Journal of Educational Psychology
2008, Vol. 100, No. 2, 473–489

0022-0663/08/$12.00 DOI: 10.1037/0022-0663.100.2.473

Cognitive Processing About Classroom-Relevant Contexts: Teachers' Attention to and Utilization of Girls' Body Size, Ethnicity, Attractiveness, and Facial Affect

Shirley S. Wang, Teresa A. Treat, and Kelly D. Brownell
Yale University

This study examines 2 aspects of cognitive processing in person perception—attention and decision making—in classroom-relevant contexts. Teachers completed 2 implicit, performance-based tasks that characterized attention to and utilization of 4 student characteristics of interest: ethnicity, facial affect, body size, and attractiveness. Stimuli were 24 full-body photos of girls that varied along the dimensions of interest. Teachers completed a similarity-ratings task and 4 preference-ratings tasks. Results showed that teachers attended to ethnicity and body size but did not utilize this information when selecting students across contexts. In contrast, teachers relied heavily on affect and attractiveness when making decisions. These results suggest that further investigating cognitive processing in person perception is important in understanding how teachers attend to and use multiple salient student attributes in real-world contexts. This study also illustrates the potential utility of adopting a method that places a premium on internal validity to investigate questions relevant to educational researchers. Future work should investigate how other student information, such as student background or personality, affects teachers' cognitive processing in different classroom-relevant contexts.

Keywords: obesity, attractiveness, education, ethnicity, attention

Perception and categorization of people on the basis of salient person attributes is a useful and necessary heuristic for filtering information from complex social stimuli and making sense of the social world (see Fiske, 1993; Macrae & Bodenhausen, 2000, 2001, for a review). McFall's (1982, 1990) social information-processing model provides one way of examining the person-perception process. This framework posits that a series of basic cognitive processes—decoding, decision making, and enactment—operate on the continuous stimulus input received from the environment to produce a behavioral output (i.e., behavior). Understanding the way teachers encode specific student characteristics and utilize those attributes in decision making could better our understanding of teacher behaviors in the classroom. Investigating such basic processes is critical because biased or stigmatizing behavioral output can arise from a combination of biased decoding and decision making based on the input perceived in a specific environment, such as students' salient physical characteristics.

A large body of research on the educational environment has relied on observations of teacher–student interactions in the classroom (e.g., Blatchford, 2003; O'Connor, Fish, & Yasik, 2004). This work has demonstrated clearly the complexity of teaching and learning in the classroom and has shown that even well-intentioned and subtle teacher behaviors can have unintended negative consequences for students. Our current work builds on such research by attempting to elucidate various cognitive processes that underlie teacher behaviors in the classroom. The many potential facets of student–teacher interactions in real-world situations make it challenging to draw definitive conclusions on the basis of observational methods alone. More standardized and controlled, albeit less externally valid, studies can complement observational research. Studies can help to clarify our interpretation of the observed relationships as well to enhance our understanding of the mechanisms underlying the relationships. Notably, the generalizability of findings from studies that emphasize internal validity can be quite limited, because such studies necessarily control tightly for many important variables to enhance the interpretability of the findings. Thus, one cannot assume that teachers' behavior in experimental settings translates to the real world. The present research employs a compromise between these two research-strategy extremes that integrates strengths of observational and experimental work by systematically examining important teacher, student, and classroom variables in experimental settings that attempt to replicate important aspects of the real-world situation.

The present study examines two aspects of cognitive processing in person perception, attention and decision making, in a contextually meaningful domain—the classroom. Prior to making decisions based on student attributes, teachers must first attend to this information and then choose, consciously or unconsciously, to use that information as a basis for their decisions. We used methodological and analytic paradigms drawn from cognitive science to

Shirley S. Wang, Teresa A. Treat, and Kelly D. Brownell, Department of Psychology, Yale University.

This work was supported by the American Psychological Association Graduate Students' Scholarship for Research in Psychology. We thank Richard Viken, Richard Eibach, Mitch Prinstein, and David Armor for their thoughtful comments about this study and Jennifer Barta for her able assistance with data collection. We also acknowledge the students who served as models in the stimulus set in this study.

Correspondence concerning this article should be addressed to Shirley S. Wang, Department of Psychology, Yale University, P.O. Box 208205, New Haven, CT 06520. E-mail: shirley.s.wang@aya.yale.edu

investigate how four student attributes—body size, ethnicity, attractiveness, and facial affect—influenced teachers' perceptions of students and teachers' decision making in four common classroom-relevant contexts. We aimed to complement existing observational research in educational psychology by more thoroughly investigating the processes that underlie teachers' observable classroom behavior. The current work focuses on the following three overarching conceptual questions: (a) On what student attributes do teachers focus when not directed to attend to any specific attribute? (b) Does attention to student-specific attributes necessitate the utilization of the information in decision making? (c) Does utilization of student-specific information vary as a function of the decision-making context? Because teachers must make numerous decisions in the classroom in no more than a few seconds, we decided to focus on the process of rapid decision making in this study. However, teachers engage numerous other complex cognitive processes that also are important to student learning. Our examination of such simplified decision-making scenarios is intended to be only a first step toward better understanding the processes underlying teacher behavior, which ultimately may help inform such activities as training new teachers.

Prior research has focused primarily on the processing and use of physical attributes in isolation from one another, such as investigations of perception of either ethnicity or gender, but not both. Few studies have examined individual differences in attention to multiple important person attributes simultaneously. However, in the real world, perceivers must make sense of competing person attributes, each of which conveys information about the individual. In addition, person perception often is assumed to be a traitlike function of the perceiver (e.g., an individual who scores highly on the Modern Racism Scale is more likely to exhibit discriminatory behavior), and the basis for judgments frequently is assumed to be constant across situations. Yet one could imagine that relative utilization of person attributes depends in part on the context, beyond stable individual differences in the utilization of attributes during decision making. This perspective is consistent with the increasing emphasis in educational research on the situational or contextualized nature of teaching and learning (e.g., Barab, Hay, & Yamagata-Lynch, 2001; Barab & Plucker, 2002; Roth, 1998). Similarly, many salient physical attributes, such as body size and attractiveness, covary naturally in the real world (e.g., thinner individuals are viewed as more attractive), and the relative contribution of each attribute to different stages of cognitive processes and overt behavior has rarely been quantified. Finally, the majority of the existing work on processing of ethnicity, attractiveness, and body-size information has utilized explicit self-report measures rather than implicit performance-based measures (e.g., D. F. Chang & Sue, 2003; Langlois et al., 2000). Our focus in this study on performance-based cognitive methods contributes to person-perception research by examining the relative importance of particular person attributes to decision making in standardized but contextually bound situations. Incorporating cognitive-processing methods into studies of person perception may allow researchers to obtain a richer understanding of the cognitive dynamics of teacher behavior in interactions with students.

Influence of Student Attractiveness, Body Size, and Ethnicity on Teacher Behavior

In educational contexts, teachers' and administrators' perceptions of student attributes often influence their behavior, either implicitly or explicitly. Most research in this area has focused on teacher expectations as determinants of student academic performance, or the Pygmalion effect, in which students whom teachers expect to perform better do, indeed, perform better (Rosenthal & Jacobson, 1966; see Jussim, 1991, for a review). Expectation formation can occur quickly and with little information (Jussim, 1989). In addition, studies on "thin slices" of behavior show that perceptions and evaluations of individuals can form very quickly from limited information (e.g., Ambady, Hallahan, & Conner, 1999; Ambady & Rosenthal, 1992; Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004; Friedman, DiMatteo, & Mertz, 1980), even in the classroom. For example, Ambady and Rosenthal (1993) found that judges' evaluations of teachers after examining silent video clips as brief as 2 s correlated with students' end-of-semester ratings of these same teachers. Teachers, similarly, readily form expectations of students on the basis of physical characteristics, such as attractiveness, gender, and ethnicity (e.g., Ritts, Patterson, & Tubbs, 1992; Tauber, 1998).

Ethnicity is a critically important variable to study in educational contexts. Educational attainment and achievement of underrepresented minority groups continue to lag behind those of Caucasians at all socioeconomic levels, despite decades of effort to minimize the discrepancy (Education Trust, 2004; U.S. Department of Education, National Center for Education Statistics, 2001). Numerous researchers have examined how teachers' evaluations and expectations of student aggression, ability, and mental health vary as a function of student ethnicity (e.g., D. F. Chang & Sue, 2003; Graham, 1990; Neal, McCray, Webb-Johnson, & Bridgest, 2003). Yet little is known about the relative importance of ethnicity in comparison to other attributes, such as attractiveness or body size, in the classroom. In addition, research in this area often assumes that attention to ethnicity necessitates that the information will be utilized in decision making, without obtaining independent assessments of attention and utilization. Might it be the case that teachers encode ethnicity information but do not use it to make decisions?

An extensive literature shows that attractive children are perceived to be more popular, intelligent, and friendly than less attractive children (e.g., Langlois et al., 2000), and teachers are no exception to these perceptions (see Ritts et al., 1992, for a review). Facial affect has also been found to play a role in student–teacher interactions. A substantial literature points to the importance of understanding nonverbal communication, such as facial expression and posture, on the part of both teachers and students in their interactions in the classroom (e.g., Goldin-Meadow, 2004; Mottet & Richmond, 2000; Tauber, 1998). For instance, Stuhlman and Pianta (2002) interviewed and observed teachers in the classroom and found that negative affect from students was related to greater negative affect from teachers as well as increased behavioral interactions with the teacher. However, affect and attractiveness covary naturally with each other as well as with other variables, such as body size and perhaps socioeconomic status (via the niceness of clothing or grooming). Teasing apart the relative contributions of these naturally covarying or proxy variables is

important to our understanding of the extent to which attractiveness, versus other attributes, influences teachers' cognitive processing.

Another similarly salient physical characteristic, which is associated with traits such as intelligence and friendliness but which has been relatively neglected in previous research, is that of body size (Hebl & Mannix, 2003; Puhl & Brownell, 2001). The attractiveness literature typically treats body size as a control variable by using only head shots as stimuli or by including only normal-weight children in full-body stimulus sets. As a result, little is known about the extent to which teachers attend to and use body-size information independently of attractiveness information when making classroom decisions. Body size is a stigmatized physical attribute that deserves greater exploration in the literature. Being overweight in childhood is associated with a number of negative outcomes, such as social and academic difficulties (Neumark-Sztainer et al., 2002; see Puhl & Brownell, 2001, for a review). Overweight girls complete fewer years of schooling than their average-weight counterparts (Gortmaker, Must, Perrin, Sobol, & Dietz, 1993) and are less likely to receive help in applying to colleges (Benson, Severs, Tatgenhorst, & Loddengaard, 1980). Obese individuals of both genders are less likely to be accepted to college than their nonobese peers, despite equivalent academic performance (Canning & Mayer, 1966). With the rate of childhood obesity skyrocketing—15% of children now are considered obese (Strauss, 2002)—it is increasingly important to understand how teachers process students' body-size information.

The present study extends previous work by examining teachers' attention to and utilization of student-specific attributes in standardized, performance-based assessments and by comparing teachers' relative utilization of important student characteristics, such as attractiveness, body size, and ethnicity, when making rapid decisions. Our study is the first of which we are aware that attempts to tease apart the influences of body size, affect, and attractiveness on teacher attention and decision making. Although literature exists for many stigmatized attributes, these areas of research rarely have been integrated with one another. In this way, the literature fails to reflect the fact that characteristics of the students are multidimensional. This study explores in a standardized manner the process by which certain attributes are attended to over others and how these attributes influence decision making. The paradigms used to examine these cognitive processes differ from what teachers experience in the classroom, which constrains the external validity of our findings. However, these paradigms serve nicely as experimental analogues of one type of information processing that teachers frequently employ in the educational environment—that is, making rapid decisions, ones in which they do not have extensive real time to deliberate, based on limited student information. Teachers' processing of young female students' body size and ethnicity is of particular interest in this study, given overweight and ethnic-minority students' reported academic and social difficulties, as reviewed previously. We anticipated that teachers would attend to students' body size and ethnicity, rely heavily on this information when selecting students in common classroom situations, and show strong preferences for lighter weight and nonminority students.

Conceptualization and Measurement of Individual Differences in Attention and Decision Making

Similarity- and preference-rating paradigms, well established in the cognitive literature, are used in this study to characterize teachers' attention and decision-making processes in the classroom. These paradigms are used in conjunction with multidimensional scaling (MDS) methods to evaluate individual differences in teachers' attention to particular characteristics of a set of stimuli (e.g., photos, objects, words, descriptions) as well as variability in their utilization of stimulus attributes when making decisions (Bechtel, Tucker, & Chang, 1971; Davison, 1992; Nosofsky, 1992; Treat, McFall, Viken, & Kruschke, 2001; Treat et al., 2002; Viken, Treat, Nosofsky, McFall, & Palmeri, 2002). These paradigms afford performance-based examinations of attention and decision-making processes, in which researchers draw inferences about the operation of participants' cognitive processes by observing their performance on information-processing tasks that necessitate the input of these processes, rather than relying on participants' verbal reports of the operations or products of such processes. These paradigms allow for the assessment of teachers' attention and decision-making processes in a relatively implicit and indirect fashion, as the task instructions neither specify the stimulus attributes of interest nor direct teachers to attend to or use particular child characteristics. Scaling algorithms can be used to quantify individual differences in the extent to which teachers attend to and use the various unspecified child characteristics when completing the similarity- and preference-rating tasks. Additionally, teachers' strategic presentation of their perceptions and judgments are minimized by the use of relatively brief stimulus presentation times (e.g., Fazio & Dunton, 1997). Thus, these relatively implicit, performance-based assessments presumably provide more valid assessments of teachers' cognitive processing in the classroom than more explicit and direct measures, which focus participants' attention on specific student characteristics of interest (e.g., asking participants to rate the extent to which they attend to or use ethnicity or attractiveness to choose between students).

We developed a photo stimulus set of 6- and 7-year-old girls for use in the similarity- and preference-ratings tasks. The final photo set varied significantly along the four dimensions of primary theoretical interest and minimally along other potential dimensions (e.g., clothing and background characteristics). By design, the students depicted in the photos were unknown to the teachers. Thus, all teachers received identical information about the students, and potentially idiosyncratic background knowledge about the students could not influence teachers' judgments. Much previous educational research has used students or photos of students whom the teachers already knew, which introduces numerous alternative explanations for any findings. The use of a standardized stimulus set, rather than a naturally occurring one, also allows the investigator to ensure that there is sufficient variation along each of the dimensions of interest. Our approach allowed us to separate variables that might covary naturally, such as attractiveness and either body size or facial expression, as well as to adequately cover the entire multidimensional space of interest, which facilitated clearer interpretation of the results. Thus, by using a standardized stimulus set and a controlled experimental environment, we could gain a better understand of the extent to which the teacher calls on Susie Student because of Susie's body size, rather than her attrac-

tiveness or facial expression. Teasing apart the extent to which these naturally covarying attributes affect teachers' perceptions and behaviors supplements existing quasi-experimental research and may shed additional light on our understanding of teachers' decision making in the classroom.

The attributes of primary interest—body size, ethnicity, and attractiveness—were built into the stimulus set. Facial affect was also incorporated because it is a potential indicator of student interest and enthusiasm that is relevant to teachers' decisions (e.g., see Mottet & Richmond, 2000, for a review). It was not possible to represent attractiveness completely independently of body size, ethnicity, and affect in the present stimulus set. Nonetheless, the significant nonoverlap between the attributes raises the possibility that results for attractiveness might diverge from those for the other dimensions. We recognize that teachers likely attend to and use many other child-specific characteristics, such as the child's personality and past behavior or performance. Because the focus of the present study is on understanding how teachers cognitively process students' observable physical characteristics, however, we wanted to rule out competing explanations for teachers processing by eliminating from the stimuli other potential influences on their processing. Other attributes of particular interest could be incorporated readily into the stimulus set in a standardized fashion in future research.

Evaluating Individual Differences in Attention to Stimulus Dimensions

Participants' representation of and attention to stimulus dimensions can be examined within a similarity-ratings paradigm, in which participants rate the similarity of stimulus pairs on a 10-point scale, where 1 = *not at all similar* and 10 = *extremely similar* (Davison, 1992; Schiffman, Reynolds, & Young, 1981). Participants' similarity ratings provide an indirect indicator of their relative attention to the stimulus dimensions. For example, a participant who judges two happy-looking girls of different ethnicities to be quite similar likely is attending more to affect than to ethnicity. In contrast, a participant who evaluates an attractive pair of heavier and lighter girls as very dissimilar likely is attending more to body size than to attractiveness.

Participants' similarity ratings served as the input for an MDS analysis, which provided a group-level representation of the stimuli or "psychological space" (Davison, 1992; Nosofsky, 1992; Schiffman et al., 1981; Treat et al., 2002). This multidimensional depiction of the stimulus set was spatial in nature: Stimuli that were perceived to be more dissimilar were scaled farther apart than stimuli that were judged to be more similar. Figure 1A depicts a two-dimensional (2-D) psychological space in which each point corresponds to a unique stimulus (i.e., a photo of a particular girl). Stimuli are plotted along the two dimensions spanning the psychological space: body size and affect. This solution indicates that Girl A and Girl B were viewed similarly, whereas both girls were viewed as quite dissimilar to Girl C.

The weighted MDS approach (WMDS; Carroll & Chang, 1970; Carroll & Wish, 1974) simultaneously represents both the group-level psychological space and individual-specific differences in attention to the stimulus dimensions in the group space. Thus, WMDS estimates not only the group-level multidimensional stimulus coordinates but also individual-specific dimensional weights

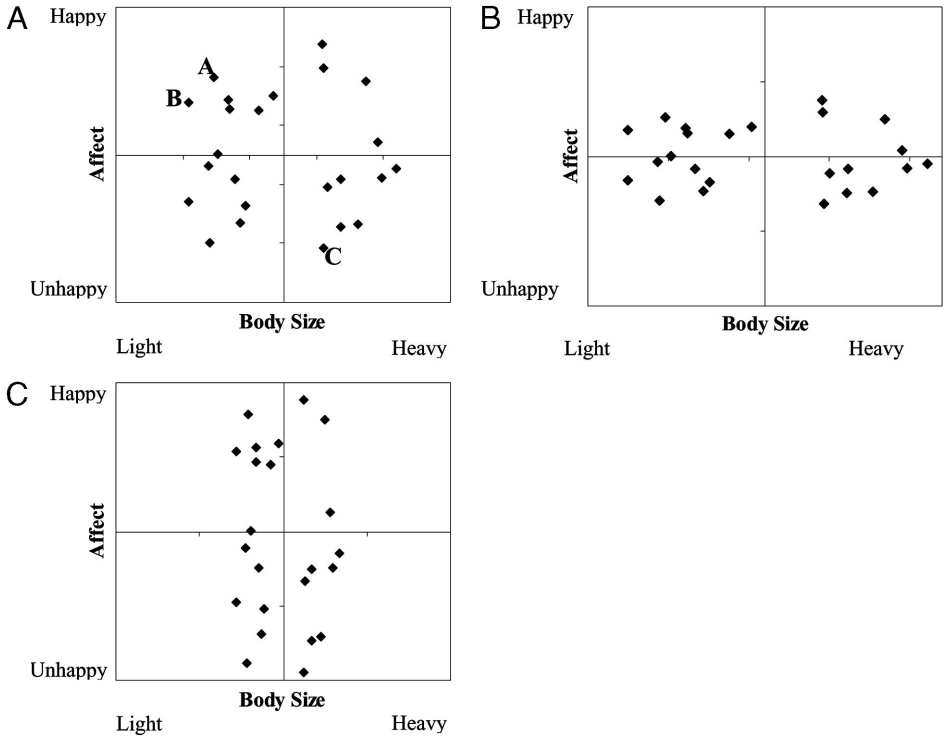

Figure 1. Group- and individual-level scaling representations of psychological space. Panel A: group-level psychological space for 24 photo stimuli. Panel B: individual-level psychological space for the body-size-oriented individual. Panel C: individual-level psychological space for the affect-oriented individual.

that indicate how much an individual attends to each dimension in the group solution. These dimensional weights are applied to the group-level stimulus coordinates and are assumed to stretch or shrink the dimensions of the group-level psychological space. For example, Figure 1B depicts the individual-specific psychological space of a "body-size-oriented" participant who attends relatively more to body size than to affect, in comparison to the average participant. This orientation is characterized by the stretching of the body size dimension and the shrinking of the affect dimension in the shared psychological space in Figure 1A. Note that this representation scales heavy and light girls further apart than happy and sad girls. Thus, the stretching and shrinking of these two stimulus dimensions represent the participant's perception that heavier and lighter girls are relatively more dissimilar than happier and sadder girls, in comparison to the perceptions of the participant group as a whole. In contrast, Figure 1C portrays an affect-oriented participant who views heavy and light girls as more similar than happy and sad girls.

The present study uses the similarity-ratings paradigm to assess teachers' group-level psychological representation of students as well as individual differences in teachers' attention to the student-specific characteristics of body size, ethnicity, affect, and attractiveness. We anticipate that teachers will attend strongly to students' body size and ethnicity.

Evaluating Individual Differences in Utilization of and Preferred Directions Along Stimulus Dimensions When Making Rapid Decisions

In addition to exploring teachers' attentional processes, we also seek to understand how teachers utilize information about students when making relatively rapid decisions (i.e., in no more than a few seconds). Teachers often make rapid decisions in the classroom in which they have minimal opportunity to deliberate and limited direction as to the basis for these decisions, such as when selecting a child to answer a question in class. Of course, there are many important classroom situations in which teachers have ample time to deliberate in decision making, such as when awarding student grades. Nonetheless, the constraints under which teachers operate in the classroom necessitate that decisions such as those explored in the present study frequently must be made very quickly. Under these circumstances, teachers do not have time to evaluate consciously and deliberately which student attributes will be the focus of their attention or will be weighted heavily in their decisions. Thus, we limited stimulus presentation times and urged participants to respond quickly in the present study, in an effort to provide an experimental context that is analogous to that encountered by teachers in the classroom. The pressure to respond quickly also minimizes the influence of social desirability and other presentation biases that come into play as stimulus presentation and decision-making times increase.

Attention and decision making are distinct cognitive processes, as teachers might attend to particular student characteristics but not necessarily use them as a basis for making decisions in the classroom. Given that discrimination against overweight and ethnic minority individuals occurs, however, it appears that many people do use body size and ethnicity as a basis for their decisions. Thus, using the same photo set described previously, we investigate the extent to which teachers use student body size, ethnicity, attractiveness, and affect when making rapid decisions in specific classroom contexts.

The preference-ratings paradigm, in conjunction with the PREFMAP scaling program (Carroll, 1972; J. J. Chang & Carroll, 1972; Meulman, Heiser, & Carroll, 1986), frequently is used to assess individual differences in participants' utilization of the dimensions of a previously specified group-level psychological space; the group-level space typically is obtained from a separate MDS analysis of participants' similarity ratings, as described above. Participants again view stimulus pairs in a preference-ratings task, but they select one of the stimuli rather than rate the similarity of the two stimuli. For example, in one of the preference-ratings tasks in the present study, teachers indicated which of two girls they would call on in class. The summary data that were submitted for PREFMAP analysis consisted of the number of times that each teacher chose each girl.

PREFMAP also calculates individual differences in the preferred direction of the previously specified group-level psychological space. PREFMAP computes individual-specific vectors, which specify the direction that is preferred by an individual in the psychological space. Figure 2A displays sample graphic PREFMAP output for one teacher. Each point again corresponds to a unique stimulus, and the overall stimulus configuration is assumed to be the same group-level psychological space that was uncovered in the similarity-ratings solution depicted in Figure 1A. A teacher's preference data are represented by the arrow that points toward the

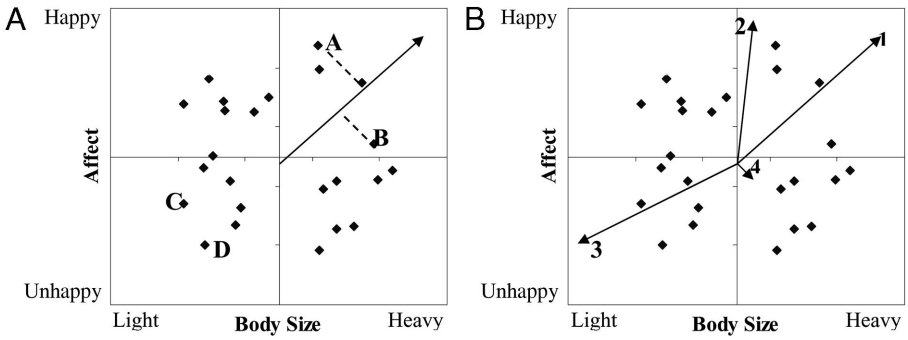

Figure 2. Vector model representation of teachers' preferences. Panel A: group-level psychological space and preference vectors for one teacher. Panel B: preference vectors for four teachers.

region of the space that contains the girls she is more likely to choose and away from the region of the space that contains the girls she is less likely to choose. According to the PREFMAP vector model, stimuli that exhibit perpendicular projections to the vector that are closer to the preferred direction are selected with greater frequency than stimuli with perpendicular projections that are farther from the preferred direction. Thus, the teacher in Figure 2A selected heavy, happy girls (e.g., A and B) more frequently and light, unhappy girls (e.g., C and D) less frequently.

We analyze both the signed and the unsigned values of the vector heads in the present study, as they provide different types of information. The absolute values of the vector endpoints indicate individual differences in the utilization of the stimulus dimensions. Figure 2B presents four teachers, each of whom is represented as a normalized vector in this space, and indicates that both Teachers 1 and 3 relied heavily on both body size and affect when making decisions, because their vector endpoints are extreme along both the body size and the affect dimensions. In contrast, Teacher 2 relied almost exclusively on affect when making decisions: The vector endpoint is extreme along the affect dimension and near zero along the body size dimension. Finally, Teacher 4 used neither body size nor affect in her decision making, as the vector endpoints are near zero along both dimensions. Thus, the unsigned vector endpoints for a particular teacher tell us about the teacher's utilization of the stimulus dimensions when making decisions. In contrast, the signed vector endpoints along each dimension indicate individual differences in teachers' preferred directions along the stimulus dimensions. In the present example, focusing on the signed endpoints allows us to distinguish Teachers 1 and 3, who both relied heavily on body size and affect when making decisions but who selected heavy, happy and light, unhappy girls, respectively.

The preference-ratings paradigm is used in the current study to examine teachers' use of girls' body size, ethnicity, affect, and attractiveness when making rapid decisions in four classroom-relevant contexts. Context selection was informed by the literature on stereotyping based on ethnicity, attractiveness, and body size (Puhl & Brownell, 2001; Ritts et al., 1992; Zebrowitz, Hall, Murphy, & Rhodes, 2002) as well as informal discussions with numerous teachers about the kinds of rapid decisions they make routinely in the classroom. We designed and selected contexts in which it seemed likely that teachers would use the dimensions of interest to us in this study. Teachers in this study also were asked to imagine that they were substitutes who did not know these students, as this provided a plausible rationale for making decisions about students with whom they were unfamiliar. We recognize that there are numerous other classroom-relevant contexts and teacher roles that we could have examined. Given our focus on understanding the underlying processes of how teachers use specific student information to inform their decisions, however, we chose to design a tightly controlled study, despite its limited generalizability. Future research can and should examine teachers' perceptions and behaviors in other contexts involving different cognitive processes, such as situations that call for more deliberate and time-consuming decision making.

In the current work, one context required a teacher decision that conveyed beliefs about students' perceived abilities (i.e., selecting a student to complete a difficult problem on the board). Another required a decision that communicated teacher perceptions of the student's responsibility or dependability (i.e., asking a student to take a note down the hall). A third context required a teacher decision that potentially resulted in special attention or encouragement for a student (i.e., calling on a student to answer a question). The final context targeted a teacher decision that conveyed who the teacher felt would like or deserve special attention (i.e., assigning the lead role in a class skit), which we chose specifically because we hypothesized that physical appearance would be a factor in the teachers' decision making.

Present Study

The present study aimed to characterize three aspects of teachers' cognitive processing in the classroom that have not been explored previously: (a) teachers' relative attention to young girls' body size, ethnicity, attractiveness, and facial affect; (b) teachers' relative utilization of these characteristics when selecting girls in four commonly occurring classroom contexts; and (c) teachers' preferred directions along these dimensions when selecting girls in the four contexts. Additionally, we explored the link between individual differences in these cognitive variables and teachers' self-reported teaching experiences and demographic information. Given the marked social and academic difficulties reported by heavier and ethnic minority students, we anticipated that teachers would (a) attend strongly to body-size and ethnicity information in the similarity-rating task; (b) utilize body-size and ethnicity information heavily when selecting children in the preference-rating tasks; and (c) exhibit a preference for lighter, nonminority children in the preference-rating tasks.

Method

Participants

Twenty-seven elementary school teachers (21 women, 6 men) from nine different schools within a local school district participated in the study; they were predominantly Caucasian (24 Caucasians, 1 Latina, and 2 Asian Americans). Their mean age was 36.8 years ($SD = 12.1$), and they reported an average of 10.2 years ($SD = 9.2$) of teaching experience. Participants were informed of the study at their monthly staff meeting and by subsequent individual contact at lunch or after school. They were invited to participate in the study during nonschool hours in exchange for $20 or a book donation to their classroom.

Development of Experimental Stimuli

Twenty-six 6- and 7-year-old female models were recruited from an elementary school outside the district in which the study was conducted for development of the stimulus set. Written parental permission and verbal child assent were obtained for each child. Each model was photographed individually with standard lighting while standing and facing the camera at the same fixed distance. All models were asked to wear plain white T-shirts, blue jeans, and light-colored sneakers to minimize variability along dimensions that were irrelevant to the study. Models were asked to vary their facial expression across photographs (e.g., look happy, look sad, and look "neutral"). The stimulus set was quite ethnically diverse; 10 of the 26 models were African American or Asian American. Multiple photos of each child were taken, which pro-

vided us with a large number of photos from which to select a stimulus set that varied sufficiently along the dimensions of interest.

To enhance the variability along the body-size dimension, we digitally altered the photos using the WinMorph program (Kumar, 2002) to increase and decrease the original body size of the models. Only body size was warped; faces and facial expressions remained untouched. Each model was warped to appear both heavier and lighter than her current body size so that there were nine possible combinations of body size and affect for each model (happy, sad, and neutral affect crossed with actual, thinner, or heavier body size).

Normative data collection. Normative data were collected to quantify the stimulus values along each dimension and to ensure that the dimensions of interest in the stimulus set varied sufficiently and as independently as possible. Data were collected on those photos that did not appear grossly unrealistic or inappropriate to the experimenter (e.g., facial expression was incongruent with the desired expression).

Twenty-seven undergraduate women rated 140 photos along four 10-point scales for the following attributes: body size (1 = *light,* 10 = *heavy*), affect (1 = *unhappy,* 10 = *happy*), friendliness (1 = *unfriendly,* 10 = *friendly*), and attractiveness (1 = *unattractive,* 10 = *attractive*). Participants also rated the perceived ethnicity of the models using any possible combination of five racial groups (Asian, Hispanic, African American, Caucasian, and Native American), the age of the model (4 to 13 years old), and whether the photo looked realistic (i.e., yes or no). Photos were presented in a random order. Participants were instructed to respond as quickly as possible, because we were interested only in their first impressions, and they were told that there were no right or wrong answers.

Stimulus set selection. The final stimulus set included 24 photos of unique girls. Stimulus selection was based on the normative data and subject to several constraints. Stimuli were selected to cover the entire 2-D Body Size × Affect space as completely as possible.[1] Girls of different ethnicities were distributed proportionally across this space. The judged realism of the stimuli also was taken into account in the selection process; we eliminated those photos that raters deemed unrealistic.

Stimuli also were selected such that the dimensions of primary interest varied as independently as possible. Affect and body size were uncorrelated, as intended, Pearson[2] $r(24) = -.004$. Friendliness and affect correlated nearly perfectly, $r(24) = .988$, $p < .01$; we focused only on the affect dimension in pilot testing and actual testing procedures. Attractiveness correlated with both affect and body size, $r(24) = .599$, and $r(24) = -.421$, respectively, although these correlations were minimized to the extent possible during the stimulus selection process. Age did not correlate significantly with any of the attributes.

Cognitive Tasks

Similarity-ratings task. Participants viewed multiple pairs of stimuli on a laptop computer and rated their similarity on a 10-point scale (1 = *not at all similar,* 10 = *extremely similar*). Participants viewed a random subset of 100 of the 276—that is, (24 × 23)/2—pairwise stimulus combinations. They were asked to respond as quickly as possible and were told that we were interested only in their first impressions and that there were no right or wrong answers. Each stimulus pair was also presented for only five seconds to encourage participants to respond more rapidly and to avoid lengthy deliberation about their responses.

Eight undergraduate students completed a pilot version of the similarity-ratings task for credit in their introductory psychology class. This pilot work ensured the following: (a) Ethnicity, body size, and affect emerged as dimensions in the psychological space; (b) the stimulus set adequately covered the psychological space; (c) the dimensions varied as independently as possible; and (d) the MDS solution based on the first 100 trials was nearly identical to the solution yielded from all trials.[3]

Preference-rating task. Participants were asked to assume that they were substitute teachers for the day and had never seen this group of students (i.e., the stimulus set) before. Participants viewed all 276 possible pairs of stimuli for 2 s apiece[4] and, for each pair, selected one of the two displayed stimuli. The presentation time was established on the basis of previous research and practical considerations. Social perception research has found that behavioral snapshots as brief as 2 s yield meaningful information for making evaluations (e.g., Ambady & Rosenthal, 1993; Friedman et al., 1980) and that longer observations do not lead to more accurate prediction of social outcomes (see Ambady & Rosenthal, 1992, for a review). Information processing related to person perception also often uses photo stimuli, and these stimuli are commonly presented for periods of time similar to the duration in which the stimuli in the current study were presented (e.g., Cloutier, Mason, & Macrae, 2005; Macrae, Quinn, Mason, & Quadflieg, 2005; Michel, Caldara, & Rossion, 2006). Given the number of trials that participants would have to complete, it also was important to select the briefest significant presentation time possible to decrease participant fatigue while ascertaining meaningful data. Thus, using the social perception literature and practical considerations as guides, we selected 2 s as the presentation duration in this task. This relatively brief presentation time also maximized similarity to the short time scale on which teachers necessarily make such decisions in classroom contexts.

Four independent decision-making contexts were presented to participants in a counterbalanced order:

1. You ask a question in class. These two students raise their hands at the exact same time. They both speak a

[1] The affect dimension was adequately represented by girls with neutral and happy expressions, as stimuli with neutral expressions were perceived as very unhappy. Thus, it was unnecessary to include stimuli with sad expressions in the stimulus set.

[2] All correlations reported in the text are Pearson correlations, unless otherwise indicated.

[3] Pilot data showed that the MDS solutions based on 100 trials were nearly identical to those estimated from the full 276 trials. Thus, participants in the primary study were asked to rate only 100 pairs in the interest of minimizing participant fatigue.

[4] We conducted pilot work to examine whether it was feasible for participants to complete the ratings within this short time frame. The data analyses yielded readily interpretable and adequately fitting multidimensional solutions, indicating that participants were able to complete the task within this time frame.

similar amount in class. Who do you call on to give the answer?

2. You need a student to take a note to the principal's office all the way on the other side of the building. Who do you ask?

3. Two students are going to the board to complete a problem in front of the class. One problem is easier and one is hard. Who do you assign to do the hard problem?

4. Each reading group in the class acts out a short story for the others on Fridays. The roles are assigned two days prior, and today is "casting day." Each student is assigned a role, but the "leading lady" is assigned first. Who do you choose to play this part?

Twenty-four undergraduate students completed a pilot version of the four preference-rating tasks for credit in their introductory psychology class. This pilot work demonstrated that the task was feasible under speeded conditions and that participants utilized the stimulus dimensions when making decisions in the four contexts.

Self-Report Measures

All participants completed a questionnaire that assessed demographic information, teaching-relevant information, and their evaluation of the cognitive tasks. Teaching information included years of teaching experience, amount of experience with a diverse student body (e.g., gender, ethnicity, socioeconomic status, and body size), current satisfaction with teaching experience (1 = *not at all satisfied,* 7 = *completely satisfied*), and intention to continue teaching (1 = *do not intend to continue teaching,* 7 = *definitely intend to continue teaching*).

The cognitive-task evaluation consisted of three components: (a) a written description of the student characteristics that teachers used to make decisions in each of the four decision-making contexts; (b) a written description of what additional information they would use in the real world when making similar types of decisions; and (c) a checklist of child characteristics that the teacher deliberately attempted not to use in the preference-rating tasks, including hair color, body weight, height, style of clothing, ethnicity, facial expression, body posture, and hair style.

Procedure

Participants provided informed consent and then completed the similarity-ratings task and the four preference-ratings tasks on a laptop computer. Instructions urged participants to complete the tasks as quickly as possible, as we were interested in their first impressions and there were no right or wrong answers to the questions. We purposely did not direct participants to attend to any of the stimulus dimensions of interest. Finally, participants completed the self-report measures. They were debriefed and paid after completing the experimental tasks.

Data Screening

All data were checked for missing values and possible outliers. Although the distributions of several demographic variables were skewed, there were no obvious outliers, and thus all data were retained for analysis. Nonparametric analyses were conducted with nonnormally distributed variables. Normality of proximity indexes is not assumed in MDS analyses; therefore, all similarity-ratings and preference data were retained.

Results

WMDS Analysis of Dimensional Attention

Analysis specifications. Participants rated the similarity of 100 randomly presented pairs of photos out of a total of 276 possible photo pairs. WMDS was used to characterize the group-level psychological space as well as individual differences in teachers' attention to stimulus dimensions. Similarity ratings were reverse coded prior to analysis (i.e., 10 = 1, 9 = 2, etc.), because WMDS analyzes dissimilarity ratings (Carroll & Chang, 1970; Carroll & Wish, 1974). After recoding, a dissimilarity matrix of the input data was created for each participant; missing data (i.e., 176 ratings per participant) were ignored. Equal dissimilarity values, or "ties" in the data, were "untied," or not constrained to be equal in the analysis. Nonmetric MDS analyses of the 27 resulting matrices estimated both group-level stimulus coordinates and individual-specific dimension weights in two, three, four, and five dimensions.[5] All participants' data were retained, as fit indexes were adequate for all individual participants across all four solutions.

Selecting solution dimensionality. We determined the dimensionality of the selected solution by examining the relative fit of the models, the interpretability of the estimated dimensions, and the consistency of the obtained dimensions with the dimensions of theoretical interest. The primary indicator of model was the stress index, a badness-of-fit index that ranges between 0 and 1. Stress quantifies the magnitude of the deviation of the scaled distances from an ordinal transformation of participants' similarity ratings (Davison, 1992; Schiffman et al., 1981). Stress values for the 2-, 3-, 4-, and 5-D solutions were .192, .133, .104, and .088, respectively.[6] The magnitude of the fit indexes was comparable to that reported in other scaling studies of complex social perception (e.g., Treat et al., 2001, 2002). The relative improvement associated with an increase in dimensionality was greatest in the move from a 2-D to a 3-D solution (.059), but modest improvement also was noted for the 4-D solution relative to the 3-D solution (.029). However, both visual inspection of the solution and the results of the correlational analyses described below suggested the superiority of the 4-D solution, which accounted for 85.9% of the variability in participants' similarity ratings.

[5] Nonmetric MDS assumes only an ordinal relationship, rather than a linear relationship, between participants' proximity ratings for stimulus pairs and the scaled distances between stimuli in the MDS solution. Thus, only the rank ordering of participants' similarity ratings is assumed to be meaningful.

[6] The fit of the WMDS model varies not only as a function of the number of retained dimensions but also as a function of the number of stimuli and the number of participants. Moreover, model fit is expected to be worse when perceptually and conceptually complex stimuli are being evaluated, as in the present study. Thus, fit adequacy is best evaluated on a study-by-study basis by ascertaining whether the obtained stress values are decidedly lower than those observed when comparable random data matrices are evaluated (see Treat et al., 2001, for an illustration of this).

Interpreting solution dimensions. To characterize the dimensions of the selected 4-D solution, we correlated the 4-D stimulus coordinates with the normative data for body size, affect, and attractiveness. Affect correlated most strongly with the fourth dimension (Pearson $r = -.59$), while body size correlated most strongly with the third dimension ($r = .91$). Attractiveness showed moderate associations with both the first and the third dimensions (rs $= -.47$ and $-.41$, respectively).

Visual inspection of the psychological space suggested that the first two dimensions in the WMDS solution represented variation in the girls' ethnicity, as girls with similar ethnicities were scaled more closely to one another than girls with different ethnicities. As illustrated in Figure 3, this 2-D representation of the girls' ethnicities was more interpretable as four clusters than as two continuous dimensions. The four clusters contained the 5 African American girls, the 4 Asian American girls, the 5 dark-haired Caucasian girls, and the 10 light-haired Caucasian girls.

In summary, our analyses suggest that the first two dimensions in the WMDS solution represented variability in ethnicity, whereas the third and fourth dimensions represented variation in body size and affect, respectively. Attractiveness clearly was relevant to participants' similarity ratings but did not emerge as a separate fifth dimension in the WMDS analyses. Thus, we did not evaluate individual differences in attention to attractiveness.

Individual differences in dimensional attention. We depicted individual differences in attention by allowing dimensions to be weighted between 0.0 and 1.0 for each individual, such that a higher weight indicated greater attention to that dimension. Figure 4 depicts the average dimensional attention weights for the 27 teachers in two 2-D scatterplots. The average dimensional attention weights were similar for the four dimensions: .49, .45, .44, and .41 for Ethnicity 1, Ethnicity 2, body size, and affect, respectively. The similarity of the magnitude of these attention weights indicated that the average participant attended at a similar level to all four dimensions (i.e., the perceived salience of the four dimensions represented in this stimulus set was roughly equivalent). Substantial individual variation in participants' dimensional attention also emerged, particularly for the Ethnicity 1 and body-size dimensions, as indicated by greater standard deviations in the weights for these two dimensions (SDs $= 0.15$ and 0.16, respectively) than for the Ethnicity 2 and affect dimensions (SDs $= 0.08$ and 0.10, respectively). Overall, therefore, participants on average clearly were attending to the girls' body size, ethnicity, and affect.

Individual differences in dimensional attentional patterns were unrelated to teachers' age, years of teaching experience, job satisfaction, or amount of experience in working with students of diverse backgrounds. Nonparametric (Spearman's) correlations between attentional subject weights and individual-differences variables were uniformly small and no more frequently significant than would be expected by chance alone. For example, teachers who reported having a large percentage of African American or Asian American students in their classrooms in the last 5 years did not attend more or less to ethnicity than teachers who reported little experience with ethnic minorities. Moreover, teachers who reported avoiding the use of certain student characteristics did not differ in their attention to dimensions compared to teachers who

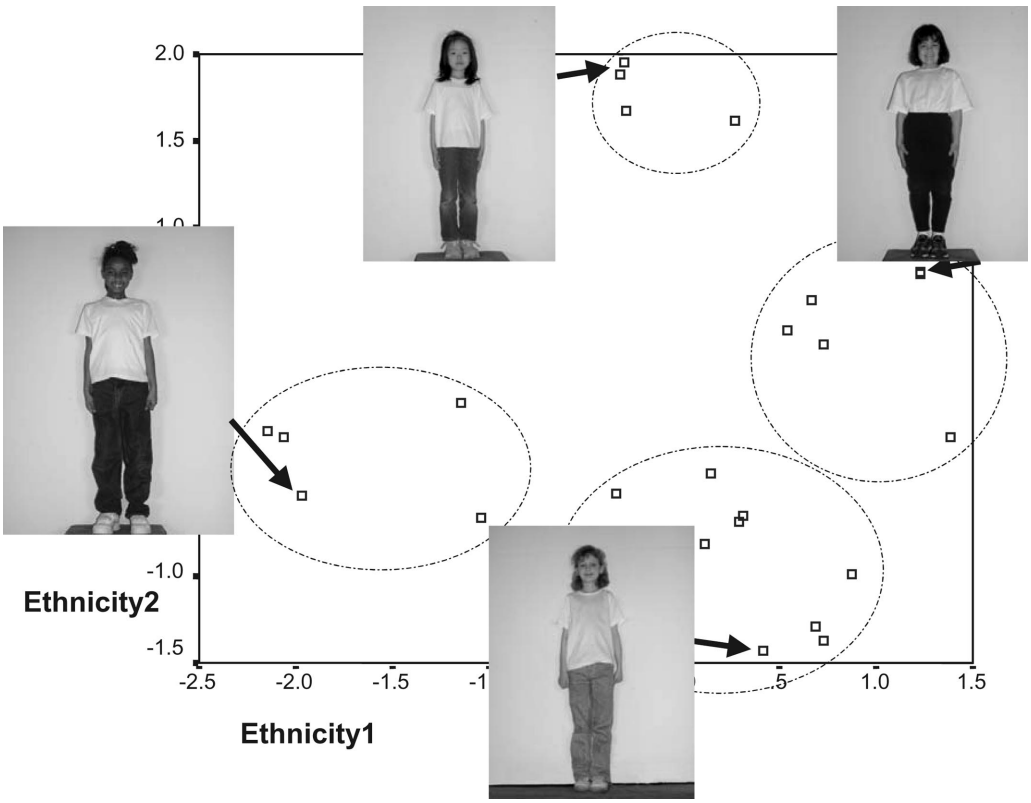

Figure 3. Two-dimensional scaling representation of ethnicity.

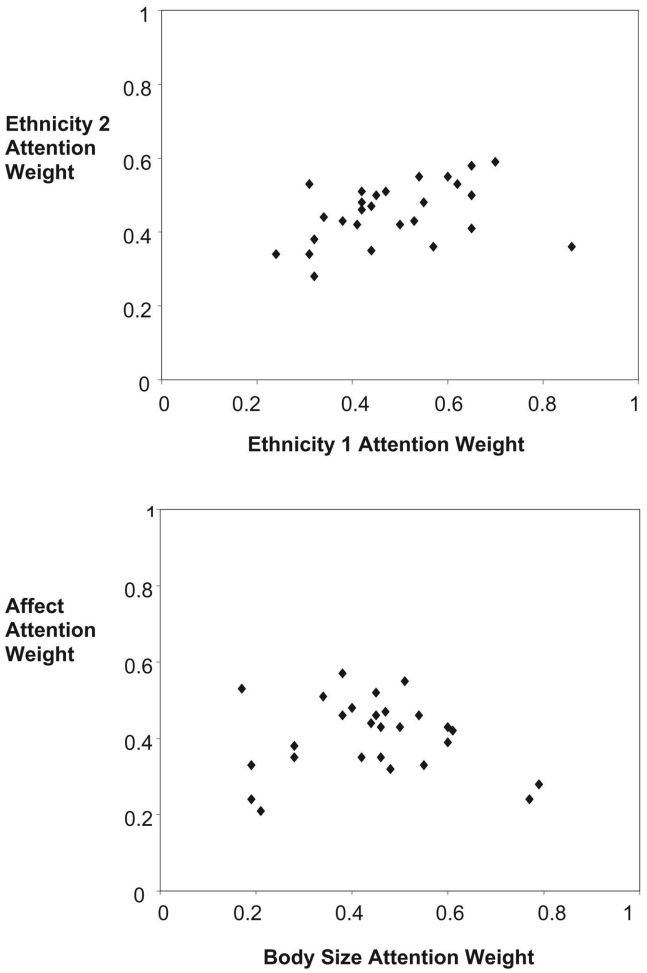

Figure 4. Dimensional attention weights for four-dimensional weighted multidimensional scaling solution.

did not report avoiding the use of characteristics. For instance, the 16 teachers who reported avoiding body size did not attend less to body size than the 10 teachers who did not report avoiding body size. These results suggest that there were substantial individual differences in attention to the student attributes of interest—body size, affect, and ethnicity—that were not associated with basic teacher demographic information.

PREFMAP Analysis of Dimensional Utilization and Preferred Dimensional Directions

Participants viewed all 276 pairwise combinations of the 24 girls and selected 1 of each pair of girls in each of the four decision-making contexts. The PREFMAP-3 program (Meulman et al., 1986) was used to quantify individual differences in the utilization of and preferred directions along the stimulus dimensions in the four decision-making contexts. To prepare the data for analysis, we totalled the number of times each girl was selected separately for each teacher and context; the resulting values ranged from 0 to 23 selections for the 24 girls in each of the four contexts. Then we created a Participant × Stimulus (27 × 24) matrix of these counts for each of the four contexts. These matrices served as the input data for four separate PREFMAP analyses.

For each of the four contexts, we conducted a 5-D, external, nonmetric PREFMAP analysis (Meulman et al., 1986). In external analyses, the stimulus coordinates are constrained to be equal to relevant values external to the choice data. The "external" approach to preference analysis eliminates the need to estimate both stimulus coordinates and vector endpoints in a single analysis, as the stimulus coordinate estimates are fixed, rather than free, parameter estimates. The resulting reduction in the number of estimated parameters reduces the likelihood of problematic solutions, such as multiple solutions that fit equally well but provide markedly different parameter estimates (Borg & Groenen, 1997; Davison, 1992; Schiffman et al., 1981). Such problems commonly arise when "internal" approaches to preference analysis are used, because so many parameters are being estimated (i.e., the model is far too complex to fit to the available data). Thus, in the present case, only 27 vector endpoints were estimated (i.e., five parameters were estimated per teacher). Stimulus coordinates were derived from two external sources in our analyses: (a) the WMDS solution, which provided stimulus coordinates for body size, affect, and the two dimensions of ethnicity, and (b) the standardized normative ratings for attractiveness. Attractiveness was included in the PREFMAP analyses to facilitate evaluation of teachers' relative utilization of body size and attractiveness. Ties in the preference data were untied in the analyses.

In the nonmetric approach to preference scaling, PREFMAP-3 selects parameter estimates that maximize the correlation between an ordinal (rather than linear) transformation of participants' preference data and the model-predicted preferences (Meulman et al., 1986). This goodness-of-fit index was highest for the first context (r = .829) and was similar for the remaining three contexts (rs = .755, .750, and .788, respectively). These values indicated that the five dimensions accounted for a substantial proportion of the variability in participants' choice data across the four decision-making contexts. Here again, the fit of the model to randomly generated data was markedly worse.

We normalized teacher-specific vectors within teacher to be of unit length across the five imposed dimensions prior to conducting further analyses (i.e., the square root of the sum of the squared endpoint values equaled 1.0). Thus, the absolute values of the five vector endpoints ranged from a minimum of 0.0, which indicated no utilization of a dimension, to 1.0, which indicated sole utilization of a dimension. Normalization of vector length maximized the comparability of the vector endpoint values across teachers, as the length of unnormalized vectors in the PREMAP model varied as a function of the fit of the model to each teacher's choice data. Parallel analyses of the unnormalized vector data resulted in identical conclusions, so we present the findings based on the normalized vector data in the following section to maximize their interpretability.

Analysis of dimensional utilization. The unsigned values of the vector endpoints indicated teachers' dimensional utilization of the five dimensions but not the preferred direction along the dimension. For example, these values indicated whether body size was important to a teacher's decisions but not whether the teacher typically tended to select heavier or lighter girls.

Figure 5 presents average utilization values for the five attributes across the four decision-making contexts. A 5 (attribute) ×

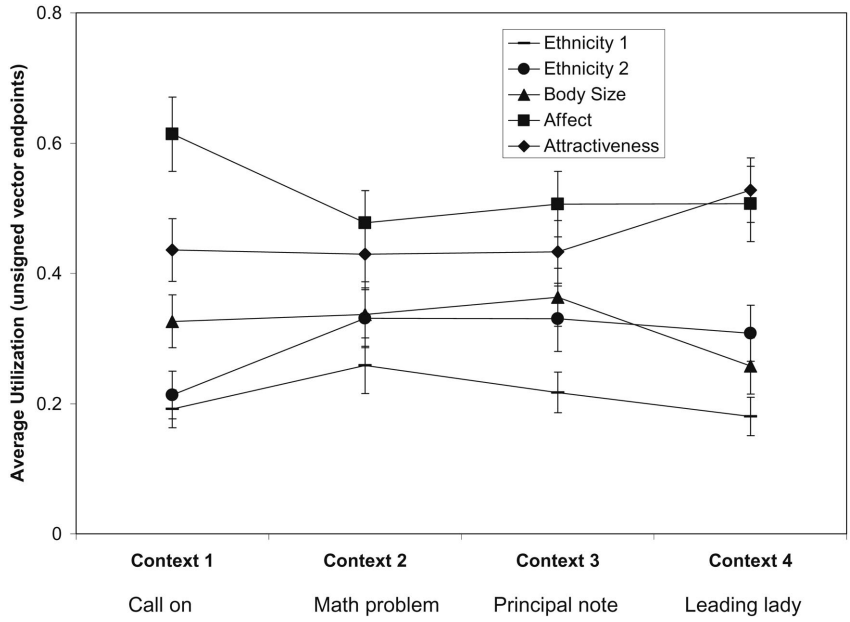

Figure 5. Average dimensional utilization of five attributes in four contexts. Vertical rules depict standard errors of the means.

4 (context) repeated-measures ANOVA indicated a main effect of attribute, $F(4, 104) = 16.536$, $p < .001$, on dimensional utilization. Neither the context effect nor the Attribute × Context interaction was significant. Post hoc examination of the attribute effect, using Sidak-based multiple comparisons, indicated that (a) teachers used affect and attractiveness (utilization Ms = 0.526 and 0.457, respectively) significantly more across contexts than the body size, Ethnicity 1, or Ethnicity 2 dimensions (Ms = 0.321, 0.296, and 0.212, respectively; ps $< .05$) and (b) teachers used body size significantly more than the Ethnicity 1 dimension ($p < .05$). Minimal individual differences were present in teachers' utilization of the Ethnicity 1, Ethnicity 2, and body size dimensions (SDs = 0.110, 0.113, and 0.122, respectively), whereas variability in utilization of affect and attractiveness was greater (SDs = 0.193 and .179, respectively) and potentially predictable in later analyses.

Figure 6 presents the PREFMAP representation of teachers' decision making in a representative context, the "principal note" context. The 27 vectors specify the 27 teachers' preferred directions along each of the five dimensions. The figure illustrates teachers' greater utilization of affect and attractiveness (bottom panel), relative to the remaining three attributes, when selecting a student to take a note to the principal's office. In other words, the length of the typical teacher's vector was substantially longer along the affect and attractiveness dimensions than along the remaining three dimensions.

Analysis of preferred dimensional directions. The signed values of teachers' vector endpoints indicated their preferred direction along the five dimensions (e.g., whether a teacher tended to choose happy or sad girls). Figure 7 displays the average signed values along the five dimensions for the four decision-making contexts. A 5 (attribute) × 4 (context) repeated-measures ANOVA indicated effects of both attribute, $F(4, 104) = 6.472$, $p < .001$, and context, $F(3, 78) = 3.000$, $p < .05$. The Attribute × Context interaction was not significant. Sidak post hoc evaluations of the attribute effect revealed that the preferred direction along the affect dimension was significantly more positive (i.e., happy) than the preferred directions along body-size and both ethnicity dimensions (all ps $<$ .05) and that the preferred direction along the attractiveness dimension was significantly more positive (i.e., attractive) than the preferred directions along the Ethnicity 1 and body-size dimensions (both ps $< .05$). In other words, happy, attractive children were more likely to be selected across the four contexts than children of a particular body size or ethnicity. These findings are readily discerned from a reinspection of teachers' preferred directions along the five dimensions in Figure 6. That is, the majority of the vector heads point toward the positive ends along the affect and attractiveness dimensions; few vectors point toward the sad–unattractive quadrant of the space. Post hoc evaluations of the significant context effect indicated that the preferred direction was significantly more positive across dimensions in the first context than in the second context ($p < .05$); this finding simply reflects the greater consensus of teachers' preferred directions along the five dimensions in the first decision-making context (i.e., teachers were much more likely to select attractive, happy girls in the first context).

We supplemented this quantitative analysis of teachers' preferred directions along the five stimulus dimensions with a more qualitative characterization of the data for two reasons. First, the preferred direction along a particular dimension only matters substantively to the extent that a teacher utilizes this dimension significantly when making decisions. In other words, showing a slight preference for lighter children when one's decisions are determined almost entirely by children's affect or attractiveness is of limited concern in the present context. Second, marked disagreement among teachers about the preferred direction along a

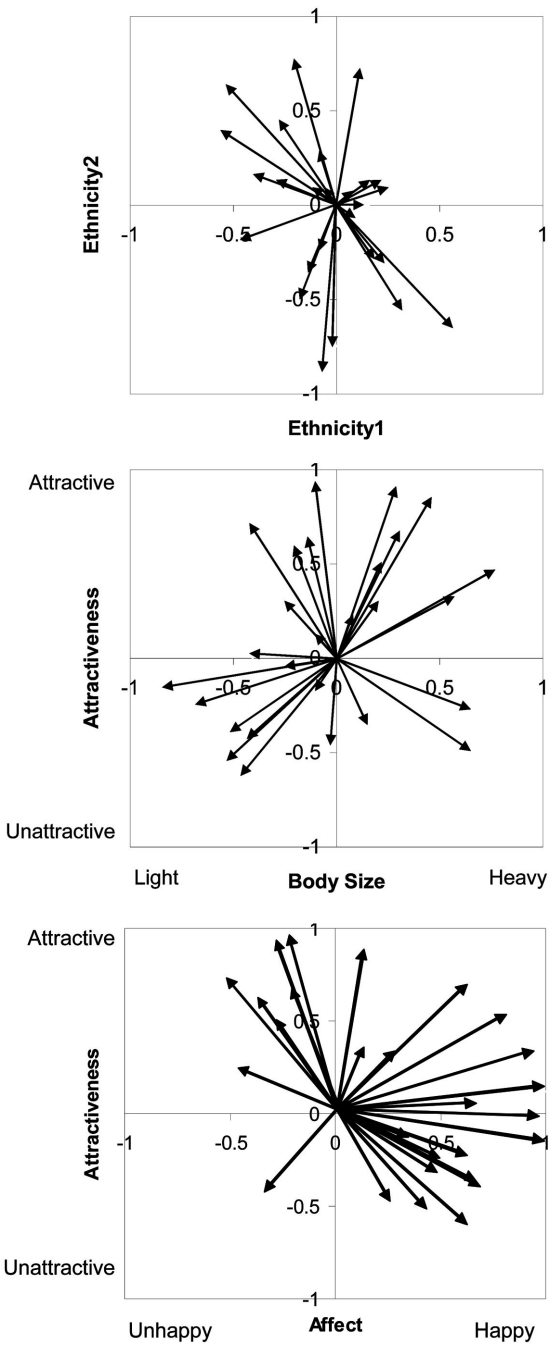

Figure 6. PREFMAP representation of 27 teachers' decision making in the "principal note" context.

dimension could result in a mean signed value of zero. Thus, Table 1 summarizes the preferred directions of the 27 teachers who showed a strong preference for any of the five dimensions in each of the four contexts; a strong preference was indicated by an average utilization value greater than or equal to .50 for a dimension. As demonstrated in the prior analysis of the utilization data, far more teachers utilized affect and attractiveness than the remaining three dimensions. This supplemental analysis reveals that teachers who utilized these dimensions strongly in their decision making showed a marked preference for happy and attractive girls. Chi-square analyses demonstrated that the preferred direction varied significantly for both the affect and the attractiveness dimensions when collapsed across context, χ^2s$(1, N = 27) = 23.113$ and 17.894, respectively, ps $< .05$. In contrast, teachers who utilized the remaining three dimensions did not show a significant directional preference, although our power to detect directional preferences was quite small for these three attributes, given their limited utilization.

Individual differences in dimensional utilization and preferred directions. Nonparametric correlational methods were used to examine individual differences in dimensional utilization and preferred directions. Neither dimensional utilization nor the preferred directions along those dimensions were related to teachers' age, years of teaching experience, teacher satisfaction, and amount of experience with students of diverse backgrounds. In addition, teachers who reported avoiding the use of student characteristics did not utilize these characteristics significantly less than teachers who did not report such avoidance. One-tailed t tests were used to evaluate whether teachers who reported avoiding body size or ethnicity when making decisions actually used body size or ethnicity significantly less than the remaining teachers. No evaluations were significant. In fact, the average effect size (Cohen's d) across the four contexts for utilization of body size by teachers who did and did not report avoiding body size was -0.67, opposite of the predicted direction of the effect, indicating that teachers who reported avoiding body size actually were more likely to use it. Across the four contexts, utilization of body size correlated with avoidance of using body size .22, .10, $-.07$, and .23, with positive correlations indicating that teachers who reported avoiding body size actually used body size information more in decision making. Correlations between avoidance of ethnicity information and use of ethnicity in decision making were similar in magnitude and direction. The average effect sizes comparing the utilization of ethnicity for teachers who did and did not report avoiding the use of ethnicity were .09 and .03 for the first and second ethnicity dimensions, respectively, across the four decision-making contexts. Overall, these findings suggest that teachers were unsuccessful in modifying their decision making in accordance with their desires to avoid use of ethnicity and body size, presumably in part because of the relatively brief stimulus presentation times and the urging to respond quickly.

Discussion

Previous research suggests that overweight children and some ethnic minority students struggle both socially and academically in school, but few studies have considered the role of teachers' cognitive processing of students' attributes as potential correlates of these difficulties (Puhl & Brownell, 2001, 2004; U.S. Department of Education, National Center for Educational Statistics, 2001). The purpose of this study was to examine two aspects of cognitive processing of person attributes in classroom-relevant contexts—attention and decision making—by investigating teachers' perception of students across multiple stigmatized attributes. We examined teachers' relative attention to competing student-specific characteristics and teachers' utilization of and preference for student characteristics when making different decisions in

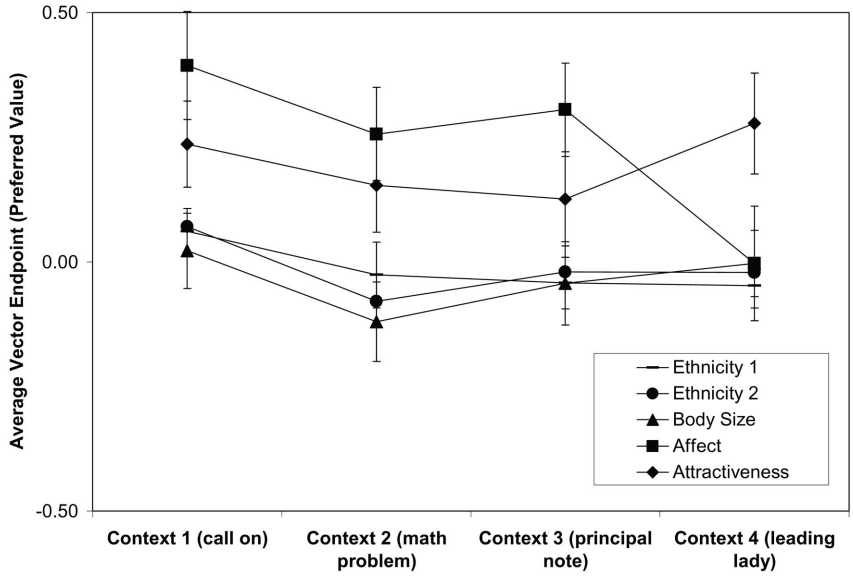

Figure 7. Average preferred directions for five attributes in four contexts. Vertical rules depict standard errors of the means.

classroom-relevant contexts. The student characteristics of particular interest to us in the study were a subset of those found previously to be associated with student performance or teacher judgments—ethnicity, attractiveness, affect, and body size—but had not been investigated relative to one another. Our study emphasized internal validity at the cost of external validity, allowing us to examine the independent impact of these attributes, which often covary under naturally occurring conditions, on teachers' cognitive processing in specific decision-making contexts. Isolating a subset of dimensions of interest also ensured that we had ruled out the influence of other potential covariates of these dimensions (e.g., students' personality, background information) on teachers' processing in these contexts. We recognize that there are many differences between the situations in the study and those that occur in the classroom and that the research program increasingly needs to include stimulus features that make the situations as real as possible. Such standardized situations and stimuli were necessary in this initial study, however, to parse out the extent to which teachers were processing specific student information in classroom-relevant contexts involving rapid decision making. We hypothesized that teachers would show substantial attention to and utilization of students' body size and ethnicity and would exhibit preferences for lighter, nonminority students.

Teacher Attention to Student Characteristics

WMDS analysis of the similarity-rating data revealed that teachers attended, as expected, to four interpretable, underlying dimensions that corresponded to the dimensions we built into the stimulus set: body size, ethnicity (two dimensions), and affect. As a

Table 1
Number of Teachers Showing Strong Preferred Directions for the Five Attributes in the Four Decision-Making Contexts

		Context				
Attribute	Endpoint	1	2	3	4	Total
Ethnicity 1	+ values	1	3	1	0	5
	− values	0	2	1	1	4
Ethnicity 2	+ values	1	2	3	0	6
	− values	0	3	3	2	8
Body size	Heavy	4	3	4	3	14
	Light	1	5	4	1	11
Affect	Happy	16	10	11	7	44
	Sad	3	0	0	6	9
Attractiveness	High	10	8	8	12	38
	Low	2	2	2	3	9

Note. Average dimensional utilization was greater than .50. Context 1 refers to selection of a student who asks a question in class, Context 2 refers to choosing a student to take a note to the principal's office, Context 3 refers to selecting a student to solve a difficult math problem, and Context 4 involves choosing a student to be the leading lady in a classroom skit.

group, participants attended to these dimensions at similar levels, which indicates that the dimensions were perceived to be of similar salience in this particular stimulus set. Attractiveness did not emerge as an independent underlying dimension but correlated moderately with two other dimensions in the WMDS solution. Substantial individual differences in teacher attention to different dimensions emerged, particularly with respect to body size and one of the ethnicity dimensions. Variability in teachers' attentional patterns did not correlate with the individual-differences variables that we assessed, however, such as teacher demographic information and teaching experience with diverse groups of students. Other individual-differences variables, such as teacher ethnicity or body size, could not be examined as moderators of teachers' attention or utilization patterns because of the restricted range of variation but are important to examine in future research.

The use of MDS techniques allowed us to map teachers' perceptual representations of complex person attributes, such as ethnicity. Rather than assuming that ethnicity was perceived as varying continuously along a single dimension, we conducted MDS analyses that indicated that teachers' perceptions of ethnicity were best represented nominally along two dimensions. Girls from different ethnic groups were perceived as belonging to one of three fairly distinct clusters: Asian American, African American, and Caucasian. Dark-haired Caucasian or possibly Hispanic stimuli served as "transition" stimuli between the groups. These results raise questions for future research in terms of how ethnicity is perceived and how its perception might differ as a function of the individuals' own ethnicity and the social context in which the perceiver exists. Implicit, performance-based measures may allow us to capture more accurately how individuals perceive such complex person attributes under specific conditions of interest.

Teacher Utilization of Student Characteristics in Decision Making

Given the documented academic and social difficulties of overweight and ethnic-minority students, we hypothesized that teachers would rely heavily on students' body size and ethnicity when selecting students in four contexts that teachers had deemed classroom relevant: choosing a student to call on in class, selecting a student to take a note to the principal's office, assigning a student to complete a difficult math problem on the board, and picking a student to take a leading-lady role in a class skit. Although the length of time that stimuli were presented may seem brief, teachers routinely make similar rapid decisions in the classroom, and the scaling analyses indicated that teachers systematically used multidimensional student information to make decisions in the preference-ratings task. Unexpectedly, PREFMAP analyses of teachers' choice data indicated that teachers relied predominantly on girls' affect and attractiveness in these decision-making contexts and used ethnicity and body size to a much more limited extent. Despite the moderate correlation between attractiveness and body size, a different pattern of findings emerged for teacher utilization of girls' body size versus attractiveness. Thus, it appears that teachers attended to but did not utilize body-size and ethnicity information when making decisions in classroom contexts. We need to conduct future work to better understand the extent to which the decisions made under these highly controlled conditions converge with decision making in actual classroom contexts.

Teachers' surprisingly infrequent use of body-size and ethnicity information warrants further investigation. Their efforts to present themselves in a favorable light provide a poor account of this finding; the tasks were speeded and required teachers to make over 1,000 choices between pairs of complex multidimensional stimuli, which presumably decreased the likelihood that participants would or could avoid the use of body size or ethnicity when making decisions. Additionally, teachers who reported attempting not to use this information nonetheless used it to a similar degree as other teachers. Future research should examine whether teachers rely on students' body size and ethnicity when making decisions in other situations that were not presented in our study. For example, teachers might make greater use of this information when making decisions that necessitate excluding, rather than including, children (e.g., selecting someone to sit out of an activity). Finally, our findings raise the possibility that other key players in the overweight or ethnic-minority child's social and academic environment are more central to their difficulties. Peers, for example, play an important role in children's social and academic environments at school. Although teachers may not use body size and ethnicity as a basis for student selection, one can readily imagine that some children use these criteria when choosing a teammate in gym class or a study partner for a science project.

Teachers' heavy reliance on attractiveness and affect across decision-making contexts stands in stark contrast to their limited use of body size and ethnicity. Previous researchers have minimized variation in body size when investigating the influence of student attractiveness on teachers' attitudes and behaviors, by using only head shots of students or depicting only average-weight students. In contrast, we allowed both characteristics to vary substantially in our photo stimulus set and minimized the relationship between body size and attractiveness to the extent possible when selecting stimuli. By tightly controlling the covariation between the body size and the attractiveness of the stimuli, we were able to distinguish between the patterns of results for attractiveness compared to body size. The divergence in the findings for attractiveness and body-size information in the present study indicates that aspects of attractiveness that are unrelated to body size may exert a significant influence on teacher decision making. Facial affect was a significant correlate of, though not synonymous with, attractiveness. Some teachers chose happy and attractive children in the decision-making tasks, while others preferred those who were smiling, regardless of attractiveness, or highly attractive but unhappy-looking girls.

The impact of body size and affect on attractiveness raises questions about what exactly attractiveness is and what aspects of attractiveness influence teacher decisions. Perhaps attractiveness consists of multiple components that vary in stability, such that some aspects routinely suggest attractiveness (e.g., body size), whereas other aspects (e.g., emotional expression) may be more malleable and contextually bound. Regardless, teachers' uniformly heavy reliance on attractiveness when selecting students for common classroom tasks is discouraging and suggests the importance of intervention efforts designed to minimize this influence. Future research examining the construct of attractiveness is important to further understand why it is such a reliably important variable to teacher expectations and behaviors, independent from facial affect and body size.

Some variability in teachers' utilization of ethnicity, body size, affect, and attractiveness emerged, but the overwhelming majority of teachers used affect and attractiveness far more than the other dimensions. Given the homogeneity of the parameter estimates, it was unsurprising that teachers' individual differences in utilization patterns were unrelated to the assessed individual-differences variables. In sum, PREFMAP analyses of teachers' choice data demonstrated that teachers relied primarily on students' affect and attractiveness when making decisions in common classroom contexts.

Teachers' Preferred Directions of Utilized Student Characteristics in Decision Making

When examining teachers' preferred directions along heavily utilized dimensions, we anticipated that teachers not only would rely heavily on body size and ethnicity when making decisions but also would exhibit strong preferences for lighter, nonminority students. Few teachers displayed strong utilization of body size and ethnicity, however, and these teachers' preferred directions were distributed similarly across the two ends of the dimensions. In other words, teachers did not display systematic preferences for light students over heavy students or Caucasian or Asian American students over African American students. These findings are inconsistent with the marked social and academic difficulties reported by heavier and ethnic-minority students, and they suggest the importance of examining teacher decision making in other contexts (e.g., exclusionary situations) and investigating peers' decision making in school contexts. Further examining the cognitive processes involved in person perception may yield greater understanding of how stigmatized information is used when varying amounts of information are known about a person. For instance, does an individual's ethnicity become less important to person perception and to decisions based on these perceptions as additional person information becomes available? Such information about how teachers process ethnicity information relative to other important student information could raise questions about real-world interventions, such as the training offered by many school districts designed to enhance teachers' cultural sensitivity to and awareness of ethnically based biases.

Almost all of the teachers who showed strong utilization of affect and attractiveness routinely selected happy-looking, attractive children, although a few teachers systematically chose sad-looking or unattractive children. This overwhelming preference for attractive children is cause for concern and consideration of efforts to diminish this effect, as the stable aspects of attractiveness do not necessarily imply intelligence, responsibility, likability, or academic potential any more than body size or ethnicity do.

Our efforts to enhance the internal validity of our conclusions necessarily constrained the ecological validity of our findings. Thus, one should use caution when generalizing these findings to different student and teacher populations, experimental and stimulus conditions, and decision-making contexts. For instance, we included only girls in the stimulus set (i.e., we did not include gender as a dimension in the stimulus set) to constrain the dimensions being investigated to a tractable number, and the extent to which similar findings would emerge for teacher processing of boys is unknown. Similarly, although we did not find any processing differences across decision-making contexts, such differences might emerge in other situations or if different students attributes were examined. We also purposely limited the amount of time that teachers had to examine the photo stimuli in an effort to create an experimental situation that was as analogous as possible to ones in which teachers must make rapid decisions, but we recognize that teachers often have longer to deliberate in many other significant classroom situations. Therefore, the present study was quite limited in its external validity, relative to the abundance of rich observational studies in this area, and future research should examine the convergence of the findings in the present study with observed teacher behavior in classroom situations.

Implications and Future Directions

The present study relied on well-developed methods drawn from cognitive science to investigate the importance of several competing, well-researched, stigmatized characteristics to teachers' perceptions and decision making in common classroom-relevant situations. Using a study design that placed a premium on internal validity while incorporating significant externally valid features, we aimed to better understand teachers' processing of students in controlled decision-making contexts in an effort to supplement the existing research in educational psychology that has used other study designs, such as observational methods. Teachers attended to body size, ethnicity, affect, and attractiveness but unexpectedly relied primarily on affect and attractiveness when selecting students in four common classroom contexts. Teachers also exhibited a marked preference for happy, attractive girls across contexts in this study. One implication of these findings is that teachers may be inadvertently communicating that happy or attractive students are more capable or responsible than students who are have less positive affect or are less attractive. The current work suggests that it may be useful for teachers to attend more to how they are selecting students in these situations involving rapid classroom decision making.

This study is intended to be only a first step in a program of research aimed at understanding teachers' attention to and decision-making processes involving students, particularly those from traditionally stigmatized groups. Future work in this line of research can and should integrate other real-world variables of interest to educators. For instance, researchers should examine teacher decision making in a wider array of classroom situations, as well as other academically relevant situations and social situations. In addition, other theoretically important student information, such as the previous year's school performance, could be added in a standardized fashion to the stimulus set via short descriptive phrases at the bottom of each stimulus photo to increase ecological validity in a standardized fashion. Another future direction entails conducting the same study with older children depicted in photographs, because research indicates that the stigma associated with being overweight increases as children age and that older children are viewed as more responsible for their own condition. Moreover, teachers' striking tendency not to select unattractive children warrants further consideration, as this may exacerbate perceptions of unattractive children as less popular, intelligent, and friendly (Langlois et al., 2000). Finally, the relationship between teacher processing patterns and other teacher characteristics should continue to be investigated. For instance, teachers' own concerns about body shape and weight might

heighten their attention to variability in students' body size. Similarly, ethnic-minority teachers might process student ethnicity information differentially.

Better understanding how teachers think about and make decisions in the classroom, beginning with how they use student information to inform their decisions, may have implications for improving student learning and teacher training. For example, effective teachers may be systematically processing classroom information differently than less effective teachers. Although this study focused on how teachers attend to and utilize four student characteristics, similar work could be conducted examining other complex teacher behaviors that are important to student education, such as problem solving and communication, to understand where in their processing more versus less effective teachers differ. Having a better understanding of the way successful teachers process student information and recognizing the effective components in successful teachers' information processing could be instructive to other teachers by leading to increasingly specific, effective training for new teachers.

Experimental research also could help elucidate how individual differences among teachers impact teaching behaviors and student learning. In the present study, participants reported about some aspects of their teaching experience and various philosophies about teaching, such as whether all children have the potential to succeed and whether teachers should give more attention to struggling children. Although there were no systematic relationships of significance between these variables and which student characteristics teachers attended to or used in the classroom-relevant contexts in this study, there seems to be great potential for examining more teacher variables across different aspects of cognitive processing and teaching behaviors in future work. Experimental work could help determine, for instance, how teachers who believe that all children have the potential to succeed differ in their teaching style compared to those who do not. Such egalitarian teachers may be more likely to attend to negative facial affect, and they also may engage in a whole host of other thoughts or behaviors that are distinct from teachers who believe otherwise.

More generally, the present work highlights the feasibility and potential utility of translating performance-based paradigms drawn from cognitive science to investigate individual differences in complex social perception, even though these methods traditionally have been used to study normative processing of simple, highly artificial stimuli (Treat et al., 2001, 2002, 2007; Viken et al., 2002). It also serves to illustrate how highly controlled experimental work can be used to complement more externally valid research to better understand the processes underlying the behavioral phenomenon of interest. In particular, the similarity- and preference-ratings paradigms, in conjunction with scaling techniques, should be used more widely to investigate the role of attention and decision-making processes in more complex social phenomena, such as stigma and prejudice, which are particularly important to investigate in educational contexts. These paradigms allow for the simultaneous examination of multiple person attributes, which is more consistent with what perceivers must do in the real world. They also allow for greater experimental control and clearer interpretation of results than studies that maximize external validity, such as those using observational designs. Most important, investigating specific stages in information processing using such performance-based paradigms will provide a more detailed understanding of how person features are processed and used in decision making, which may enhance the effectiveness of teacher training workshops.

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Received November 3, 2005
Revision received June 28, 2007
Accepted July 3, 2007 ■