the opportunity for further achievement often depends upon recognition of previous accomplishments. Recruitment, hiring, salary, and advancement all depend on recognition of previous work and also enhance opportunities for further achievement.

There is little evidence of intentional discrimination against women. Virtually all educated people sincerely endorse equality of opportunity and equality of reward. These principles are encoded in law and explicitly affirmed in official institutional policy statements. But in spite of these sincere good intentions, perceptual bias creates discrimination by distorting perceptions of the evidence to be evaluated.

Research on Equal Recognition for Equal Performance

Research shows that identical expertise, authority and achievements are evaluated significantly lower for women than for men. Goldberg (1968) found that a man's ideas, scholarship, and arguments are judged superior in quality to the identical ideas, scholarship,and arguments presented by a woman. Forty students were asked to do a critical reading exercise which involved judging the quality of six essays on different topics such as law, city planning, dietetics, and elementary education. Each student received a booklet containing all six essays, three ostensibly by male authors and three ostensibly by female authors. In half the booklets,the author of a particular essay was listed as Dr. John T. McKay. In the other booklets,the same essay bore a female author's name, Dr. Joan T. McKay. The students were asked to judge the essays for quality of ideas, soundness, logic of arguments, organization, author's persuasiveness,and scholarly reputation. The results showed that the identical essays were rated higher if the author was believed to be a male than if a female. This was true whether the topic area of the essay was traditionally male, female,or neutral. Each essay was followed by nine specific evaluation questions. The ostensibly male-authored essays were judged superior to their identical female-authored counterparts on 44 of the 54 specific items. Seven items favored the female authors, and three were tied. If these evaluations were hiring decisions based on a pool of equally qualified men and women candidates, we would expect to find a faculty composed of about 82% males. This is close to the actual 75% in 1980.

Similarly, Pheterson, Kiesler, and Goldberg (1971) found that a woman's intellectual-artistic products are perceived as inferior to the identical products attributed to a man. Four abstract oil paintings, pretested as equal in attractiveness to college students, were used. The paintings, described as "contest entries," were shown to other students and the ostensible sex of each artist was varied. All four paintings were judged superior in quality when they were believed to have been painted by a male compared to the identical paintings attributed to female artists.

The evaluators in these situations were not intentionally discriminating against women. They actually "saw" the contents of the essays or paintings as more authoritative and convincing when the author was a male. These studies examined evaluation of specific intellectual products. Other research has investigated evaluations of overall records of achievements. Fidell (1975) sent vita summaries of ten Ph.D. psychologists to 147 academic psychology chairpersons around the nation. The summaries presented different combinations of extent of publication, excellence of teaching, conscientiousness about departmental committee work, and sociability. Female names were randomly assigned to four summaries in each questionnaire. The rest bore male names. Chairpersons were asked to rate each of the ten ostensible faculty members for desirability for hiring and indicate the appropriate faculty rank for each of them. Chairpersons were genuinely unprejudiced in their willingness to consider women as faculty members. There were no differences in rated desirability for hiring. However, the average faculty rank suggested for the males was "Associate Professor." The identical descriptions were seen as meriting "Assistant Professor" when identified with female names. Equal recognition for equal achievements is a sincere ideal, but it is not as powerful as the automatic tacit assumptions which bias our perceptions in daily life. This study illustrates how unequal recognition of past achievements can cause unequal advancement and therefore unequal salary for equal performance.

Deaux and Taynor (1973) also found that men and women are not evaluated equally for equal performances. Forty-seven male and 50 female students judged one of four types of people (a competent male, a competent female, an incompetent male, and an incompetent female) who were presented on videotape being interviewed as applicants for a study-abroad scholarship program. The competent and incompetent scripts had been prepared in advance and the same two scripts were used by both male and female actors. After viewing their assigned videotape, the students evaluated the "applicant" for intelligence, competence, and qualifications for the program. The results showed that competent males were rated higher than competent females. Equally interesting, incompetent males were rated lower than incompetent females. In other words, for men candidates competence determined evaluations; for women, competence was less strongly related to evaluations.

A similar pattern of results was found by Day and Stogdill (1972) in a field study of 38 male and 38 female supervisors matched for civil service rank, job status, type of work, and having at least two male and two female subordinates. The supervisors were rated by their subordinates as not differing in their supervisory styles or leadership effectiveness. However, the male supervisors' advancement records reflected their effectiveness ratings. The female supervisors' advancements had been slower and were unrelated to their individual effectiveness ratings. Laboratory data and field studies agree: Women do not receive equal reward for equal performance. Other research shows how inequality of recognition creates inequality of opportunity.

Research on Equal Opportunity

Porter and Geis (1981) showed that tacit stereotypic assumptions about men, women, and leadership produced perceptual bias in evaluating particular men and women. College students (224 of each sex) saw one of eight different colored slides of a group of five graduate students seated around a table and described as working on a group project. Half of the slides showed same-sex groups (all men or all women). In these slides, the person at the head of the table was overwhelmingly seen by viewers as the group's leader—regardless of which particular man (in the male groups) or woman (in the female groups) occupied that position. The other four slides showed the same stimulus persons, but arranged in mixed sex groups. A man at the head of the table was viewed as the leader, but a woman was not. The same objective evidence—being seated at the head of the table—was interpreted differently by perceivers depending on the sex of the person being evaluated. Since becoming a leader depends not only on acting like a leader, but also on being seen as a leader by others, the data showed that women do not have the "equality of opportunity" we assume they have.

Other opportunities are subject to the same perceptual bias. Rosen and Jerdee (1973) found that supervisory styles may be restricted by sex. The "friendly-dependent" style was rated appropriate and effective for both sexes. The "reward style" (promising a pay raise) was rated appropriate and effective for men supervisors, but inappropriate and ineffective for women supervisors. Opportunity also depends upon allocation of resources. In another study, Rosen and Jerdee (1974) demonstrated in a controlled experiment that in organizational situations, women are discriminated against in personnel decisions related to promotion, development, and credibility. Ninety-five bank supervisors were sent a series of four decision requests. The requests were sent in the form ordinarily used for such actions in the organization. Thus, the supervisors were unaware that the requests were part of an experiment. The results showed that: (1) A male was selected for promotion to branch manager over a female with identical experience and credentials. (2) Seventy-six percent of the supervisors selected a young, highly qualified male to attend a professional development conference in preference to an older unpromotable female, but only 56% selected a highly qualified young woman over an older unpromotable man. (3) A male subordinate's recommendation for terminating an employee due to a performance problem was found more credible and was more often accepted than an identical recommendation from a female subordinate. Again, both laboratory and field studies agree. Equally qualified women are not given equal opportunity for development or performance.

The "Damned if She Does, Damned if She Doesn't" Dilemma

When the evidence is clear and objective, forcing an inescapable conclusion that a woman is highly competent, she is often disliked and rejected. A prevalent finding is that success at tasks involving intellectual expertise makes the actor appear "masculine;" failure makes the actor appear "feminine." The companion finding that makes this pattern a problem for women is that in order to be liked and accepted, a man must be seen as masculine and a women as feminine. Thus, women face the "damned if you do, dammed if you don't" dilemma. If they appear less competent and successful they appear "feminine" and may be liked and accepted (but not advanced); if they appear more competent and successful, their abilities may (or may not) be recognized, but they will be disliked and risk rejection from the group. A common rationalization for rejection (see pp. 50-52) is provided by the perceptual bias to perceive the performance as less good than it actually was. Examples of such studies follow.

In a series of studies, Horner (1972) found that femininity and competitive achievement for women, though both desirable, appeared to be almost mutually exclusive. Women students were given the cue, "After first term finals Anne finds herself at the top of her medical school class," and asked to write a brief statement giving their impressions of Anne. The responses were then coded for negative content. More than half of the responses portrayed Anne as physically unattractive, unpopular, lonely, neurotic, confused, and unhappy. Many students resolved Anne's "problem" by suggesting that she would soon drop out of medical school and find happiness as a nurse, social worker, or wife of a fine young doctor. When male students were given the same cue about "John," the responses portrayed a bright, talented, happy, ambitious man who had worked hard, richly deserved the honor, was admired by everyone, and would live happily ever after.

Feather and Simon (1975) also suggested that success and failure in competitive situations are perceived and evaluated differently according to the sex of the actor. The perceivers tended to upgrade successful males but downgrade successful females. Forty-eight female students were provided three short verbal cues describing either a male or female actor as succeeding or failing a qualifying exam for entry into medicine, teaching, or nursing. E.g., "After first term finals John (Sue) finds himself (herself) at the top (bottom)of the class." In terms of personality, men actors were evaluated more positively, seen as more powerful,and viewed as more obedient, more polite,and less feminine if they succeeded than if they failed. Women actors, however, were evaluated more positively, seen as more powerful, obedient, polite,and feminine if they failed than if they succeeded. Successful males and unsuccessful females were rated significantly higher than either unsuccessful males or successful females. Successful persons of both sexes were seen as less feminine. A woman who succeeds will be seen and described less favorably,and her success will have negative consequences based solely on her sex.

Similarly, Seyfried and Hendrick (1973) found that strangers expressing attitudes appropriate to the stereotype for their sex were liked better than strangers expressing inappropriate attitudes. Strangers, regardless of sex, exhibiting the masculine role attributes were rated significantly more independent, courageous, ambitious, less sensitive, and less passive than strangers exhibiting feminine role attitudes. Both male and female strangers expressing the stereotypic attitudes for their sex received more favorable ratings than those who deviated from them.

Hagen and Kahn (1975) found that neither men nor women liked a competent woman. Students (60 males and 60 females) took part in what they believed to be an exercise predictive of intellectual ability. Some subjects were told they were competing with fellow group members; some were told they were cooperating; others were told they were simply co-participants. The perceived competence of other participants in the group was varied by giving the subjects feedback at the halfway and end points of the task on all group members' performance levels. After receiving the performance feedback, subjects completed a questionnaire asking how much they liked the other players, who should be group leaders, and who might be excluded next time if group size were an issue. Competent men were most liked by all subjects. Competent women were least liked, especially by male subjects competing with them. Both men and women were more likely to exclude a competent woman from their group than a competent man. They were more likely to include an incompetent woman than an incompetent man. Again, competence was the salient and straight-forward dimension for evaluating men; women's evaluations and acceptance were less clearly related to their competence.

Siegler and Siegler (1976) found that less assertive speech forms were associated with women and also judged as less intelligent. One group of 24 men and 24 women were asked to judge the sex of the speaker. A second group judged intelligence rather than sex. Tag questions (e.g., "Professional football is a bloodthirsty game, isn't it?")were most often attributed to women, and rated as showing least intelligence. Strong assertions (e.g.,"Professional football is a bloodthirsty game.") were rated as indicating the highest intelligence and were associated with males.

Deaux (1979) found in a managerial field study that male managers viewed themselves as performing better on their jobs, having more ability,and higher intelligence than women. They also rated their jobs as more difficult than those of comparable women even though the positions of the males and females were essentially the same.

As a result of the stereotypes, competent men are consistently seen by others and view themselves as more competent than competent women.

Costrich, Feinstein, Kidder, Marecek and Pascale (1975) demonstrated the two-sided nature of sex-role stereotyping. Violation of sex-role expectations (stereotypes) incurred penalties for both the aggressive, assertive female and for the passive,dependent male. In the first study, 54 students participated in small group discussions and student confederates performed either passive or aggressive roles in the group. Passive confederates agreed with the group, did not assume leadership, and assented to the group's decision. Aggressive confederates tried to control the group. Passive men and aggressive women were rated as least popular by both men and women subjects, but especially by men. In a second study, 128 students listened to a script of a counselor and student discussing the student's low grade on a term paper. In the aggressive script, the student complained about the grade and accused the teacher of unfairness. In the passive script,the content was similar but the student was apologetic, emphasizing his or her own inadequacy. The results indicated that aggressive females and passive males were both seen as more in need of psychotherapy than their traditional counterparts. The aggressive women were also seen as more dominant than the aggressive men, indicating distorted perceptions due to the inappropriate behavior. In the final study, 60 students read a booklet of ten psychotherapy vignettes which portrayed dialogues between both aggressive and dependent clients with their therapists. Aggressive patients were disliked in general. However, both aggressive women and dependent men were liked less than their traditional counterparts. In all three studies, men were given no more leeway to deviate from traditional stereotyped roles than women. The difference was that men were devalued for passivity, women for assertiveness.

The derogation and rejection of women who are assertive or highly competent is usually unconscious and unintentional. Research shows that once an evaluative conclusion is reached, rationalizing justifications for it can easily be found and believed. Research evidence on rationalization is reviewed on pp. 50-52.

How Research Results are Judged for Validity

The scientific answer to a research question is always in terms of probability, not certainty. Science differs from other disciplines in (1) using observable (repeatable) methods which can *dis*confirm the investigator's initial opinion if it is in fact incorrect, and (2) using quantifiable measurements for which the probability of error can be calculated mathematically.

In the basic procedure, two samples of subjects (e.g., "evaluators") are randomly drawn from the same population. One sample is given one value of the factor of interest (e.g., a female listed as author of an essay), and the other sample is given the comparison value (a male listed as author). All else in the testing situation is the same for both samples—the content of the essay, the measurement scales on which they mark their judgments, introductory explanation and instructions, etc.

The subjects' quantified evaluations are then analyzed statistically to determine the probability that an observed difference between the samples was due to chance (i.e., random fluctuations *un*related to sex of essay author). A measure of the amount of variability in evaluations *within* each sample is called the "error." The amount of "error" includes both error of measurement and also individual differences between subjects (e.g., idiosyncracies in taste or preference related to the topic or style of the essay, tendencies to rate any essay high, etc.).

The observed difference between the samples is compared against the probability of finding a difference that large by chance in a sample of the given size with the calculated amount of variability due to "error." An observed difference is reported as "a difference" only if it would occur by chance five or fewer times in 100 repetitions of the experiment (i.e., if the probability that the difference was unrelated to the factor of interest was five percent or less). If the observed difference fails to pass this statistical test, "no difference" is reported, and the investigator's initial opinion (hypothesis) has been disconfirmed.

In practice, the stringent five percent error criterion means that the "conservative error" (failing to find a difference which actually exists) is more frequent than the "radical error" (reporting as real a difference which is actually due to chance). In fact, many of the results reviewed above had chance probabilities of less than one percent or less than one tenth of one percent. The statistical tests and probability of error are routinely reported in the journals. Contemporary statistical methods permit more complex sets of comparisons to be tested simultaneously, but they all use the basic ideas outlined.

Sex of Evaluator Differences. Many of the studies reviewed above used both male and female evaluators, and differences in evaluations were examined for both sex of the person evaluated and sex of the evaluator. In some few of the specific comparisons, men evaluators showed a statistically larger anti-female bias than women did. However, differences associated with men versus women evaluators were less frequent and generally smaller than the differences associated with the sex of the person evaluated. Accordingly, the major conclusion is the conservative one that men and women do not differ as evaluators. Both sexes discriminate against women.

Interpretation of the Results. The empirical evidence of perceptual bias and discrimination against women's intellectual products and achievements is clear and conclusive. But the interpretation of the evidence must always remain open to question. The major weakness in most of the controlled experimental studies is that the subjects, the perceivers, evaluators, and "decision makers" were college students. It might be argued that college faculty and administrators, with their greater maturity and experience and a greater stake in their evaluations, would be more accurate and less biased. The available evidence does not support this objection. Fidell's (1975) study of academic rank assignments used academic department chairpersons as evaluators and found the same bias and discrimination as found by other investigators using college students. Similarly, Rosen and Jerdee's (1974) high level bank administrators showed the same bias and so also did Day and Stogdill's (1972) civil service supervisors' advancement records. In addition, the statistical studies of academic men's and women's recruitment, advancement, and salaries reviewed in the following section show exactly the pattern that would be produced by perceptual bias. Even though college students lack the maturity, experience, and stake in decisions possessed by actual academic decision-makers, there is no evidence that basic human cognitive functioning changes between early adulthood and middle age. The stereotypes are tacit knowledge for everyone, and tacit knowledge interprets the evidence at all ages.

It could also be argued that the results of the experiments probably underestimated the amount of bias and discrimination which actually occurs. College students are reputedly more liberal and egalitarian than their elders. Their lack of experience similarly means that their stereotypes are not as deeply ingrained or long-practiced. Finally, their lack of long-term personal stake in their evaluations in the experimental situations should make them freer to evaluate on the basis of the evidence without considerations of future colleagueship or having to explain their decisions to the candidates the next day. It appears plausible that actual decision-makers would be more motivated to hire the best person available than students would be to designate the best candidate in a hypothetical situation. However, such motivation does not eliminate perceptual bias in assessing the candidates. On the contrary, it can increase bias (Borgida & Nisbett, 1977). Further, some mistakes are invisible because the non-hired (or unpromoted) applicants are no longer available for comparison.

The research reviewed so far does not show that the average woman actually does perform as well as the average man. It does show that when men and women do perform equally, the woman is evaluated lower. The data also do not show that every evaluation of every woman is discriminatory. There are individual differences among evaluators in how much they discriminate. There are also individual differences among candidates in eliciting discrimination. The data do show that over a number of evaluations of objectively equally qualified men and women, evaluators favor most men over most women.

The research results can be difficult to believe because most of us personally know a woman (or man) who fails to fit the pattern (e.g., a competent woman who has succeeded brilliantly, a woman who turned out to be incompetent; a competent man who lost out "because they had to hire a woman," etc.). Personal examples are vivid and psychologically compelling. We often feel that they are more valid than written reports of research couched in pallid, abstract language. However, the vividness and salience of examples has no logical bearing on the validity of the general principle. General principles of human behavior are derived from controlled observation of hundreds of examples. For an excellent account of this and other common errors in seeing and evaluating evidence, see Nisbett and Ross, 1980.

Actually, examples answer the wrong question. The fact that a few outstanding women have succeeded in academia has little bearing on whether equally qualified men and women receive equal treatment. The facts of perceptual bias and discrimination against women do not mean that women cannot succeed in academia. They do mean that women suffer extra burdens, less opportunity for productivity, and less recognition than equally qualified men.

Summary

Research shows that women's products, performances, and records of achievement are evaluated lower than the identical products, performances, and records of men. Empirically, equal performance does not bring equal reward to women. Neither is opportunity accorded equally to equally qualified men and women. Women who are competent, assertive, or both are often disliked and rejected (often by devaluing either their competence or their congeniality, or both). Less competent women are more liked and accepted (but only to the extent that they are perceived as "less competent"). Thus, women are "damned" if they are modest in their claims of achievement, and doubly-damned if they aren't. The reported differences between evaluations of men and women were based on statistical comparisons of the observed difference against the standard error of measurement, using matched products or performances and matched samples of evaluators. The probability that any single result was actually due to chance was five percent or less. The probability that the entire set of results was due to chance is infinitesimal.

IV. DISCRIMINATION AGAINST WOMEN IN ACADEMIA

The data on academic advancement show the same pattern as the evaluation data from controlled experimental studies reviewed in the previous section. For men, recognition, opportunity, and advancement depend straightforwardly on achievement. For women, recognition, opportunity and advancement are lower, slower, and significantly less closely tied to achievements. This is the kind of situation which can lead to demoralization and reduced efforts on the part of both men and women.

Unequal Treatment of the Sexes in Academia Begins Early and Continues

Differential encouragement of males and females occurs from preschool level on, and the differences at each level create differences in opportunity at the next. Serbin and O'Leary (1975) sent trained observers into 15 classrooms to record 13 specific types of teacher response to seven categories of children's behavior. The results indicated that teachers actually teach boys more than they teach girls. Boys received more attention, more directions, more individual instructions, and more physical and verbal rewards. In one situation, 3 year-olds Michael, Patty, and Daniel were being shown by the teacher how the same quantity of water can be poured into different containers of varying heights and widths. Michael and Daniel were allowed to try the water themselves, each time with the teacher's instructions on how water can change shape without changing amount. Patty twice requested a turn and was twice told to wait. Patty eventually got her turn, but by then the teacher had turned her attention to other matters, so Patty did not receive the individual instructions that both the boys did. In another example, the children were making paper baskets. Boys were taught to use the stapler to fasten the handle to the basket. When a girl had difficulty, the teacher did not provide instruction but instead took the child's basket and stapled it for her. Problem solving ability is related to the amount of attention and instruction a child receives. These preschool inequities reflect differential encouragement which occurs at every educational level.

Dweck (1975) studied teacher-child interactions in the primary grades. Boys were praised for academic achievements, correct answers, and completed assignments. Girls were praised for the neatness of their work, for their physical appearance, and for good behavior. Boys were criticized for sloppy work and bad behavior, girls for poor academic performance. Thus, boys received encouragement for academic success and penalities for immaturity. In contrast, girls received penalties for academic failure and encouragement for "femininity."

Recruitment Into Academic Careers

In spite of this inequality, girls' grades are as high as boys' throughout elementary school, high school, and college (Roby, 1967). Although no specific research data are available, it is possible that differential encouragement of the sexes takes on more subtle forms in the undergraduate years. Women students may be given high course grades when they earn them, just as men are, but women students may be given less personal encouragement by faculty to consider an academic career and seek graduate training. In spite of their equal grades, fewer women than men apply to graduate and professional schools.

The Importance of Same-Sex Role Models. One empirical correlate of undergraduate women's later professional success has been identified. Tidball (1973) found that as the ratio of women faculty to women students increased, so did the college's output of career-successful women graduates. Conversely, the higher the percentage of men faculty, the smaller the output of women achievers. In a study of women achievers, 1500 women were chosen at random, 500 from each of three editions of Who's Who of American Women. A comparison between women's colleges and co-educational colleges for the decades 1910-60 indicated that the women's colleges produced more than twice as many women achievers per 100 women enrolled. The minimization of interpersonal relationships with other women in favor of men (pressure to find a mate) and lack of adult women role models in the co-educational colleges were at fault. The effect of women faculty on undergraduate women's achievement was tested by correlating the number of student women achievers and women faculty members at two colleges matched for academic reputation and entrance requirements. The number of women faculty and women student achievers was highly and positively correlated. The number of men faculty neither enhanced nor detracted from the output of women achievers. These data suggest that the mere presence of female faculty as visible role models may enhance women's later achievements.

Male achievement has long been correlated with "a college education." It may be that achievement depends not so much on the course content that is learned, but rather on exposure to multiple same-sex role models of authority and expertise.

Women Faculty and Administrators on Campus. If later achievements depend on same-sex role models, American colleges have been increasingly disadvantaging their women students. Roby (1973) found that despite unprecedented growth in higher education over the past 50 years, women faculty have lost ground relative to men. Although student enrollment increased from 2.3 million in 1950 to 7 million in 1970, women faculty and professional staff declined from 28% to 22% in the same time period. The ratio of women faculty to women students declined by 48% in women's colleges and by 60% in co-educational colleges over the four decades prior to 1970. Doctorates granted to women dropped from 16% in the 1920's to 13% in 1969-1970.

This downward trend appears to have begun reversing in the 1970's. By 1978 women were 26% of the academic faculty, overall (Hornig, 1980). However, many of these women were in two-year colleges and in colleges or schools of nursing, home economics, library science, and education in universities, so women represented a much smaller percentage of the core academic faculty in arts and sciences. Among Ph.D.'s in the labor force in 1979,women represented 11% of those in the sciences and engineering, and 25% of those in the humanities (National Research Council, 1979). Percentages of women doctorates in the separate disciplines ranged from 1% in engineering to 25% in psychology among the sciences, and from 15% in history to 36% in languages,in the humanities. The percentages of women faculty in both sciences and humanities can be expected to increase further in the 1980's. Women received 20% of all doctorates in the sciences between 1975 and 1978, and 38% of all doctorates in the humanities (National Research Council, 1979).

One reason that more men than women applied to graduate school, especially in the decades prior to 1970, may have been that fewer women planned full-time professional careers. However, career plans reflect social expectations and opportunities as much as individual interests. Men with good grades and an intellectual bent had ample same-sex role models on campus to make an academic career appear feasible. Women with good grades and an intellectual bent had no such visible evidence of feasibility. Colleges have always charged equal tuition to men and women students, but they have not provided equal opportunity for personal growth and development.

Research on the Academic Careers of Men and Women

In large-sample surveys of academic careers, the research question is again "does one sample (e.g., women) differ from another (e.g., men)?" In these studies, the question is addressed by examining whether individual differences on one variable (e.g., academic rank) predict corresponding differences between the same individuals on some outcome variable (e.g., salary). Again, the decision about the existence of a relationship is based on statistical analysis which takes into account the amount of variability (i.e., measurement error) in the sample on both of the measured variables.

The variables of interest in these studies are: academic degree (having a Ph.D. versus not having one); prestige of one's graduate training institution; type of institution of present employment (e.g., research university, four-year college, two-year college); academic discipline; academic rank; number of publications; salary; and, in the studies reviewed below, sex of the survey respondent. The relationship between any of these variables and any other can be analyzed. Contemporary statistical methods (e.g., Finn, 1977) permit a whole set of "predictor" variables to be analyzed together to assess the relative contribution of each of them to some outcome variable of interest.

In general, the survey results show that sex makes a significant difference on every outcome variable. Being male rather than female predicts a higher value of outcome, given the same value of qualifications on all of the "predictor" variables examined in the analysis.

Recruitment, Hiring, and Unemployment Rates. Sex discrimination in faculty recruitment and hiring can be inferred from unemployment rates. In one discipline, mathematics and computer science, which had the lowest unemployment rate (.2%) of any discipline, the rates for men and women were identical in 1979. In every other discipline, the rate for women Ph.D.'s was greater than for men. Overall, .8% of men Ph.D.'s were unemployed, 3.4% of women. In the sciences, the rates for men and women were .7% and 2.8%, in the humanities 1.4% and 4.6% (National Research Council, 1979). The frequent suggestion that "reverse discrimination" due to affirmative action pressure is unfairly disadvantaging men is not supported by the empirical data. The sex difference in unemployment rates is not due to a recent glut of women Ph.D.'s. Unemployment rates of women have been two to five times as high as men's since data were collected by sex in 1973 (Vetter, 1981). Furthermore, women's unemployment rates have been highest in physics and astronomy, chemistry, and engineering, the same fields in which women were most conspicuously absent. Family pressures are also not the cause. The rates are the same for single women as for married ones (Vetter, 1981).

Advancement: Rank and Tenure. Astin and Bayer (1973) reported the results of a national survey by the Carnegie Commission on Higher Education in cooperation with the Office of Research of the American Council on Higher Education. A comprehensive questionnaire was filled out by 60,028 faculty members from 57 two-year colleges, 168 four-year colles, and 78 universities. A final sample of questionnaires from 3,438 women and 3,454 men was drawn for analysis. Academic rank, tenure status, and basic salary were analyzed. In terms of academic rank, men occupied the highest ranks. Twenty-five percent of the sample of men faculty were full professors, 9% of the women. Thirty-five percent of the women were instructors, 16% of the men. The most frequent rank for women Ph.D.'s was assistant professor. According to Hornig (1980) assistant professor is still the dominant rank for women, regardless of cohort (number of years since receiving the Ph.D.). (Recall Fidell's, 1975, p.22, finding that department chairs assigned assistant professorships to the same vita summaries with female names that they judged as meriting associate professorships for males.) Forty-six percent of the men held tenured positions in 1967, compared to 25% of the women. The quality of one's graduate institution predicted rank, tenure, and salary for men, but not for women. The researchers concluded that women who obtain a doctorate from a prestigious institution and demonstrate scholarly productivity cannot expect promotion as quickly or with the same certainty as a male counterpart.

Sex differences in faculty rank and tenure cannot be explained by the relatively large numbers of young faculty women with recent doctorates. The sex difference in rank is found within each cohort (years since Ph.D.) as well as overall (National Research Council, 1979). For example, among 1960-69 science doctorates, 55% of the men were full professors by 1979, but only 29% of the women. For the same cohort in the humanities, 55% of men were also full professors, but only 41% of women. For the 1970-74 cohort, 51% of the men in the sciences were associate or full professors, but only 32% of the women. In the humanities, 62% of the men were in the two upper ranks, compared to 46% of the women. Similarly, the sex difference in tenure occurred in every cohort considered separately.

Salary. Astin and Bayer (1973) found that men received higher salaries than equally productive women. In 1967, 28% of the men had a salary less than $10,000, compared to 63% of the women. The major variables explaining salary differentials were rank, productivity, type of parent institution, and sex. Due to discriminatory hiring practices, women often taught at smaller and less prestigious institutions. However, even when rank, productivity, and type of parent institution were held constant, men still received higher salaries than women. Eleven years later (National Research Council, 1979), the same sex differences in salary still persisted. In the sciences, the average salary for men Ph.D.'s was $30,000, for women Ph.D.'s, it was $23,000. Men Ph.D.'s in the humanities earned $24,000, women $20,000. The sex discrepancy in salary occurred in every discipline and in every cohort.

Analysis of Sex Differences in Rank and Salary. Horning (1980) analyzed the available surveys of academic careers and concluded:

> "Numerous studies in this field agree that women faculty are overconcentrated in the least prestigious institutions and in the lower ranks, carry a disproportionate share of teaching loads especially at introductory levels, and are seriously underpaid at all levels when rank, field, Ph.D. cohort, type of institution, and work functions are held constant. Evidence is adduced which suggests that such faculty distributions and reward systems may adversely affect the quality of education and of scholarly research."

Horning found that although women scientists who had received doctorates five to seven years previously had studied in higher rated institutions than comparable men, and completed their doctorates as fast or faster than men, they still occupied lower rungs of the academic ladder and received lower salaries than their male counterparts. Part of the sex difference in rank advancement and salary may be due to the different assignments given men and women. Promotion and salary in universities have been based more on publications than on teaching, and women are assigned more teaching than men. Over half of all male university faculty (53%) taught eight hours or less per week, compared to 35% of women. Over 28% of the women, but only 15% of men, taught 13 hours or more.

Part of this sex discrepancy was due to differences in discipline. More women were in disciplines in which all faculty taught more hours, on the average. However, the sex discrepancy in teaching hours held even within disciplines as well as overall. It also held within each rank and Ph.D. cohort, so the argument that more teaching is assigned to junior faculty also cannot explain the data.

Women may choose more teaching than men (but there is no evidence that they do), but if they do, it may be because of lack of access to opportunity, support, facilities, and encouragement for research. Hornig also found data suggesting that women may be assigned disproportionately large shares of introductory-level courses and disproportionately small shares of upper-level and graduate courses. An explanation that could account for these data is the "accommodation script" described in the next section (pp. 44, 56). More hours in teaching and course preparation mean fewer hours for research and publication.

The percentage of men with tenure at each rank exceeds the percentage of women at the same rank. The percentage of men achieving tenure has exceeded the percentage of women by 5-20% depending upon the field, even when publication productivity is held constant. Continuing the same pattern of differences in promotion, over half again as many men as women were involved in administrative work. The salaries of male faculty exceed women's by 20% overall. Men's salaries exceeded women's by 15% even when rank, tenure, publications, and type of institution were held constant.

Sex differences in salary are greater for administrators than for faculty. The average man administrator made over 30% more than the average woman with the same rank and position in 1981-82 (Chronicle of Higher Education, 1982). Out of 81 administrative positions for which comparative data were available, men's salaries were higher in 76, women's in five. Hornig concluded that some disparities were due to the fact that a larger number of men than women held doctorates. However, even when factors such as field, level of degree, and experience were held constant, major sex disparities in rank, tenure, and salary remained.

A study by Tanur and Coser (1978) revealed additional factors affecting women's salaries. Women who started employment in the early 70's or earlier, before the enactment of equal employment laws, were paid lower entering salaries than men. Since annual salary increments are typically expressed as percentages of preceding salary: (1) The discrepancy between their salaries and those of comparable men would increase over time. (2) Discrepancies would also increase with higher rank (since increments for promotion are also relative to preceding base rates). Further, women's fields are lower paying than men's fields (but male faculty in women's fields earn more than equally qualified women in the same field). Women who combined all three attributes--old timers of high rank in a field with proportionately more women--had salaries conspicuously below those of comparable men.

Salary discrimination is often obscured by the relatively high salaries of a few recently hired women. Thus, by paying a few women very high salaries, discrimination against the majority of women can be statistically obscured. Within every type of institution and within every discipline, sex differences increase with career advancement. The effects of lack of support and recognition cumulate over time. Rank advancement profiles differ for men and women. Administration, research, and publications, all of which are engaged in more often by men than women, receive higher reward than teaching, to which women devote most of their time--either by choice or by assignment, or both (Astin & Bayer, 1973). Perceptual sex bias limits women's academic opportunities, evaluations, and advancement.

Interpretation of the Data. The major weakness of the survey studies is in the incomparability of the data to be compared. Aggregate results do not give an accurate picture of the actual situation in any given academic unit. For example, performance and evaluation criteria at two-year colleges differ from those in research universities. The percentage of women in the arts and sciences college differs from that in the professional college of nursing on the same university campus, and both differ from the professional college of engineering. Somewhat greater comparability is achieved by restricting comparisons to faculty with doctorates--but that excludes two-thirds of the faculty in the country (Hornig, 1980). Data which are broken down by type of institution and individual discipline are probably most useful, but too detailed for the scope of this report. Interested readers should consult the annual reports of the National Research Council, Commission on Human Resources, 2101 Constitution Avenue, Washington, D.C. 20418, or the annual reports published by the American Association of University Professors in Academe.

The survey studies of advancement and salaries in academia probably underestimate the actual level of bias and discrimination. Salaries are compared between men and women of equal rank. However, it takes more publications for a woman than a man to advance to a given rank. And, since there is no reason to assume that academic journal editors are immune to perceptual bias, it seems reasonable to surmise that a woman's work must be significantly better than a man's to receive equal publication. Thus, a woman who has achieved the same rank as a given man probably has produced more research of higher quality than her male counterpart. In effect, we are giving women fewer and poorer opportunities than men and, at the same time, setting higher achievement requirements for their advancement and salary. The result is that women are increasingly under-represented in the higher ranks and higher salary levels of academia. Surveying the causes, correlates, and consequences of professional success in The Academic Marketplace, Caplow and McGee (1958) commented that women could not succeed in an academic career because women's intellectual contributions simply could not be taken seriously. This observation was intended as descriptive, not as prescriptive. We no longer make such statements and perhaps no longer believe them consciously. However, their import is encoded in our store of tacit knowledge, and continues to influence our perceptions unconsciously.

Summary

Research shows that males are consistently favored over females in academia from preschool on. Undergraduate women's later career achievement is directly related to the percentage of female faculty members on their college campus, but the percentage of college faculty who are women decreased over the 40 years prior to 1970. Studies of career advancement and recognition show that women are disadvantaged relative to equally qualified men in recruitment, hiring, promotion, and salary. The data also show that discrimination increases with increasing experience, rank, and status. These studies suggest that the perceptual bias and discrimination against women revealed by the laboratory studies reviewed earlier (pp. 20-30) are not simply artifacts of the laboratory or the use of students as evaluators. The same bias and discrimination are evident in the actual career records of academic men and women.

V. DISCRIMINATION IN NATURAL SETTINGS IS INVISIBLE

Discrimination against women was documented in the research reviewed earlier by controlled, experimental methods. A sample of viewers evaluated a performance, product, or set of achievement credentials presented as that of a woman, and a matched sample of viewers from the same population evaluated the same stimulus attributed to a man. The results consistently showed bias in favor of the man. Similarly, the survey studies using statistical analysis of actual men's and women's recruitment, hiring, promotion, and salary in academia showed corroborating evidence that men are more recognized than equally qualified women. However, when discrimination occurs in natural settings it is "invisible" because there is no matched sample of stimulus persons, products, or evaluators for exact comparison. In addition to the lack of objective comparison data: (1) The processes which create discrimination are unconscious; (2) by the time a formal evaluation is made, discriminatory bias has already tipped the scales; (3) the evaluation rules and criteria are as subject to interpretive bias as the evidence; (4) social consensus makes bias appear "objective" and valid; and (5) biased perceptions and expectations create self-fulfilling prophecy effects.

Discrimination Can Occur Unconsciously

Research reviewed so far has shown that tacit knowledge shapes and guides unconscious perceptions (pp.8-9), and that sex stereotypes operate as tacit knowledge to bias perceptions and evaluations of men and women. This section will review some of the major cognitive-perceptual processes which create the effects and keep them invisible.

Mental Categories, Tacit Knowledge and the Meaning of Information. Categorization is a major part of human thinking. Most of our dealings with people as well as objects are based on our tacit knowledge (pp.8-9) about the categories they belong to as much or more than on their unique, individual qualities. Familiar categories in academia include "faculty," "administrators," and "students." "Good students" and "high-level administrators" are also examples of categories. The complaint that "Professor X's lectures are impossible to follow" has a different meaning coming from a good student than from a poor student. We interpret the "true meaning" of information in terms of the category characteristics of the persons involved. Our interpretation is based on previous, tacit knowledge of characteristics of the category. The meaning of a category is the meaning of the characteristics tacitly associated with it.

Sex Categories are Basic Perceptual Categories. Sex categories are among the most basic, if not the most basic, in contemporary culture. They are basic in that each sex category, "male" and "female," has many distinguishing characteristics closely associated with it. These are the stereotypic tacit assumptions described earlier (pp.10-12). The characteristics include not only descriptive qualities such as "rational" or "emotional," but also behavioral norms and expectations such as "assertive" or "accommodating." The sex categories are also basic in that they make a difference in so many areas of daily life. Thus, they are among the earliest learned and most deeply ingrained in our conceptions of ourselves, others, and acceptable patterns of social behavior. The fact that sex categories are basic, pervasive, and vivid means that they are among the most easily available categories in our minds for interpreting the meaning of our own and others' performances. Research (Kahneman & Tversky, 1973, Nisbett & Ross, 1980) shows that the availability of a category in our mind determines the likelihood that it will be used,but may be unrelated to its actual relevance.

Locksley and Colten (1979) and Bem (1981) pointed out that gender is a basic category of daily life. In most social settings, including academic settings, norms and rules governing behavior are often contingent upon the sex of the individuals in the setting. The influence of one's sex on others' perceptions and one's expectations for one's self are unavoidable in daily experience.

Three studies by Taylor, Fiske, Etcoff and Ruderman (1978), showed that both sex and race are dominant, salient categories which shape our perceptions and misperceptions of people. After watching a videotape of a group discussion, subjects were shown a still photo of the group and asked to identify which group member had made each of several statements. When mixed-sex groups were viewed, subjects misattributed one woman's statement to another woman more often than they misattributed it to a man. When bi-racial groups were viewed, subjects similarly mistook one black for another more than they confused blacks and whites. These data showed that race and sex are tacit perceptual organizing categories of "automatic" cognitive structure.

In a paper reviewing research on the categorization of persons, Brewer (1979) concluded that the mere labeling of others as being similar to oneself, or in one's own group, versus being dissimilar, or in a different group can cause a difference in perceptions of them or behavior toward them. For example, in one study subjects were asked to estimate the number of dots on a placard and then told either that they were "overestimators" or "underestimators." Subsequently, they attributed more favorable personality and behavioral traits to others in their own category than to members of the other group. The categorization process and the salience of belonging to one group versus another is sufficient to cause favoritism within one's own group. The result is that in a "man's world," men are more likely to be favored and advanced than women of equal merit.

Category concepts are called "prototypes," "schemas," or "scripts" depending on the function being investigated. The important point is that the sex category distinctions and their associated stereotypic qualities operate as tacit knowledge in all of the functions.

ERIC
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Prototypes. A prototype is a composite image or concept embodying the most salient, identifying characteristics of the "most typical" category members. For example, the concept "doctor" evokes a different set of characteristics than the concept "truck driver." Although we do not expect any particular doctor to match the doctor prototype exactly, we do expect a substantial amount of correspondence.

Cantor and Mischel (1977) found that subjects distinguished grossly between presented and nonpresented characteristics of persons representing various prototypes, but had a memory bias favoring attribution of characteristics which were conceptually related to the prototype over characteristics which were unrelated to it. The evidence suggested that the perception of persons reflects both their actual characteristics and the observer's prototype (category or stereotype) information about them. Our prototype of "the congenial woman" is largely defined by the stereotypic characteristics reviewed earlier (pp. 10-13). In academia, we also have prototypes of a "distinguished professor" and a "high-level administrator." The identifying characteristics associated with these professional prototypes include assertiveness, intellectual authority, superior status--and masculinity. A woman candidate for such a position simply does not match our prototypic expectations. Thus, her application and credentials for such a position will be received and reviewed with greater scepticism than the identical evidence from a man.

Schemas. Schemas are similar to prototypes, but include situational implications as well. A schema is a familiar category of persons, events, or situations with its associated qualities and especially its causal implications.

A much-studied function of schemas is that they "fill in" interpretations and conclusions which are not given by the evidence. For example, Rumelhart (1976) gave subjects short stories such as, "Mary heard the ice cream truck coming down the street. Remembering her birthday money, she ran into the house." Asked what was going on in this story, most subjects described a little girl who wanted ice cream--although none of those facts was given in the evidence. Much of our evidence about people and their performances is similar to the story. It provides some facts but not all of them, and our schemas fill in the missing "information" based on the cues available.

The study by Smith and Miller (1979) described earlier (p. 9) showed the operation of schemas: Subjects interpreted a situation faster with less information than with more information about it. Their ready-made schemas filled in the "missing" information almost instantly, but it took them longer to reach a conclusion with more information because they had to process the additional information for correspondence with the tacit knowledge already encoded in the original schema.

When information about a woman's action or product is incomplete, our schemas "fill in" the missing information and provide a conclusion which explains the situation in terms of the stereotypic qualities associated with our category knowledge about "women." The mental processes of filling in, explaining and concluding occur rapidly, automatically, and outside of conscious awareness. We are often unaware of how much of the supporting evidence was externally given and how much supplied by our own prior "knowledge." This is the kind of process which can create misunderstandings about anything, but the results are particularly damaging when a woman's actions or products are being considered.

Research evidence (Hansen & O'Leary, 1982) shows that the schemas we use to explain men's actions differ from those we apply to women. For example, given the event, "John laughed at the comedian," and asked why, subjects attributed the laughter to something about the comedian--e.g., the comedian was funny. Given "Mary laughed at the comedian," subjects attributed the laughter to something about Mary--e.g., she was one of those giggly types. The data suggested that actions by males are seen as realistic responses to the situation, but the same actions by females are seen as due to the constraints of their inner nature. The implications of this distinction are far-reaching. For example, if Professor Jones is absent from a meeting or arrives late, a common explanatory schema is that he is very busy or was unavoidably detained by legitimate, important responsibilities. However, if Professor Jones happened to be a woman, observers' explanatory schema would probably focus instead on internal qualities such as irresponsibility. Similarly, think of hearing that "Chris Colley balked at teaching the introductory course this year," or that "Chris insisted on bringing up the vacation schedule in a staff meeting devoted to the budget problem." Explanatory schemas differ depending on whether "Chris" is "Christopher" or "Christine."

Summarizing research to date, Wyer (1980) concluded that schemas organize our perceptions. Information which is consistent with the dominant schema is more noticed, better learned, and better recalled. Zadny and Gerard (1974) had subjects view a skit. Prior to the viewing, they were informed that the actor was either a chemistry, psychology, or music major. Later, when subjects were questioned about the skit, they were able to recall more information from it related to the major area mentioned than information relating to either of the other two areas. The information cue about the actor's college major activated the subjects' schema for the prototypical major in that discipline. As a result, the information in the skit related to that schema was expected and thus encoded more carefully. Therefore, it was more easily retrieved from memory.

Scripts (Abelson, 1976; Schank & Abelson, 1977). A script is a behavioral schema. A script tells what to do, often in what sequence, and what not to do in various categories of situations. For example, in a restaurant the waiter brings a menu, takes the customer's order, and brings the food. The customer eats the food and pays the bill. Waiters do not sit down and eat with customers; customers do not enter the kitchen; neither waiters nor customers play catch with a frisbee during idle moments of waiting. Scripts specify rights and obligations, and many are sex-coded. The behavior expected of women differs from that expected of men in the same situation. Who pays the bill in a restaurant is a traditional example just beginning to change. Paying the bill, like many other traditional chivalry scripts, was based on the assumption that the man was the competent and responsible member of the pair. In return, women (like children and other status subordinates) were expected to defer and accommodate to the man's opinions, preferences, needs, and wishes.

Much of the traditional dominance-deference script still persists. For example, in a mixed sex group such as a committee meeting, it is acceptable for a man to interrupt a woman. Ordinarily, she will stop talking as soon as he interrupts. If she fails to defer fast enough, others in the group turn their attention to him, ignoring her. This makes it appear that she is the one "out of place." In contrast, if a woman interrupts a man, he continues talking and others continue attending to him. Our conscious experience in such situations is that what the man has to say is "more important." (Research on the dominance-deference script is reviewed on pp. 55-56.)

A closely related script is that even when women get the floor, they are not heard in the same way that men are heard. The underlying stereotype is the implicit assumption that women's intellectual contributions cannot be taken seriously. Thus, if a woman provides important information or a creative solution to a group problem, it is not heard as important or credible, she is ignored, and it is forgotten. Fifteen minutes later, when a man arrives with the same information, or devises the same solution, its importance is obvious and he is recognized as the contributor and group benefactor. Notice the self-fulfilling prophecy. Tacit assumptions create listener-responses which then seemingly "confirm" the initial assumptions.

The sex-coded "accommodation script" is also familiar in academia. Women are expected to be accommodating; men to be accommodated. The empirical finding that women teach more hours and more introductory level courses than equal-status men (p.36) may be a result of the greater pressure on women to be accommodating compared to the tacit assumption that men's needs and preferences should be accommodated.

The accommodation script also occurs in daily routine. For example, a man's needs take precedence over a woman's. If two faculty members, a man and a woman, arrive simultaneously at a secretary's desk, or in a department chair's office, the secretary or department chair will look to the man and take care of his business first, before attending to the woman. Even if the woman arrived first and was waiting for the secretary or chair to complete a task, and the man arrived second, he would often, still, be attended to first. Exactly the same script prevails when a number of persons raise their hands to speak in a staff meeting--or a class seminar. If the woman in such cases were to object, she would be seen as petty and "oversensitive" about a trivial matter. But as such incidents repeat over days, weeks, semesters, and years, the result is that she spends more time waiting and has less time to get on with her work, or less opportunity to contribute, than the man. A second result is that she learns that her needs, concerns, and ideas are "less important" than those of male colleagues. A third result is that everyone's schemas, and scripts specifying "male pre-eminence and female accommodation" are reinforced and validated.

Stereotypes Operate Like a Spotlight in a Theatre. One consequence of our tacit category knowledge about women is selective attention, interpretation, and recall of information about them. Sex stereotypes provide the tacit knowledge which defines our prototypes, schemas, and scripts involving women. This familiar category knowledge then organizes and edits both our perceptions of the evidence and also the conclusions we can draw from it. An important point brought out by research on these cognitive categories is that as long as the expected formulas are followed, events flow smoothly without question, and the expected characteristics and behaviors (i.e., the stereotypes) are reinforced. However, when the formulas are violated, we do a cognitive-perceptual double-take. Discrepancies require explanation. For example, if a woman appears highly competent or behaves very assertively, our initial fleeting reaction is surprise, a sense that "something is wrong." Indeed what is actually "wrong" is that the incoming information does not match our pre-coded (scripted) expectations. Thus, we must resolve the discrepancy. Our unconscious causal schemas fill in the missing "information." Thus, common explanations are that the competence is less than it first appeared, or that the woman has serious personality problems. This reinterpretation can occur so rapidly in neural processing that we may be unaware of the initial discrepancy. In a sense, our pre-coded category characteristics determine the conclusion we must come to, and "perceptual bias" (pp. 4-10) can then be understood as the unconscious reinterpretation of the evidence to make it justify or fit the conclusion.

The spotlight in a theatre determines where we will focus our attention, what we will see, and what we will not see. The tacit stereotypes defining our prototypes, schemas, and scripts involving women serve the same kinds of selective highlighting, obscuring, and guiding functions in our daily lives.

Why Men are Viewed as Colleagues and Women are Viewed as Women. Our familiar schemas and scripts cause us to treat men as colleagues but treat women as females. Recall the research evidence presented earlier (pp. 24-27) which showed that evaluations of men depend straightforwardly on their competence, but evaluations of women depend on their stereotypic "femininity" as much or more than on competence. This is because "male gender" is an unconscious component of our prototypes, schemas, and scripts associated with "academic authority." When we encounter a male colleague the fact that he is a man fits our unconscious category associations, so we can focus on his individual competence and qualifications. Since masculine stereotypes match authority figure stereotypes, the fact that he is a man does not contradict or interfere with evaluations of individual competence. In fact, they tip the balance toward a judgment of competence unless the evidence clearly proves otherwise. In contrast, when we encounter a female colleague the most visible, salient perceptual fact about her is that she is a female. Thus we unconsciously "see" her in terms of our tacit category knowledge about "females" at the same time that we are consciously evaluating her in terms of "professional competence." The female stereotypes (p.10) are either irrelevant, or contradictory to stereotypes of intellectual competence and authority. Thus, our focus on her competence suffers from both unconscious distraction (see the Hernandez-Péon study, p. 8) and unconscious interpretations of the evidence which directly contradict the possibility of competence.

Research data showing the results of this unconscious confusion were reviewed earlier (pp. 24-27) in connection with the "damned if she does, damned if she doesn't dilemma:" Competent women are evaluated lower than equally competent men, disliked personally, and perceived as "unfeminine." Incompetent women are evaluated higher than equally incompetent men (but far below competent men), liked personally, and perceived as "feminine." The data suggest that tacit assumptions about what females are like and what they should be like interfere with perceptions and evaluations of their competence. Examples of this phenomenon are provided by recent history. Margaret Thatcher, Prime Minister of Great Britain, was reportedly considered "cold and haughty." Dr. Jean Kirkpatrick, U.S. Ambassador to the United Nations, was reportedly viewed as "uppity." The kind of people usually called "uppity" are servants or status inferiors who "step out of place" by failing to show the expected deference to their "betters"--their status superiors. The term was most frequently used in this country in reference to "niggers" in the hundred years preceding the 1960's. It is possible that the "faults" of both Thatcher and Kirkpatrick consisted entirely of high levels of intellectual competence, serious task orientation, and assuming the authority (i.e., responsibilities) of their official positions. These behaviors and attitudes from men in those positions would elicit respect, acceptance, and probably admiration. It would appear that the women were evaluated more as "females" than as the representatives of their governments.

The unconscious confusion of behavior expected of women and behavior expected of professional colleagues can multiply misunderstandings between a woman and her colleagues, especially her supervisor. A woman may speak or act from her self-definition as "a faculty member," but be heard or seen from the other's definition of her as "a woman." Thus, if she adopts the assertiveness or prerogatives of "a faculty member," she may be "seen" as "out of line," "arrogant," "inflexible" or "uncooperative." (I.e., she has violated the deference and accommodation expectations for women.) Since neither is aware of what caused the misunderstanding, it is difficult to resolve.

Category Thinking and the Persistence of Sex Stereotypes. Category thinking is highly efficient. We would never have time to obtain and process all of the needed information about every particular person, object, event, or situation we encounter. In general, category thinking is sufficiently accurate to serve our purposes adequately. Subcultures develop specialized categories for important areas. (Eskimos distinguish among 27 categories of snow; academics distinguish subspecialty areas within their discipline). As Nisbett and Ross (1980) pointed out, category thinking creates serious errors when: (1) the defining category characteristics are, or become, grossly inaccurate for many or most category members; (2) the defining characteristics are applied unconsciously in the belief that the evidence is being interpreted without the aid of category constructs; or (3) when the defining characteristics preempt examination of the evidence.

Research reviewed in this paper shows that all three of these error-producing conditions occur in evaluating women. Traditional sex category characteristics are becoming less and less accurate for "women in general" as conscious, legal, and social opportunity constraints against women are gradually lifted. As noted (p. 19), the stereotypic characteristics may be even less applicable to the highly educated women who pursue academic careers. The problem is that sex *category membership* is biological and inherent. As Allport (1954) and Campbell (1967) pointed out, this leads us to assume that *behavioral category characteristics* are biologically inherent in the same way as physical category characteristics. In fact, research (pp.13-14) shows that the behavioral characteristics are learned, and even those few with some biological basis can be modified by training. The fact that we now know consciously that sex stereotypes are ill founded then creates the second error, sincerely believing that they no longer influence perceptions and evaluations. The third error, preempting examination of the data, occurs when our schemas "fill in" ambiguous or missing evidence (pp. 42-44).

The question is not *whether* we will categorize people. We will. That is the way the mind works. The question is, what are the dominant, automatic characteristics unconsciously associated with the categories that are salient? As long as our tacit knowledge about women emphasizes their family and sexual roles and represents them as unsuited "by nature" for intellectual authority and status, perceptual bias will continue to cause invisible discrimination. In response to a frequently-asked question, there is nothing wrong, *per se*, in seeing women as sex-objects--as long as one can, with equal ease, see one's sex-objects as intellectual authority peers or superiors.

Rose and Hamilton (1979) concluded that the persistence of stereotypes is due to the use of schemas, prototypic vignettes or scenarios, which are by nature selective. Individuals more easily process information relevant to their schemas.

Wyer (1980), made the important point that information which directly contradicts a schema will be more noticed and recalled than irrelevant information, at least in the immediate context. This is not inconsistent with the other research reviewed in this paper. Contradictory evidence which is extremely vivid, objective, and clear-cut may be noticed, but the ambiguous or incomplete evidence more commonly encountered in natural settings may be ignored. It is also possible that the contradicting facts may be recalled, but their meaning may be reinterpreted. For example, Osgood, Suci and Tannenbaum (1957) found that when subjects were given "inconsistent" assertions linking a previously-rated positive concept with a negative one (e.g.. "Stalin praises peace"), the subtle, connotational meaning of both concepts changed: "Stalin" became slightly less negative and "peace" became less positive.

Two excellent review articles summarized the recent empirical data on how stereotypes bias perception and evaluation: Ashmore and DelBoca (1980) concluded that the prejudice resulting from sex category distinctions is not conscious or knowingly discriminatory against women. The evidence appears to the perceiver to be genuine. We assume our evaluations are valid but they are our brains' interpretations of the evidence. Our category knowledge has shortcut the information process by directing our attention to the information about an individual or group which confirms our previous expectations.

Hamilton (1979) reviewed five causes and the consequences of stereotyping. (1) One attends more to those features or characteristics which identify a person as a member of a particular group such as male or female, than to the person as an individual. This causes the observer to adopt a biased way of viewing an individual which may cause the observer to see things which are not part of the individual's identity and miss things that are. The observer is selectively perceiving the salient features which identify that person as a member of a group. (2) Stereotypic statements about social groups are usually correlational. When there is a relationship between group membership and psychological attributes, such as women are dependent, this relationship is often overestimated. (3) Behavior which confirms expectations is attributed to a person's personality or inborn biological factors, whereas behavior which is inconsistent with stereotypic expectations is attributed to external factors. (4) Tacit knowledge focuses our attention on a particular aspect of a person's behavior. We notice how good or bad the service is in a restaurant because the quality of service is a relevant dimension of restaurant dining. Similarly, we notice a man's competence, but the most salient dimension of women (in the eye of the beholder) is the fact that they are female, and often their physical appearance. (5) Information about people is coded, organized, and stored in the form of prototypes or schemas. Additional information which is consistent with the prototype will be noticed and recalled more than unrelated information.

Categorization and the use of prototypes, schemas and scripts to construct and fill in missing information can produce conclusions for which there is little or no objective evidence. However, we all assume that our conclusions were based on the evidence. Thus, when we need to explain or justify a judgment, either to ourselves or others, another familiar unconscious process quickly provides the needed explanation.

Rationalization: How Actions and Decisions are Justified. Rationalization is giving socially acceptable but false reasons for an action or decision. Rationalization can occur consciously as dissimulation or hypocrisy; however, it can also occur unconsciously. Classic conceptions of rationalization (e.g., Freud) emphasized a motivational basis, such as defending insecure self-esteem. Current work emphasizes a purely cognitive basis--a tendency to "fill in" plausible explanations for judgment outcomes when the real explanations are simply inaccessible. (Recall that judgment outcomes are often shaped by unconscious tacit knowledge during neural processing before the perception becomes conscious.)

For example, Nisbett and Bellows (1977) had subjects read a case study describing a woman applicant for a camp counselor position. Different evaluators received different combinations of information items. Those who received information that she accidentally spilled a cup of coffee during her employment interview subsequently indicated that they liked her more than did those who did not have this item of information. Thus, knowledge of the coffee-spilling incident was an actual, empirical cause of liking. In contrast, information that the applicant had high grades in school was empirically unrelated to liking. Yet, when the evaluators were then asked why they liked the applicant, those with both information items listed her high grades as the major reason and did not mention the coffee incident at all.

In another study (Nisbett and Wilson, 1977), a guest professor with a slight European accent gave the same lecture in two different undergraduate class sections of the same course. In one class the professor introduced his lecture arrogantly, insulting the students' intelligence, preparation, and motivation. In the other class, the same lecture was introduced with enthusiasm, showing acceptance and appreciation of students. Afterwards, the regular instructor asked the students to evaluate the lecture. Not surprisingly, the students with the arrogant introduction found the lecture less valuable, relevant, and stimulating than those with the accepting introduction. The more interesting finding, however, was that students with the accepting introduction mentioned the professor's accent as a positive feature of the lecture, claiming that it added emphasis and color and made the content easier to follow. Those with the arrogant introduction mentioned the accent as a major cause of their low ratings, claiming that it made the speaker almost incomprehensible.

Nisbett and Wilson (1977) concluded that conscious reasons for a decision or judgment are those that are socially defined as "good reasons" for that kind of judgment, but they may have little to do with the actual reasons for the decision. The actual determinants of decisions may be unconscious, especially when they are socially unacceptable. In academia, it would be unacceptable to devalue a woman for competence or expertise. Accordingly, the evidence or rules are reinterpreted to provide acceptable reasons for the discriminatory decisions. As noted above, the process of reinterpretation may be completely unconscious. Only the product of the reinterpretation is conscious. The implication of such data is that each particular allocation of opportunity or reward is sincerely perceived as "justified by the evidence." Indisputable discriminatory bias can be detected only by the matched-comparison procedures used in the research described above. Since our conscious intentions to be fair and objective are sincere, we assume our evaluative conclusions are correspondingly fair, and perceptual bias spotlights the evidence to justify them.

The rationalization process could be responsible for the "damned if she does, damned if she doesn't" results described earlier (pp. 24-27). A competent, assertive woman violates the expected deference and accommodation scripts. Observers' rejection reactions to the violation are then rationalized by devaluing her competence.

A related mental process was also repeatedly observed in research on attitude change (Festinger, 1957; Brehm & Cohen, 1962; Zimbardo, 1969). The general finding was that actions do not correspond to previously measured conscious beliefs in abstract principles or preferences. (However, actions do follow the tacit beliefs of category prototypes, schemas and scripts associated with the situation, see pp. 42-45, 53-63). Rather, conscious beliefs change to represent (justify) overt actions. For example, students opposed to a proposal to make a course in religion a graduation requirement were induced to write an essay advocating the proposal. After writing the essay, their private beliefs were more favorable to the proposal than they had been previously. Another consistent finding was that the less objective justification people have for their actions, the more their attitudes change to supply that justification. In one study, subjects were given a long, tedious laboratory task with no explanation of its meaning or significance, then offered either one dollar or twenty dollars to tell the next subject waiting outside that the session was interesting and informative. Those who lied for one dollar ("insufficient justification") later privately reported that the experiment was much more interesting and valuable than did those who lied for twenty dollars.

Generalizing from this line of research, Bem (1967) concluded that our conscious beliefs and attitudes are less the product of a reasoning-through of evidence and logic, and more the product of summary inferences based on observation of our previous actions in relevant situations. Thus, actions shape conscious attitudes more than conscious attitudes shape actions. This is a rationalization process in that conscious evaluations are unconsciously shaped to give the appearance of justifying actions which were actually determined by unconscious tacit beliefs. As long as we continue to discriminate against women, we will find reasons which appear to justify the unequal outcomes.

Summary. One major reason that discrimination against women is invisible in natural settings is that the mental processes which create perceptual bias are unconscious. Views and evaluations of men and women are conditioned by tacit knowledge of traditional sex stereotypes which are unconsciously associated in our minds with sex category membership. Category knowledge operates as prototypes, schemas, and scripts which define expectations and assumptions about men's and women's products and actions. They influence what evidence is noticed and what is unnoticed, the meaning of the evidence which does register, what is later recalled, the explanation of what is perceived, and the conclusions to be drawn from it. They also provide inferences which fill in the gaps in ambiguous or incomplete evidence. In the same way, they provide rationalizations to justify the conclusions. These processes describe how the discriminatory perceptions and evaluations reviewed previously could have occurred without being noticed by the evaluators involved.

The "Established Fact" Effect:

Bias Occurs Before the Evaluation and Accumulates Over Time

The second major reason that discrimination in natural settings is invisible is that it occurs as a fait accompli. Perceptual bias operates before the conscious or formal evaluation takes place, as well as during the conscious evaluation process itself. For example, Zadny and Gerard (1974) found that we selectively attend to information or behaviors which confirm our expectations. This perceptual bias takes place during the encoding process, before any evaluation occurs. One of their experiments, in which subjects selectively encoded information from a skit, was reviewed earlier (p. 43). Recall that Hamilton (1979 p. 49) also concluded that information about people is stored in the form of category prototypes. Any additional information which is consistent with the prototype will be remembered more often than unrelated information.

In evaluating in-house candidates, as in salary and advancement decisions, the evaluators will have had repeated exposure to first-hand or second-hand information about the candidates. Perceptual bias operates on the interpretation of each of these separate items of information at the time it occurs. Many of the incidents may in themselves be trivial--a displeasing statement in a committee meeting, an incipient frown of disapproval by a trusted colleague when the candidate's name was mentioned. Such trivial incidents may be scarcely noticed at the time and quickly forgotten. But the perceiver's evaluative reaction to the incident is encoded into his or her cognitive image of the person.

Ross, Lepper & Hubbard (1975) demonstrated that personal and social impressions become relatively independent of the specific evidence that created them. Anderson, Lepper & Ross (1980) showed that beliefs and expectations about ourselves, others, and situations can persist even if we learn that the information on which they were based was false. The process of forming the initial explanation creates a "conclusion" which remains in our memory, independent of the evidence which initially required explaining.

As these conclusions about a colleague accumulate, a global impression of the colleague is formed. As the global impression develops and solidifies over time, it exerts a more and more selective and biasing influence on the perception and interpretation of new evidence. By the time formal evidence is examined for formal evaluation, the actual evaluation is, partly at least, a _fait accompli_, and the formal evaluation consists primarily of identifying aspects of the formal evidence which confirm and justify the foregone conclusion. Because of the different content of the stereotypic assumptions and expectations for the two sexes, this process is more likely to overestimate a man's value and underestimate a woman's. (Recall that the _same_ behavior which elicits positive reactions when performed by a man provokes negative reactions when performed by a woman--pp. 24-27).

The fact that this "infinitesimal accretion" process occurs does _not_ mean that evaluators never respond to overwhelming evidence contrary to their former impressions or sentiments. It does mean that over a large number of evaluations, men candidates on the average will get more mileage from the same amount and quality of work, and women will accrue more "deficit" from the same amount and seriousness of "problems." Recall (pp. 35-38) that sex discrepancies in rank increase with years of experience, and sex discrepancies in salary increase with increasing rank.

The Natural Metamorphosis of Rules: Bending the Rules for Men

The third major reason that discrimination in natural settings is invisible is that stereotypes not only influence our perceptions of individuals, but also influence our perceptions of the rules as well. Rules and criteria are often reinterpreted to facilitate a man's advancement, but followed more literally (or sometimes less literally) for a woman.

For example, if a department's evaluation criteria include "research publication," the work of a junior man who has published two articles in two years may be described as "showing promise of continued productivity." In contrast, two articles in two years by a junior woman could be described as "a delay in her research program." Similarly, a man's "in press" articles (accepted but not yet in print) might bolster the global impression of his "productivity," but a woman's "in press" articles may be carefully excluded from consideration because they are _not_ yet "publications." Securing a large extramural research grant may be "worth" a larger salary increment than publishing in a distinguished journal--or the reverse--depending on the sex of who did which. In administrative units, a man who consistently fails to complete assignments may be perceived as having an unduly heavy job which warrants hiring an assistant to work under his supervision; a woman who is consistently behind schedule may be perceived as simply "inefficient." (Recall the research data, p. 43, showing that a man's action is perceive as a realistic response to the external situation, but the same action by a woman is seen as caused by her own internal nature.)

It is hard to believe that such inconsistencies could occur and even harder to believe that they could occur without being noticed. They do occur unnoticed, partly because no one involved has the comparative information needed to detect them, but primarily because the outcomes fit the familiar script of male achievement and recognition. When expectations are fulfilled, no one has the sense that "something is wrong" needed to prompt closer examination of the evidence in order to resolve the discrepancy. In effect, we are using an elastic ruler to evaluate elastic evidence.

The same shifting of the rules occurs in daily routine, with similar disadvantaging of women. As indicated in the discussion of "scripts" (pp. 44-45), the informal behavioral rules often dictate different behaviors for men and women in the same situation. A major example was the dominance-deference script for mixed-sex conversation. Men hold the floor more and interrupt women more than women interrupt men. As a result, women tend to appear less competent. Strodbeck and Mann (1956) found that because men tend to talk more by giving more opinions than women, they appear more competent to discuss the issues. In a series of mock jury deliberations, jurors listened to a recorded trial, deliberated, and returned their verdict. Because men more frequently gave opinions, as opposed to the women who tended to react to others' contributions, women were seen as less competent to discuss the issues.

Piliavin and Martin (1978) demonstrated that authority figures who tend to reinforce males cause females to contribute less in terms of task participation. Subjects were asked to discuss three 10-to 15-minute cases having to do with social problems such as heroin, delinquency, and race relations. During the second discussion an initially quiet member of the group was encouraged to participate more. When males were encouraged and rewarded, their participation increased and females fell back on sex-stereotypical socioemotional behavior. On the other hand, when females were encouraged to participate and were rewarded, both sexes became less stereotyped. Males and females in this case both displayed equal levels of both task and socioemotional contributions during the final discussion. However, in natural settings women are seldom rewarded since the rules continually allow men to talk more. This makes men appear more competent and therefore brings them more rewards for their competence. The process is a circular one.

Francis (1979) confirmed that men talk more, take longer turns in conversations and thus hold the floor longer. They also engage in a greater variety of body postures during conversations. Eighty-eight law and social service students were asked to get acquainted by engaging in two seven minute conversations, one with a stranger of the same sex and one with a stranger of the opposite sex. The interactions were videotaped and time spent talking, number of turns taken, and number of interruptions were counted. The results showed that men talked more and took longer turns while women did more smiling and laughing, as prescribed by the script for feminine role expectations.

Interruptions by men are accepted and go unnoticed; if a woman interrupts, however, she is violating the dominance-deference script and appears aggressive. In a corporate gathering, a scientific discussion, or a staff meeting, most of the speaking time will be taken up by men. After the meeting members will not remember how much time the men took or how often they interrupted. They will only recall that the women did not speak out or make clear contributions. The familiar scripts are enacted "automatically" without conscious attention.

Langer, Blank and Chanowitz (1978) conducted three field studies showing that scripted routines are followed automatically regardless of content. An experimenter carrying either a short or long manuscript approached a student about to use the library xerox machine and asked to use it first. Compliance was frequent with the short manuscript, regardless of whether the experimenter gave a real or nonsense reason for the request ("May I go first because I'm in a hurry;" "May I go first because I have to make copies.") In contrast, when the experimenter carried a long manuscript, compliance was lower, but better with the real reason than the nonsense one. The short manuscript evoked the familiar script of doing a minor favor for a fellow student, so compliance was "automatic" without conscious consideration of the justification (reason) for complying. The longer manuscript did not fit the familiar script, and so evoked conscious processing of the situation. The same principles operate in the dominance-deference script for interruptions in mixed-sex groups. We assume that we listen to the man and ignore the woman for a real reason (i.e., because the man's comments are "more important"). In fact, interruptions by men and deference by women fit a familiar script and so are enacted and accepted automatically, regardless of their content or importance.

Another stereotype that changes the rules by which men and women are evaluated is the "accommodation script." As noted above (p. 45), we expect women to be accommodating and men to be accommodated. For example, if a department chair asked a faculty man to teach a particular course and he preferred not to, a way would usually be sought, with little fuss or notice, to accommodate his preference. Such accommodation could then be repeated year after year with minimum attention or discussion. In contrast, a woman is expected to be accommodating. Her preference in the same situation would appear "unrealistic," "impossible," and "presumptious," and consequently provoke greater insistence and pressure for compliance. Recall from the Rosen and Jerdee (1974, pp. 23-24) study that whatever reasons a woman gives for her demands or decisions appear less credible and justified than the same reasons given by a man. As a result, she would have to be more assertive to get her way than the man would, and would therefore be seen as "uncooperative," "arrogant," and "inflexible," as well as presumptious. The same reward costs the woman more than the man. On the other hand, if the preference could not be accommodated, the scenario would operate in reverse. The accommodating man would be seen as being "owed a favor" in return for the imposition, but the woman's accommodation would be taken for granted. The sex-scripted responses of accommodation by a woman and accommodation to a man fit our tacit expectations and pass unnoticed. Violations of the script create feelings of discomfort and must be "paid for."

The stereotype that women should be accommodating can lead to unintentional exploitation if they conform to expectations and penalty if they refuse. This is another example of the "dammed if she does, dammed if she doesn't dilemma." Recall (p. 53) that it is evaluators' reactions to an incident rather than the specific facts of the incident which are encoded and retained in memory. Thus, decision-makers' differential recall of favors owed to men and favors owed by women provides seeming justification for each particular opportunity and reward assignment. As a result, the empirical inequality in opportunity and reward is unnoticed or appears justified.

As long as sex-coded scripts dominate daily interactions, the "rules" for men and women will differ. The present situation is analagous to encouraging both men and women to enter the race, and promising equal rewards for winning, but requiring all women to run in high-heeled shoes.

Two more specific processes, social consensus and self-fulfilling prophecies, also contribute to making discrimination in natural settings invisible.

Social Consensus Reflects the Bias and Defines It as "The Truth"

The exact quality and merit of most performances and achievements of faculty and staff in academia are more or less ambiguous. If you doubt this, try listing the specific items of "job performance" and achievement in your unit and assign them weights which, when added up for each member, would accurately place him or her on an overall scale of "merit" relative to all other members in similar positions. In fact, most evaluations are interpretations of the evidence available. Implicitly, we recognize the fallibility of individual perceptions and impressions by having most important evaluations done by a committee with decision by majority or consensus. Consensus in a group is subjectively experienced by members as "the truth." As Festinger (1954) pointed out, we all need to evaluate our own opinion on an important issue. Most crucially, we need to form and act on opinions which are correct. When there is no objective, physical criterion (such as a yardstick or thermometer) to evaluate evidence, group consensus is needed and then experienced as definitional.

Sometimes consensus is spontaneously immediate. More often it emerges gradually in the course of group discussion. What is actually happening is that group members are persuading others and also changing their own opinions to agree more with others. More specifically, their brains are "reorganizing" the configuration, weighting, and meaning of elements of evidence to correspond more closely to the descriptions presented by others. The mental process of opinion change is not conscious. Only the product is conscious, the conclusion or opinion at a given time.

Group consensus is seen as more accurate and valid than individual judgment. The assumption is that any one individual's biases and misperceptions will be cancelled out by the different biases and misperceptions of others, and the consensual core of perceptions will be valid. In general, this system of decision-making is the best we can do in terms of accuracy. Serious inaccuracies arise only when all group members share the same bias. In such cases the consensus will be biased. More unfortunate still, the biased decision will be experienced and perceived as "the truth." This is exactly the problem in evaluations of women. Sex-stereotypes are culture wide. The resulting perceptual bias against seeing or accepting competence in women is encoded in everyone's private cognitive structure. Thus, the results of the bias (lower ratings of women) are consensual in nearly every group, and the fact that the outcomes are consensual makes them appear accurate, valid, and "objective."

Research has identified the social consensus phenomenon and demonstrated its power to shape and change individual opinions. Sherif (1935) had subjects estimate how far a point of light moved in a dark room. Subjects believed the experimenter moved the light for each trial, and was testing their perceptual accuracy. Actually, the light did not move at all; the apparent movement was an optical illusion. Tested alone, individuals differ in their reported estimates. Over hundreds of trials, some perceive distances averaging as little as two or three inches; others reliably estimate 10-12 inches. After being tested alone, the same subjects were again tested in groups of two or three persons. Over the course of the session, in which they heard each others' estimates, group members converged on a common estimate. They had been explicitly instructed to make up their minds for each trial before any of the others reported for that trial, and they reported after the session that they had been careful to follow this instruction and remain independent of the others. In fact, their perceptions of reality had been influenced. Another sample of subjects was tested first in small groups and then a week later in individual sessions. A group consensus was formed rapidly in the first session, and the consensual judgment was retained in the later private sessions. Once having learned "the truth" about an ambiguous phenomenon, it shapes our later perceptions of other events in the same category.

Asch (1956) had subjects judge which of three comparison lines matched a criterion line in length over a set of 20 judgment trials. (There was an objective correct answer for each trial.) The perceptual judgment required by the task was easy. When subjects were tested alone, virtually no errors occurred. However, when subjects were tested in a seven-person group, and all six others gave a unanimous wrong answer (following secret previous instructions from the experimenter), a third of the subjects reported agreement. The unanimous wrong answer condition was repeated 12 times during the 20 trials and two-thirds of all subjects conformed at least once. This work suggested that even when social consensus is contrary to objective, physically-measurable reality, it can shape individual votes. Further work revealed that the "majority" need not be as large as six. Groups of five, four, and three unanimous others created as much compliance as groups of six and larger. Equally interesting, the influence of the false majority on the individual's judgments was broken if just one other group member broke with the group and reported a correct answer. The problem is that it takes more courage than most of us apparently possess to be the first to disagree.

The Sherif and Asch studies above demonstrated consensus effects on physical length judgments. Other researchers (e.g., Festinger, 1954; Gerard, 1953; Back, 1951; Allen & Levine, 1969; Suls & Miller, 1977) have had groups of subjects discuss various opinion issues. The consensus effect prevails. Typical procedure in these studies is to measure each group member's opinion on the issue privately before the discussion. Then the group discusses the issue. Subsequent private opinion measures are taken after the discussion (sometimes periodically during the discussion). The range of opinion is smaller after the discussion than before it. That is, group members report the group consensus as their own private opinion after the discussion. Group members also report more confidence that their opinion is correct after a discussion than before it. Consensus has the effect of appearing to validate an opinion simply by defining it. When there are differences of opinion on the issue, a process of persuasion, compromise, and gradual shifting takes place. A lone dissenter in an otherwise unanimous group often capitulates quickly, sometimes before discussion begins. Other work indicates that the consensus effect is stronger on issues more relevant or important to the group. Hiring and promotion decisions are important to the group in academia. Since the stereotypes are universal, bias against women is consensual. Since the decision is consensual, it appears objective and accurate, and thereby renders the resulting discrimination "invisible."

The fact that social consensus defines "the truth," and thus defines individuals' beliefs, works hand-in-hand with the perceptual bias principle which makes us "see" in the evidence what we already believed about it. Perceptual bias and social consensus combine together to create self-fulfilling prophecies which then further insure that discrimination in natural settings will remain "invisible."

Perceptual Bias Creates Self-Fulfilling Prophecies

A self-fulfilling prophecy is an initially false belief which causes behavior (by the believer or others) which then causes the belief to come true (James, 1890; Merton, 1957, Jones, 1977). For example, in the Victorian era it was believed that females were less intelligent than males, and that their "delicate nervous systems" could not stand the discipline and stress of serious intellectual education. As a result, they were protected (i.e., excluded) from education by both expectation (social norms) and lack of opportunity. Their lack of education then shaped their interests and abilities, and thus provided seeming confirmation of the initial belief in their mental inferiority. This process was, of course, invisible to the sincere, well-intentioned people who perpetuated it. The same kind of process operates in contemporary society, but in more subtle ways which are invisible to most of us.

Self-fulfilling prophecies are often called "expectancy effects" in the research literature. Rosenthal (1974) found that one person's expectations about another, however unfounded, influence the other's actual behavior. Teachers of 30 fifth-grade classes were told that a new kind of I.Q. test was being developed which predicted "intellectual blooming"--the readiness of a child to make significant intellectual advances, even if the child had shown little promise previously. Actually, a standard academic achievement test was administered to all pupils at the beginning of the school year. The experimenter then selected about a third of the pupils in each class, completely at random, and gave their names to their teachers as the "bloomers" in the class. At the end of the school year, the achievement test was administered again. Each child's "before" and "after" achievement scores provided a measure of actual intellectual gain. Children whom teachers expected to "bloom" made greater actual gains than the other two-thirds of the children in the same classroom. A second finding was that the few children in the non-identified two-thirds who had actually made large gains (presumably because they were actually brighter) were rated by their teachers as less enjoyable to work with and as having noticeable personality defects and social adjustment problems.

These findings have serious implications for women's achievement opportunities. Early-learned traditional stereotypes have created broad social expectations that men will achieve in professional occupations and women will not. The results suggest that these social expectations may facilitate and enhance men's achievements but not women's. In addition, they suggest that women who achieve in spite of negative expectations may be viewed as "difficult" or as having personality problems and thus be considered undesirable for further advancement.

Snyder and Swann (1978) had pairs of male subjects play a competitive game and provided a "noise weapon" to one and then the other on successive trials. The weapon could be set by the possessor to deliver low, medium, or intense distraction to his opponent. In half of the pairs, one player (A) was given false prior information that the unseen other (B) was a hostile, belligerent person. (A) was given the weapon first. Those with prior hostility information delivered higher noise levels to (B) than those without it. The (B) players responded accordingly; those who received more hostility returned more, thus confirming (A)'s initially false belief. Following the game trials, half of the (B) players in each hostility condition were given an explanation by the experimenter describing behavior in the game as indicative of stable, internal personality disposition. The other half were told that game behavior was highly specific to this particular situation and partner and had no implications for other situations. Each (B) player was then asked to play another 20 rounds with a new partner, (C). (B) players who had been made hostile by their former partner, and believed their behavior was internally caused, were more hostile to their new, innocent partner than those not made hostile initially or those told it was not stable or personally based. Thus, initial expectations by one person led to "confirming" behavior by the other which then generalized to interactions with third parties. Sex stereotyped social expectations define men as both aggressive and superior and women as nonaggressive and inferior, and also include the tacit assumption that these characteristics are biologically inherent.

Word, Zanna & Cooper (1974) had subjects interview other subjects for a highly desirable summer job position. Half of the interviewees were black, half white. A videotape was made of each interviewee and a separate tape of each interviewer. A sample of evaluators later judged the black interviewees as less qualified than the whites. A new sample of interviewees, this time all whites, was then "interviewed' using the videotapes of the original interviewers. Those whose interviewer tapes had been made while interviewing a black applicant were judged less qualified than those whose interviewer tapes had been made with a white. Subsequent analysis of the interviewer tapes revealed subtle differences in vocal intonation and inflection and in body posture. Interviewers' unconscious expectations about the competence of their interviewee created subtle cues which then elicited confirming responses from the interviewee.

Snyder, Berscheid and Tanke (1977) had men and women strangers get acquainted by phone. Prior to the conversation, each man was shown a photo ID card, allegedly that of his unseen female partner. In fact, half of the men were given the card of a beautiful woman, the other half were given one showing an unattractive woman. A separate audiotape was made of each partner's conversation. Evaluators later judged the voices of women whose partners believed they were beautiful as more warm, open, and responsive than voices of the women whose partners believed them unattractive.

One person's expectations create demands, opportunities, and encouragements for the other's behavior. The research data suggest that women may be performing at lower levels than they would perform under conditions of equal expectation. This means that it probably requires more ability and effort for a woman to achieve the same performance produced by men with less ability and effort (but more opportunity, support, and encouragement). The data suggest that equal expectations (opportunity, support, and encouragement) would increase a unit's productivity. It must also be recalled that perceptual bias in evaluation of achievements operates in addition to the expectancy effects on actual achievement. Thus, women's achievements probably represent greater ability and effort than identical achievements by men, but are then evaluated as less valuable.

Sex stereotypes create self-fulfilling prophecies which bias perceptions of women's personal characteristics and also bias perceptions of their professional competence. The stereotypes operate as unconscious beliefs that women are submissive, dependent, nurturant, and accommodating. The beliefs cause them to be assigned service tasks and subordinate positions. Occupying subordinate positions itself creates the impression of dependence, submissiveness, and lack of leadership (see Geis et al., p. 16). Stereotypes that women "have nothing of importance to contribute" make it easy for men to interrupt them, thereby reducing their opportunity to contribute. The same stereotypes make listeners "not hear" the contributions women do manage to present, similarly "confirming" the initial bias. Women are expected to be deferent and are pressured to be accommodating. If they comply it confirms the "low status" stereotype; if they refuse, it confirms the "difficult personality" stereotype. Similarly, stereotypic beliefs and expectations of evaluators cause perceptual bias which lowers women's evaluations and thus slows their advancement. Since the bias is unconscious, the women's actual lack of progress then appears to confirm the initial belief that "women are inferior"--both in the eyes of the evaluators, and in the eyes of the women themselves.

Summary

Discrimination can be identified by using matched samples of evaluators judging identical performances, or in aggregate data from large samples of comparable academic men and women. But specific instances of discrimination in natural settings are invisible. This is because: (1) Discrimination is unintentional and unconscious. The sex categories of "male" and "female" are basic and automatic in perception and experience, and sex stereotypes provide the tacit knowledge which defines their meanings. The tacit category knowledge operates in prototypes, schemas and scripts which shape our images, inferences and social behavior expectations. Academic women frequently fail to match our stereotypic prototype of either "a 'feminine' woman" or "an intellectual authority peer." We explain women's actions differently than the same actions by men, and our schemas "fill in" ambiguities or missing facts to justify (rationalize) the stereotypic conclusion. Our social behavior scripts require dominance of men and deference of women. They also require that women be accommodating and that men be accommodated. These automatic images, inferences, and rules operate like a spotlight in a theatre to determine what is seen, what it means, and what is unseen. (2) Discrimination is also invisible because evaluations are shaped by the infinitesimal accretion of evaluators' reactions to many fleeting incidents over time. The incidents are usually forgotten; the information may even be proved false; but the reactions remain, independent of their source, and accumulate. (3) The same mental processes which bias perception and interpretation of the evidence also bias perception and interpretation of the rules. Evaluation criteria can shift subtly in meaning, weight, or application. Men and women are routinely held to different speaking and interrupting rules in mixed-sex conversation with little awareness by participants. (4) Discrimination is also invisible because social consensus among evaluators makes an opinion appear valid. Since the stereotypes are culture-wide, the resulting private bias is common to most group members and is therefore incorporated into the group consensus. (5) Discrimination is also invisible because it becomes a self-fulfilling prophecy. Low evaluations of women actually caused by perceptual bias and social consensus appear to confirm the initial stereotypes and thus justify further lack of support, opportunity, and encouragement.

VI. PERCEPTUAL BIAS AND DISCRIMINATION AGAINST RACIAL AND ETHNIC MINORITIES

Perceptual bias is not specific to the perception or evaluation of women. The neural and cognitive processes involved operate in all perception (pp. 4-10 and 39-53). These processes bias perception and evaluation whenever prior beliefs are inconsistent with the actual facts. For example, perceptual bias can operate in all-male groups to make the performance of high-status members appear better than it is, and low-status members' performances appear worse. Sherif, Harvey, White, Hood & Sherif (1961) had adolescent boys at a summer camp pitch baseballs at a bullseye target wired to record the point of impact, but covered with an unmarked canvas face. As each boy took his turn, the onlooking group members each recorded their estimate of his score. Their instructions emphasized visual accuracy. However, these perception-based evaluations bore no relationship to the objectively-recorded scores, but closely matched the throwers' relative social status in the group.

Empirical Studies of Race Discrimination

Just as the negative connotations of sex stereotypes create perceptual bias against women, stereotypes of minority groups create bias and discrimination against them. For example, Allport & Postman (1945) had viewers study one of four different versions of a picture of a black man and a white man in angry confrontation. In one version, the black man held a knife. The other three versions showed the white man with a knife, both men with knives, or neither man. Later asked "who had the knife," subjects were more likely to report that it was the black, regardless of the version of the picture they had seen.

Thirty years later, Duncan (1976) found that the "aggressive" stereotype of black men still persisted. Subjects viewed a videotape of an all-male group discussion. From time to time the tape was stopped, and subjects were asked to answer questions about what was going on. As the discussion progressed, group members became highly involved, and an opinion disagreement developed between two of them. The sequence ended with one punctuating his point with a quick, mild shove to the upper arm of his opponent. When the shover was white, the shove was seen as playful. When the shover was a black man, it was seen as hostile and aggressive.

Similarly, Gaertner and Dovidio (1977) found that group members were less likely to intervene in a possible emergency to help a black victim than a white victim. They had students participate in an experiment on bystander responsiveness to an emergency situation. Students tended to help black victims less quickly when given the opportunity to diffuse responsibility or explain the situation as less serious. This discrimination was as characteristic of students who had previously claimed to be unprejudiced as of those who had reported biased attitudes. The study also illustrated another important point. When the situation was clearly defined as an emergency, and the student believed he or she was the only one aware of it when it happened, the black victim received as much help as the white. Even highly prejudiced bystanders, although willing to express their prejudice, wanted to avoid being seen as refusing to help an accident victim solely on the basis of race.

Discrimination is less likely in clear-cut situations which are likely to be discovered. It is more likely in more ambiguous situations which require interpretation. It is the interpretation process which causes the discrimination and makes it "invisible" to the perceiver.

Why Stereotypes of Women and Blacks Were Similar

Curiously, many of the stereotypes of women and black people were similar in content. As Myrdal (1944) observed:

1) Women were considered intellectually inferior to men just as blacks were considered inferior to whites.
2) Both women and blacks were seen as emotional, fickle, gullible, irresponsible, dependent, and submissive compared to men and whites.
3) Both women and blacks were accepted, protected, and even loved as long as they "stayed in their place." "Place" had both an attitudinal definition (deference) and an occupational definition (domestic service or other menial work). It was also assumed as natural that the labor of women or blacks would be paid at a lower rate than the same labor done by a white man.
4) There was a myth of "the contented Negro," happy eating watermelon and strumming a banjo, not wanting the onus and responsibility of education or serious career. The parallel myth of "the contented woman" usually featured a house with a white picket fence and the joys of homemaking, and similarly included disinterest in higher education or career.

The stereotypic characteristics were assumed biologically inherent in race when black people were being considered, and the same characteristics were assumed biologically inherent in sex when women were being explained. In effect, the mythic implicit assumption was that white men differed biologically from black members of their sex in the same way as from female members of their race. The unnoticed logic of the other side of the coin was that black women, black men, and white women were all biologically more similar to each other than any were to white men.

As Allport (1954), Campbell (1967) and others have pointed out, disadvantaged groups do in fact share a number of similar behavioral traits. However, what they have in common is not biology, but inferior social status--the fact that they are believed and treated as status inferiors throughout their lives. The difference in social expectations creates differences in opportunity, support, encouragement, and task assignments. The resulting differences in life experience then create actual differences in personality, interests, and abilities. The stereotypes of blacks and women were similar because members of both groups were treated as "inferior by nature" throughout their lives. In Huxley's (1939) Brave New World, readers were horrified at the use and withholding of additives for the test-tube embryos to create different classes of people. In effect, contemporary culture has been unwittingly supplying or withholding psychological additives to individuals' spheres of life experience.

This principle was illustrated in the interview situation studied by Word, Zanna, and Cooper (1974, p. 62). Interviewers of black applicants unwittingly created less opportunity, support, and encouragement, and this had the effect of eliciting less evidence of competence. Recall also the Rosenthal (1974) study (p. 61) in which teachers' favorable expectations raised the actual performances of school children. Further, superior performance from children from whom it was not expected made them appear to the teacher less pleasant to work with and more maladjusted. This is similar to the finding (p. 24) that competent women are often unrecognized, and often rejected if their competence is recognized.

The question of whether there is more discrimination by race or by sex is sometimes asked, and the answer seems moot. In some situations, race and sex may create the same effects; in some, race would seem to be the greater disadvantage; in others, sex would be. For example, 13.1% of doctorate-holders in the labor force in 1979 were women; 8.4% were minorities (National Research Council, 1979). Both groups were underrepresented in relation to their respective percentages in the population. The question unanswered by these statistics is, what percent of the "minorities" were minority women and what percent of the "women" were minorities? Relative degrees of discrimination are often less important than the fact of discrimination. In hiring and recruitment, the issue usually is which one of a group of candidates will be given the offer. If the best white man is objectively equal in qualifications to the best woman or minority candidate, even a very small bias will throw 100 percent of the decisions in his favor. The bias need not even be unanimous. If only 20%

of the decision-makers have a pro-white male bias and the remaining 80% split evenly between him and the other top candidate (as would be expected by chance), the white man will receive 60% of the votes and the equally qualified competitor 40%.

The important point is that minority women suffer from the disadvantage of both ethnic and sex stereotypes. Minority women may often be pressured by their minority group identification to give first priority to supporting the men in their group vis-a-vis white men. The deference and accommodation scripts for women operate in minority groups just as among whites. The tacit assumption that men's needs and concerns "naturally" take priority over women's has also served to make race-consciousness more salient than sex-consciousness among minority members of both sexes. Thus, minority women suffer from perceptual bias and discrimination because of tacit stereotypes of their ethnic group, just as minority men do, but the women also suffer from bias and discrimination caused by sex stereotypes, both within their group and in society at large.

The "Minority Effect" Causes Discrimination, Regardless of Behavior

In most university faculty and administrative units women are in the minority, as are other ethnic and racial group members. Research suggests that simply being in a minority position creates perceptual bias in the majority. Kanter (1977) studied the effects of being the only one, or one of only a few, of one's kind (i.e., one's category) in a group. The minority effect could be based on sex (one woman in a group of men, or vice versa), race or ethnicity (one black, Mexican, or Jew in a group of whites, anglos, gentiles, or vice versa), age (one older person in a group of younger ones), etc. She found that the majority group members reacted to the token members in such a way as to create the expected stereotypic behavior. For example, a majority member would offer to help the minority person with a rather simple, routine task. If the help was accepted, the minority person would be seen as incompetent. If the assistance was refused, the minority person would be seen as "one of those militants,' and help would then be withheld in other situations actually warranting it. Thus, minority group members were often manipulated into social roles such as "cheerleader" or "sex object" which were irrelevant to task performance. Another effect of a minority group member was to make majority group members feel much more similar to each other than they had before. The enhanced identification and mutual support within the majority group served to further exclude the minority person from crucial informal communication channels in the group.

Hamilton and Gifford (1976) studied subjects' perceptions of majority and minority group members. They gave subjects series of sentences asserting various actions performe by a member of "group A" or "group B." Two-thirds of all sentences involved "group A" members, thus making "group B" a minority in the target population. However, two-thirds of the actions attributed to both groups were socially desirable. E.g., "Tom, a group A member, visits a sick friend in the hospital." One third of the actions of both groups were undesirable, e.g. spreading malicious gossip. After exposure to the "population," subjects were given a list of actions and asked whether they would be performed by "group A" or "group B" members. The more frequent category of actions was overattributed to the majority group and the less frequent type of actions was overattributed to the minority group.

In a second study (Hamilton & Gifford, 1976), two-thirds of the actions attributed to both groups were undesirable and one-third desirable. Again, two-thirds of all statements referred to "group A" members. Again, the more frequent type of action was overattributed to the majority group and the less frequent type to the minority group. As the authors noted, natural groups are probably best represented by the first study: desirable actions are more frequent in the group than undesirable ones. Thus, even if the rate of mistakes and inadequacies is the same among both groups, everyone's impression will be that they are more characteristic of minority group members and less characteristic of majority group members. Thus, women and minority group members may be seen as "lacking drive" or "responding emotionally" when in fact these traits may be characteristic of something like 20 percent of both sexes and both races.

In many studies examining racial bias and discrimination, the researchers seem to be addressing the problems of black men compared to white men. The perspectives and problems of black women seem as nonexistent in racial research as those of all women seem in most behavioral research. Similarly, sex bias research relevant to academic career performance and evaluation has also neglected black women. The fact of this double neglect of black women and other minority women in both of the relevant research areas is further evidence that perceptual bias operates even in those who study it professionally.

Summary

"Perceptual bias" refers to the influence of beliefs and values on what is perceived. It is a general human cognitive process and not one specific to perception of women. Perceptual bias can occur whenever prior beliefs and values diverge from objective reality. For example, the performance of high status men may be overestimated and that of low-status men underestimated. As a result of perceptual bias, perceptions of any stereotyped group are likely to be biased. Perceptual bias against black people has a long research history. Stereotypes of black people are curiously similar in content to stereotypes of women. Both groups were considered intellectually inferior, emotional and irresponsible by nature, and contented with their lot. However, the actual similarities between blacks and women appear to lie in their life experiences as members of socially disadvantaged groups. Black women, in particular, suffer the social disadvantages of both race and sex.

VII. COUNTERACTING DISCRIMINATION IN ACADEMIA

Perceptual bias and invisible discrimination do not indicate conscious prejudice or ill will. Thus, they cannot be overcome by sincere egalitarian beliefs or good intentions alone. If bias cannot be eliminated, or even identified in specific instances, then the task is devising procedures to counteract it. There is no known procedure which guarantees 100% accuracy. All human evaluation systems result in some mistakes. The goal must be equalizing the probability of mistakes in either direction for all candidates.

Conditions which Reduce Sex Bias

Bias causes discrimination through automatic tacit assumptions about the qualifications and legitimacy of men and women as holders of intellectual authority positions. As Lockheed and Hall (1976) observed, men are automatically assumed qualified unless there is clear evidence to the contrary, but women are automatically doubted unless there is clear evidence to the contrary. In fact, they are frequently doubted in spite of such evidence, because most evidence is sufficiently ambiguous to allow for easy reinterpretation by the initial bias. If bias causes discrimination by making us see and treat men as qualified but women as doubtful, it follows that visible evidence of support and legitimacy might do for women what our automatic assumptions have always done for men. Research supporting this idea is beginning to appear. The support and legitimacy must be unambiguous, preferably visible, public, consistent, and authoritative.

A study by Pheterson, Kiesler and Goldberg (1971, p. 21) showed that paintings described as entries in a national art contest were judged superior in quality when evaluators believed the artist was a man rather than a woman. In the same study, the same paintings were described to a separate group of evaluators as "winners" in the contest, and these evaluators judged the paintings equally good, regardless of the artist's sex. Tacit knowledge defines a "contest winner" as publicly certified by a legitimate authority, the contest judging panel. When the evaluators "knew" the woman's painting was as good as the man's, they "saw" it as equal.

Geis et al. (1982, p. 16) had subjects judge the personality characteristics of male and female actors playing high and low status roles in TV commercials. This study created validating legitimacy not by authority certification, but by the definitional power of social consensus (p. 57). Both the women and men actors who were consensually accorded status and authority by their partners were perceived as "dominant, independent, rational, ambitious leaders." The same actors consensually treated as lower-status subordinates in matched versions of the same commercials were perceived as "submissive, dependent, emotional, contented followers."

Brown (1981) examined the effects of both authority legitimation and group consensus on evaluations of men's and women's leadership. The same leadership performance embedded into the same group discussion was judged superior when a higher authority personally endorsed the leader than when the authority's comments were impersonal and hedged. Similarly, the same leadership performance was judged superior when the group members "leaked" subtle nonverbal cues of consensual approval rather than disapproval. The differentiating cues consisted of attentiveness, facial expressions and glances, and subtle vocal inflections. The discussion content was the same in all conditions. Visible authority and group support raised the perceived value of both leaders' performances. The social conditions which created the perceived sexual inequality prevailing in contemporary society were those in which the male leader received authority

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and group support, but the woman leader received neither. In contrast, equal evaluations of the man's and woman's leadership performances were produced by equal visible support from the authority and group members. This study showed how subtle, unconscious cues can produce large differences in the perceived quality of identical evidence.

All three studies showed that a woman's evidence of competence was perceived equal to the same evidence from a man after it had been officially validated. In none of the studies was the evidence presented or evaluated as credentials for prospective advancement. The studies do suggest, however, that perceptual bias can be counteracted by visible recognition and support of women—thus providing them the same legitimacy and support that we automatically provide for men. Other studies supporting this conclusion are described next.

Storms' (1973) research with videotape feedback emphasized the importance of visual information. The study suggested that a reorientation of one's perceptions of women (e.g., seeing them in high status roles) might lead one to focus on the positive aspects of female behavior and thus process information about women in such a way as to lead to a more positive interpretation of it. Lord (1980) found that images as informational structures are based on visual data and are most effective for remembering things about other people. The implication of this finding suggests that stereotypes of women as suited for low status positions might most effectively be changed by presenting visual evidence of women performing in high status positions. Simon (1976) found that a new stimulus that resembles one previously encountered, but altered on one salient dimension, leads to a new way of viewing the stimulus, therefore providing a new perception.

Arbib, Kilmer and Spinelli (1976) in a book in which data relevant to explanations of neural processing were reviewed, focused on explanations of input and output relations in neural networks of the brain. Some current explanations view neural networks as operating on a y-type system, that is, two inputs to a single output. A key aspect of this system is that each step in processing information involves two possible neural or "association" pathways. This suggests that a change in either one or both of the inputs in such a system could result in significant output modification. The application for change in stereotyping is apparent. For example, seeing women in authoritative roles could, over time, alter the "automatic" (neural) link between the concepts "female" and "low status."

The practical problem is that visible support depends upon consistency.

In the myriad interactions of daily routine, conscious attention is focused on specific tasks or concerns, and the subtle evaluative cues occur unconsciously and reflect the unconscious, automatic assumptions of early-learned stereotypes. In effect, the problem is that women probably will not be equally supported until they are actually believed equally competent, and they will not be believed equally competent until they are equally supported. The dilemma suggests the need for arbitrary intervention at both the attitudinal (belief) and action (support) levels simultaneously. It also suggests the need for tolerance of the discomfort that is likely to be felt in the transition period. After we have become accustomed to seeing numbers of women (not just one or two "exceptions") accepted and supported in high-level positions, our automatic unconscious expectations and assumptions will be revised, thus eliminating perceptual bias and invisible discrimination based on sex. (Research by Zajonc, 1968, showed that sheer familiarity enhances both liking and evaluations. Male authority is familiar; female authority must become equally familiar.) Evaluations can then more accurately reflect the actual individual differences among candidates, and both quality and productivity can be maximized.

Before considering specific suggestions for change, a common response to "the woman problem" must be noted. It is often assumed that if women do not succeed as well as men in academic or business organizations, it must be because they lack the skills and expertise required for success. Evidence of this assumption is found in the proliferation of training workshops for women to help them remedy their deficits. It may be true that women lack some of the political and strategy skills of men, so such workshops are genuinely helpful. However, the research reviewed in this paper shows discriminatory bias in evaluating identical performances. The data suggest that workshops to remedy women's performance deficits may be of little avail unless they are accompanied by companion workshops to remedy evaluators' perceptual deficits.

Specifically: (1) academic decision-makers need to learn the facts about perceptual bias and invisible discrimination so they can begin taking conscious measures to counteract them; (2) we need to recruit and advance significant numbers of women faculty and administrators. This would (a) recruit presently underutilized talent and thereby raise academic quality and productivity, and (b) provide multiple, visible role models for both students and colleagues and thereby begin to change the unconscious stereotypes which cause bias and discrimination in the first place. Five approaches to counteracting invisible discrimination are outlined below. They are not mutually exclusive alternatives. Adopting all of them together would only begin the shifting of attitude and action toward the equality of opportunity and reward required for accurate evaluations.

Specific Proposals For Counteracting Invisible Discrimination

(1) Individual Responsibility and Public Commitment. Invisible discrimination is caused by cultural beliefs and social structure, but it operates through individual perceptions and individual votes on evaluation decisions. Being aware of perceptual bias is the first step toward counteracting it. Bias controls perceptions most powerfully when it operates least consciously (cf. Asch, 1956). The problem with private self-reminders, however, is that they tend to evaporate in the heat of attention to other matters. Public commitment and reminders are more robust, but even they require frequent repetition.

Snyder and Swann (1976) demonstrated that when individuals were asked to think about their attitudes toward affirmative action prior to judging a sex discrimination case, the correlation between the verdicts and previously measured attitudes was substantial, but egalitarian attitudes did not produce egalitarian verdicts when no reminder was given. One hundred twenty-five subjects were asked or not asked to think privately about their affirmative action attitudes (e.g., Is it a good idea to have women equally represented in employment?) prior to reading an affirmative action lawsuit and case history. The results showed that individuals who had the most egalitarian attitudes, and thought about them prior to reading the case, judged the female plaintiff most favorably. Those who had not been reminded to review their attitudes judged the plaintiff least favorably unless they anticipated that someone might question their judgment. The data suggested that a public reminder about affirmative action attitudes and commitments prior to each evaluation meeting might reduce unintentional discrimination against women.

For example, a unit could have Seeing and Evaluating People (Geis, Carter & Butler, 1982) read and discussed by all members. As a followup, oral reminders might be instituted at all evaluation meetings. Peltz (1952) found that public commitment was more effective than private conscience. She asked students in class to volunteer to participate as subjects in a research study at a specified date and hour. Students in classes in which volunteers were asked to raise their hands and give their names were far more likely to volunteer and show up for the study than those asked only to raise their hands, or sign up (privately) after class, or simply make a private note of their intended commitment.

Zimbardo (1969) found that public commitment made difficult tasks easier and painful situations less painful. In one of many studies, subjects worked at a difficult learning task while receiving a series of painful electric shocks. They were then either asked to commit themselves to do the task a second time, or informed that the second session would follow and asked to do their best. Subjects in the commitment condition reported the shocks were less intense in the second trial and their actual learning scores increased. Those not asked for commitment reported no diminution in pain and learned no more than in their initial trial. Public commitment is more likely to change behavior than private conscience.

Individual responsibility and public commitment can also be applied to many of the seemingly trivial details of academic life which collectively weave the fabric of reality. Students, faculty, and administrators can cooperate in reminding each other to avoid sexist language. For example, if male college students are "men," then female college students are "women," not "girls." "Girls" implies immaturity and status inferiority. Although "girls" is not intended as derogatory, it reinforces the stereotype in the tacit knowledge store of both speaker and listeners. Similarly, sexist statements and examples should be avoided in class and other conversations. "Both workers and their wives enjoyed the change" implies that "workers" are exclusively male. Course titles such as "Man and Machines" imply that women are unimportant or irrelevant. Textbooks can be examined for implicit sexist assumptions as well as explicit statements.

The disadvantage of public pronouncements and private responsibility is that they are unreliable. The ubiquitous, automatic assumptions in our sex-coded prototypes, schemas, and scripts can operate in disguise, in spite of conscious intentions. Individual responsibility and public reminders can be strengthened substantially by combining them with automatic, mechanical procedures.

(2) Delete Sex-Identification from Evaluation Credentials. Have all credentials received by a central office at which all sex indication are deleted. This would involve some editing and retyping. Even better, creden-

tials could be retyped with ostensible sex assigned at random. Since evaluators would know this had been done, it would provide valuable practice in mentally discounting sex cues in evaluations of competence. Disadvantages: This would be expensive and time-consuming. Its effectiveness is limited to evaluation of applicants' credentials before the applicants are known or interviewed personally. Thus, it would be effective primarily in graduate school admission and the early stages of faculty recruitment.

(3) Quantify Credentials and Criteria. (Using objective rather than essay tests is an example. The test items may be poor or unfair, but the benefits and penalties fall on all students alike.) This procedure would produce an objective "score" for each candidate on each criterion. The quality and quantity of evidence defining each value of a given criterion would be specified in advance. Similarly, the weight of each criterion in the total evaluation would be specified. The major disadvantage is the difficulty of scaling the criteria. What is the value of one article in a top-ranked journal compared to two in lesser ones? How much is a large grant worth compared to two research articles, one invited theoretical chapter, or praise from an outside reference? What is the value of three years of experience va. seven years? How should a lesser position in a larger university be weighted compared to greater responsibility in a smaller one? The difficulty of making such quantifications is itself an evidence of how much interpretation is involved in evaluations.

The fact is, however, that we continually carry out evaluations based on a subjective mental calculus involving exactly such comparisons. Devising an objective scale would be time-consuming, but once in place it would provide an objective check on what is now decided by more bias-vulnerable consensus. If such a scale were to be used for salary decisions. it would also have to include teaching (perhaps with "extra credit" for very large or difficult courses, or assignments contrary to choice), student advisement, and committee service.

(4) Get the Facts and Make Them Public. Discrimination cannot be counteracted in the abstract. A major impediment to reducing discrimination is the sincere belief of many faculty and administrators that they personally are unbiased and that their own units are similarly exempt from the problem. Indeed, some of these beliefs may be accurate. Discrimination must be empirically identified and located before it can be counteracted. A tabulation of the percentage of women in each of the following populations can provide some basic data.

1. The Board of Trustees
2. Administrators
    a. Deans, Vice Presidents, and other top level positions
    b. Department Chairs and Directors
    c. Assistant Deans, Vice Presidents, Chairs, and Directors
3. Faculty and Professional Staff
    a. Professors
    b. Associate Professors
    c. Assistant Professors
    d. Professional Staff
    e. Temporary and Part-Time Faculty
    f. Ph.D.'s granted nationally in the past six years
4. Students (majors or unit constituency)
    a. Graduate students
    b. Undergraduate students

The data above should be gathered for the institution as a whole, for each unit separately, and for groups of units. Useful groupings might include administrative units, academic departments, separate colleges, humanities, behavioral sciences, natural sciences. With some exceptions, the supply pool of candidates for each position level can e represented by a category below it. The percentage of women faculty and administrators should also be compared with the percentage of women students from the perspective of providing same-sex authority role models equally to both men and women students (see pp. 32-34). If the percentages of women decrease as the rank, authority (and salary) of positions increase, the unit has cause to examine its recruitment, development, and advancement procedures. Similarly, men's and women's salaries in each category should be compared. (For this purpose, groupings may be based on average salary in the unit rather than on function or disciplinary area.) For a more precise analysis, a salary evaluation kit is available from the American Association of University Professors, Suite 500, One Dupont Circle, Washington, D.C. 20036. The percentages and salary comparisons should be updated annually, so the direction and rate of changes can be evaluated. The collection, comparison, and public reporting of these data should be the explicit responsibility of an independent unit.

Similar procedures could be used to monitor individual and average evaluations and salaries by sex and rank within each unit (or groups of similar units). As noted above, discrimination continues to pass unnoticed because

(1) it is unconscious and unintentional; (2) the apparent inequality in achievement is implicitly expected, so the basis of one evaluation is never compared explicitly with the basis of another; and (3) the women on the receiving end also assume that evaluations are fair and objective, and they lack the comparative information needed to ask for a reevaluation of the evidence. All three of these contributing factors could be reduced if information on each unit member's achievements, evaluations, and salary adjustments were regularly tabulated and disseminated. To protect individual privacy, unit members could be listed by code number, not by name, and each given only his or her own code number. The tabulation must be specific enough to permit genuine comparison. For example, for faculty, separate categories of teaching, research, and service might be used. Additional categories such as "outside funding," "value of prior reputation," or "market pressure" might also be required to account adequately for the final summary evaluations or salary adjustments. Compiling such a tabulation would call the attention of evaluators to inequities which otherwise would have gone unnoticed. Possessing such information would allow unit members to make inquiries based on facts.

One disadvantage of this procedure is the time required to do it. Another is the feeling that such specific data might affront the sensitivities of less-productive unit members. However, the kinds of stress academic professionals are expected to accept is actually defined by social consensus and has, in fact, shifted over the past fifty years. In the present era of tightening budgets in the face of increased pressure for quality as well as productivity, facing the facts about one's own performance may be a realistic requirement.

(5) Adopt Sex-Representation Goals with Accountability. The percentage of women in each unit's supply pool of qualified candidates for entry positions would be identified from national statistics. For in-house advancement decisions, "supply pools" for any upper rank would reflect the proportion of women in the unit at the rank below. The need for women faculty at all ranks could also be adjusted to reflect the percentage of women majors to be served by the unit. The unit would then use normally occurring decisions to work toward its percentage goals. For example, if the supply pool for assistant professors in Chemistry is "Chemistry Ph.D.'s nationally for the past six years," and women are ten percent of that pool, Chemistry would work toward

having ten percent women among its assistant professors. This system is not expensive and uses familiar evaluation procedures. Success in counteracting invisible discrimination is judged not by process, but by outcome.

Resentment against the affirmative action process can sometimes make goals feel like quotas. In fact, quotas imply no choice. (If a unit is below quota, the next hire or advancement must be a woman.) In contrast, goals imply incentive for success, and the closer a unit approaches its goal, the more choice it achieves. This system does not guarantee sexual equality. If women continue to shun math in spite of changes which actually equalize opportunity and support, they will never constitute 50% of any math supply pool, so math departments, on the average, will never have 50% women faculty at any level.

A serious problem is that goals existing only in the form of lip service and official policy documents are often presented as an evidence of "good faith efforts," but in fact, nothing actually changes. Commitment to the goals implies effective procedures for making progress, such as accountability, tangible incentives, or both. For example, annual progress toward the unit's goal could be made a specific item in evaluation of deans, directors, department chairs and other high-level administrators. Obviously, expectations of progress would depend on opportunity. More progress would be expected of a unit making more hires and advancements during the year than one making proportionately fewer. In this system, each unit head is held directly accountable for progress in his or her unit. The other way to turn policy goals into action is to provide tangible incentives to units in proportion to actual empirical progress. Incentives may be in the form of special funding for colloquia, travel, research or special projects, or in the form of nonfinancial privileges or benefits. The size of incentives may vary from one institution to another; they should be large enough to create an effect, but not so large as to be experienced as coercion.

Summary

Most of the research reviewed in this paper has documented bias and discrimination against women. More recent work has begun to suggest that bias and discrimination can be reduced or eliminated by giving women the same visible validation and social support that is normally (by automatic tacit assumption) available only to men. Outside of controlled laboratory conditions, this is easier said than done.

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Five specific proposals for counteracting invisible discrimination in academia were presented:

(1) Individuals can learn how bias works and take individual responsibility for counteracting it in their own actions and decisions. Units can institute public reminders of commitment to equal opportunity at evaluation meetings.

(2) Deleting all sex identification from candidates' initial application credentials would eliminate much sex bias in the early stages of evaluation. Having credentials retyped with sex reassigned at random would accomplish the same thing and also give evaluators practice in disregarding sex in forming their evaluations.

(3) Objectifying evaluation criteria would reduce the amount of interpretation involved, and thus reduce the latitude for bias. The distinguishable levels of each criterion should be defined in terms of quantity and quality of relevant evidence.

(4) Collecting the facts relevant to discrimination and making them public can provide an important prerequisite for corrective action. The percentage of women at each status level should be compared with the percentage in the supply pool for that level--and with the percentage in the student constituency to be served. Average salaries of men and women at each status level should be compared. The same principle can be applied to evaluations and salaries of individuals (e.g., by code number) within each unit or group of units. Tabulating the data would bring sex discrepancies to the notice of evaluators, and possessing the facts would bring them to the notice of those evaluated.

(5) Adopting sex representation goals with accountability for progress involves a commitment to work toward sex representation at each status level equal to the sex percentages in the supply pool (or student constituency) of that level. Accountability means that progress toward the goal is a specific item in the evaluation of units and unit-heads, and that progress toward the goal versus lack of progress has tangible consequences.

When we have many visible role models of women validated and supported in intellectual authority positions, the traditional stereotypes will no longer be supported by social reality. When the stereotypes are no longer supported, they will lose their power as beliefs, and perceptual bias against women will be eliminated.

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