Gender-Related Biases In Admission Decisions

NADIA BUGG, Ph.D., R.T.(R)
DIANA G. POUNDER, Ph.D.

This study tested the effects of applicant gender and attractiveness on admission ratings, personality attributions and causal attributions in the student admission decision-making process in allied health education. The study showed that although gender stereotypes are very strong, they did not affect admission ratings. However, the study did reveal that attractive candidates received higher admission ratings than unattractive applicants and the past successes of attractive applicants were more likely attributed to internal causes while the past successes of unattractive applicants were more often attributed to external causes.

The competitive admission process for educational programs in health sciences usually begins with a screening phase. Raters, who are often the same people who later interview the applicants, screen candidates based on information on their application forms. Only the applicants who survive the screening phase progress to the interview phase. In these early stages of the admission process, when only limited information about the applicant is available, the rater's cognitive biases are likely to cause errors in judgment and may prevent qualified applicants from reaching the next stage of the application process.

A number of studies have demonstrated that gender and physical attractiveness can influence evaluation of an applicant.[1,2,3,4,5] In general, males are rated higher than females and attractive applicants are rated higher than unattractive applicants. However, few studies have specifically analyzed the effects of gender and physical attractiveness on personality attributions and causal attributions made during the applicant evaluation process.

The purpose of this study was to investigate the effects of applicant attractiveness and gender on admission ratings, personality attributions (expressive and instrumental) and causal attributions for past performance (internal and external) in the student admission process.

The study was guided by attribution theory, stereotyping theory and empirical findings on the associated cognitive processes involved in the psychological phenomenon of person perception.

Attribution theory is concerned with the reasons an individual uses to explain the cause of another's behavior to predict future behaviors.[6,7,8,9] Heider (1958) suggested that any given behavior can be explained either in terms of factors within the person (internal attributions) or factors in the environment (external attributions).

For example, if a student scores well on an exam, the achievement could be perceived as resulting from dispositional factors, such as ability or amount of study time, or from situational factors, such as an easy exam or a liberal grading policy. How we evaluate the achievement will depend on whether we attribute its perceived cause to the person or to the environment.

According to stereotyping theory, we select and organize our perceptions in categories that are based on salient characteristics such as race, gender or attractiveness.[10,11,12] A study of the literature revealed that stereotypes regarding traits attributed to men and women were pervasive and, perhaps more importantly, that traits attributed to males were more positively valued than traits attributed to females.[13,14]

A number of studies also suggest that an attractiveness stereotype exists, with high attractiveness associated with more desirable personal traits. These studies suggest that differential evaluations in selection procedures may result from a

pro-male and a pro-attractiveness bias.[15,16,17,18] Additionally, one or both biases may influence differences in personality attributions, with female candidates more likely to have "expressive" characteristics attributed to them and attractive applicants more likely to have more positive personality characteristics attributed to them.

Hypotheses

On the basis of related research, it was hypothesized that the ratings of hypothetical applicants would reflect a pro-male and a pro-attractiveness bias. Traditional gender stereotypes were expected to influence differences in personality attributions for male and female candidates, with women candidates being more likely to have "expressive" characteristics attributed to them. Attractive and unattractive applicants were expected to show no significant differences in causal attributions, but attractive applicants were expected to have more positive personality attributions than unattractive applicants.

Methods

This study experimentally manipulated application profiles of four hypothetical candidates for admission to a health science program with selective admission procedures. Applicant gender and attractiveness were manipulated through a photograph attached to each candidate's application form. Sixty subjects evaluated each of four hypothetical applicants (an attractive male, an attractive female, an unattractive male and an unattractive female) on four admission rating criteria, nine personality attributions and four causal attributions. Application packets for the four hypothetical candidates were randomly ordered across subjects to reduce potential order effects in screening activities.

The chosen academic program was health sciences. Health science programs typically include areas of study such as dental hygiene, medical technology, nursing, occupational therapy and radiologic technology. However, no specific major was indicated in the experimental admission process to maintain the gender-neutral occupational profile of the health science professions overall.

Subjects were undergraduate students enrolled in the senior year of the professional program in a health science discipline at a Southeastern university. These students typically were familiar with similar screening procedures for admission into health science professional programs. They were given extra course credit for completing the task.

Table 1
Descriptive Statistics of Study Participants

Age	Gender Frequency/ Percentage	Major Frequency/ Percentage
x = 21	Male:	Dental Hygiene:
s.d. = 2.86	30/50%	6/10%
Range = 18-35	Female:	Medical Technology:
	30/50%	12/20%
	Total:	Radiologic Technology:
	60/100%	40/70%
		Other:
		2/3%
		Total:
		60/100%

Since participants were volunteers, their responses may not be representative of the population as a whole. They may have been more cooperative and somewhat less critical in their evaluation of the applicants. These factors place limitations on the external validity of the findings. Additionally, the use of student subjects raises the issue of generalizability. However, many simulated selection studies have used student subjects and have obtained results and responses patterns analogous to those of similar field studies.[19] Table 1 provides a description of study participants. The majority of the participants were enrolled in a radiologic technology program.

Student subjects were told they were participating in an experiment in admission procedures. They were told the admissions committee for undergraduate programs in health sciences was considering including student members on the admission committee and wanted to determine how effective students were at evaluating applicants. All raters were asked to read a brief description of the admission requirements for the educational program to standardize their perceptions of admission standards. Raters were told that each applicant had been prescreened for acceptability of minimal educational and background qualifications. Additionally, they were told there were a limited number of spaces available in the educational program.

Stimulus Materials

Two pilot studies were conducted to develop and test the stimulus instruments used in the study. In the first study, 32 nursing students participated in a Q-sort activity to establish the level of physical attractiveness of the hypothetical applicant photographs. Subjects evaluated photographs of 60 Caucasian students (30 males and 30 females) from an out-of-state high school's yearbook. To reduce the influence that clothing and other characteristics might have on ratings of physical attractiveness, all photographs were black and white and depicted students who were smiling and wearing casual attire, but no eyeglasses. Pilot study participants rated each photograph from one to nine, with one being extremely unattractive and nine being extremely attractive. Inter-rater agreement was $r = .96$.

On the basis of the calculated means and standard deviations for each photograph, 16 photographs were chosen to use in the study – four attractive males, four attractive females, four unattractive males and four unattractive females. The photos with the highest means and lowest standard deviations represented the attractive applicants, and the photos with the lowest means and lowest standard deviations represented the unattractive applicants.

T-tests of pilot data indicated that there were significant differences in attractiveness ratings between attractive and unattractive males ($t = 4.15$, $p < .01$) and between attractive and unattractive females ($p < .05$). However, there were no significant differences in attractiveness ratings between attractive males and attractive females or between unattractive males and unattractive females. Inter-rater agreement for the 16 selected photographs was $r = .85$.

A manipulation check was conducted later with actual study participants to verify if attractiveness and gender were appropriately perceived by subjects. Also, applicant photos were systematically rotated among the four application forms so content of each application form would not be confused with the experimental manipulations of gender and attractiveness.

A second pilot study was conducted to establish the equivalency of four application forms developed for the study. Subjects in the second pilot study were 28 professional educators in a health science field knowledgeable of admission procedures for undergraduate students in health science programs.

Four candidate application forms were developed; each was equivalent in qualifications. Each application contained personal data, educational qualifications, employment background and a statement of intent.

Pilot subjects rated a hypothetical candidate's application qualifications, with name and photo omitted, on the admission rating criteria from the researcher-developed evaluation instrument described below. Using mean scores of the admission rating criteria, analysis of variance verified the equivalence of the four application forms ($p > .05$). Subsequent analysis of actual study data also verified the equivalence of the four application forms.

Dependent Measures

Three evaluation instruments were developed by the researcher to measure the candidate's admission rating, personality attributions and causal attributions. The first evaluation instrument, admission rating, included six items measured on a seven-point Likert scale. Four items addressed specific admission criteria designed to assess the applicant's academic and professional suitability for the program; the fifth item was an overall evaluation, and the sixth item was a recommendation for admission.

The arithmetic mean of the four admission criteria was used as the dependent measure for the candidate's admission rating and had a computed Cronbach's Alpha reliability of .87. Concurrent validity was tested by correlating admission rating with the overall evaluation item ($r = .86$) and the recommendation for admission item ($r = .83$). Construct validity was verified by factor analysis.

The second evaluation instrument was designed to measure personality attributions of the applicants. This instrument included 11 bipolar adjective pairs measured on a seven-point scale. Nine of the adjective pairs identified personality characteristics such as "warm-cold," "friendly-unfriendly," "competitive-noncompetitive," and "decisive-indecisive." The additional two adjective pairs were used as manipulation checks for the stimulus variables of applicant gender ("masculine-feminine") and attractiveness ("attractive-unattractive").

Factor analysis of the nine personality characteristics yielded two factors, labeled "expressive" and "instrumental," that were used as dependent measures for personality attributes. Each factor yielded a

Table 2
Means and Standard Deviations For Applicant Gender

Dependent measure	Female	Male
Admission rating	5.54 (.701)	5.68 (.635)
Causal attribution		
Internal	5.30 (.791)	5.43 (.758)
External	3.99 (1.313)	4.24 (1.495)
Personality attribution		
Expressive	5.25 (1.020)	4.60 (1.147)
Instrumental	4.46 (.957)	5.47 (.887)
	N = 119	N = 121

Table 3
Means and Standard Deviations For Applicant Attractiveness

Dependent measure	Attractive	Unattractive
Admission rating	6.046 (.610)	5.175 (.727)
Causal attribution		
Internal	5.829 (.774)	4.904 (.776)
External	3.688 (1.378)	4.539 (1.481)
Personality attribution		
Expressive	5.515 (.943)	4.340 (1.225)
Instrumental	5.365 (.997)	4.567 (.848)
	N = 120	N = 120

reliability coefficient of < .81.

The third evaluation instrument contained four items to measure causal attributions for past performance. Subjects were asked to indicate on a seven-point Likert scale the degree to which they believed an applicant's past performance was due to high ability, high effort, good luck or easiness of the pre-professional program. The four items were factor analyzed and yielded two factors, "internal attribution" (high ability and high effort) and "external attribution" (good luck and an easy academic program), as dependent measures for causal attribution. The reliability coefficient was .74 for internal attributions and .62 for external attributions.

Design and Analysis

The study design was a completely within subjects 2 x 2 factorial design. Dependent measures (admission rating, expressive personality attributions, instrumental personality attributions, internal causal attributions and external causal attributions) were analyzed using multivariate analysis of variance (MANOVA).

Results

MANOVA revealed significant differences ($p < .001$) between males and females on the dependent measures. Univariate F-tests indicated ($p > .001$) that female applicants were rated higher on expressive personality attributes and males were rated higher on instrumental personality attributes. (See Table 2.)

MANOVA also showed significant differences ($p < .001$) between attractive and unattractive applicants on the dependent measures. Univariate F-tests ($p < .001$) indicated attractive applicants received significantly higher admission ratings than unattractive applicants. Attractive applicants were rated significantly higher on expressive and instrumental personality attributes than unattractive applicants. Attractive applicants also were rated significantly higher on internal attributions, while unattractive applicants were rated significantly higher on external attributions. (See Table 3.)

The effect of applicant gender and attractiveness on the dependent measures yielded significant ($p = .05$) results. The only Univariate F-test of the five dependent measures that was significant ($p < .05$) was the interaction effect of gender and attractiveness on instrumental personality attributes. Attractiveness increased the instrumental personality attribution proportionately more for male candidates than for female candidates, as shown in Table 4.

Discussion

Gender Effects

Analysis of the data yielded results largely consistent with the hypotheses and the results of previous studies. In particular, traditional gender stereotypes tended to influence the personality attributions of male and female applicants differentially. Female candidates were rated significantly higher in expressive personality attributes, while male applicants were rated significantly higher in instrumental personality attributes. There were no significant differences in causal attributions. Perhaps the subject group was young enough not to have been influenced by traditional gender stereotypes in the culture to the same degree as previous generations.

Table 4
Means and Standard Deviations For Dependent Measures

Dependent measure	Unattractive Female	Unattractive Male
Admission rating	5.089 (.751)	5.262 (.703)
Causal attribution		
Internal	4.856 (.737)	4.951 (.815)
External	4.356 (1.365)	4.721 (1.498)
Personality attribution		
Expressive	4.597 (1.183)	4.082 (1.267)
Instrumental	4.200 (.854)	4.934 (.842)
	N = 59	N = 61
Dependent measure	**Attractive Female**	**Attractive Male**
Admission rating	5.996 (.652)	6.096 (.568)
Causal attribution		
Internal	5.742 (.846)	5.917 (.702)
External	3.625 (1.261)	3.750 (1.494)
Personality attribution		
Expressive	5.904 (.858)	5.125 (1.028)
Instrumental	4.720 (1.060)	6.010 (.933)
	N = 60	N = 60

Attractiveness Effects

Attractiveness effects were also largely consistent with the hypotheses. Attractive applicants received significantly higher admission ratings than unattractive applicants. Further, attractive applicants were attributed with more favorable personality traits and received higher ratings on both expressive and instrumental personality characteristics.

However, one of the most unexpected and even disheartening effects of applicant attractiveness was on causal attributions. Attractive applicants' past success was more likely attributed to internal causes, such as high effort and high ability, while unattractive applicants' past success was more likely attributed to external causes, such as good luck or an easy academic program.

It is difficult to explain the strong effects that attractiveness had on ratings and attributions. It may be that the field of interest, health sciences, may place more emphasis on attractiveness than some other occupational groups due to its often close contact with client groups, or it may be the result of the youth of the raters used in the study.

Interaction Effects

The interaction effects of gender and attractiveness were only slight, and in particular significantly influenced only instrumental personality attributions. Examination of means suggested that attractiveness increased the instrumental personality attributions of both males and females, but increased the ratings of males proportionately more. Interestingly, examination of the means also suggests that a similar interaction pattern exists for expressive personality attributions with females. Although the effects of gender and attractiveness on expressive personality attributes were not significant, the means showed that attractiveness increased the expressive personality ratings of both males and females, although there was a proportionately stronger effect on females. This pattern of findings would reinforce the findings of Gillen, suggesting that attractiveness may exaggerate gender-related stereotypes.[9]

Conclusion

The results of this study have several implications for practice in the area of student selection procedures, particularly for educators and admission committees in the radiologic sciences who are faced with the problem of identifying adequate selection procedures for increasing numbers of qualified applicants.

First, the results suggest that evaluators must be especially sensitive to potential gender-related biases, especially in the screening phase of the selection process. Since most educational programs in the radiologic sciences have a greater number of qualified applicants than can be accepted, the screening of applicants is a crucial step in the selection process.

Training for evaluators should address the problem of gender-related biases in first impression situations. To avoid possible errors in the evaluation of applicants, decision-makers should take all necessary precautions to eliminate inappropriate biasing factors from screening procedures. This would be especially important in radiologic technology programs associated with colleges or universities, where decision-makers are often the applicant's academic adviser during the pre-professional phase of the program. There-

fore, screening and/or admission committees should include individuals who are not previously familiar with the applicant.

The results also suggest that traditional gender stereotypes about personality characteristics of males and females persist. In the radiologic sciences, males and females may be treated differently in admission selection or subsequent occupational referral and placement processes. For instance, females may be preferred in areas that value sensitivity or warmth and males may be preferred in areas where decisiveness and professional aggressiveness are encouraged.

The effects of applicant attractiveness on the student selection process may be even more potent than most of us would expect. This study's findings suggest that not only do attractive applicants have a competitive edge over unattractive applicants in the admission process itself, but may also have an edge throughout their educational program. For instance, if the success of attractive students is attributed to their own high effort and ability, they may be more highly valued and respected throughout their academic training and may receive stronger recommendations for future professional positions.

By contrast, if the success of unattractive students is attributed to good luck or an easy academic program, the successes of unattractive students may be discounted and these students may not receive the academic or professional attention and rewards they deserve. Further, perceptions of important personality attributes may be similarly distorted in favor of attractive students. Unattractive students may be perceived to have less appealing personalities.

These potential attractiveness effects suggest that students may need to maximize their attractiveness, especially in admission interviews or at other important decision-making points in their academic and professional careers. Correspondingly, admission decision-makers need to be more conscious of and sensitive to the potential bias inherent in their own perceptions of applicant attractiveness. At the very least, the use of photos, videotapes or personal interviews should be delayed until some initial screening of student applicants has taken place to reduce bias due to attractiveness.

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Nadia Bugg, Ph.D.,R.T.(R), is director of the Radiologic Technology program in the College of Nursing and Health Professions at Arkansas State University. Diana G. Pounder, Ph.D., is an assistant professor of Educational Administration at the University of Utah in Salt Lake City.

Reprint requests may be sent to The American Society of Radiologic Technologists, Publications Department, 15000 Central Ave. SE, Albuquerque, NM 87123-3917.