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The Role of Cognitive Development and Parental Factors in the Development of Attitudes About Weight

Linda Rhodes

A Thesis

in

The Department

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ABSTRACT

The Role of Cognitive Development and Parental Factors in the Development of Attitudes About Weight

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Concordia University, 1988

The first goal of the present study was to identify sex differences and developmental trends in children's attitudes about weight. The second goal was to identify factors which contribute to the development of these attitudes; the influence of cognitive development and parental factors was examined. Measures of children's use of weight as a categorization dimension, weight preferences, and trait attributions on the basis of weight were administered to 256 boys and girls in kindergarten through grade 6. Children in grades kindergarten through grade 3 were also given Goldschmid & Bentler's (1968) Concept Assessment Kit - Conservation. Fifty-one mothers submitted completed questionnaires on past and present parental weight status and maternal attitudes about weight.

There were several developmental trends: the number of body responses declined with age; the number of positive attributions to the normal weight figure decreased; the number of shared attributions increased; and the number of normal weight preferences in a normal weight/underweight selection task also increased. The results of the regression analyses predicting children's attitudes suggested that the child's level of cognitive development accounts for some of the variance explained in the developmental trends.

With respect to sex differences, girls made more underweight choices in an underweight/overweight preference task and more normal weight choices in a normal weight/overweight preference task. Preferences were influenced by maternal variables such as a maternal history of overweight as well as by cognitive development.

The majority of boys and girls at all of the grade levels expressed a preference for an overweight playmate pictured with a relevant toy versus a normal weight playmate without a toy.

The results were interpreted as modifying notions of the existence of a global negative attitude toward overweight children, expressed in all situations. Instead, children seem to gradually adopt the view that overweight peers can possess good qualities, but are to be pitied for their condition.

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The purpose of the present study is to explore the development of children's attitudes about weight. The first goal is to investigate developmental trends and sex differences in specific aspects of children's weight attitudes. The second goal is to explore the processes which contribute to the development of these attitudes.

The past 10 to 15 years have been marked by an increasing interest in childhood obesity. This interest has grown with research indicating that childhood obesity predicts later obesity (e.g. Zack, Harlan, Leaverton & Coroni-Huntley, 1979) and may be associated with later health problems (e.g. Lauer, Connor, Leaverton, Reiter & Clarke, 1975). In addition to the medical implications, there is also concern that obesity seriously affects the quality of children's lives (e.g. LeBow, 1986).

The bulk of past research on the social implications of obesity has taken two forms. One approach was to interview obese adults and children about the consequences of obesity in daily life (e.g. Allon, 1979, Millman, 1980). While these clinical reports produced valuable insights into the social stigma of obesity, their validity was questionable.

The second way researchers have studied the social implications of obesity has been to measure normal weight children's awareness of weight categories, trait attributions by weight type and preferences for specific weight groups in children. These studies have shown that children as young as 3 or 4 years of age are aware of weight and use the dimension

to categorize or match (e.g. White, Mauro & Spindler, 1985); that children as young as 5 years of age express a slight preference for normal weight or an aversion to overweight figures (e.g. Lerner & Gellert, 1969; Lerner & Schroeder, 1971a; Lerner & Korn, 1972; Lerner, Karabenick & Meisels, 1975; Young & Avdzej, 1979); and that children 6 years of age and older tend to attribute positive traits to normal weight and negative traits to overweight or underweight peers (e.g. Caskey & Felker, 1971; Kirkpatrick & Sanders, 1978; Lerner, 1969a; Lerner & Korn, 1972; Lerner & Schroeder, 1971b; Staffieri, 1967, 1972; Young & Avdzej, 1979).

However, recent reviewers (Woody, 1986; Jarvie, Lahey, Graziano & Framer, 1983) have suggested that the results of these studies are questionable. Some common criticisms include the lack of studies assessing developmental trends and sex differences, the use of a rigid forced choice trait attribution paradigm, and the use of an unreliable, one dimensional measure of preference. In other words, early preference and trait attribution measures may have encouraged subjects to respond in a negative or "stereotyped" manner toward the overweight stimuli.

The present study takes these criticisms into account by adding a new free choice trait attribution task and a two dimensional measure of preference. These improvements allow children with no negative attitude about overweight peers to demonstrate it by attributing traits to both stimuli or by using another dimension as a basis for their peer preferences.

Thus, it is hoped that the improved measures used in the present study will more accurately reflect how children see their overweight peers.

The exclusive focus on trait attribution and peer preferences used in early studies now seems narrow. While early research on person perception focussed on ideas people have about others, newer studies have also explored the social and mental processes which contribute to these perceptions (Hamilton, 1979). One obvious social factor which has been implicated in the development of other social attitudes (e.g. Serbin, 1980) is the attitude held by the society as a whole, and the child's parents in particular. At the present time, there is no evidence linking parents' and children's attitudes about weight. However, there is considerable evidence that adults also have negative attitudes about overweight (Dibiase & Hjelle, 1968; Lerner, 1969b; Roberts & Herman, 1980; Spigelman & Schultz, 1980; Wells & Siegel, 1960). Therefore, researchers have speculated that children may adopt some of their parents' attitudes about weight (e.g. Woody, 1986). As a result, the contribution of parents attitudes about weight to the development of children's attitudes is explored in the present study.

A second process variable which has been recently implicated in the development of children's social attitudes is cognitive development (e.g. Livesley & Bromley, 1973; Martin & Halverson, 1981). A recent study by Rhodes & White (1985) demonstrated that both Piagetian stage level and

particular processes hypothesized by theorists Martin & Halverson (1981) contribute to the development of some attitudes about weight. However, this earlier study was conducted on a small sample with a restricted age range. The present study attempts to expand understanding of the relationship between cognition and weight attitudes in a larger study within a cross-sectional developmental design using regression techniques.

Background

The review of the literature is divided into two major sections. The first section, Weight Attitudes, describes the importance of research on children's attitudes about weight in general, and the need for further research at the present time. It also includes a critical evaluation of past research on weight awareness, preference, aversion and attributions to overweight versus normal weight by children and adults. Of particular relevance to the present study is evidence of gender and developmental differences in such attitudes.

The second section, Weight Attitude Development, reviews various theories of attitude development as they relate to the development of weight attitudes. Cognitive-developmental theory and social learning theory are emphasized. Examples from the literature on the relationship of cognitive development and gender attitudes are reviewed as, to date, these theories have not been tested for attitudes about overweight.

Weight Attitudes

Why Study Attitudes About Weight?

The study of attitudes about weight has been motivated by the belief that obesity negatively affects the quality of children's lives, and an adequate understanding of such attitudes is necessary to be able to help obese children cope with their condition.

The belief that overweight is a negative condition is supported by a large body of sociological work which attests

to the stigma or social disgrace associated with overweight in North America (e.g. Cahnman, 1968; Sobol, 1984a). While the negative evaluation of overweight is thought to be pervasive, it is often described as particularly burdensome for women (e.g. Gordon & Tobias, 1984) and members of lower social classes (e.g. Schwartz, 1984). At least part of the negative evaluation of obese persons seems to be due to their perceived responsibility for their condition (Maiman, Wang, Becker, Finlay & Simonson, 1979).

Empirical work by sociologists confirms that this general disapproval of overweight in our society applies to overweight children as well. A series of studies (DeJong, 1980; Goodman, Dornbusch, Richardson & Hastorf, 1963; Mathews & Westie, 1966; DeJong, 1980; Richardson, Goodman, Hastorf & Dornbusch, 1961) on child and adult preferred rankings for children with various disabilities revealed that an obese child is consistently evaluated less positively than children with more functionally disruptive and dramatic disabilities (i.e. crippled children, children with facial disfigurements). The results of DeJong's (1980) study of high school girls confirmed that negative evaluations of overweight resulted wnen the subjects believed the overweight people were responsible for their weight.

Some writers have suggested that the negative effects of overweight have been exaggerated. For example, although writers Ford & Beach (1951) wrote that "extreme corpulence... in either sex tends to lessen the individual's sexual

attractiveness" (p.86), Sobol (1984b) found little demographic evidence that obese individuals tend to remain single, have more sexual or marital problems or become divorced more often than normal weight people. Similarly, others have found that the negative traits attributed to anonymous overweight figures are not systematically attributed to overweight friends (Lawson, 1980; Sallade, 1973).

However, there is some experimental evidence that overweight people are actually treated differently by others as a function of their weight status. The few studies conducted on overt discrimination suggest that young overweight adults are less likely to attend prestigious American colleges (Canning & Mayer 1966), less likely to be accepted as tenants (Karris, 1977), and less likely to be recommended for jobs (Larkin & Pines, 1979).

The negative effects of overweight are also borne out by interviews of overweight children and adults by researchers (e.g. Allon, 1979; Monello & Mayer, 1963) and popular writers (e.g. Chernin, 1981; Millman, 1980). These authors present compelling portraits of what it is like to grow up overweight in North America. The overweight subjects interviewed repeatedly refer to their shame, humiliation and disgrace. They speak of having lost social and occupational opportunities because of their weight, but their self-esteem is so low they tend to consider the discrimination appropriate.

Empirical studies of body- and self-esteem in overweight

children and adults also suggest that overweight has a negative effect on the development of these concepts. Overweight children and adults are consistently reported to dislike their bodies more than do normal weight people (e.g. Pearlson, Fluornoy, Simonson & Slavney, 1981; Stunkard & Burt, 1967). Stunkard & Mendelson (1961) described this negative evaluation of their bodies as part of "an overwhelming preoccupation with one's obesity, often to the exclusion of any other personal characteristic (p.328)". Therefore, it is not surprising that researchers have found that self-esteem also suffers in some overweight people. While young children appear to have intact self-esteem (Lawson, 1980; Wadden, Foster, Brownell & Finley, 1984), by early adolescence overweight adolescents begin to make more negative self-evaluations than normal weight adolescents (Hammar, Campbell, Campbell, Moores, Sareen, Garies & Lucas, 1972; Mendelson & White, 1985; Sallade, 1973; Worsley, 1981).

Review of Past Research

Society's attitudes about overweight have wide ranging effects on the lives of obese children. These attitudes have long been considered worthy of study. In the past, researchers have explored several distinct aspects of attitudes about weight. These three areas are: children's awareness of weight as a social category, their preferences for weight types, and their weight-based trait attributions.

Schema development or categorizing by weight. In general, the literature on the development of a schema or

mental category for weight suggests that such a schema exists by the age of 3. It also appears that the tendency to use that schema rather than an activity schema to categorize peers declines between 3 and 10 years of age, and there are no sex differences in weight schema development.

Children must have some type of mental structure for a concept in order to have any feelings or thoughts about it (Vaughn, 1978). Therefore, it seems logical that the first step in developing attitudes about weight must be an awareness of various body types. Early researchers attempted to demonstrate that young children were aware of body type differences by showing that they could correctly identify their own body or weight types. Several studies found that while older children could identify their own weight group (e.g. Kagan, 1966), most 5 to 7 year old children could not identify their own weight or body type (Lerner & Schroeder, 1971a; Lerner & Korn, 1972; Staffieri, 1967; Young & Avdzej, 1979). Ironically, these same studies found body type or weight-based preferences, aversions and trait attribution patterns.

Since one must be aware of weight in order to possess such preferences and aversions, this is a confusing set of findings. However, there are several reasons to believe that identifying one's own weight or body type may be a distinct task from demonstrating awareness of others' weight or body type. First, identification of own weight may simply be a more difficult task than identifying the weight type of

others. Many studies have found that most adults do not estimate their own weight accurately (e.g. Gray, 1977; Kallen & Doughty, 1984; Pearlson et al, 1981; Pirie, Jacobs, Jeffrey & Hannon, 1981; Stewart & Brook, 1983). Secondly, others have suggested that a lack of awareness of your own weight status might serve defensive functions (Fisher, 1986; Monello & Mayer, 1963).

A study by Lerner & Gellert (1969) confirms that the identification of one's own and the awareness of others' weights are distinct processes. Their study compares 5 year old children's ability to identify the photograph they "most look like", with their ability to identify peers who look like each of the three photographs. They found that while only 24% of the children could correctly identify their own body type, most of the children could accurately match their peers to photographs. Thus, it appears that identification of their own weight is not an accurate measure of children's general awareness of weight categories.

More recent evidence using a different task confirms that very young children can distinguish differences in weight type (White et al, 1985). They gave 3 to 11 year old children the opportunity to match drawings of peers on the basis of weight, activity or no known dimension. They found that even 3 year old children made 37% of their matches by weight. Their results were replicated in a subsequent study by Rhodes & White (1985). Therefore, even by the age of 3, children must possess a rudimentary schema for weight. They must have such

a structure in order to differentiate the drawings by weight, which in turn allows them to match by that dimension.

These two most recent studies also yield the only data available on developmental and gender differences in children's awareness of weight. White et al (1985) found that the choice to match by weight rather than activity declined with increasing age. The 3 and 4 year olds matched by weight significantly more than all the others, and the 10 and 11 year olds matched by weight significantly less than the others. There were no sex differences. Rhodes & White (1985) also found no sex differences in the tendency to match stimuli on the basis of weight. The present study is a replication of this earlier work on using weight as a categorization dimension.

Preferences. In general, the results of past studies on weight preferences suggest that there is a slight preference for the normal weight, or perhaps non-overweight, figure and that this preference is present by the age of 7. In addition, they strongly suggest there is an aversion toward the overweight child present by the age of 6. No developmental differences in these attitudes appear to exist between the age of onset and 20 years of age. There is some evidence girls have a stronger preference for the non-overweight figure or aversion for the overweight figure than boys.

Once children have some sort of mental structure for weight, it might be expected that they would begin to develop

feelings about various weight categories. These feelings may be measured as preferences or aversions for particular weight groups. These concepts have been measured in two different ways. The most common method involved asking children which of three different weight stimuli they would prefer to "look like". The second method involved using a social distance measure. In these studies, children were asked to indicate how close they would like to be to figures of varying weights.

The results of studies conducted using the "look like" paradigm consistently reveal a preference for normal weight figures and an aversion for overweight figures. Two of the earliest studies were conducted by Staffieri (1967; 1972). In one study of 90 boys from ages 6 to 10, he found a clear preference for the normal weight figure in subjects 7 years of age and older. In a second study, the subjects were 60 girls from ages 7 to 11. Again, girls preferred to look like the normal weight figure. The preference for normal weight figures in subjects over the age of 5 or 6 was also obtained in two later studies of 5 to 20 year old subjects (Brenner & Hinsdale, 1978; Lerner & Korn, 1972).

In another study, Lerner & Gellert (1969) asked children about whom they would "least like to look like" as well. They found that kindergarten boys and girls chose the overweight figure as the one they did not want to look like significantly more than the other two body types. This aversion for the overweight figure was subsequently replicated in later studies of kindergarten children (Lerner & Schroeder, 1971a), and 5 to

20 year olds (Lerner & Korn, 1972).

Similar results have been obtained using the social distance paradigm. Lerner (1973) found that boys and girls in grades 1 to 3 left more space between the self figure and the overweight figure than between the self figure and underweight or normal weight figures. Only the kindergarten children did not allocate more space to the overweight figure. This aversion for the overweight figure was later replicated in two studies of American children (Lerner, Karabenick & Meisels, 1975; Lerner, Venning & Knapp, 1975) and two studies of Japanese children (Iwawaki, Lerner & Chihara, 1977; Lerner, Iwawaki & Chihara, 1976).

Several of these studies used wide enough age ranges to provide information on developmental changes in children's weight preferences. In general, there appear to be no developmental changes in weight preferences following the onset of clear preferences and aversions. There were no developmental changes in subjects already possessing a clear preference for normal weight or aversion for overweight in Staffieri's (1967; 1972) studies of elementary school age children. The social distance studies conducted by Lerner and his colleagues' (Iwawaki et al, 1977; Lerner, 1973; Lerner et al, 1976; Lerner, Karabenick & Meisels, 1975; Lerner & Korn, 1972; Lerner, Venning & Knapp, 1975) are more difficult to interpret. They all reveal one large increase in distance between the self and overweight figures occurring after Kindergarten or grade 1. This effect seems to represent the

onset of weight preferences.

Two of the aforementioned studies yielded data on sex differences in weight preferences and aversions. In their study of kindergarten boys and girls, Lerner & Gellert (1969) found that the girls had a stronger desire to look like non-overweight figures than boys. Similarly, Rhodes & White (1985) found that 4 to 8 year old girls tended to choose non-overweight figures more than boys.

These early studies on preference using the "look like" and social distance paradigms raise a number of methodological issues. In a sense, the "look like" paradigm may not directly reflect social preferences or aversions and may be confounded by the child's own body type. The reliability of both types of measures is also questionable. Although reliability is always an issue in studies using child subjects, it is particularly pertinent here for two reasons. First, the subjects were exceptionally young; more studies used a kindergarten age group than any other single group. Second, the tasks consisted of only one or two preference or aversion choices. Two of the three studies which had subjects repeat the task a second time reported the reliability of responses. While Lerner, Karabenick & Meisels (1975) found their subjects, particularly the older ones, were generally reliable, Lerner & Schroeder (1971a) found only 50% of their subjects were reliable. Even those studies which repeated the task, did so with the same stimuli. Thus, while short term reliability may have been adequate, the extent to which

idiosyncratic characteristics of the stimuli elicited the responses can not be assessed. As a result, the generalizability of the results is questionable.

In addition, the nature of the tasks may have forced the subjects to be unnaturally rigid or oversimplify a more complex value system. In all of the studies, subjects were asked to choose only one of two or three body types. This procedure allowed the experimenters to identify only the most preferred and most aversive figures; the possibility that which figures were paired might affect which figure was preferred or found aversive was not explored. Similarly, the data obtained from one-dimensional measures of preference is very limited, because the child was forced to make weight-based preferences. The likelihood of using weight as a basis for preferences can not be assessed.

Two studies have manipulated more than one stimulus dimension in this manner. In other words, they explored factors which mediate the effect of weight in determining preferences. Young & Avdzej (1979) assessed the relative importance of behaviour and weight. Their subjects were 108 boys and girls in grades 3 through 5. They showed each subject two videotapes of an adult and child interacting. Some of the videotapes featured an obese boy, while others featured a normal weight boy. In addition, he was depicted as obedient or disobedient. Afterwards, subjects were shown photos of these boys and asked to point to the one they "wanted to play with". In keeping with research using other

paradigms, when the behaviour of both boys was normal, the normal weight boy was selected as a playmate more often than the obese boy. However, when an obedient obese boy and a disobedient normal weight boy were compared, the obese boy was preferred. These findings were independent of age and sex.

The results of a recent study by White et al (1985) support Young & Avdzej's (1979) finding that aversion for overweight may be modified by other factors. White et al (1985) studied the relative importance of an attractive prop and weight in children's playmate preferences. They asked 3 to 11 year old children to choose with whom they wished to do a particular activity. In each case, they chose between an overweight peer with the activity-related prop and a normal weight peer with no prop. They found that prop-based responses were made three to four times more often at all ages. However, they also found that girls, regardless of age, made more weight-based responses than boys. Girls chose to play with the propless normal weight, same-sexed peer more often than boys.

Thus, it appears that preferences for various weight groups are mediated by at least two other factors. As such, current research should include a measure which gives children the opportunity to make preferences on the basis of other dimensions, as well as improving the reliability of more traditional preference measures. The preference measures used in the present study were designed to meet both these objectives.

Trait attributions. A similar review was undertaken of studies on how children attribute traits to peers of varying weights. In general, the results of these studies suggest that both boys and girls attribute negative traits to overweight figures and positive traits to normal weight figures. There is some indirect evidence that girls have more favorable attitudes toward underweight figures. The evidence for developmental changes is equivocal, and may be the result of methodological problems with the paradigm used in these studies.

Early researchers referred to the study of children's weight-based trait attributions as "stereotyping". They typically used a forced choice trait attribution paradigm. Children were asked to attribute a set of traits or adjectives to one of three silhouettes, photographs or drawings representing normal weight, overweight and underweight same-sex peers. These researchers attempted to demonstrate the existence of a stereotype for each body type (e.g. Staffieri, 1967;1972). In other words, they expected to find a consistent set of positive and negative traits attributed to each body type. However, the results of these early studies did not support this expectation. One reason may be that each trait has not been studied often enough to judge whether it is reliably associated with one of the three body types. In a sample set of five studies in the area, only 34 of 123 traits used were studied more than three times. Furthermore, even traits which had been studied more than three times had not

been attributed to the same weight group each time. Therefore, it appears that there is no evidence that children have specific trait stereotypes about weight.

One way to make sense of studies using many different traits is to compare the attribution of positive and negative traits, rather than specific traits, to each weight group across studies. Taking this approach, the results clearly support the existence of a negative attitude toward overweight. All of the studies found that subjects of varied socio-economic levels, cultures and weights assigned negative traits to the overweight figure and positive traits to the normal weight figure most often (Caskey & Felker, 1971; Counts, Jones, Frame, Jarvie & Strauss, 1986; Johnson & Staffieri, 1971; Kirkpatrick & Sanders, 1978; Lawson, 1980; Lerner & Korn, 1972; Lerner & Pool, 1972; Staffieri, 1967; Stager & Burke, 1982; Wright & Bradbard, 1980; Young & Avdzej, 1979).

Most of these studies also found that the underweight figure was evaluated negatively as well. However, two studies found that the underweight figure was evaluated as positively as the normal weight figure. The discrepant results obtained by these researchers can be easily explained in terms of their samples. Both Staffieri's (1972) and Brenner & Hinsdale's (1978) samples were composed entirely of girls, whereas the above studies used mixed samples of boys and girls or only boys. There is considerable evidence that societal standards for ideal weight are more stringent for girls than boys (e.g.

Millman, 1980); therefore, it is logical that girls would have a more positive view of underweight figures.

Several of these researchers examined their data for sex differences. Four of them directly analyzed the results of their studies for sex differences. Lerner & Pool (1972), Wright & Bradbard (1980) and Stager & Burke (1982) all reported no differences in boys and girls' trait attribution patterns. Kirkpatrick & Sanders (1978) found sex differences in how some traits were attributed. However, they described these effects as negligible compared to those obtained by age, and failed to fully describe the differing attribution patterns.

Some of these same studies also explored developmental trends in trait attribution. In general, the data on developmental effects in trait attribution are much less consistent than the data on sex differences. There are a large number of studies which found no age differences in trait attribution. For example, Staffieri (1967) compared trait attribution in grade 1 through 5 boys (1967) and grade 2 through 6 girls (1972). In both cases, no age differences were obtained. Two other studies of elementary school age children confirm Staffieri's findings with respect to age. Caskey & Felker (1971) studied 90 girls from grades 1 through 5 as subjects using most of Staffieri's adjectives. Trait attributions were too random in grade 1 to be included in the analyses. However, there were no age differences in the grade 2 through grade 5 children. Similarly, Lerner & Pool (1972)

found no age differences in their grade 4 through grade 6 subjects.

One explanation for the lack of age differences in these studies may be that the researchers simply did not study a wide enough age range of subjects. However, several studies extending the age of their sample into adolescence have also failed to find age differences. Lerner (1969a) studied body type attitudes in 10, 14 and 17 year old boys. Somewhat atypically, he asked these 50 boys to attribute traits to photographs of adult males of the three body types. No age differences were reported. Subsequently, Lerner and Korn (1972) compared trait attribution patterns in 5-6 year old boys, 14-15 year old boys, and 19-20 year old young men. They were asked to assign 28 bipolar traits to drawings of male peers. Once again, no age effects were found. Finally, Stager & Burke (1982) also found no age differences in their 9 to 16 year old subjects.

These studies seem to indicate that body stereotypes are held by children from 7-8 years of age through adolescence, with no developmental changes. However, three other studies reported age changes in attitudes toward normal weight figures. Lawson (1980) compared trait attribution in boys and girls in grades 2, 4 and 6. She reported that the overweight figure was perceived equally unfavorably by all age groups. However, between the ages of 8 and 9, the normal weight figure became more positively perceived. Brenner & Hinsdale (1978) compared trait attributions in 6, 15 and 19 year old girls and

found the youngest subjects were more positive toward the overweight figures than the two older groups.

However, one study (Kirkpatrick & Sanders, 1978) found a contradictory age trend; the 6 to 18 year old subjects in their study became less favorably disposed to the normal weight figure with age. They supported Lawson's (1980) findings that the overweight figure was perceived negatively at all ages. However, in contrast to Lawson, they found that the normal weight figure was perceived less positively at the age of 13, and the underweight figure was perceived consistently moderately across all ages.

It is difficult to explain these two opposite age trends. It is equally difficult to explain the fact that these three studies found age trends while the preceding three studies examining age trends in elementary school age and adolescent children found no differences by age. Except for Lerner's (1969a) study in which children attributed traits to adult figures, the methodology of studies finding no age effects is no different from those which found age effects.

One general explanation for these discrepancies may be that all of the studies on trait attribution are using an unreliable or invalid paradigm which is yielding ambiguous results across studies. One major issue, often mentioned in relation to social attitude measurement, is the validity of the forced choice paradigm (Jarvie et al, 1983; Singleton & Asher, 1977). It is possible that forcing children to attribute each trait to one and only one figure results in an

unnaturally rigid attribution pattern, more reflective of knowledge of social convention than their own attitudes about a subject. Thus, there appears to be a need for researchers to assess trait attributions based on weight using a free choice paradigm.

Summary and Implications for the Present Study

The preceding review of research on children's attitudes about weight suggests the need for further research on children's attitudes about weight for several reasons. First, there are a number of areas which require more study. For example, the awareness of weight as a social category has only been examined in one study to date. There is also a need for more studies on developmental and sex differences in all aspects of weight attitude development. Secondly, the methodological difficulties with those early studies available render even their results questionable. For example, the use of very primitive, one-dimensional preference measures and a forced choice trait attribution paradigm are severe limitations to understanding these aspects of weight attitudes.

Despite the limitations of the previous research, the results do have implications for the design of the present study. First, the fact that children appear to have a schema for weight by the age of three, and some weight preferences, aversions and trait attribution patterns by the age of 7 years, suggests the need to study elementary school age children in order to understand the development of these

attitudes. Secondly, the suggestion that there are probably sex and developmental differences in weight attitudes suggests the need for a design comparing boys and girls at each grade level.

The present study was designed to address these issues. The subjects were boys and girls in grades kindergarten through grade 6. New and improved measures of children's weight attitudes were used. Their awareness of weight was measured using White et al's (1985) method of comparing the use of weight as a social category with the use of activity as a social category, rather than asking children to identify their own weight type. Weight-based preferences were measured using a preference measure composed of repeated trials where the weights of stimulus pairs vary. White et al's (1985) two-dimensional affiliation-preference measure was also used in order to obtain a measure of the likelihood of using weight as a basis for preferences, and to better approximate real-life preference judgements. Weight-based trait attributions were measured using a new free choice measure.

Weight Attitude Development

Yet another limitation of the literature on children's attitudes about weight is the lack of information on the processes which contribute to the development of these attitudes. Very few researchers have even speculated on the processes by which attitudes about weight are acquired, and none have attempted to measure the effect of these influences. One goal of the present study is to identify and measure

factors contributing to the development of children's attitudes about weight. Therefore, a review of some theories and empirical research on social attitude development and their possible relevance to the development of attitudes about weight is undertaken in this section.

Previous researchers have speculated on three basic factors which might influence the development of attitudes about weight in children. First, it has been suggested that children learn to prefer certain weight groups and have ideas about those groups as a result of their actual experiences with individuals of varying weights (e.g. Lerner & Gellert, 1969). Secondly, it has been suggested that children learn these attitudes as part of the "cultural lore" passed on by their parents and other agents of socialization (e.g. Goodman et al, 1963; Lerner & Gellert, 1969). Thirdly, the interaction of socialization with cognitive factors has been stressed (Lerner & Korn, 1972). The theoretical rationale and empirical evidence for each factor's influence is discussed below.

The Effect of Learned Body-Behaviour Associations

One frequently suggested theory of social attitude development is that children acquire their social attitudes partly through their experiences with people (e.g. Vinacke, 1957; Kohlberg, 1968; Martin & Halverson, 1981). In other words, they learn to associate certain characteristics with certain weight groups because they have seen people in those weight groups exhibit those traits.

The history of this theory with regard to attitudes about weight begins with work by Sheldon (1942). He hypothesized that personality traits and body types were highly correlated. Over the years, this idea has received very little support. While a few characteristics have occasionally been associated with particular weight categories (Kagan, 1966; Stewart, 1982), the results were not replicated, studies were poorly controlled and even positive results were not as robust as Sheldon (1942) would have predicted. Therefore, it seems unlikely that children could acquire either specific or uniformly negative ideas about overweight or underweight people through experience with individuals in those weight groups.

The Effect of Socialization

A better-supported theory is that children acquire their attitudes through social transmission. While the impact of such a process on children's attitudes is very difficult to measure empirically, the following review suggests that there is theoretical and empirical evidence to support the influence of socialization on the development of children's attitudes. While there have been no empirical tests of such a relationship between socialization and attitudes about weight, there is indirect support for the existence of such a relationship.

Social influences and attitude development. Social transmission theories of attitude development suggest that children simply adopt the prevailing ideas in a culture or are

directly taught what it means to belong to a particular weight category during the process of socialization. The broadest theories, such as Bandura's (1969;1977) social learning theory, see many potential sources of influence in the child's world. The major point of Bandura's theory is that children learn most of their knowledge about the world through observing and imitating people in their environment. Social learning theory differs from learning theory in that children are thought to acquire observed behaviors by vicarious processes. In other words, they can learn a behaviour simply by observing the consequences of others performing the behaviour.

The theory of modeling has good face validity; everyone can recall adopting a point of view after hearing a high status person voice the same opinion or learning a new behaviour by watching someone else perform it. Bandura and many others have also empirically demonstrated that children imitate the behaviors of others. For example, in Bandura, Ross & Ross' (1963) classic experiment children were found to imitate the aggressive acts they observed being performed on a bobo doll by an adult model. In Bandura's theory, the people children choose to imitate are called models. While parents and other important figures in the child's life are more likely to be imitated than others, Bandura stresses that anyone children observe is a potential model. Thus, the theory recognizes the role that friends and the media play in transmitting the larger society's values to young children.

In recent years, there has been some support for the notion that society has an influence on the development of children's social attitudes. One way the society's values are thought to be transmitted to children is through the media (e.g. Huston, 1983; Serbin, 1980). In recent years, the influence of television on children has been studied extensively. While much of the research done to date has tended to focus on children's understanding of content (e.g. Kunkel, 1987) and its effects on their behaviour (e.g. Potts, Huston & Wright, 1986), there has been some recent attention to the issue of the effect of television on children's ideas and attitudes. In a recent review of this literature, Van Der Voort (1986) noted the following: there is a positive correlation between the time children spend viewing violent television shows and their positive feelings about aggression; conversely, children who watched pro-black or pro-Jewish mini-series' were later found to have more positive attitudes toward that racial group; and children who watch more typically sexist American television have stronger sex stereotypes. Obviously these findings do not imply a causal relationship between children's exposure to the media and the development of particular attitudes and values; however, they do support a relationship between exposure to values and the development of similar attitudes that is consistent with social learning theory.

Bandura's social learning theory is intended to explain how all kinds of behaviors are learned. In contrast, more

specific theories on the social transmission of attitudes have been developed. These theories typically emphasize the importance of parental behaviour in children's adoption of attitudes. In Allport's (1954) classic book on the acquisition of what he called "prejudice", he described how children adopt their parents' values and attitudes in response to explicit or implicit teaching. The development of prejudice was thought to occur more indirectly through an atmosphere created by the family. Allport (1954) stated that the parents' "mode of handling the child (disciplining, loving, threatening) is such that the child cannot help acquire suspicions, fears, hatreds that sooner or later may fix on minority groups" (p.297). According to this model, it is only at puberty and adolescence that more complex and varied social influences seriously influence children's attitudes. Thus, the influence of parental attitudes on the development of pre-adolescent children's attitudes is considered primary.

One area in which a great deal of work has been conducted on the influence of parents is the development of attitudes about gender. There is considerable evidence of sex stereotypes in young children (see Lewis & Weinraub, 1979). At the same time, there is a large body of work supporting the existence of sex stereotyped attitudes in parents. For example, in one often-cited study Rubin, Provenzano & Luria (1974) asked parents to describe their newborn infants. They found that parents already described these babies in sex-typed

terms; girls were described as softer and more attentive, while boys were described as stronger and better co-ordinated despite the fact that the babies did not seem to differ behaviorally. Since parents have these attitudes so early in the child's life, it seems plausible that children would incorporate these parental attitudes into their ideas about themselves and the world.

However, the existence of sex-typed attitudes in both children and their parents is not very solid grounds for concluding that parents have transmitted these attitudes to their children. Direct evidence of a causal link between parents and children's attitudes is not available. However, there is indirect evidence that suggests children may have acquired these attitudes through social learning. Evidence to support this theory comes from research identifying parents' differential behaviors toward sons and daughters. Researchers have suggested that it is through this type of social learning that children learn about sex typing.

There is evidence that parents behave differently toward boys and girls. For example, researchers have found that boys are handled more roughly than girls (Parke & O'Leary, 1975); boys and girls are assigned sex-typed household chores (Duncan, Schuman & Duncan, 1973) and boys are reinforced more for aggressive behaviour than girls (Maccoby & Jacklin, 1974). Thus, it is clear that parents can be considered sex-typed models. While no-one has observed the modeling process in action, experts in the area have no difficulty accepting the

suggestion that children model these sex-typed behaviors from their parents. For example, Serbin (1980) concluded a review of this literature by stating, "there is no doubt that children do learn about sex roles from parents by observing them, by questioning... and by direct instruction" (p.68). Thus, it can be concluded that there is some consensus regarding the social transmission of gender attitudes from parents to their children.

Social influences and weight attitudes. While the influence of societal and parental values on children's attitudes about weight has been repeatedly suggested (e.g. Woody, 1986), there have been no empirical tests of this hypothesis to date. Therefore, the present review can only evaluate the possibility that society's attitudes about weight are communicated to children. One necessary condition for a social transmission theory of weight attitude development is that there must be evidence that adults possess attitudes about weight similar to those expressed by children. In general, the results of a review of the adult literature on attitudes about weight support the existence of attitudes like those exhibited by children.

Adult studies on attitudes about weight have explored both preferences and trait attribution patterns. Preference has been measured by asking adults which of three photographs of adults of varying weight they liked best or most preferred to look like. The results of these studies have been very consistent; researchers have found a clear preference for the

normal weight figure, even when the non-normal weight stimuli presented are only very slightly overweight or underweight (e.g. Dibiase & Hjelle, 1968; Galper & Weiss, 1975; Powell, Tutton & Stewart, 1974).

The results of studies on trait attribution have been equally consistent. The typical paradigm involves asking adults to view figures of varying weights and rate them on a number of bipolar personality trait scales. As with the earliest studies on trait attribution in children, the results of these studies do not support the existence of a specific personality trait stereotype for each weight group. Instead, there seems to be a general "negativity" towards non-normal weight figures; negative traits are assigned to overweight and underweight figures, while positive traits are assigned to the normal weight figure (e.g. Dibiase & Hjelle, 1968; Larkin & Pines, 1979; Lerner, 1969b; Litman, Powell & Stewart, 1983; Roberts & Herman, 1980; Spigelman & Schultz, 1980; Strongman & Hart, 1968; Wells & Siegel, 1961). The methodology of these studies has been criticized for biasing the results in a negative direction (e.g. Jones & Signall, 1971). However, the basic findings have been replicated in studies using a less rigid procedure (e.g. Galper & Weiss, 1975; Lerner, Knapp & Pool, 1974), more subtle variations in weight categories (e.g. Powell et al, 1974) and the use of stimuli varying on more than one dimension (e.g. Gascaly & Borges, 1979). Therefore, it must be concluded that the findings are at least reasonably reflective of adults' attitudes about weight.

These preferences and trait attribution patterns are exactly the same as those observed in young children. The results obtained in studies of adults and children are also consistent in terms of sex differences. Both girls (e.g. Brenner & Hinsdale, 1978; Staffieri, 1972) and women (e.g. Litman et al, 1983; Powell et al, 1974) evaluated thin figures more positively than boys and men. Thus, it can be concluded that children could be learning their attitudes from the attitudes in their environment.

Implications for the present study. There seems to be at least preliminary support for investigating the relationship between parents' and their children's attitudes about weight. The present study was designed as a preliminary exploration of this relationship.

Since there is no previous work on parental attitudes about weight, measures were derived on the basis of the previous literature on adult attitudes about weight. The findings obtained with these measures seem robust, and the fact that negative attitudes were discovered suggests that there was no social desirability bias operating. However, one limitation of previous work is that only parents' preferences and trait attributions were examined. There were no data collected on the adults' own weight status and history. Furthermore, the measurement of preferences and trait attribution patterns alone seems overly simplistic for representing adults' attitudes. Most new work on adults' social attitudes also measures some of the attributional

processes associated with a negative attitude toward a particular group (e.g. Hamilton, 1979). For example, one attribution which has been associated with attitudes about weight is the person's perceived responsibility for their condition (e.g. Maiman et al, 1979).

The measure of parental attitudes used in the present study represents an attempt to broaden the way adult attitudes are measured. The parental attitudes questionnaire derived for the present study attempts to measure the weight status and history of both parents, their trait attribution patterns to overweight and normal weight adults, their general negativity toward the condition of overweight and their attributions about the causes of overweight.

Since there is no previous work in this area, the hypotheses of the present study were derived from the nature of the relationship between adult and child attitudes about weight, modelling theory and previous research on sex differences in children's attitudes about weight. The first aspect of children's attitudes about weight examined in the present study is the use of weight as a categorization dimension. Unfortunately, there is no comparable work on adults; therefore, there is no empirical evidence to support the effect of modeling on children's tendency to categorize by weight. There is also no theoretical reason to believe that this particular aspect of weight attitude development would be transmitted from parents to children via modeling. In order for modeling to take place, the child must actually observe

the parent engaging in the behaviour in question. The matching task used to measure this concept is not one that parents would have modeled for their children. Sex differences in a behaviour are often considered evidence of some sort of socialized phenomenon (e.g. Block, 1983). Therefore, the lack of sex differences obtained in previous studies on children's categorization (e.g. Rhodes & White, 1985) also belies the influence of social variables such as parental attitudes. Therefore, there is no hypothesis regarding the influence of parental attitudes on children's use of weight as a categorization dimension.

In contrast, there is evidence supporting the modeling hypothesis for children's weight-based preferences. Children and adults were observed to have identical preferences for normal weight figures (e.g. Gascaly & Borges, 1978; Lerner, 1969a). Such findings are consistent with modeling theory; it implies the existence of exactly parallel attitudes in parents and their children. Some type of social transmission is also implicated by the sex differences found in children's preferences (e.g. Lerner & Gellert, 1969). Therefore, one hypothesis of the present study is that there will be sex differences in children's preference for non-overweight figures, with girls exhibiting a stronger preference. It is expected that parents' attitudes about overweight will be predictive of their children's preferences for non-overweight figures in both the preference and affiliation-preference tasks.

Finally, modeling theory may also apply to children's trait attribution patterns. There is evidence that parallel trait attribution patterns exist in adults and children (e.g. Lerner & Korn, 1972; Roberts & Herman, 1980). Furthermore, the parental and child measures of trait attribution are directly parallel; therefore, it might be expected that parents' trait attribution patterns will be predictive of children's trait attribution patterns. However, there is not enough empirical support for the influence of social learning on trait attribution to hypothesize this relationship in the free choice paradigm.

The Effect of Cognitive Development and Processes

As children's learning has become viewed as an active process, cognitive structures and processes have also been implicated in the development of social attitudes (e.g. Ashmore & Delboca, 1979; Campbell, 1976; Kohlberg, 1968; Seifer, 1979; Vaughn, 1978). To date, there is strong theoretical and empirical support for its involvement in the development of many social attitudes. Evidence of its involvement in the development of attitudes about weight is sparse; only one unpublished study (Rhodes & White, 1985) has supported the role of cognitive processes in the development of attitudes about weight at the present time.

The role of cognitive factors has been proposed in interaction with other influences on the development of attitudes. Piagetian theory allows for social as well as experiential influences on the child's mental development.

Piaget's view is that the child actively constructs an individual understanding of the world through interactions with the physical and social world. The child's knowledge develops from experience and pre-existing mental structures (Furth, 1970). As new information is encountered, the existing structures are modified in a process referred to as accommodation. Thus, a cognitive-developmental theory of social attitude development can be seen as a multivariate model of attitude formation.

The role of cognitive development in social perceptions. In general, research and theory suggest a link between cognitive development and social perceptions. One way investigators have attempted to link cognitive-developmental theory to social development has been noting that changes in thinking about objects and thinking about people occur at similar ages. For example, both Peevers & Secord (1973) and Livesley & Bromley (1973) studied children's perceptions of others. Peevers & Secord (1973) found that descriptions of acquaintances became more differentiated between kindergarten and grade 3, grade 7, high school and university. Livesley & Bromley (1973) found that elementary school age children began using more personal qualities to describe others at the age of 7 or 8. Furthermore, after the age of 9 children focussed less on how the qualities of others affected them personally and became able to take situational and other factors into account. Since the transition to concrete operational thought occurs at approximately the same time as these changes in

person perception, these changes in how people are perceived could be associated with cognitive development.

Although such findings are provocative, they do not strongly support or elucidate the relationship of cognitive and social attitude development. Tests of more specific hypotheses, directly related to specific cognitive theories and tested in a fashion which controls for the effects of age, have been made. The bulk of the work linking specific cognitive developmental milestones and social attitudes involves the transition from the pre-operational stage to the concrete operational stage.

In Piagetian theory, this particular transition is usually thought to take place between 5 and 8 years of age (Turner, 1984). During this time, children lose their simple, egocentric response to the world, which is primarily in terms of actions and images, and acquire a response which includes the ability to symbolize, to use internal cognitive mediators and, to reflect upon relations between general symbols. Piaget believed that the development of concrete operations marked a critical qualitative shift in the thinking of children in that they moved from the intuitive, perceptually-based world of pre-operational intelligence, to the period of concrete operations (Piaget, 1952). At this time, their thinking becomes governed by operations or internalized actions which are reversible and governed by laws (Turner, 1984). These cognitive changes are reflected in behavioral changes (Uzgiris & Hunt, 1975; White, 1965).

Piaget and his followers have noted the development of many new mental abilities (i.e. classification, seriation, number, conservation, perception, memory, and language) at this time (e.g. Ginsburg & Opper, 1979). Three of these areas seem suitable for relating knowledge about physical reality to children's development of social attitudes: perception, classification, and conservation. With respect to perception, the pre-operational child is thought to focus on perceptual aspects of stimuli (Piaget, 1968). Perception also frequently provides the basis for classification in the pre-operational stage. In contrast, the concrete operational child is more likely to relate two objects in terms of their functions. Furthermore, the pre-operational child is said to focus on only one aspect or dimension of a stimulus, whereas by about 7 years of age, children had developed hierarchical systems of classification (Gelman & Baillargeon, 1983).

Both perception and classification are related to the concept of conservation. According to Piaget (1968), it is the diminished importance of perceptual cues and focus on one aspect of a stimulus ("Centration") which allows the child to conserve. "Conservation means the understanding that certain attributes such as number, substance, weight, volume, and identity of objects or people will remain invariant, i.e., be conserved, despite apparent, often perceptual, changes which have no bearing on the attribute in question" (Turner, 1984, p.83). Many authors consider the acquisition of this concept to be the primary boundary between pre-operational and

concrete operational thought (Hamel, 1974; Kohlberg, 1968; Singer & Reveson, 1978; Turner, 1984).

Several researchers on gender attitudes have experimentally examined the relationship between the acquisition of conservation and attitude development. For example, Marcus & Overton (1978) studied the relationship between conservation and gender constancy in kindergarten, grade 1 and grade 2 children. Gender constancy increased with age; however, controlling for age, non-conservers had significantly lower gender constancy scores than conservers. Coker (1984) also attempted to sequence the development of some gender concepts and conservation in 3 to 6 year old children. For girls, conservation was positively correlated with age, recall memory, stereotypic knowledge (attributes and objects) and sex categorization. For boys, conservation was negatively correlated with stereotypic knowledge for attributes.

One common finding in these studies was that cognitive measures were related to some gender concept measures when age was held constant. This conclusion suggests that developmental trends in children's perceptions of others may be the result of the transition to concrete operational thought. In addition, Coker's (1984) results tentatively suggest that there may be sex differences in the relationship between cognitive development and social attitudes.

Specific cognitive processes involved in social perceptions. Studies relating Piagetian stage and social

attitudes imply a relationship between cognition and social attitudes, but they contribute little to understanding exact processes involved. Other attitude researchers have addressed this question by hypothesizing specific cognitive processes involving attitudes. In gender research, these theories are called gender schema theories. One of the earliest, Vinacke (1957), believed that people possessed "concept systems", which included personality traits and identifying characteristics. He suggested that these characteristics might be based on experience or social learning. More recent theorists (e.g. Bem, 1981; Bryntwyck & Serbin, 1983; Kohlberg, 1968; Lewis & Weinraub, 1979; Livesley & Bromley, 1973; Marcus & Overton, 1978; Martin & Halverson, 1981; Stewart, Tutton & Steele, 1973; Vaughn, 1978) suggest that the self-concept interacts with social influences to produce social schemas.

Martin and Halverson (1981) describe a model which is conceivably generalizable to the development of other social attitudes. They emphasize social modeling as the source of gender schemas, and suggest that gender is such a common dichotomy in society that children automatically incorporate it into their manner of thinking. However, they conceptualize the resultant categories as representing "like me" and "not like me" as opposed to "male" and "female". Thus, they too suggest that the self plays a primary role in the development of gender schemas. The sex typing process is described as an object becoming salient through self-relevance, being categorized as masculine or feminine, and being re-labelled

"like me" or "not like me". Then a decision is made about the appropriateness of using the object. A second schema, containing specific information for the child's own sex, then allows the child to manipulate the object appropriately.

The existence of such a schema is consistent with previous research on attitudes and interpersonal attraction. There is a large body of work which suggests that attitudes are largely a function of an ingroup/outgroup distinction (Hamilton, 1979). In other words, people tend to evaluate similar others more positively than dissimilar others. Studies of interpersonal attraction suggest that people are more attracted to others if they are perceived similar to themselves (e.g. Byrne & Griffitt, 1966).

The relationship between schematic processes and the child's level of cognitive development is not completely clear. However, Martin & Halverson (1981) found that children's use of the like me/not like me category system increased with age in 2 to 5 year old children. They suggested that older children were more capable of sorting in the less random, more differentiated manner embodied in schema-based sorting. The transition to concrete operational thought is also marked by increasingly complex, differentiated and organized thought and the ability to differentiate the self from the rest of the world (Piaget, 1973); therefore, concrete operational children might be expected to use the like me/not like me schema more efficiently than pre-operational children.

Thus, there seems to be considerable evidence that at least some of children's social attitudes are influenced by their level of cognitive development. In particular, the transition to concrete operational thought, as measured by the achievement of conservation, seems to be important. Furthermore, there is some suggestion that some of the observed changes in attitudes corresponding to cognitive development may be due to the child's greater facility to engage with schema-based processing using a "like me/not like me" schema.

Cognitive development and processes in weight attitudes. To date, only one study has suggested the influence of both cognitive developmental level and schema-based processing in children's attitudes about weight. In an unpublished study, Rhodes & White (1985) compared attitudes about weight in conserving and non-conserving boys and girls between the ages of 4 and 8. Non-conservers found weight a more salient matching dimension, demonstrated less preference for the normal weight figure and assigned fewer negative traits to overweight figures and positive traits to normal weight figures. In other words, conservers in this age range tended to assign traits more rigidly than non-conservers.

The results of this study support the importance of the transition to concrete operational thought for children's use of weight as a categorization dimension, preferences, and trait attributions. The trait attribution results also provide support for schema-based processing of the type

suggested by Martin & Halverson (1981). Concrete operational children were more inclined to systematically attribute positive traits to their own group (normal weight) and negative traits to the other group (overweight). However, these results were only found using the forced choice format.

Implications for the present study. There appears to be at least preliminary support for the role of cognitive factors in the development of children's attitudes about weight. However, the only study previously conducted on attitudes about weight was conducted on a very small sample (n=42) with a limited age range of children. Furthermore, while the series of analyses of variance revealed group differences, they did not contribute any information on the relative contribution of cognitive factors versus purely social factors, like parental attitudes, in the development of attitudes about weight. The present study was designed to confirm the importance of the acquisition of conservation in a larger sample of children, and compare the relative impact of cognitive-developmental processes and social influences on children's attitudes using a multiple regression design. Goldschmid & Bentler's (1968) measure of conservation was retained as the measure of cognitive development since its use was validated.

The previously mentioned literature and findings about the impact of cognitive development, together with the results of earlier work on children's attitudes about weight, also lead to several hypotheses for the present study. Previous

work on the use of weight as a categorization dimension found that it decreases between the ages of 4 and 8 (White et al, 1985), and that it decreases with the acquisition of conservation (Rhodes & White, 1985). Furthermore, Piagetian theory suggests that pre-operational children tend to focus on single, perceptual stimulus aspects than concrete operational children. Therefore, another hypothesis of the present study is that these previous results will be replicated. In other words, there will be a tendency for children to begin to use weight as a categorization dimension less with age, with the biggest decrease following grade 1. Furthermore, conservation would be expected to predict the salience of weight as a categorization dimension in regressions.

In contrast, the previous research on weight related preferences found no developmental trends in weight-based preferences (e.g. Staffieri, 1967;1972), but evidence for a stronger preference for normal weight figures and aversion for overweight figures in girls (e.g. Lerner & Gellert, 1969). Although Rhodes & White (1985) found differences in the preference for normal weight between conserving and non-conserving children, they found only sex differences in their aversion for overweight score. Thus, there is only limited evidence for the effect of cognition on preferences. Furthermore, since sex differences are often thought to reflect differential socialization between the sexes (e.g. Block, 1983) and preferences may sometimes be considered independent of cognitive processes (Zajonc, 1980), there is no

basis to hypothesize a cognitive level effect for preferences.

Finally, previous research yielded equivocal results on the existence of developmental trends in trait attribution patterns. There is also theoretical support for expecting pre-operational and concrete operational children to differ in trait attribution (e.g. Martin & Halverson, 1981). However, all of the previous empirical work and theorizing was based on a forced choice model of trait attribution. Therefore, it has limited relevance to the present study.

As previously mentioned, there is no empirical evidence on free choice trait attribution patterns in elementary school aged children. However, Piagetian theory would support an increase in flexible trait attribution by concrete operational children, since they have a reduced perceptual focus, the ability to attend to more than one aspect of a stimulus and later stages are described as more complete, differentiated and integrated. Therefore, the final hypothesis of the present study is that there will be a developmental increase in sorting traits to both overweight and normal weight figures with the biggest increase occurring after grade 1. Furthermore, conservation will predict the attribution of traits to both figures in regressions.

Statement of the Problem

As indicated by the literature review, there are many omissions and methodological problems in early studies of children's attitudes about weight. Some of these difficulties include the following: a lack of attention to the use of weight as a categorization dimension and the tendency to use weight as a basis for preferences; a lack of attention to sex differences and developmental trends; and the use of measures which focussed on negative rather than positive attitudes. Therefore, the first goal of the present study is to more fully describe children's attitudes about weight. It was designed to explore the developmental trends and sex differences using new and improved measures of the awareness of weight as a categorization dimension, preferences, and trait attributions in boys and girls in kindergarten through grade 6.

Another difficulty with early work is their lack of attention to the processes which contribute to the development of particular attitudes about weight. In contrast, work on gender and other social attitudes has implicated both parental variables and cognitive development in the development of particular aspects of these attitudes. While there is little empirical support for the role of these variables in the development of attitudes about weight, there is theoretical support for their involvement. Social learning theory suggests that children would model their attitudes from their parents' statements and behaviour. Furthermore, Piagetian

stage theory seems pertinent to the development of some aspects of attitudes about weight.

The hypotheses of the present study were developed on the basis of these theories, the available empirical support for the role of parental and cognitive variables, and the earlier findings on developmental trends and sex differences in attitudes about weight. The three hypotheses are summarized below:

1) There will be a developmental trend toward decreasing use of weight as a categorization dimension with the biggest decrease following grade 1. Furthermore, conservation would be expected to predict the salience of weight as a categorization dimension in the regressions.

2) Both boys and girls will prefer non-overweight figures in the preference and affiliation-preference tasks; however, girls will exhibit a stronger preference for these figures than boys. Parental attitudes will also be positively related to children's preferences for non-overweight figures.

3) There will be a developmental increase in sorting traits to both overweight and normal weight figures with the biggest increase occurring after grade 1. Furthermore, conservation will predict the attribution of traits to both figures in the regressions.

Method

Subjects

A total of 258 boys and girls in Kindergarten through grade 6 were recruited for the first phase of an intensive three year study of social attitude development. They ranged in age from 60 months (5 years) to 159 months (13.24 years). These subjects were attending one of three elementary schools located in lower-middle to upper-middle class socio-economic areas of Montreal. All subjects met three criteria: their parents had given permission for them to participate, they attended English language schools, and they themselves agreed to participate.

Critical demographic data were missing for two subjects. As a result, they were dropped from the present study, reducing the total sample to 256 subjects (127 boys and 129 girls). In addition, incomplete data for some variables reduced the total number of subjects tested in each group for those particular variables.

The parents of all 258 boys and girls were requested to complete questionnaires. A total of 100 mothers, between 36% and 44% of mothers in each school, agreed to participate. Only 27 fathers completed questionnaires; therefore, these data were omitted from the present study.

Measures

Body salience. White et al's (1985) Body Salience Test was used to assess the extent to which weight was a salient categorization dimension for each child. This measure is a series of 14 matching items. Each item consists of four

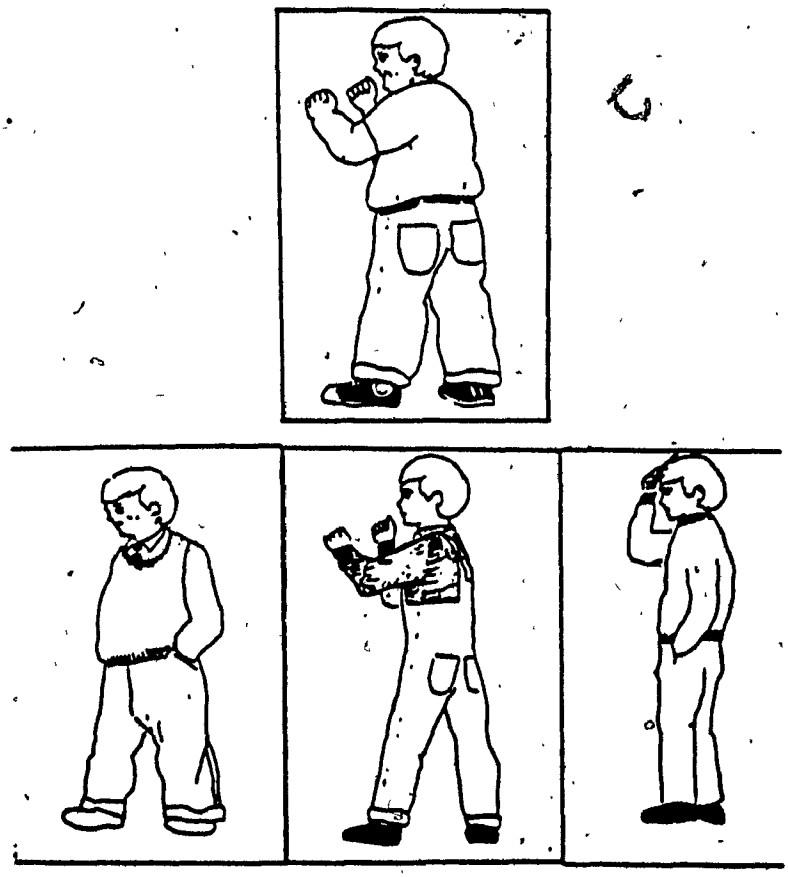
simple line-drawings of male or female children engaged in some activity. An item by item description can be found in Appendix A. A sample item is pictured in Figure 1.

The 14 standards vary in sex, weight status, and activity. The corresponding three drawings are the same sex as the standard. For each item, one of these three drawings matches the standard in terms of weight, one matches the standard in terms of activity, and one does not match the standard on any known dimension. For example, in the sample item the standard pictures an overweight boy fighting. The child can match this drawing with an overweight boy standing still (body match), a normal weight boy fighting (activity match) or a normal weight boy combing his hair (random match).

The stimuli were designed such that the potential for matching on the basis of incidental cues, such as dress or stance, is minimal. All of the pictured children had the same faces. The faces were simply altered to fit the body type. They are pictured participating in socially acceptable, unacceptable or neutral activities. The relative position of the types of matches on the page varies.

The reliability of this measure was assessed in a pilot study conducted by White et al (1985) on 96 children from 3 to 9 years of age. The split half coefficient obtained at this time was .72. The validity of this measure has yet to be assessed. Two scores may be obtained from this measure. The sum total of random responses is used to identify subjects who respond unreliably. The score retained for data analysis is

Figure 1. Body Salience Task Item



the body responses score. This score is the number of times the child chooses to match two figures on the basis of body weight. Both scores can range from 0 to 14.

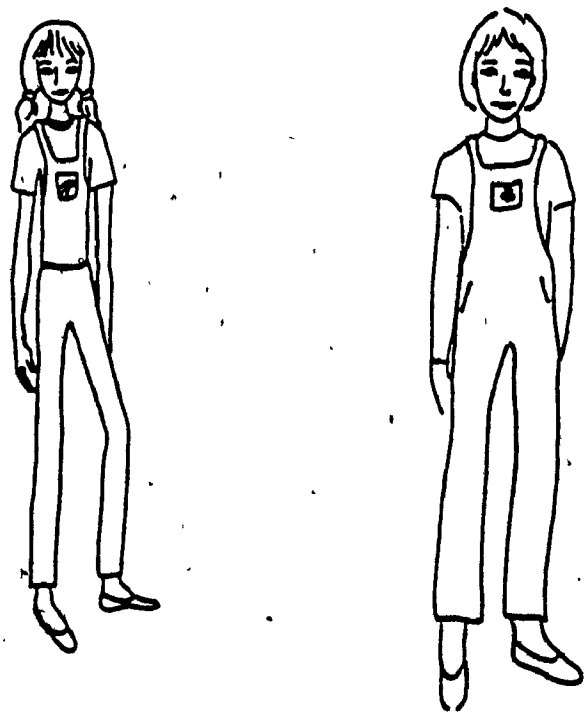
Preference. Preference was measured using nine pairs of line-drawn children. A sample item is pictured in Figure 2. This task differs from the Body Salience Task in that the stimuli used are the same sex as the subject.

For this measure, both drawings of an item are presented with no prop, and the subject is asked to identify the child he/she would most like to play with. The drawings are of either an overweight, normal weight or underweight child. For example, in the sample item the child must choose between an underweight boy/girl and an normal weight boy/girl. All possible combinations of two body types are presented three times, with the position of each on the page varying.

Thus, there are three types of selection tasks: underweight versus overweight, normal weight versus overweight, and normal weight versus underweight. One score is obtained for each selection task. For example, the number of times the child chooses the underweight figure rather than the overweight figure in the underweight versus overweight selection task is the Preference for Underweight over Overweight score. Similarly, the two other scores are the Preference for Normal Weight over Overweight score and the Preference for Normal Weight over Underweight score. These scores range from 0 to 3.

Affiliation-preference. White et al's (1985)

Figure 2. Preference Task Item



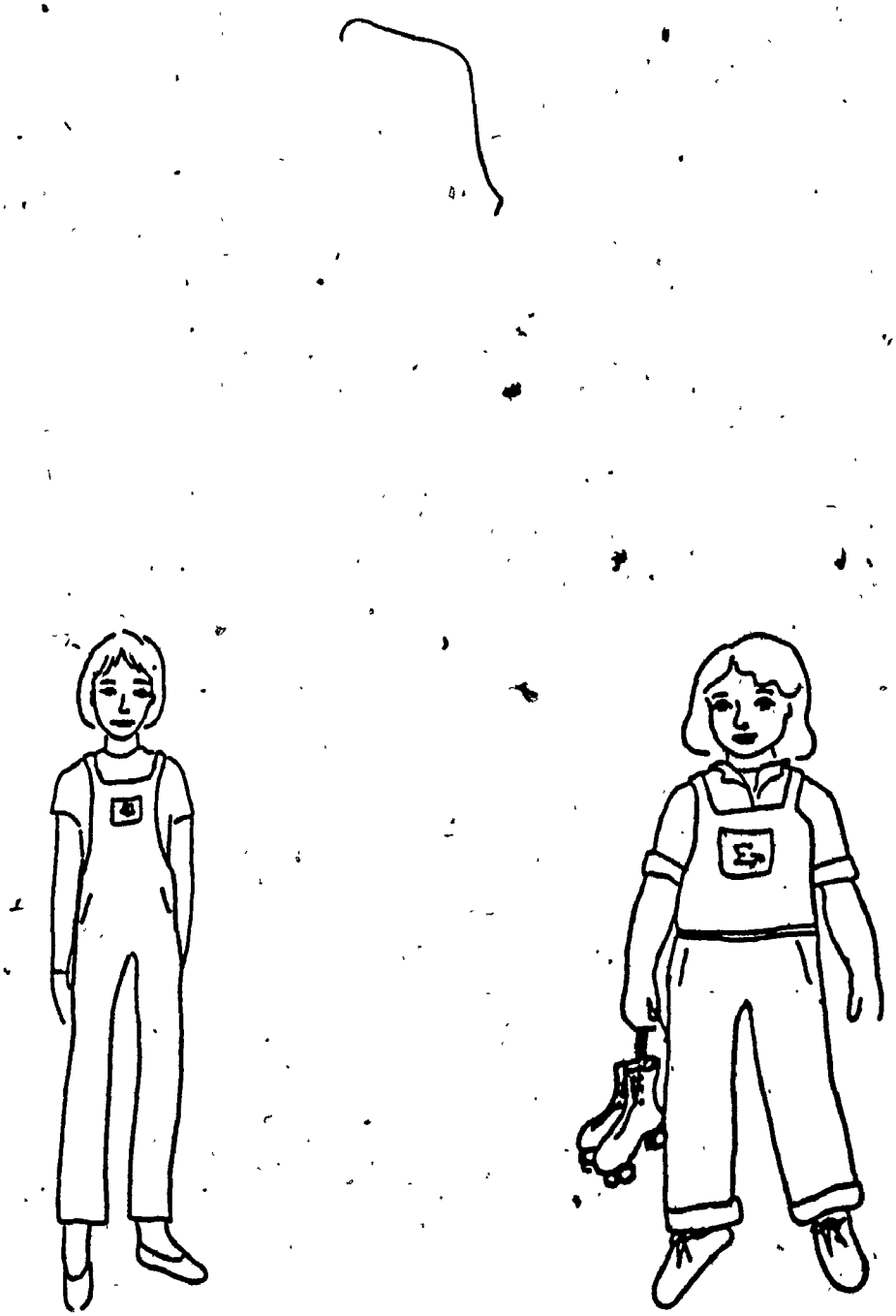
Affiliation-Preference Test was used to measure the relative likelihood of choosing playmates by weight compared to another dimension. As can be seen in Figure 3, the other dimension presented is the presence of an attractive prop (i.e. a toy). Only overweight and normal weight pairs of drawings are presented. The overweight figure is always pictured with an attractive prop such as a ball, sled, guitar or skates. Once again, the position of each body type on the page varies.

The question asked of the child also varies with each item; for the first item, the child is shown a normal weight peer with no prop and an overweight peer with a sled, and he/she is asked with whom he/she would like to play. However, for the remaining items, the child is asked with whom he/she would like to participate in the specific prop-related activity. For example, when the overweight child is pictured with skates, the child is asked with whom he/she would like to skate.

The score derived from this measure is the number of prop-based choices the child makes. In other words, the number of times the child chooses to play with the overweight child with the attractive prop rather than the normal weight child with no prop. Since the first item is a trial item in which the child is not asked about the prop-related activity, only the child's responses on the remaining three items are scored. This score ranges from 0 to 3.

Trait attributions. A Weight Attributions measure was developed to assess the manner in which children attribute

Figure 3. Affiliation-Preference Task Sample Item



characteristics to overweight and normal weight figures under both forced and free choice conditions. This measure is a pictorial version of measures used by previous researchers to assess stereotyping. It consists of a series of 20 pictures. Presentation of each picture is followed by a standardized verbal explanation. These remarks describe the picture, name the trait, and ask the child to identify who is being described. For example, the trait addressed by the first item is "smart". The children are shown a picture of a test paper with an "A" and a star on it. Then they are asked, "Someone always does well in school. Who is smart and does well in school. Each item is described in detail in Appendix A.

The pictures are simple, colored drawings on white, 10 by 15.5 cm cards encased in plastic. Few children are pictured in the drawings. When picturing children was unavoidable, they were the same sex as the subject and only the faces were pictured. There is a pre-determined random order of presentation for the pictures.

Each picture reflects a concrete behavior associated with the particular trait. Twelve of the pictures represent a positive or neutral trait (smart, clean, polite, neat, jolly, strong, affectionate, generous, likes to play, watches tv, quiet, likes music), and eight represent negative traits (mean, sad, gets teased, lazy, teases, sneaky, naughty, afraid).

These stimuli are accompanied by three, silver and white, 16 cm square cardboard boxes. Each box has a clip for

attaching one or two figures. One box displays an overweight silhouette, one a normal weight silhouette, and one both normal and overweight silhouettes. The silhouettes are black, 18 cm high, cut-out figures typically the same sex as the subject. The relative positions of the silhouettes is varied when the test is administered.

Three scores are calculated from this measure. The total number of attributions to both body types is calculated (flexibility score). This score ranges from 0 to 20. The attribution of positive and negative traits are scored by calculating the number of positive traits attributed to the normal weight figure (range = 0 to 12) and the number of negative traits attributed to the overweight figure (range = 0 to 8).

Conservation. A modified version of Goldschmid & Bentler's (1968) Concept Assessment Kit - Conservation test (form B) was used to assess the level of conservation children in kindergarten through grade 3 had achieved. The original measure was developed for use with male and female children between 4 and 7.5 years of age. It is a series of six conservation tests: conservation of two dimensional space, number, substance, continuous quantity, weight, and discontinuous quantity. The kit contains many items which must be manipulated by the experimenter and the child.

Goldschmid & Bentler's (1968) final 6 tasks were chosen from the original 10 piloted by Goldschmid (1967). Although this form was internally reliable and seemed to measure one

global construct, Goldschmid & Bentler (1968) created two parallel forms to decrease the administration time and allow subjects to be retested. A subsequent analysis demonstrated that scores on the two forms were highly correlated (.95). Pilot testing using this measure with the present sample revealed a tendency for children in grades 2 and 3 to reach "ceiling" on this task. Therefore, an additional item concerning the conservation of volume was devised and added.

Goldschmid & Bentler's (1968) stimuli, the additional item on conservation of volume and the rationale for the revised scoring system are described in detail in Appendix A. A total conservation score is derived from the sum of the child's scores on all the tasks. This score, ranging from 0 to 28, takes into account both the answer and the explanation for the answer.

Parent questionnaire. Maternal weight attitudes were measured by means of a three part questionnaire (See Appendix A). The first section asks the mother to identify her past and present weight status and her spouse's present weight status. She is asked to circle the response which best approximates her answer. For example, to indicate self and spouse weight, the parent can circle underweight, normal weight, overweight or obese weight categories.

The second section of the parent questionnaire assesses the mother's general attitudes about weight. This section was designed to measure two distinct aspects of adult weight attitudes. These are beliefs about the overweight person's

control over his/her weight status ("Internality/Externality Scale") and the overall negativity of overweight status ("Negativity Scale"). Six items were intended to relate to each scale.

The items are presented as twelve declarative statements. For each statement, the mothers are instructed to indicate the extent of her agreement with the statements on a 6 point scale ranging from "strongly agree" to "strongly disagree". In order to avoid the possibility of a response set bias, half the items were phrased positively and half were phrased negatively. In other words, the response "strongly agree" to an internality/externality item could be scored either internal or external depending on the wording of the particular item. The scoring system for each item of the general attitudes section of the parent questionnaire can be found in Appendix A.

The range of scores for each scale is 0 to 36. A low score on the internality/externality scale indicates internality. In other words, the parent believes overweight people are responsible for their condition. A high internality/externality score indicates externality; in other words, the subject believes overweight people cannot control their condition. A low score on the negativity scale indicates a parent who believes overweight is a positive or neutral condition. In contrast, a high score on this scale indicates the belief that overweight is a very negative condition. The internal reliability of this section of the

parent questionnaire will be assessed in the present study.

Finally, the third section of the parent questionnaire requires the respondent to attribute 22 traits to overweight, normal weight or both overweight and normal weight people. This task was patterned after White & Rhodes' (1984) Weight Attributions measure given to children in the present study. Seventeen of the traits are exactly those attributed by the children. The five dissimilar items include three substitutions of more adult words or phrases for the child form. The traits "jolly", "naughty", and "play with instruments" were replaced with the traits "happy", "disobedient" and "likes music". The two new traits were "healthy" and "good looking" were also added for adults to attribute. The number of traits out of 20 attributed to both figures (parental flexibility) is scored.

Procedure

Subjects in schools 1 and 2 and their parents were tested between October, 1983 and May, 1984. Subjects in school 3 and their parents were tested between September, 1984 and May, 1985. As participants in a larger study, these subjects were given a variety of social attitude-related measures and tested on five separate occasions. Each was tested individually by one of several female experimenters.

Data collection was designed to minimize the disruption of school programs. Subjects were called out of class at times deemed appropriate by the teacher. They were reminded that the experimenters were conducting a study of how kids

think", and that their parents had given permission for them to participate. They were tested in a separate room and returned to their classroom 20 to 35 minutes later. The sessions were typically 3 weeks apart. The Body Salience, Preference and Affiliation-preference measures were given in the first session. The Weight Attributions measure and Conservation task followed.

Body salience, preference and affiliation-preference. These measures were given in one session. The experimenter introduced the task, saying "Here is a book full of pictures. I'd like to play a game with you and ask you some questions about the pictures." If the child asked about right or wrong answers, the experimenter then said, "These are special kinds of questions; they don't have a right and wrong answer. Kids answer many different ways to these questions, and all the answers are ok. I just want to find out what your answers are." Then the child was shown each item in turn and told, "Look carefully at the picture on top. Now, which one of the children down here (experimenter pointed to each one in turn) goes best with this one up here (experimenter pointed to the standard)?" The pictured children were the same sex as the child tested.

After the matching items had been completed, the experimenter said "Now we will do something a bit different. Look at these two people and pretend that you had to choose one of them to play with. Which one would you choose?" After the preference items had been completed, the

experimenter turned to the affiliation items and asked the question for each item.

Trait attributions. In the training phase of the Weight Attributions Measure, each child was shown the two cut-outs, one of an overweight and one of a normal weight peer. Once again, children were shown same-sex peers. For example, girls were told, "Here are cut-outs of two girls. Can you tell me what's different about these two?" If the child did not know, the experimenter pointed out that one is fatter than the other. Regardless of her response to this question, each child was asked the same question about the other two cut-outs.

Then the experimenter said, "Watch what I'm going to do with the cut-outs. I'll put the overweight girl here - with this box. And the normal weight girl here - with this box. And on this box, I'll put cut-outs of both. Then the experimenter said, "Now we are going to sort some pictures into the boxes. I'm going to show you some pictures of things kids do. I want you to tell me who would usually do these things." The experimenter then presented each picture in turn, asking the appropriate question. These questions are listed in Appendix A. After each question, the experimenter pointed to each box, in a random order, and said, "Would this girl, would this girl, or would both girls (adjective)?"

Conservation. The revised Goldschmid & Bentler (1968) tasks were introduced to the child by saying, "I have lots of games for you to play here. I'm going to show you some things

and then ask you some questions". Then she proceeded with the exact verbal instructions and manipulations specified on the record form (See Appendix A). In each case, the experimenter directed the child to identify two equal quantities, then to watch her transform them, and then asked the child if the two were the same or if one had more.

Parent questionnaire. One copy of the parent questionnaire was mailed to all parents who had given permission for their children to participate in the present study. Either parent was requested to complete the questionnaire as fully as possible, and return it to the experimenters as soon as possible. A stamped, self-addressed envelope was included for this purpose.

Results

The results section is divided into two sections based on the goals of the study. The first section, children's weight attitudes, includes explorations of grade and sex effects in the various aspects of children's attitudes about weight. The second section, predicting children's weight attitudes, includes explorations of the relation of children's level of cognitive development and parents' attitudes about weight to children's attitudes about weight.

The results of a number of preliminary analyses, not central to the hypotheses of the present study, can be found in the appendices. A summary of analyses intended to assess the psychometric properties of all of the measures used in the present study can be found in Appendix B. Another set of analyses were conducted on each variable to determine the most appropriate statistical analyses. Detailed rationales for the selection of the statistical analyses reported in the following results section can be found in Appendix C.

Children's Weight Attitudes

Data were collected on three aspects of children's attitudes about weight: the use of weight as a categorization dimension, trait attributions on the basis of weight and weight preferences. Correlational analyses of the variables derived from each of the four measures revealed that the measures were independent (see Appendix D). Therefore, the data obtained from each measure were examined separately.

Categorizing by Weight

The Body Salience task was intended to measure the importance of weight versus activity as a categorization dimension. This task is scored by calculating the number of times the child chooses to match two figures on the basis of body weight (body responses score). The body responses score was transformed using a logarithmic transformation in order to render it suitable for univariate analyses (see Appendix C for a discussion).

Two subjects were missing data for this task and therefore were dropped from the analyses. Ten other subjects were dropped from analyses due to their unreliability. The frequency of random matches was used to identify subjects who responded unreliably. The vast majority of subjects (96.06%) made between 0 and 2 random matches. In contrast, the ten subjects who were eliminated made 3 or more random responses. Thus, the sample size was 244 for the analyses.

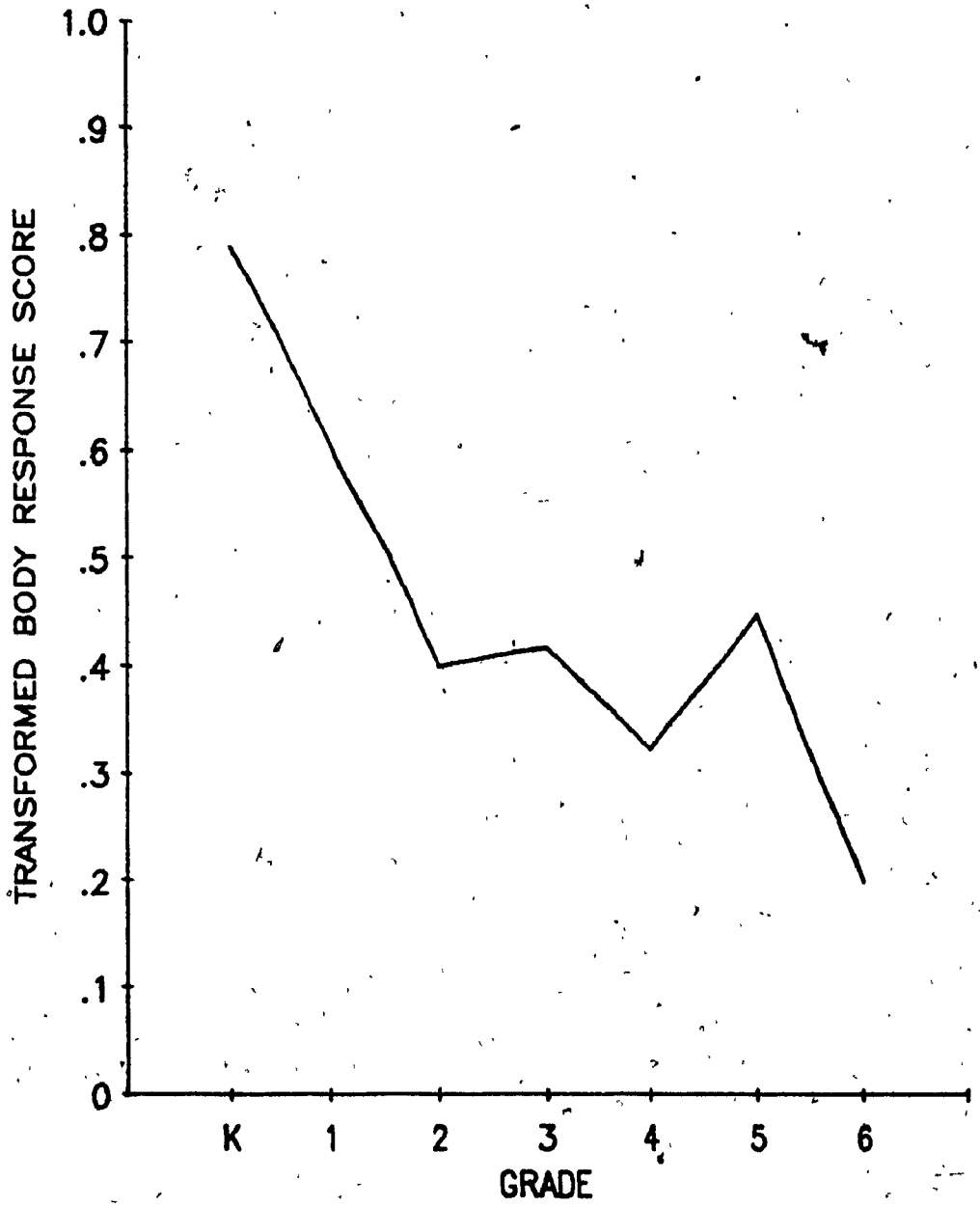
A grade (kindergarten through grade 6) X sex (boys, girls) analysis of variance was chosen to examine grade and sex differences in this variable. The mean raw body responses score and the transformed body responses score for each grade by sex group in the sample are presented in Table 1. There was a significant grade effect, F (6, 230) = 2.36, $p < .001$. As can be seen in Figure 4, the number of body responses declined with age. Due to the unequal cell sizes, a scheffe post hoc test, with significance set at .05, was conducted on this effect. Significant differences were

Table 1

Grade by Sex Raw and Revised Body Responses Means for Total Sample

Group	n	Revised Scores Mean (S.D.)	Raw Scores Mean (S.D.)
Kindergarten	30	.79 (.29)	6.47 (4.46)
boys	17	.71 (.30)	5.29 (4.31)
girls	13	.90 (.24)	8.00 (4.34)
Grade 1	34	.60 (.38)	4.71 (4.71)
boys	16	.59 (.37)	4.50 (4.79)
girls	18	.62 (.40)	4.89 (4.76)
Grade 2	40	.40 (.36)	2.56 (3.44)
boys	22	.44 (.36)	2.82 (3.55)
girls	18	.35 (.35)	2.28 (3.63)
Grade 3	37	.42 (.43)	3.35 (4.74)
boys	17	.41 (.42)	3.12 (4.41)
girls	20	.42 (.44)	3.55 (5.10)
Grade 4	37	.32 (.39)	2.35 (4.02)
boys	16	.20 (.24)	.88 (1.50)
girls	21	.42 (.45)	3.48 (4.93)
Grade 5	32	.45 (.41)	3.41 (4.55)
boys	19	.35 (.39)	2.53 (4.31)
girls	13	.60 (.41)	4.69 (4.75)
Grade 6	34	.20 (.34)	1.44 (3.36)
boys	14	.12 (.23)	.57 (1.34)
girls	20	.25 (.40)	2.05 (4.19)

Figure 4. Developmental Trends in the Transformed Body Responses Score



obtained between grade 1 and grade 6, as well as between kindergarten and grades 2, 3, 4, 5 and 6. The strength of the grade effect was assessed using the omega squared procedure. The amount of variance in the transformed body responses score explained by grade was 16.34%. This represents a strong effect (Keppel, 1982). Neither the effect of sex, F (1,230) = 2.36, p N.S., nor the grade by sex interaction, F (6, 230) = 1.04, p N.S. were significant. The anova summary table can be found in Appendix E.

Preferences

Children's preferences for each weight group were measured using two tasks: the Preference Task, and the Affiliation-Preference Task.

Preference task results. This task produces three scores: preference for underweight over overweight; preference for normal weight over overweight, and preference for normal weight over underweight. Once again, two of the 256 subjects did not complete this task. Therefore, 254 children were included in these analyses.

The grade by sex means for each of the three variables can be found in Appendix F. These three variables were judged more suited for chi square analyses than either univariate or multivariate analysis of variance. As a result, separate chi square analyses were conducted by sex and by grade for each of the variables. The obtained frequencies by sex of each possible score on each of the three selection tasks are presented in Table 2. The scores of boys and girls were

Table 2

Frequency of Weight Choices by Sex for Each Selection Task*

Underweight/Overweight Task

	Sex	
Score	Boys	Girls
0	29	15
1	33	38
2	41	36
3	24	38

Normal Weight/Overweight Task

	Sex	
Score	Boys	Girls
0	21	6
1	26	22
2	44	41
3	36	58

Normal Weight/Underweight Task

	Sex	
Score	Boys	Girls
0	8	8
1	20	28
2	34	41
3	65	50

* The frequency reported is the number of times the child chose the weight group in the first term of the selection task; for example, for UW/OW, the numbers represent the number of underweight choices made in an UW/OW selection task.

significantly different than would be expected by chance for both the number of underweight choices over overweight choices, X^2 (3) = 8.29, $p < .05$, and the number of normal weight choices over overweight choices, X^2 (3) = 13.92, $p < .01$. Girls made more normal weight choices in the normal weight/overweight selection task and more underweight choices in the underweight/overweight selection task. In contrast, the obtained frequencies of normal weight choices over underweight choices were not significantly different from the expected frequencies, X^2 (3) = 3.94, p N.S.

The obtained frequencies by grade for each of the three variables are presented in Table 3. The analyses were conducted using each grade as a level in the analysis, producing a 7 (grade) X 4 (possible score) chi square. The number of underweight choices over overweight and the number of normal weight choices over overweight did not differ significantly by grade from those that would be expected by chance, X^2 (18) = 24.62, p N.S., X^2 (18) = 14.95, p N.S. However, the number of normal weight choices over underweight choices differed significantly between grades more than would be expected by chance, X^2 (18) = 38.18, $p < .01$. Older children made more normal weight choices in the normal weight/underweight selection task.

Affiliation-preference task results. This task was designed to measure the relative salience of an attractive prop (e.g. skates) and weight status in children's playmate choices. In other words, it is a two dimensional measure of

Table 3

Frequency of Preference Choices* by Grade

Underweight/Overweight Task

Score	Grade K	1	2	3	4	5	6
0	8	5	11	4	6	6	4
1	10	8	11	7	7	13	15
2	12	9	7	16	12	10	11
3	9	12	12	10	12	3	4

Normal Weight/Overweight Task

Score	Grade K	1	2	3	4	5	6
0	5	5	6	3	2	4	2
1	11	5	3	7	11	6	5
2	12	9	14	12	12	11	15
3	11	15	18	15	12	11	12

Normal Weight/Underweight Task

Score	Grade K	1	2	3	4	5	6
0	4	1	4	3	3	1	0
1	12	14	4	6	1	6	5
2	16	7	12	10	12	7	11
3	7	12	21	18	21	18	18

* Values represent the number of times the first weight group specified was chosen over the second weight group specified.

children's weight preferences. The score derived from this measure is the number of prop-based choices the child makes. Two of the original 256 subjects were missing data on this variable; therefore, the sample for affiliation-preference analyses was 254.

The grade by sex group means on this variable can be found in Appendix F. As can be seen in these tables, the majority of children chose playmates on the basis of the presence of the attractive prop. Once again, a Chi Square analysis was selected for these data. Two separate chi square analyses were conducted on the grade and sex variables in the design. The frequency of each possible prop-based score (0, 1, 2 or 3) was compared in boys and girls, and then again among the seven grade groups. The obtained frequencies by sex can be found in Table 4. The obtained frequencies were not significantly different from those that would be expected by chance, X^2 (3) = .76, p N.S.. In other words, the number of prop-based affiliation-preferences did not differ for boys and girls. The frequency table for the seven grade levels is presented in Table 5. These obtained frequencies also did not differ from those expected by chance, X^2 (18) = 21.99, p N.S. Once again, the number of prop-based affiliation-preferences did not differ between the different grade levels.

Trait Attributions

The trait attributions task was designed to assess the manner in which children attribute characteristics to overweight and normal weight peers under free choice

Table 4

Frequency of Prop-based Affiliation-Preference Scores by Sex

Scores	Boys	Girls
0	5	7
1	13	16
2	27	26
3	82	78

Table 5

Frequency of Prop-based Affiliation-Preference Scores by Grade

	Grade						
	K	1	2	3	4	5	6
Scores							
0	3	4	2	1	1	0	1
1	5	1	3	4	7	4	5
2	10	5	11	3	7	6	11
3	21	24	25	29	22	22	17

conditions. Many scores can be calculated from this measure. In order to avoid singularity or multicollinearity, only three are scored. The total number of attributions to both the normal weight and overweight figures is the flexibility score. The attribution of positive and negative traits are scored by calculating the number of positive traits attributed to the normal weight figure and the number of negative traits attributed to the overweight figure. Five of the original sample of 256 subjects were missing data, leaving a sample of 251 for the trait attribution analyses. Data from one more subject was deleted from the multivariate analysis because it was judged to be extreme (see Appendix C for a discussion).

The grade by sex means for each of the three variables are presented in Tables 6, 7 and 8. A grade by sex multivariate analysis of variance was selected for the analysis of these means. Pillais' criterion was selected due to the unequal cell sizes in the design (Olson, 1976). This test revealed a significant multivariate effect of grade, F (18, 708) = 3.46, $p < .001$. There was also a significant effect of sex, F (3, 234, $p < .05$. However, there was no significant interaction effect, F (18, 708) = .65, p N.S. The multivariate analysis of variance summary table is contained in Appendix G.

The univariate analyses of variance results can also be found in Appendix G. However, significant correlations between the three variables (see Appendix C) make interpretation of these results suspect. There are several

Table 6

Grade by Sex Means: Positive Attributions to Normal Weight Figures

Group	n	Mean	Standard deviation
Kindergarten	38	5.59	2.93
boys	23	5.70	3.34
girls	15	5.44	2.31
Grade 1	35	5.03	2.91
boys	16	5.50	2.99
girls	19	4.63	2.86
Grade 2	39	4.62	3.03
boys	20	5.00	3.08
girls	19	4.21	3.01
Grade 3	35	3.37	2.73
boys	16	3.63	3.10
girls	19	3.16	2.46
Grade 4	37	3.38	2.90
boys	16	3.75	3.19
girls	21	3.10	2.70
Grade 5	32	2.53	2.41
boys	19	2.74	2.75
girls	13	2.23	1.88
Grade 6	34	2.53	2.38
boys	14	3.36	2.65
girls	20	1.95	2.04

Table 7

Grade by Sex Means: Negative Attributions to Overweight Figures

Group	n	Mean	Standard deviation
Kindergarten	39	3.51	1.88
boys	23	3.22	1.73
girls	16	3.81	2.04
Grade 1	35	3.87	1.90
boys	16	3.69	2.02
girls	19	4.05	1.78
Grade 2	39	3.82	2.08
boys	20	3.85	2.23
girls	19	3.79	1.93
Grade 3	35	3.22	1.89
boys	16	3.19	1.97
girls	19	3.26	1.82
Grade 4	37	3.65	2.33
boys	16	3.88	2.78
girls	21	3.43	1.89
Grade 5	32	3.00	1.64
boys	19	3.00	1.77
girls	13	3.00	1.58
Grade 6	34	2.93	2.09
boys	14	3.07	2.34
girls	20	2.80	1.85

Table 8

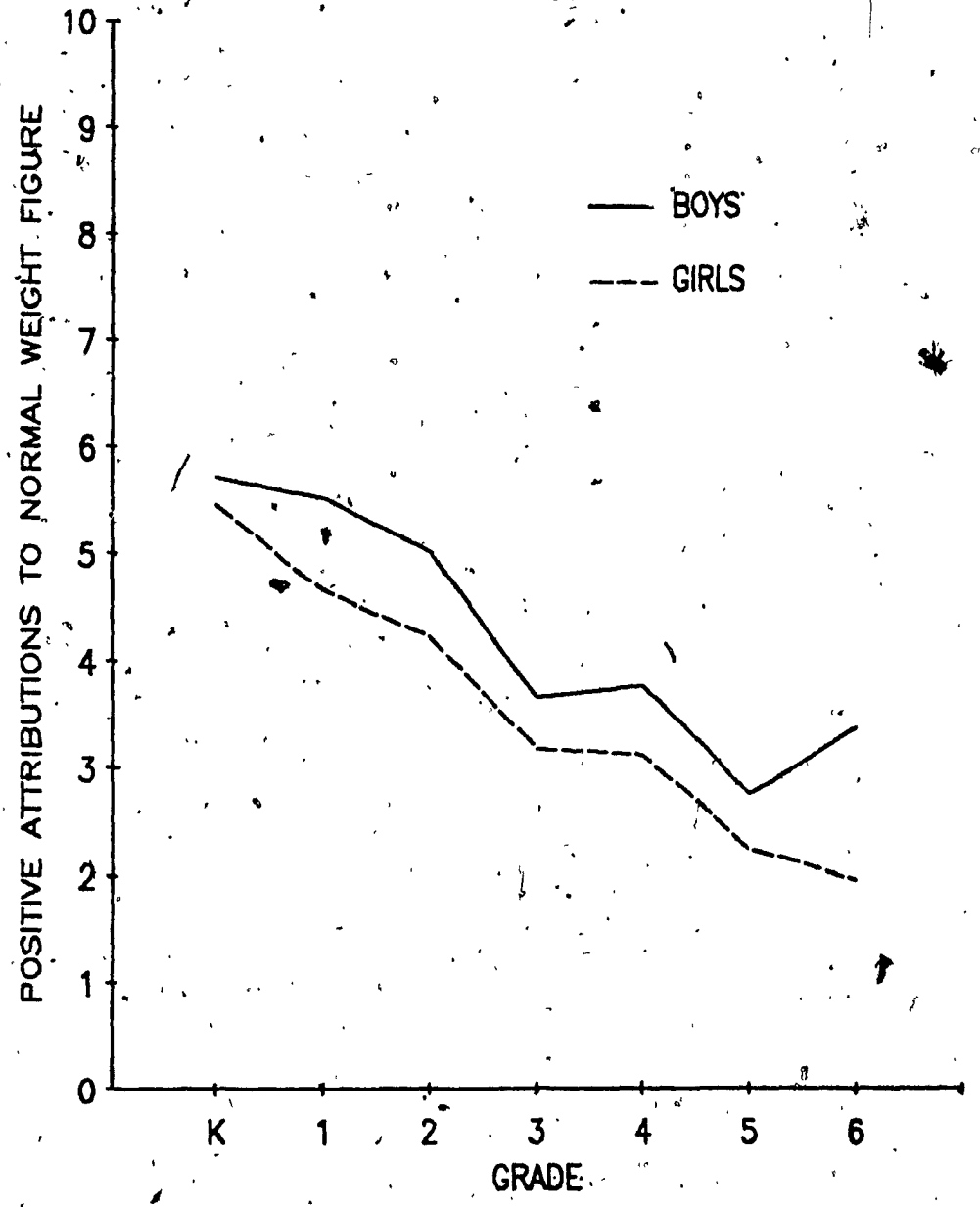
Grade by Sex Means: Flexibility or Attributions to Both Figures

Group	n	Mean	Standard deviation
Kindergarten	39	6.90	4.04
boys	23	6.70	4.61
girls	16	7.19	3.17
Grade 1	35	7.03	4.46
boys	16	6.38	4.57
girls	19	7.58	4.41
Grade 2	39	8.77	5.24
boys	20	8.30	5.31
girls	19	9.26	5.27
Grade 3	35	9.51	5.24
boys	16	10.38	6.41
girls	19	8.79	4.06
Grade 4	37	10.54	5.52
boys	16	10.06	5.99
girls	21	10.90	5.24
Grade 5	32	10.94	4.95
boys	19	11.26	5.22
girls	13	10.46	4.70
Grade 6	34	11.56	5.13
boys	14	10.57	5.50
girls	20	12.25	4.88

more appropriate ways of determining the contribution of individual variables to the multivariate effect (Gabriel, 1979). The present data were judged suitable for using a direct entry discriminant function analysis as a way to explore the significant multivariate effects obtained using manova.

The number of positive traits attributed to normal weight figures, negative traits attributed to overweight figures and the flexibility score were entered into a direct discriminant function analysis of the sex effect using the Wilk's lambda criterion. The pooled within-groups correlation between the canonical discriminant functions and each variable was examined to determine the contribution of each variable to the significant multivariate effect. The variable with the strongest contribution to the multivariate sex effect is the number of positive traits attributed to the normal weight figure (r = .73), followed by the number of attributions to both figures (r = -.29), and finally, the number of negative traits attributed to the overweight figure (r = -.02). This order of importance was confirmed in both the F to enter, and Wilk's lambda statistics (see Appendix G). Inspection of the Wilk's lambda coefficients indicated that only the number of positive traits attributed to the normal weight figure significantly differentiates boys and girls, Wilk's lambda = .98, p =.02. This effect is presented graphically in Figure 5. As can be seen in the figure, girls made fewer positive attributions to normal weight figures at all ages than boys.

Figure 5. Sex Differences and Developmental Trends in the Attribution of Positive Traits to the Normal Weight Figure



The same three variables were entered into a direct entry discriminant function analysis of the grade effect using the Wilk's lambda criterion. In this case, the variable with the strongest contribution was the number of positive traits attributed to the normal weight figure (r = -.85), followed by the number of traits attributed to both figures (r = .74), and finally, the number of negative attributions to overweight figures (r = -.20). This order of importance was confirmed by the F to enter and Wilk's Lambda statistics (see Appendix G). Both the number of positive attributions to the normal weight figure, Wilk's lambda = .86, p = .001, and the number of attributions to both figures, Wilk's lambda = .89, p = .001, significantly differentiated the grade levels. As can be seen in Figure 6, the number of positive attributions to the normal weight figure decreased with age. In contrast, there was an increase in flexibility, or the number of attributions to both figures, with age.

These findings lead to the hypothesis that the primary change in children's attribution patterns with age is that positive traits once attributed to the normal weight figure begin to be attributed to both figures. In order to explore this hypothesis, a more detailed exploration of the traits attributed to both figures was undertaken.

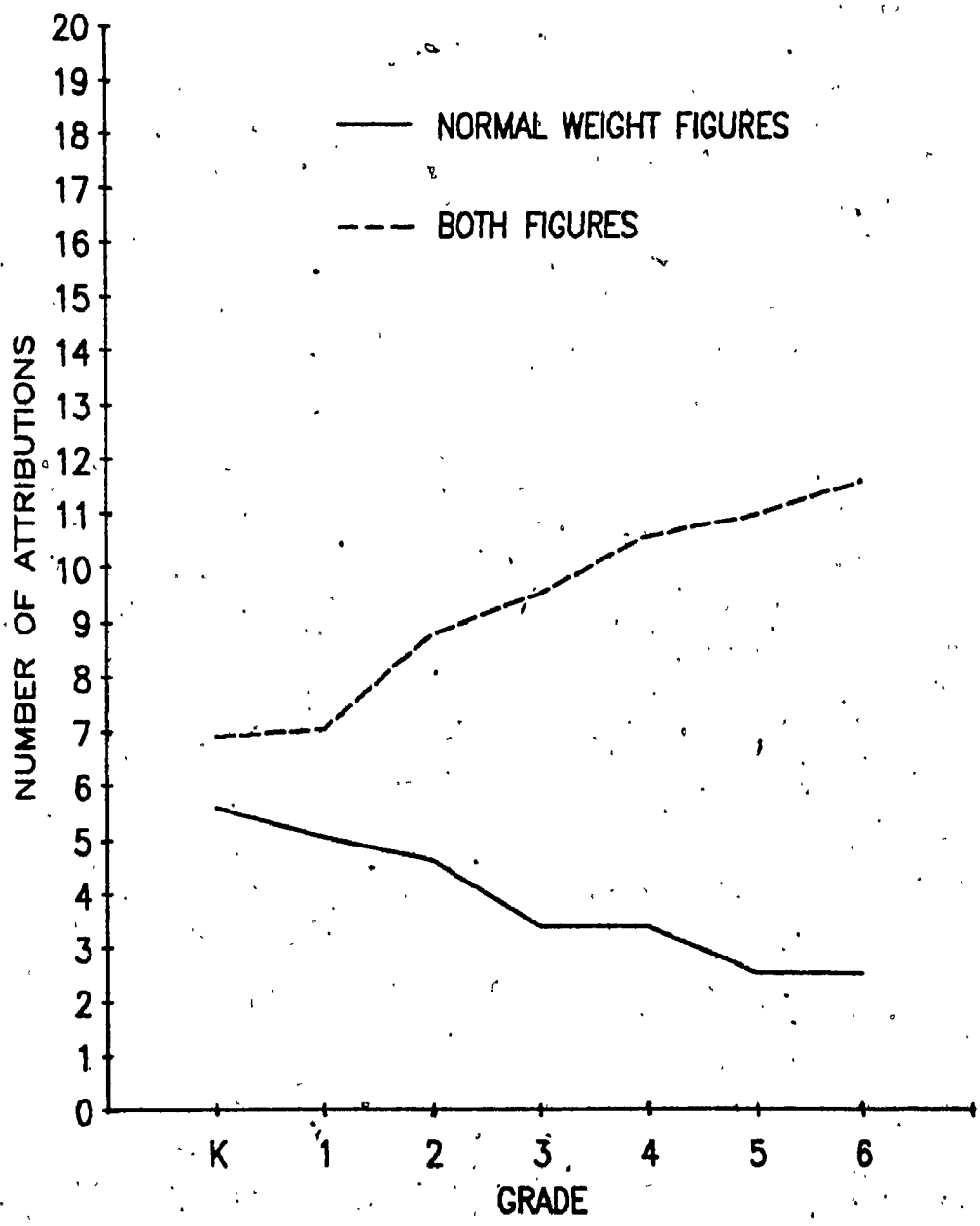
The mean number of positive and negative traits attributed by children to both figures was calculated separately for the sample of 251 children (see Table 9). Although only the grade effect was significant in tests of the

Table 9

Grade by Sex Means for the Number of Positive and Negative Traits Attributed to Both Figures

		Valence of Trait			
		Positive		Negative	
Group	n	Mean	(SD)	Mean	(SD)
Kindergarten	39	4.15	(2.80)	2.74	(2.12)
boys	23	3.91	(3.29)	2.78	(2.19)
girls	16	4.50	(1.93)	2.69	(2.09)
Grade 1	35	5.23	(3.22)	1.80	(1.73)
boys	16	4.75	(4.44)	1.63	(1.78)
girls	19	5.63	(3.06)	1.95	(1.72)
Grade 2	39	5.87	(3.51)	2.90	(2.30)
boys	20	5.45	(3.56)	2.85	(2.41)
girls	19	6.32	(3.50)	2.95	(2.25)
Grade 3	35	6.63	(3.34)	2.89	(2.29)
boys	16	6.94	(3.89)	3.44	(2.76)
girls	19	6.37	(2.87)	2.42	(1.74)
Grade 4	37	7.05	(3.47)	3.49	(2.46)
boys	16	6.75	(3.71)	3.31	(2.70)
girls	21	7.29	(3.35)	3.62	(2.31)
Grade 5	32	7.44	(3.17)	3.50	(2.36)
boys	19	7.37	(3.61)	3.89	(2.18)
girls	13	7.54	(2.54)	2.92	(2.56)
Grade 6	34	7.71	(3.08)	3.85	(2.44)
boys	14	7.21	(3.14)	3.36	(2.73)
girls	20	8.05	(3.07)	4.20	(2.21)

Figure 6. Developmental Trends in the Attribution of Positive Traits to the Normal Weight Figure and Traits to Both Figures

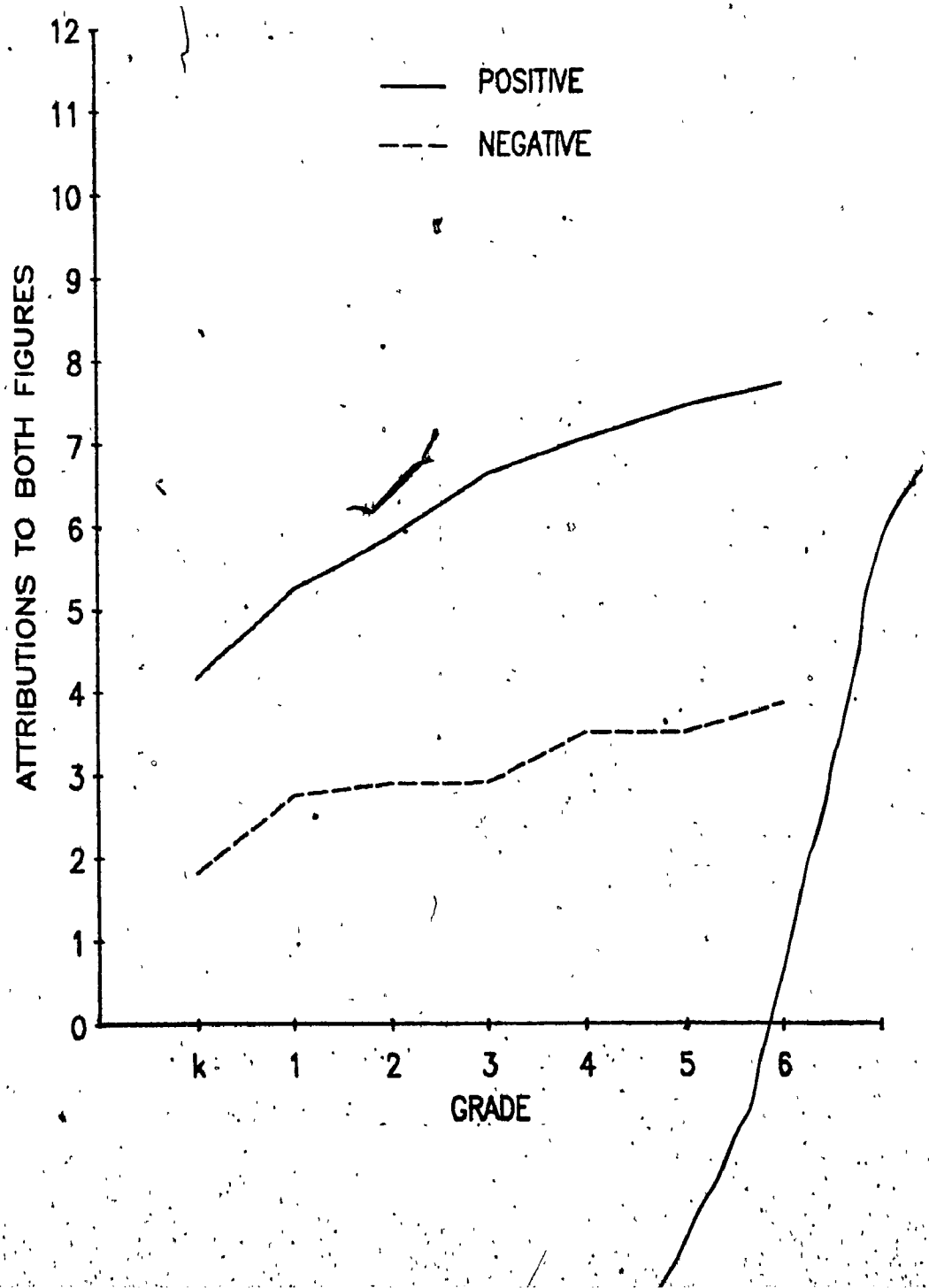


original flexibility score, the manova analysis on these new variables was conducted by grade and sex in order to rule out the possibility of sex effects in the new variables. As with the original flexibility score, there was a significant multivariate effect of grade, F (12, 474) = 3.74, $p < .001$, and there were no significant effects of sex, F (2, 236) = 2.09, p N.S., or the grade by sex interaction, F (12, 474) = .45, p N.S. The manova summary table can be found in Appendix G.

Once again, the significant grade effect was followed up by means of a direct entry discriminant function analysis. This analysis confirmed that the number of positive traits attributed to both figures was the most important variable in differentiating grade levels (r = .99, Wilk's lambda = .88, p =.001), but the number of negative traits attributed to both figures also contributed significantly to the multivariate grade effect (r = .51, Wilk's lambda = .93, p = .006). Supporting statistical results can be found in Appendix G. As can be seen in Figure 7, there was an increase in both the number of positive and the number of negative traits attributed to both figures with age. Thus, children begin attributing more traits in general to both figures, rather than simply increasing the number of positive traits to both figures, with age.

However, these results are inconsistent with the earlier finding that there is no change in negative trait attribution with age. Two subsequent analyses were undertaken to clarify

Figure 7. Developmental Trends in the Attribution of Positive and Negative Traits to Both Figures



this discrepancy. First, children's overall willingness to attribute positive versus negative traits to both figures was explored. The per cent of positive traits and negative traits attributed to both figures was calculated for each grade level. These results are graphed in Figure 8. There were more positive traits than negative traits attributed to both figures at all ages. Thus, it appears that children are more likely to attribute positive traits to both figures at all ages.

Secondly, an item by item analysis of the attribution of traits to both figures was undertaken to further clarify the age trends in positive and negative attributions to both figures. For the sake of clarity, the attribution of each negative and positive trait was compared in younger (kindergarten through grade 2) and older children (grades 3 through 6) rather than in each grade level. The total number of times each trait was attributed to both figures at the two grade levels is presented in Table 10.

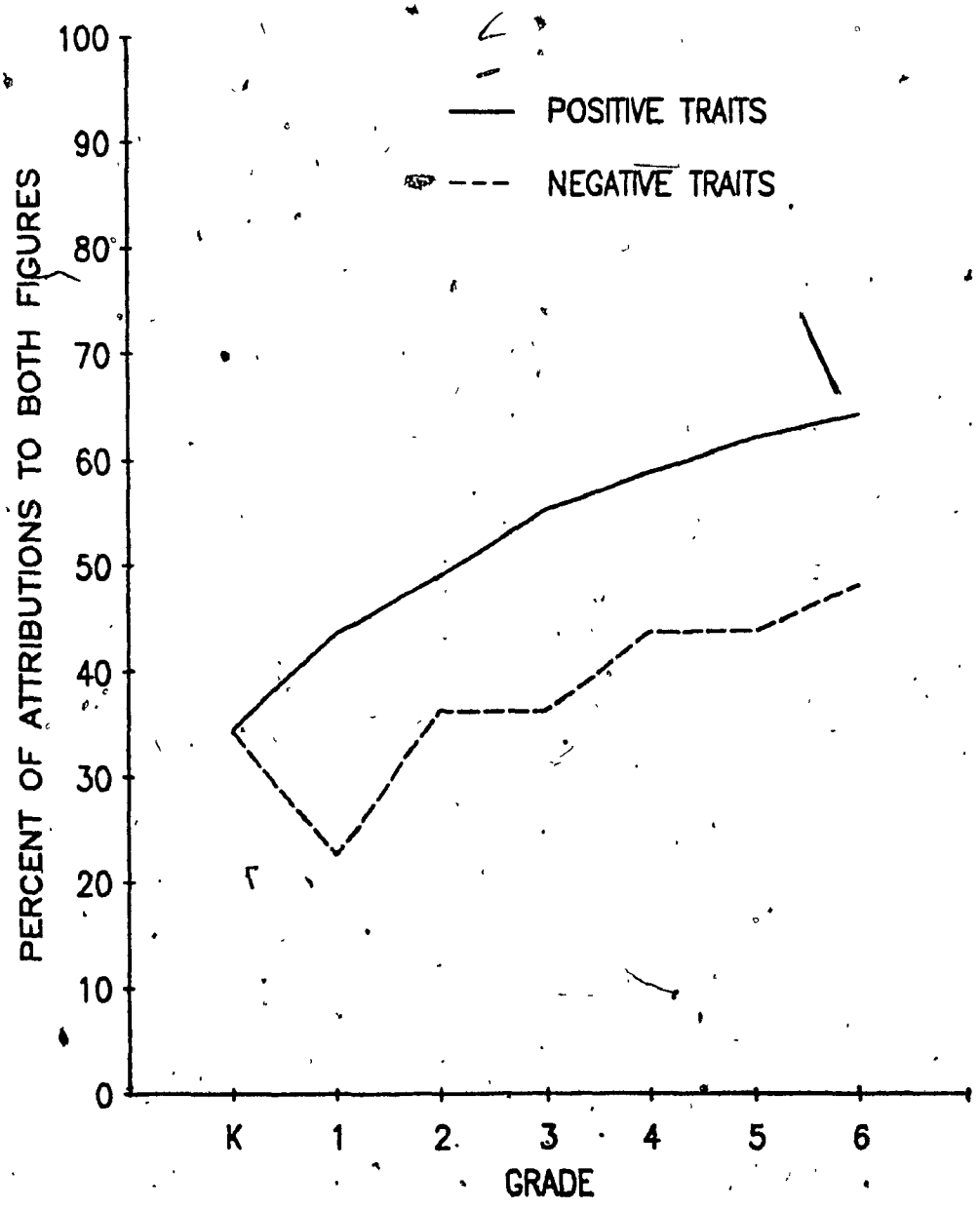
These means both reflect and extend the previously reported findings. The finding that flexibility increases with age can be observed; the percentage of children attributing each trait to both figures was generally greater in later grades. The greater strength of the trend toward increasing the attribution of positive traits to both figures can also be observed. The increase in attributions to both figures between younger and older grades appears greater for positive than negative traits. Furthermore, the only two

Table 10

Frequency of Individual Attributions to Both Figures in Younger and Older Children

	Grades			
	K through Gr.2		Grs.3 through 6	
	Absolute Frequency	Percent	Absolute Frequency	Percent
Positive Traits				
Play (toys)	65	57.52	97	70.29
Play quietly	39	34.51	66	47.83
Watch TV	64	56.64	93	67.39
Play (instruments)	65	57.52	94	68.12
Smart	65	57.52	109	78.99
Jolly	35	30.97	72	52.17
Strong	32	28.32	52	37.68
Neat	36	31.86	74	53.62
Affectionate	44	38.94	89	64.49
Polite	40	35.40	84	60.87
Generous	38	33.63	84	60.87
Clean	51	45.13	79	57.25
Negative Traits				
Teasing	23	20.35	42	30.43
Mean	31	27.43	56	40.58
Sneaky	31	27.43	75	54.35
Unhappy	48	42.48	63	45.65
Gets Teased	23	20.35	26	18.84
Naughty	37	32.74	71	51.45
Lazy	34	30.09	56	40.58
Afraid	56	49.56	84	60.87

Figure 8. Developmental Trends in the Percent of Positive and Negative Traits Attributed to Both Figures



traits which were not attributed more to both figures with age were both negative: unhappy and gets teased. Thus, it appears that while children also begin to attribute more negative traits to both figures with age, they continue to reserve some particular negative traits for the overweight figure. This finding explains the lack of a developmental shift in the overall attribution of negative traits to overweight figures.

Summary

These analyses revealed both sex differences and developmental trends in children's attitudes about weight. Girls made more underweight choices in an underweight/overweight preference task and more normal weight choices in a normal weight/overweight preference task. Girls also made fewer positive attributions to normal weight figures at all ages than boys. There were many developmental trends: the number of body responses declined with age; the number of positive attributions to the normal weight figure decreased; the number of attributions to both figures increased; and the number of normal weight preferences in a normal weight/underweight preference task also increased.

Predicting Children's Weight Attitudes

The second goal of the present study was to discover factors which contribute to the development of children's attitudes about weight. The two factors examined were children's level of cognitive development, as measured by the achievement of conservation, and their parents' attitudes

about weight, as measured by a parent questionnaire.

This question was addressed using regression analyses. The selection of dependent variables for the regression analyses is described in detail in Appendix H. The variables judged appropriate for regression analyses included seven independent variables derived from these measures and four dependent variables derived from the child attitude measures. The seven independent or predictor variables are: the total conservation score, maternal weight status, spouse's weight status, past maternal weight status, negativity, flexibility and internality/externality. The four dependent variables or variables to be predicted are: the body responses score, the number of underweight over overweight preference choices, the number of prop-based affiliation-preference choices and the child's flexibility score on the trait attribution task. The regression equations were designed to meet the goals of the study and to conform to the statistical restrictions on these analyses (see Appendix H for a discussion).

Categorizing by Weight

The results of the regressions predicting the transformed body responses score are presented in Table 11. As can be seen in the table, the only significant regression was obtained by using conservation alone to predict the number of times the child chose to use weight rather than activity as the categorization dimension. The relationship between conservation and the body responses score is negative; children who had obtained higher levels of cognitive

Table 11

Results From Direct Entry Regressions to Predict the Body Responses Score

Predictors	N	F	p	Semi-Partial	sig. t
Regression 1					
Conservation	141	13.22	.001	-.29	.001
Regression 2					
Negativity				-.02	NS
Externality				-.09	NS
Flexibility				-.21	NS
Mother's Weight				.07	NS
Father's Weight				.24	NS
Mother's Past Weight				-.001	NS
	48	1.18	.33		
Regression 3					
Conservation				-.35	NS
Father's Weight				.14	NS
Externality				.02	NS
Flexibility				-.10	NS
Mother's Past Weight				-.06	NS
	26	.84	.54		

development tended to use weight as a categorization dimension less often than children at lower levels of cognitive development. The conservation score accounted for 8.69% of the variance in the body responses scores. The parent scores were not predictive of the child's body responses score when entered alone or when they were entered with the conservation score. Furthermore, when the child's conservation score and the four most predictive parent variables were entered together, the regression was not significant.

Preferences

Two sets of regressions were calculated to predict children's weight preferences: one was designed to predict the number of times the child chose the underweight over the overweight figure in the preference task, and the other was designed to predict the number of prop-based affiliation preferences the child made on the affiliation-preference task.

The results of the regressions predicting the child's performance on the preference task are presented in Table 12. As can be seen in the table, the regressions using conservation alone and the parent scores alone as predictors did not significantly predict children's preference for underweight over overweight figures. However, these variables, plus the one significant interaction and minus the three least predictive parent variables, yielded a significant regression equation. This effect explains 40.37% of the variance in the number of underweight over overweight preference choices the child made. It was the parent's past

Table 12

Results From Regressions to Predict the Number of Underweight Choices on the Underweight/Overweight Preference Selection Task

Predictors	N	F	p	Semi-Partial	Sig. t
Regression 1					
Conservation	150	.11	.74	.03	.74
Regression 2					
Negativity				.04	NS
Externality				.06	NS
Flexibility				-.14	NS
Mother's Weight				-.14	NS
Father's Weight				-.15	NS
Mother's Past Weight				.04	NS
	51	.53	.78		
Regression 3					
Block 1:					
Conservation				-.08	NS
Negativity				.06	NS
Externality				.23	NS
Mother's Past Weight				-.51	.001
	29	3.79	.02		
Block 2:					
Conservation X Negativity				.13	NS
	29	3.11	.03		

weight status which was most predictive of the child's tendency to choose underweight over overweight figures in this preference task. The relationship between these two variables is negative, and a high score on the dummy variable representing past weight status means the mother has never been overweight. Therefore, it appears that mothers who had been overweight in the past had children who preferred underweight to overweight figures in the preference task.

The results of the regressions to predict children's prop-based choices on the affiliation-preference task are presented in Table 13. As can be seen in the table, when conservation is entered into the regression equation alone, it predicts a small (2.74%) but significant proportion of the variance in the number of prop-based affiliation-preferences the child makes. The association between these two scores is positive; therefore, children at higher cognitive-developmental levels chose their playmates by the presence of attractive props, not weight status. In other words, they chose to play with the overweight child with an attractive toy rather than the normal weight child with no toy. The regression based on all the parent scores was marginally significant. A total of 21.5% of the variance was explained by the parent scores. In this case, it was maternal internality/externality and flexibility which predicted the child's attitude score best. Mothers who were flexible in trait attribution and saw overweight as under external control had children who made few affiliation-preference choices on

Table 13

Results From Direct Entry Regressions to Predict Prop-based Affiliation-Preferences

Predictors	N	F	p	Semi-Partial	Sig. t
Regression 1					
Conservation	150	4.17	.04	.17	.04
Regression 2					
Negativity				-.18	NS
Externality				-.32	.02
Flexibility				-.32	.02
Mother's Weight				.001	NS
Father's Weight				-.01	NS
Mother's Past Weight				-.02	NS
	51	2.01	.08		
Regression 3					
Conservation				.36	.02
Externality				-.30	.05
Flexibility				-.41	.01
Father's Weight				-.05	NS
Mother's Past Weight				-.18	NS
	29	5.20	.002		

the basis of toys. In other words, their children preferred to play with the normal weight child with no toy rather than the overweight child with an attractive toy.

When conservation and parent variables were combined in one regression omitting the two least predictive parent variables, the amount of variance predicted was significant. Once again, this significant regression was the result of the maternal flexibility and externality scores. However, the child's level of conservation also contributed. The direction of these effects follows the pattern described in the two earlier regressions. As can be seen in the table, these five variables combined accounted for 53.08% of the variance in children's prop-based affiliation-preferences.

Flexibility

The results of the regressions to predict children's flexibility in the trait attribution task are presented in Table 14. As can be seen in the table, conservation alone significantly predicted the child's flexibility in the trait attribution task. Conservation predicted 3.36% of the variance in the child's flexibility score. Children at higher levels of cognitive development attributed more traits to both figures than children at lower cognitive levels. The parent variables alone failed to predict a significant proportion of the variance in the child's flexibility score. Finally, the regression including both conservation and parent variables, plus the significant interaction and minus the least predictive parent variables was also not significant.

Table 14

Results From Direct Entry Regressions to Predict the Child's Flexibility Score

Predictors	N	F	R	Semi-Partial	sig. t
Regression 1					
Conservation	147	5.05	.03	.18	.03
Regression 2					
Negativity				-.11	NS
Externality				-.02	NS
Flexibility				.02	NS
Mother's Weight				.09	NS
Father's Weight				-.001	NS
Mother's Past Weight				-.14	NS
	51	.27	.95		
Regression 3					
Block 1:					
Conservation				.32	NS
Negativity				-.16	NS
Mother's Weight				.17	NS
Father's Weight				.08	NS
	29	1.12	.37		
Block 2:					
Spouse's weight X Past weight				-.14	NS
	29	.99	.45		

Summary

The results of the regression analyses predicting children's attitudes suggested that the child's level of cognitive development accounts for some of the variance explained in the developmental trends. Children at higher levels of cognitive development tended to use weight as a categorization dimension less often than children at lower levels of cognitive development. They also chose to play with the overweight child with an attractive toy rather than the normal weight child with no toy more than children at lower levels of cognitive development. Finally, the more cognitively advanced children also attributed more traits to both figures than children at lower cognitive levels.

The regressions also supported the influence of social transmission suggested by the sex differences. A maternal history of overweight was associated with children choosing more underweight rather than overweight figures. Furthermore, mothers perceiving overweight as externally controlled and attributing traits flexibly to figures of both weights was predictive of children choosing to play with the normal weight child with no prop in the affiliation-preference task.

Discussion

There were two goals of the present study: to investigate sex differences and developmental trends in children's attitudes about weight and to relate children's level of cognitive development and their parents' weight status and attitudes to children's attitudes. The results of this study clarify the results of previous studies on the nature of children's attitudes about weight, and suggest that both the child's level of cognitive development and parental factors contribute to children's attitudes about weight.

Developmental Trends and Cognitive Development

As predicted on the basis of cognitive-developmental theory and some of the results of past research, the age or grade of children was related to their attitudes about weight. The results of these developmental analyses revealed that the number of body responses declined with age, as did the number of positive attributions to the normal weight figure. The number of shared attributions and the number of normal weight preferences in a normal weight/underweight selection task increased with age.

The fact that the youngest children in the present sample were aware of others' weights, and that their tendency to use weight as a categorization dimension declined with age had been predicted. While the early research on children's awareness of weight failed to find evidence that elementary school age children could identify their own body types (e.g. Lerner & Schroeder, 1971a), more recent research using a

categorization task found that by the age of 4, children could match drawings on the basis of weight and that this tendency declined with age (e.g. Rhodes & White, 1985; White et al, 1985). This result is also consistent with Piagetian theory. The decline in categorizing by weight occurs when most of the children learned to conserve: after Kindergarten or grade 1. According to Piagetian theory, the acquistion of this concept marks the onset of concrete operational thought. The reduced perceptual focus associated with this transition could explain the tendency to match drawings on the basis of activity more often than weight type.

The results of the regression analyses predicting children's performance on this task support the influence of cognitive level on the use of weight as a categorization dimension. While parental factors did not have any predictive power, the child's conservation score accounted for a significant proportion of the variance in matching the drawings by weight. As the developmental trend implied, higher scores on the conservation task were predictive of less likelihood of using weight as a categorization dimension.

The ability of young children to make body responses on the Body Salience Task seems to reflect the acquisition of a weight schema. The present results support previous findings indicating that such a schema is acquired during the preoperational stage, at about 4-5 years of age. Between kindergarten and grade 2, there is a decline in weight categorization which seems best interpreted as indicating that

the weight schema is well established and that, given a choice, children prefer using newer, more complex matching dimensions such as activity (e.g. Kohlberg, 1966).

The present study provides indirect evidence that the development of a weight schema precedes the use of that schema to process information about normal weight and overweight peers. Age changes in trait attributions occur between kindergarten and grade 6. Past research, based upon forced choice paradigms, failed to find conclusive evidence of developmental trends in trait attribution. However, cognitive developmental theory (e.g. Martin & Halverson, 1981; Piaget, 1951) and the results of studies on the development of other types of social attitudes (e.g. Coker, 1984) strongly suggested that there should be developmental trends in this aspect of weight attitude development under free choice conditions. On the basis of Piagetian theory regarding concrete operational children's increased ability to classify hierarchically and take into account more aspects of a stimulus, it was hypothesized that there would be a developmental increase in sorting traits to both overweight and normal weight figures (flexible sorting), with the biggest increase occuring around Grade 1. This hypothesis was supported in the present study.

The fact that positive and negative traits begin to be attributed to both figures by boys and girls suggests that this increased flexibility is strongly developmentally programmed. On the basis of Piagetian theory, it was

predicted that this developmental effect would be related to cognitive factors. This hypothesis also received support; the child's level of conservation predicted a small but significant amount of the variance in the attribution of traits to both figures.

The results of the analyses on children's flexibility in attributing traits to figures confirm that younger children tend to attribute positive traits to figures like themselves and negative traits to overweight figures, as did subjects of all ages in studies using a forced choice paradigm. However, older children were more likely to abandon the rigid "like me/not like me" type of sorting described by Martin & Halverson (1981). Instead, they used the option of attributing traits to both figures available in the free choice format used in the present study. Thus, the free choice format has shed new light on our understanding of how trait attributions to figures of varying weights develop. It can no longer be stated that negative evaluations of overweight figures are acquired early and retained for a lifetime.

The results of the regression analyses suggest that this developmental shift is partly due to the child's ability to consider more aspects of a stimulus. However, only a small amount of the variance in flexibility scores could be attributed to cognitive level. Therefore, a number of other variables are contributing to the observed developmental trend.

There are a number of factors which could be influential; for example, the development of social conformity and/or empathy. Indeed, there is some evidence that both susceptibility to social desirability or conformity influences and empathy toward less fortunate others increases in children around the age of 8 years (e.g. Isbitsky, 1988; Strayer, 1987). This explanation is also supported by the patterns of attributing specific traits observed in the present study. The shift with age is primarily marked by acknowledging overweight children can possess positive traits. There is less of a trend toward attributing negative traits to both figures. Furthermore, while some negative traits begin to be attributed to normal weight figures with age, the traits "gets teased" and "unhappy" continue to be associated with overweight. Therefore, older children exhibit a more positive and a more realistic attitude toward overweight peers. They have learned that overweight peers have difficult social lives, and the observed trait attribution pattern may represent their increased empathy for them.

Another factor which may be contributing to the development of flexibility in trait attribution may be children's experiences with peers. As they age, children naturally have more contact with people who are overweight. It seems likely that these experiences would lead to a re-examination of schema-based trait attributions.

The use of the free choice paradigm eliminated any possible predictions about how positive and negative traits

would be attributed to normal weight and overweight figures. These results confirm that it is preoperational children who have already mastered the use of the "like me/not like me" schema, and the concrete operational children who are abandoning the rigid, schema-based way of evaluating others. Older children made fewer positive attributions to the normal weight figure. Only two negative traits continued to be primarily attributed to the overweight figure by older children.

The shift away from rigid trait attribution patterns could also be seen as the result of affective as well as cognitive growth. The previously mentioned hypothesis regarding the concurrent increase in empathy or social conformity in children around the age of 8, suggests that the shift away from rigid sorting may also be due to children's increased fear of social censure and/or increased emphathy for their overweight peers. While each of these two concepts are thought to have cognitive components, they are also considered affective processes (e.g. Hartup, 1983; Strayer, 1987).

Similarly, increased experience with overweight and normal weight peers could also have contributed to the shift in which traits are attributed to figures. By late elementary school, children may also have discovered that peers who are like them with regard to weight are not necessarily like them in other ways. The influence of experience is very likely in terms of changes in the attribution of negative traits to overweight figures. The two traits "gets teased" and

"unhappy" may well reflect the overweight child's social reality.

The results of the present study do not allow the differential role of cognitive, affective and experience factors to be distinguished in the development of trait attributions based on weight; the developmental patterns obtained are consistent with each explanation, and the child's specific trait attributions could not be explored using regression analyses for statistical reasons. Future research would do well to measure the relative contributions of affective and cognitive growth to developmental trends in trait attribution more directly. Specific measures of schematic processing (i.e. memory or information processing tasks) or affective concepts (i.e. empathy, social conformity) should be taken. Similarly, an exploration of the role of experience would be useful. The discovery of certain experiences associated with the early development of more positive attitudes about weight might be applicable to teachers and parents interested in bringing about attitude change in children.

The final trait attribution result obtained in the present study was unexpected; girls made fewer positive attributions to the normal weight figure on the trait attribution task. Instead, girls were more likely to attribute positive traits to the overweight figure as well as the normal weight figure. Unlike the developmental trends in trait attribution, this result can not be attributed to

differences in cognitive development because girls and boys did not differ in their level of cognitive development. Once again, however, this finding may reflect the involvement of affective development. Girls may be more sensitive to the social desirability pressures or empathic toward others earlier than boys (Strayer, 1987). Finally, an alternative explanation is that boys simply over-learn the association between people and things like them and positive evaluations.

The only remaining developmental trend obtained was the number of times children chose the normal weight figure over the underweight figure on the preference task. While the results suggest that older children tended to choose the normal weight figure more often than the underweight figure, past research had led to the hypothesis that preference variables would be more affected by children's sex than grade. While there is a significant correlation between children's ability to conserve and their score on this task, there is no cognitive developmental explanation for this result. Therefore, the correlation may reflect the often-discussed relationship between intelligence and conservation (e.g. Jordan & Jordan, 1975). In other words, the more intelligent children may simply be more able to pick out the normal weight figure. The lack of a cognitive developmental explanation for this result leads to an explanation regarding the nature of the task. Examination of the measure reveals that the most subtle distinctions between body types appear to be between the underweight and normal weight figures. This particular

preference task also demonstrated the poorest internal reliability of all the preference tasks. Therefore, the observed age trend may simply reflect the fact that older children were more able to make the difficult distinction between the two body types.

Sex Differences and Parental Factors

Another particular interest of the present study was the identification and explanation of sex differences in children's attitudes about weight. Largely on the basis of past research, sex differences were anticipated in weight preferences. However, the aforementioned results from the measure of children's preference for normal weight over underweight figures were inconsistent with this hypothesis. While the grade effect in this measure of preference can be explained, the lack of the hypothesized sex difference in this aspect of preference, in contrast to the other two measures derived from the same measure, is somewhat puzzling. However, one differentiating feature of this selection task is that neither figure is overweight. Careful examination of the earlier studies on preference (e.g. Lerner & Gellert, 1969; Rhodes & White, 1985) reveals that the sex differences obtained have all been in measures of aversion for overweight, not preference for normal weight. Thus, it appears quite logical that the sex differences in preference were only obtained in measures contrasting overweight and other figures. Indeed, the obtained sex differences were in the expected direction; girls made more underweight choices in an

underweight/overweight selection task, and more normal weight choices in a normal weight/overweight selection task.

Sex differences in task performance are often thought to be the result of differential socialization between boys and girls (Block, 1983). This explanation seems particularly appropriate, since the existence of biologically-based sex differences in preferences seems unlikely. Consistent with this explanation, the regressions predicting children's tendency to choose the underweight figure over the overweight figure point to the influence of variables associated with individual differences in task performance rather than developmentally programmed factors such as cognitive development. While the entire set of parental variables did not predict children's preferences on this task, the deletion of some related parental weight status variables led to the finding that past maternal weight status predicted the child's preference. Mothers who said they had been overweight in the past had children who tended to choose underweight over overweight figures. Thus, it may be that mothers with some personal concern over overweight convey this concern to their children, who manifest it as a preference for underweight figures.

One explanation for the sex difference may be differential transmission of concern about weight to female children. Many researchers have noted that girls and women are more concerned about weight than boys and men (e.g. Klesges, 1984). Others have noted that there is greater

pressure on females in our society to maintain a low body weight; girls as young as 8 years of age restrain their appetites (Davis, Best & Hawkins, 1981), and the incidence of eating disorders such as bulimia is higher in females (Halmi, Falk & Schwartz, 1981). Thus, it is conceivable that young female children internalize the societal and parental value of parental thinness better than boys.

The lack of a sex difference in the results from the measure of affiliation-preference is less easily explained than the results from the other preference tasks since the task is an overweight/normal weight choice, albeit with another dimension added. It is particularly puzzling in view of the fact that past research with the same measure has revealed sex differences; both White et al (1985) and Rhodes & White (1985) found that girls made fewer prop-based choices than boys. This conflict may be explained by the age of the children in the studies. Both previous samples included large samples of 4 year olds, wheras the present study had no 4 year olds and few 5 year olds. A re-examination of the previous results revealed that it seemed to be the extreme scores of these youngest children which produced the significant sex differences. The lack of this effect may also be explained by the fact that most of the subjects overwhelmingly chose to make their selections on the basis of the attractive prop.

Another interesting result involved the influence of cognitive developmental factors. Although no developmental differences were obtained in the univariate analyses, and

there was no theoretical or empirical rationale for relating cognitive development to performance on this task, children with higher conservation scores made more prop-based playmate choices. In other words, they chose to play with the overweight child with the attractive prop rather than the normal weight child with no prop. On the one hand, this result is consistent with the results on the use of weight as a categorization dimension, because more cognitively advanced children are paying less attention to weight. Similarly, it is consistent with the trait attribution results, because the more advanced children are acknowledging that children unlike themselves can be good.

The most perplexing results obtained in the present study were found in the regressions predicting the child's affiliation-preference task score. In all other cases, sex differences in a particular variable were accompanied by the significant influence of parental factors in the regression analyses. However, in the case of the affiliation-preference results, there were no sex differences, but the parental factors were predictive of children's scores in the regressions. Mothers who expressed a great deal of flexibility in trait attribution and seemed to believe overweight was beyond the individual's control were associated with children with low levels of prop-based responses. In other words, their children tended to avoid playing with the overweight child.

These results are counter to social learning theory; if

modelling is the process of transmission, then mothers with positive attitudes should have children with positive attitudes. There are two possible approaches to understanding this unusual and counter-intuitive result. First, the results can be accepted at face value and interpreted as best as possible. The relationship between an external view of overweight and increased interest in weight preferences in their children can be explained. Mothers with an external view can be thought of as having a more cognitively primitive view of weight, because they do not seem to have an internal locus of control. Similarly, children who make many weight-based choices on this task have been associated with lower levels of cognitive development. However, the pattern does not hold for parental flexibility. If the maternal flexibility score was equivalent to the nature of this concept in children, then flexible mothers would have to be seen as more cognitively advanced. However, flexibility can not be related to Piagetian concepts in adulthood, since most adults have reached the concrete operational stage. Thus, it is unclear exactly what flexibility represents in adults, and we can not fully explain these results without such knowledge.

Another way of looking at the unusual affiliation-preference results would be to question their validity. It is quite likely that all the mothers who had extreme scores on the two parental measures compose a unique subsample of mothers. In fact, all of the mothers who completed the questionnaire may be considered unrepresentative of the

general population, since many mothers who received the questionnaire refused to participate. It may be that those who agreed to participate were exceptionally vulnerable to social desirability pressures. Furthermore, the mothers with the most extreme scores might be considered most conforming. The questionnaire was extremely face valid. Since most adults know we are not supposed to think negatively of overweight people, these mothers may have consciously or unconsciously exaggerated their results in a positive direction. If parental scores do not reflect their real attitudes, there is no reason to expect children's scores to be comparable. Furthermore, if their true attitudes are more negative than their scores suggest, it would explain the fact that their children are more preoccupied by weight status than most of their peers.

The Nature and Origins of Children's Attitudes About Weight

Thus, the results of the present study succeeded in increasing understanding of sex differences and developmental trends in children's attitudes and the factors which contribute to the development of these attitudes. The results support the influence of both cognitive and parental factors in the development of children's attitudes about weight. The developmental trends seem to be at least partly tied to the influence of cognitive developmental factors. However, many questions also remain; there must be other factors contributing to developmental trends as well. First, the grade effect in the preference for normal weight over

underweight figures can not be explained by cognitive developmental theory. Secondly, the regressions revealed that only a small amount of the variance in any variable can be explained by the child's conservation score. Thirdly, some of the developmental trends found in the present study are also consistent with growth in affective development. Therefore, future researchers should explore the relationship of affective factors such as empathy and social conformity to children's attitudes about weight.

The incidence of sex differences was more consistently accompanied by evidence of parental influence on children's scores on the various tasks. The one exception was the absence of sex differences in affiliation-preference scores, despite the influence of parental factors observed in the regressions predicting these scores. While the influence of parents on attitudes about weight has been suggested by these results, much of parents' and society's role in the development of these attitudes remains unclear. Once again, only very small amounts of the variance in children's scores were attributable to the parental variables measured in the present study. Furthermore, most of the parental variables were totally without predictive value. Therefore, researchers may have to broaden the study of parental variables to include more detailed weight history information (e.g. number of times on diets, rating of body satisfaction) or concrete, observable parental behaviors (e.g. taking food away from children, statements about overweight to children) in the future.

Fathers attitudes should be examined as well. Finally, the process of attitude transmission between parents and children may be considerably more complex than behavioral modelling, and therefore require more creative hypothesizing about relationships between their attitudes.

The information on sex differences and developmental trends in all aspects of children's attitudes about weight documented in the present study is noteworthy. The modifications made to measures, and the systematic study of a wide age range of boys and girls are considerable improvements to previously available data. Another contribution of the present study is the documentation of the psychmetric properties of all the weight attitude measures. While doing so was not a stated goal of the present study, it is an important advance in a field marked by numerous, discrepant and unproven measurement instruments.

The results of the psychometric analyses were largely positive; most of the measures met adequate standards of internal reliability and relationships between variables derived from the same measures were not problematic for statistical analyses. The results of analyses conducted on the weight preference variables were an interesting exception. The nearly acceptable internal reliability level of the score from the affilation-preference task suggests that this task simply requires a few more items to reach an appropriate level of consistency. In contrast, the internal reliability of the three variables derived from the preference measure was

acceptable for preliminary research purposes, but requires refinement for future research. Unfortunately, other methods of scoring produced scores which were even less reliable than those reported in the present study. This lack of reliability is interesting in light of previous methods of assessing preference and our lack of understanding of weight preferences. Previous researchers (e.g.Lerner & Gellert, 1969) used only a single trial with children asked to choose between stimuli of all three weight types to determine a child's weight preference. In contrast, the method used in the present study used three trials for each of three combinations of weight types, and yet in most cases no stable preference emerged. Therefore, it seems clear that the results of previous research using one trial tasks can not be relied upon. Furthermore, the entire nature of what we have considered weight preferences must be questioned. The results of the two dimensional measure of preference revealed that children simply do not make many preference choices on the basis of weight; this finding plus the unreliability of one-dimensional preference data suggest that children simply don't have stable preferences for a particular weight group in the absence of other information about a peer. Of course, more complex, multi-dimensional measures might reveal that children have stable weight preferences. Future researchers should explore alternative means of defining and measuring weight preferences.

Other results from the present study suggest the need to

re-examine how we think about attitudes about weight in general. In the past, researchers have tended to assume that if children have a negative attitude on one measure, then the same feeling will prevail in all other measures of weight attitudes. In contrast, the results of the present study suggest that attitudes about weight can not be thought of as one unitary concept. The measures used in the present study were intended to tap three aspects of weight attitudes; schema development, preferences, and trait attribution patterns. The results of correlational analyses of the variables derived from each of the four attitude measures revealed that each aspect of children's attitudes about weight must be considered independently.

Some mild relationships between these aspects of weight attitudes might have been expected on the basis of past thinking about attitudes about weight which emphasized a globally negative reaction to overweight. However, the distinctness of each aspect of weight attitudes can be explained by the present study's findings. First, the results of analyses on developmental trends revealed that the use of weight schemas, some aspects of weight preferences and the attribution of traits on the basis of weight type differ depending on the grade of the child. Strong tendencies to categorize by weight are found only in kindergarten and grade 1 children, wheras it is older children who prefer normal weight to underweight drawings on the preference task. At the same time, however, older children begin attributing traits

more flexibly. Therefore, correlations between the four measures or three aspects of attitudes about weight across grade levels would not really be expected. Secondly, two distinct influences on the development of specific aspects of attitudes about weight have been identified, and the influence of more factors seems likely. Therefore, each aspect of weight attitudes may be uniquely and multiply-determined.

The results, in conjuction with past research, also add further support to the notion that there is no global negative stereotype about overweight by late childhood. The attitudes about overweight observed in older children can be described as fairly positive. First, they do not necessarily seem preoccupied with the weight of others, at least as a way of categorizing them. Furthermore, when given another basis for making preference choices they overwhelmingly choose to ignore the weight of drawings. Secondly, they do not simply assume that negative qualities are associated with overweight people and positive qualities are associated with normal weight people.

Thus, the body-behavior relationships hypothesized in Sheldon's (1942) constitutional psychology and the overweight stereotype described by earlier researchers do not seem to exist. The idea of an overweight stereotype seems to have been an artifact of the forced choice paradigm. It may be that forcing children to attribute traits to one figure or another yielded information about their understanding of popular opinion, rather than of their own attitudes.

The attitudes observed in the children in the present study seem to be influenced by a number of factors. Some of these factors may be cognitive development, parental attitudes and history, experience with peers, and the characteristics of the task or situation. There do seem to be some negative attitudes about overweight. However, the results of the present study modify understanding of these negative attitudes. The trait attribution results suggest that overweight is viewed as a negative condition, rather than overweight people being viewed as negative. The results on preferences suggest that whatever negative feelings children may have about overweight figures, those feelings do not necessarily influence their playmate choices. Thus, while negative attitudes about overweight do exist, they appear to be much less pervasive and unrelenting than previously thought.

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Appendix A

Measures

Table A - 1

White et al's (1985) Body Salience Measure Items

Item(sex)	Standard	Choice 1	Choice 2	Choice 3
1 (M)	Overweight Fighting	Overweight Standing	Normal Fighting	Normal Combing
2 (F)	Normal Vacuuming	Normal Swimsuit	Overweight Standing	Overweight Cleaning
3 (F)	Overweight Stealing	Normal TV	Overweight Cleaning	Normal Stealing
4 (F)	Underweight Wagon	Overweight Skateboard	Overweight Standing	Underweight Camera
5 (M)	Normal Angry	Normal Standing	Overweight Angry	Overweight Reading
6 (F)	Normal Party	Underweight Swimsuit	Normal Shopping	Underweight Party
7 (M)	Underweight Wagon	Overweight Bicycle	Underweight Swimsuit	Overweight Reading
8 (M)	Overweight Raking	Overweight Ball	Underweight Reading	Underweight Pruning
9 (F)	Overweight Combing	Normal Combing	Normal Eating	Overweight Standing
10 (M)	Overweight Snowman	Normal Snow house	Overweight Standing	Normal Swimsuit
11 (F)	Normal Standing	Overweight Guitar	Normal Swimsuit	Overweight Standing
12 (M)	Normal Reading	Overweight Reading	Overweight Guitar	Normal Chess
13 (F)	Overweight Mud	Overweight Groceries	Underweight Mud	Underweight Tennis
14 (M)	Overweight Weights	Normal Combing	Normal Exercising	Overweight TV

M = Male Stimuli
F = Female Stimuli

Top = Weight Type
Bottom = Activity/Prop

Table A -2

Trait Attributions Measure Items

Item	Picture	Question
1	A test with an "A" and a star on it	Someone always does well on tests in school. Who is smart and does well in school: this boy/girl, this boy/girl or both boys/girls?
2	A boy/girl crying (full body)	Someone teased this boy/girl. Who probably teased him/her: this boy/girl, this boy/girl or both boys/girls?
3	A collection of non-sex-specific toys	Who would like to play with these toys? Would it be this boy/girl, both boys/girls or this boy/girl?
4	A boy/girl crying and reaching out (full body)	Someone took his/her toy away. Who was mean and took the toy: Was it this boy/girl, this boy/girl or both boys/girls?
5	A smiling boy/girl with rosy cheeks (face only)	This boy/girl likes to joke and laugh a lot. Who is jolly? Is it both boys/girls, this boy/girl, or this boy/girl?
6	Males: A tool bench covered in tools	Males: Somebody's been touching Daddy's tools and he won't like it. Who was sneaky: was it this boy, both boys or this boy?
	Females: A vanity table covered in toiletries	Females: Somebody's been playing with Mom's cosmetics, and she won't like it. Who's sneaky: Is it both girls, this girl or this girl?
7	A desk and a book case	This is a nice quiet place to go. Who would like to go there This boy/girl, this boy/girl or both boys/girls?
8	A frowning boy/girl crying (face only)	This boy/girl is unhappy. Who would be sad: Both boys/girls this boy/girl or this boy/girl?

9	A large shopping bag full to the top	Who could lift this heavy bag? Who is strong; this boy/girl, both boys/girls, or this boy/girl?
10	A neat bedroom	Someone always keeps their room neat. Whose neat room is this: both boys/girls, this boy/girl or this boy/girl?
11	A couch and TV	Someone likes to watch TV. Is this boy/girl, this boy/girl or both boys/girls?
12	A boy/girl pointing and laughing (full body)	This boy/girl is teasing someone Who is being teased: this boy/ this boy/girl, this boy/girl or both boys/girls?
13	A baby lying on a blanket	Who would like to hold and cuddle this baby? Who's affectionate: is it both boys/girls, this boy/girl or this boy/girl?
14	A hand holding a box of crayons	Who would say thank you when given these crayons? Who's polite: this boy/girl, this boy/girl or both boys/girls?
15	A woman shaking her finger and frowning (full body)	Mother is angry. Who was naughty and made her angry: was it both boys/girls, this boy/girl or this boy/girl?
16	A collection of musical instruments	Who would like to play with these musical instruments? Would it be this boy/girl, both boys/ girls or this boy/girl?
17	A room with toys scattered around	Some boys/girls are lazy and never help clean up. Would it be this boy/girl, this boy/girl or both boys/girls?
18	A large gift-wrapped box	Who likes to give presents; who is generous? Is it this boy/ girl, both boys/girls or this boy/girl?

19	A sink with soap and water	Some boys/girls like to keep clean. Who's clean: both boys/girls, this boy/girl or this boy/girl?
20	A theatre with a wolf on the screen	Some kids are afraid of scary movies like this one. Who is afraid: this boy/girl, this boy/girl or both boys/girls?

Table A-3

Goldschmid & Bentler's (1968)

Concept Assessment Kit - Conservation

Record Form

	SCORES		
Task	Behavior	Explanation	Total
A			
B			
C			
D			
E			
F			
Total			

NAME _____ DATE _____

DATE OF BIRTH _____ AGE _____ SEX _____

SCHOOL _____ GRADE _____

EXAMINER _____

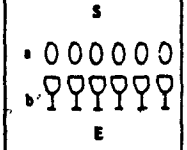
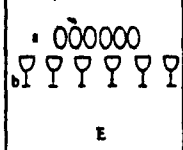
COMMENTS _____

(A) TWO-DIMENSIONAL SPACE

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
I 2 equal rectangles S a b E	*Build 2 rectangles each with 8 blocks of wood saying* *When finished, ask* *If the subject says they are both the same, say and go on to (II).* *If he says they are not the same, say* *Demonstrate to subject by pointing that they are the same, then, when S agrees, go on to (II).*	Watch what I do. Is there as much wood here* as there, or does one have more* Yes, they are both the same. Look. This one is just as big as that one. See, they are both the same.		
II. 2 unequal rectangles S a b E	*Take 2 additional blocks, saying* *Then, say* *Record. Then ask* *Record, and say*	Look. I am putting these blocks here. Now tell me Is there as much wood here as there, or does one have more? Why? O.K. Let's do something else.	Same ☐ a has more ☐ b has more ☐	
III. 2 equal squares S a b E	*Build 2 squares with 16 blocks of wood each, saying* *When finished, ask* *If the subject says they are the same, continue with (IV).* *If the subject says they are not the same, say* *Demonstrate to subject by pointing that they are the same, then, go on to (IV).*	Watch what I do. Is there as much wood here as there, or does one have more? Look. This one is just as big as that one. See, they are both the same.		
IV. square vs. single line S a b E	*Then, take the blocks from the right square and build a single line with all 16 blocks, saying* *When finished, ask* *Record, then ask.* *Record*	Watch what I do. Now, is there as much wood in this one as in that one, or does one have more? Why?	Same ☐ a has more ☐ b has more ☐	

*When saying the first underlined word, point to (a), when saying the second underlined word, point to (b) Follow this procedure for all underlined words.

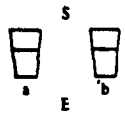
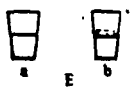
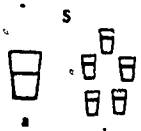
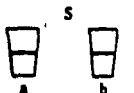
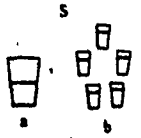
(B) NUMBER

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
I. Parallel egg-cups & eggs  	*Place 6 egg cups in a straight line about 4 inches apart. Parallel to these, stand 6 eggs in corresponding position, also in a straight line, saying* *When finished, say* *Remove eggs from cups.*	Watch what I do. Now, I want you to put each one of these eggs into the egg cup next to it.		
II. eggs vs. egg-cups  	*Restore the two lines of eggs and cups, but spread out cups (6 inches apart) and move eggs closer together (2 inches apart), saying* *Then, ask* *Record, then ask* *Record.*	Watch what I do. Now, are there as many eggs as cups or are there more of one kind? Why?	Same ☐ a has more ☐ b has more ☐	——

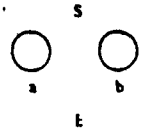
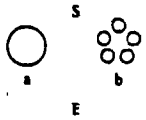
(C) SUBSTANCE

I. 2 equal balls  	*Make two equal balls of play doh (each 3 oz.), saying* *If the subject says they are both the same, go on to (II).* *If the subject says one ball is larger, say* *Continue to adjust the two balls until the subject says they are the same.*	Here are two balls of play doh. There is the same amount of play doh in each ball. They are both alike. Is there as much play doh in this ball as in that one, or does one have more? Let's make them the same. I am taking a little bit away from this one and adding it to that one. Now, is there as much play doh in this one as in that one?		
II. ball vs. pancake  	*Flatten one ball into a pancake (4 inches in diameter – use ruler), saying* *When finished, ask* *Record, and ask* *Record.*	Watch what I do. See, I am making this ball into a pancake. Now, is there as much play doh in this one as in that one, or does one have more? Why?	Same ☐ a has more ☐ b has more ☐	——

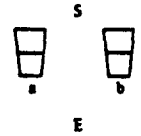
(D) CONTINUOUS QUANTITY

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
I. 2 large glasses  	*Place the two large glasses filled with an equal amount of water (150 ml) before the child, saying* *Then, ask* *If the subject says they both have the same amount, go on to (II).* *If the subject says one has more, adjust the water level, saying* *Then, ask* *Continue to adjust the water in the two glasses until he says that they both have the same*	See, here are two glasses both filled with the same amount of water. Is there as much water in this glass as in that one, or does one have more? Let's make them the same. See, I am pouring a little from this glass into that one. Now, is there as much water in this one as in that one or does one have more?		
II. 2 unequal glasses  	*Pour 25 ml of water from an extra glass into large glass at right, remove the extra glass, but leave it on the table, saying* *Then, ask* *Record, and ask* *Record.*	Watch what I do. See, I am pouring a little water from this glass into that one. Now, is there as much water in this glass as in that one, or does one have more? Why?	Same ☐ a has more ☐ b has more ☐	
III. large glass vs. 5 small glasses  	*Pour water from the large glass (which has more water) into the five little glasses, saying* *When finished, ask:* *Record, and ask* *Record.*	Watch what I do. Now, does this glass have as much water as these glasses together, or does one side have more? Why?	Same ☐ a has more ☐ b has more ☐	
IV. 2 equal large glasses  	*Place the two large glasses filled with an equal amount of water (150 ml) before the subject, saying* *Then, ask* *If the subject says they both have the same amount, go on to (V).* *If the subject says one has more, adjust the water level, saying* *Then, ask.* *Continue to adjust the water in the two glasses until he says they both have the same.*	See, here are two glasses both filled with the same amount of water. Is there as much water in this glass as in that one, or does one have more? Let's make them the same. See, I am pouring a little from this glass into that one. Now, is there as much water in this glass as in that one, or does one have more?		
V. large glass vs. 5 small glasses  	*Pour the water from the large glass into the five small glasses, saying* *Remove empty glass, but leave it on the table, and ask* *Record, and ask.* *Record.*	Watch what I do. Is there as much water in this glass as in all these together, or does one side have more? Why?	Same ☐ a has more ☐ b has more ☐	___

(E) WEIGHT

ITEM	DIRECTIONS	VERBAL INSTRUCTIONS	RESPONSE	SCORE
I. 2 equal balls  	*Make two equal balls of play doh (each 3 oz.), saying* *Give the balls to the child, and say* *(Be sure that the subject picks up the balls and weighs them in his hands.)* *If the child says they weigh the same, go on to (II)* *If the subject says one weighs more, say* *Give ball back to subject and ask.* *Continue to adjust the two balls until he says they weigh the same.*	Here are two balls of play doh. One ball is as heavy as the other ball. Is one ball as heavy as the other, or is one ball heavier than the other? Let's make them the same. I am taking a little bit away from this one, and adding it to that one. Now are they the same, is one ball as heavy as the other?		
II. ball vs 5 little balls  	*Make the right ball into 5 little balls of approximately the same size, and arrange them in a circle, saying* *When finished, ask* *(Do not allow the subject to pick up the balls.)* *Record, and ask* *Record.*	Watch what I am doing. I am going to make little balls out of this ball. Now, is this ball as heavy as all these balls together or is one side heavier? Why?	Same ☐ a has more ☐ b has more ☐	___

(F) DISCONTINUOUS QUANTITY

I. 2 equal large glasses  	*Place the two glasses, filled with an equal amount of corn (150 ml), in front of the child, saying* *(Level the surface in both glasses.)* *If the subject says they both have the same, go on to (II)* *If the subject says one has more, say* *Continue to adjust the corn in the two glasses until he says they both have the same amount, before going on to (II).*	See, here are two glasses both filled with the same amount of corn. Is there as much corn in this glass as in that one, or does one have more in it? Let's make them the same. See, I am pouring some corn from this glass into that one. Now, is there as much corn in this one as in that one or does one have more?		
II. large glass vs. tall glass  	*Pour the corn from the large glass into the tall glass, saying* *When finished, say* *Record, and ask* *Record.*	Watch what I do, See, I am pouring the corn from this glass into that one. Now, is there as much corn in this one as in that one, or does one have more? Why?	Same ☐ a has more ☐ b has more ☐	___

(G) Conservation of Volume

Item	Directions	Verbal Instructions
I. 2 equal large glasses	Place the 2 glasses in front of the child saying:	See, here are 2 glasses filled with the same amount of water. Is there as much water in this glass as in that one, or does one have more in it?
	If the child says they are the same, go on to II.	
	If the child says one has more say:	Let's make them the same. See, I am pouring some water from this glass into that one. Now is there as much water in this one as in that one or does one have more?
	Continue to adjust the water in the 2 glasses until the child says they are the same amount before going on to II.	
II.	Place a golf ball into the 2nd of the large glasses, (b) and say:	Watch what I do. See I am placing a golf ball in this glass. Now is there as much water in this

glass as in that one, or does one have more?

the same _____
a more _____
b more _____

Why?_____

III. Take the ball out of the glass. Spill some water out of glass (b) until glass (a) has a higher level with no ball but glass (b) has a higher level with the ball, and say:

Watch what I do. I am talking out the golf ball and I am pouring a little water out of this glass. Now is there as much water in this glass as in that one or does one have more?

If the child says that (a) has more, say:

Yes, this has more.

Go on to IV.

If the child says that (b) has more or that they are the same, point and say:

Look: This one (a) has more water than that one (b). See?

When the child agrees, go on to IV.

IV. Place the golf ball back in glass (b), saying:

Watch what I do. I am placing the golf ball in this glass. Is there as much water in this glass as in that one, or does one have more?

the same _____
a more _____
b more _____

Why? _____

Table A - 4

Scoring for Conservation Task

Goldschmid & Bentler's (1968) normative tables and scoring system were judged inappropriate for the present study's sample, and therefore required revision. Although they provide norms for male and female children from 4 to 7.5 years of age, their normative sample was predominantly composed of lower-middle class children. The scoring system was rejected as it seemed to excessively penalize children with lesser verbal skills by requiring a relatively sophisticated verbal explanation for the child to obtain any explanation points. Their scoring system assigned two points for the correct answer to the question "Is there as much in this one as that one or does one have more?". An additional two points were added to the score for each dimension if the children could explain their answer by giving a response containing invariant quality (for example, "You didn't add or subtract anything"), compensation ("The glass is taller, but also thinner") or reversibility ("If we put this back in a ball it would be the same"). Answers which implied one of the above rationales, but failed to fully explain the process were given scores of 0. An example of such an answer would be "you just moved them around, it's still the same".

The revised scoring system still yielded three scores. Each correct answer (behavior) to the seven conservation questions still resulted in 2 points toward the total behavior score. However, in contrast to the original 0 or 2 scoring

system, the child's verbal explanation was awarded 0, 1, or 2 points. Each fully explained correct explanation resulted in another 2 points being added to the total score as per the original scoring system. Partial answers were queried, and if no further elaboration resulted, were given scores of 1. Totally inappropriate answers or responses of "I don't know" were given scores of 0. The behavior and explanation scores are then summed to create a total conservation score for the child. This score can range from 0 to 28. This revised scoring system was piloted using the responses of 106 subjects between the ages of 3 and 10 years of age. The two independent raters agreed on 97.3% of the responses.

Table A - 5

PLEASE INDICATE: THIS QUESTIONNAIRE IS BEING COMPLETED BY:

MOTHER___ FATHER___

A. PARENT WEIGHT STATUS: Circle the best response for each question.

1. HOW WOULD YOU DESCRIBE YOUR OWN WEIGHT STATUS:

Underweight Normal weight Overweight Obese

2. HAVE YOU EVER BEEN OVERWEIGHT?

Yes No

3. HOW WOULD YOU DESCRIBE YOUR SPOUSES WEIGHT STATUS:

Underweight Normal weight Overweight Obese

B. GENERAL ATTITUDES: For each of the following statements circle the response that best describes how much you agree or disagree with the statement.

1. OBESITY IS PRIMARILY CAUSED BY METABOLIC DYSFUNCTION.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

2. BEING OVERWEIGHT IS USUALLY THE RESULT OF GENETIC FACTORS.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

3. OVERWEIGHT PEOPLE ARE JUST AS HAPPY AS NORMAL WEIGHT PEOPLE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

4. OVERWEIGHT PEOPLE HAVE POOR WILL POWER.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

5. OVERWEIGHT PEOPLE FIND IT MORE DIFFICULT TO INTERACT WITH OTHERS THAN NORMAL WEIGHT PEOPLE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

6. BEING OVERWEIGHT IS THE RESULT OF BAD EATING HABITS.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

7. OVERWEIGHT PEOPLE ARE GENERALLY LESS ATTRACTIVE THAN NON-OVERWEIGHT PEOPLE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

8. BEING MODERATELY OVERWEIGHT IS NOT RELATED TO HEALTH PROBLEMS.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

9. IT IS DIFFICULT TO CONTROL OVEREATING IN OUR FOOD-ORIENTED SOCIETY.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

10. OVERWEIGHT PEOPLE ARE LESS PHYSICALLY ACTIVE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

11. OVERWEIGHT PEOPLE ARE AS CONFIDENT AS NORMAL WEIGHT PEOPLE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

12. OVERWEIGHT PEOPLE HAVE A SLOPPIER APPEARANCE THAN NORMAL WEIGHT PEOPLE.

Strongly Agree	Agree Somewhat	Agree Slightly	Disagree Slightly	Disagree Somewhat	Strongly Disagree

C. ATTRIBUTION OF CHARACTERISTICS.

Put a check mark in the appropriate column to assign the adjective on the left to the weight category (overweight, normal weight, both) that you feel it best describes. The both category should be used to indicate that the adjective can describe both overweight and normal weight persons.

		OVERWEIGHT	NORMAL WEIGHT	BOTH
1.	SMART			
2.	TEASES			
3.	PLAYS			
4.	MEAN			
5.	HAPPY			
6.	SNEAKY			
7.	QUIET			
8.	SAD			
9.	STRONG			
10.	NEAT			
11.	WATCHES T.V.			
12.	GETS TEASED			
13.	AFFECTIONATE			
14.	POLITE			
15.	DISOBEDIENT			
16.	LIKES MUSIC			
17.	LAZY			
18.	GENEROUS			
19.	CLEAN			
20.	AFRAID			
21.	HEALTHY			
22.	GOOD LOOKING			

Table A -6

Scoring System for Parent Questionnaire

General Attitudes

1. Obesity is primarily caused by metabolic dysfunction.
   -Internality/Externality Scale
   -Strongly agree = 6 = External
   -Strongly disagree = 1 = Internal

2. Being overweight is usually the result of genetic factors.
   -Internality/Externality Scale
   -Strongly agree = 6 = External
   -Strongly disagree = 1 = Internal

3. Overweight people are just as happy as normal weight people.
   -Negativity Scale
   -Strongly agree = 1 = Positive
   -Strongly disagree = 6 = Negative

4. Overweight people have poor will power.
   -Internality/Externality Scale
   -Strongly agree = 1 = Internal
   -Strongly disagree = 6 = External

5. Overweight people find it more difficult to interact with others than normal weight people.
   -Negativity Scale
   -Strongly agree = 6 = Negative
   -Strongly disagree = 1 = Positive

6. Being overweight is the result of bad eating habits.
   -Internality/Externality Scale
   -Strongly agree = 1 = Internal
   -Strongly disagree = 6 = External

7. Overweight people are generally less attractive than non-overweight people.
   -Negativity Scale
   -Strongly agree = 6 = Negative
   -Strongly disagree = 1 = Positive

8. Being moderately overweight is not related to health problems.
   -Negativity Scale
   -Strongly agree = 1 = Positive
   -Strongly disagree = 6 = Negative

9. It is difficult to control overeating in our food-oriented society.
   -Internality/Externality Scale
   -Strongly agree = 6 = External
   -Strongly disagree = 1 = Internal

10. Overweight people are less physically active.
   -Internality/Externality Scale
   -Strongly agree = 1 = Internal
   -Strongly disagree = 6 = External

11. Overweight people are as confident as normal weight people.
   -Negativity Scale
   -Strongly agree = 1 = Positive
   -Strongly disagree = 6 = Negative

12. Overweight people have a sloppier appearance than normal weight people.
   -Negativity Scale
   -Strongly agree = 6 = Negative
   -Strongly disagree = 1 = Positive

Appendix B

Psychometric Analyses on all Variables

The psychometric properties of each variable were examined using slightly different procedures. As a result, the procedures and conclusions regarding the variables from each measure are described separately.

Body Salience Measure

The internal reliability of the body responses score was examined. The Cronbach alpha coefficient for this score (.90) was well in excess of the .6 or .7 recommended for experimental measures (Walker, 1985). Therefore, the score appears to be internally consistent or reliable.

Trait Attributions Measure

Each of the three variables derived from this measure was examined to determine its reliability. All three variables were highly reliable. The cronbach alpha coefficient for the number of positive traits attributed to normal weight figures was .82. The coefficient for the number of negative traits attributed to overweight figures was .71. Finally, the coefficient for the number of traits attributed to both figures was .85.

Some of the analyses conducted on these results required the computation of two new scores from the flexibility score. The cronbach alpha coefficients of these scores was also acceptable. The coefficient for the number of positive traits attributed to both figures was .84. The coefficient for the number of negative traits attributed to both figures was .76.

Thus, the variables derived from this measure were considered internally consistent.

Preference Measure

The Cronbach alpha coefficients of these variables were also calculated (see Table B - 1). As can be seen in the table, the coefficients were lower than the .6 or .7 recommended for experimental measures (Walker, 1985). The item-total correlations and alpha if item deleted statistics did not reveal any particular items which could be eliminated to raise the alpha coefficients. Furthermore, follow up analyses comparing the reliability of these scores by grade failed to support the hypothesis that the poor reliability might be largely confined to younger children (see Table B-2).

While these scores cannot be judged wholly internally consistent, they were nonetheless considered adequate for an exploratory study such as the present one. Their questionable reliability was considered in interpreting the results.

Affiliation-Preference Measure

The Cronbach alpha coefficient obtained when all three items were considered (.58) was slightly below the .6 or .7 recommended for experimental measures (Walker, 1985). The item-total correlation and alpha if item deleted statistics revealed that the deletion of one other item would increase the alpha level substantially (see Table B - 3). However, the deletion of an item was rejected since two highly related items do not really constitute a test (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975), and the coefficient was so close to an ideal level. Therefore, the present score was judged reliable enough for the present study.

Table B - 1

Cronbach Alpha Statistics: Preference Scores

UW over OW — Cronbach Alpha = .46

Items	Corrected item-total Correlations	Alpha if item deleted
1	.241	.440
2	.214	.482
5	.411	.125

NW over OW — Cronbach Alpha = .47

Items	Corrected item-total Correlations	Alpha if item deleted
3	.280	.387
4	.328	.301
7	.262	.418

NW over UW — Cronbach Alpha = .45

Items	Corrected item-total Correlations	Alpha if item deleted
6	.319	.271
8	.240	.413
9	.268	.366

Variable Names

UW over OW = Number of underweight choices in an underweight/overweight preference selection task
NW over OW = Number of normal weight choices in a normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in a normal weight/underweight preference selection task

Table B - 2

Cronbach Alpha Coefficients by Grade:
Preference Scores

Grade (s)	Variable	Coefficient
Kindergarten, Grade 1 and Grade 2	UW over OW	.60
	NW over OW	.58
	NW over UW	.41
Grades 3, 4, 5 and 6	UW over OW	.32
	NW over OW	.37
	NW over UW	.47
Kindergarten	UW over OW	.51
	NW over OW	.45
	NW over UW	.11
Grade 1	UW over OW	.57
	NW over OW	.67
	NW over UW	.33
Grade 2	UW over OW	.72
	NW over OW	.62
	NW over UW	.63
Grade 3	UW over OW	.32
	NW over OW	.46
	NW over UW	.55
Grade 4	UW over OW	.55
	NW over OW	.29
	NW over UW	.55
Grade 5	UW over OW	.09
	NW over OW	.49
	NW over UW	.49
Grade 6	UW over OW	-.01
	NW over OW	.23
	NW over UW	.13

Variable Names

UW over OW = Number of underweight choices in an underweight/overweight preference selection task

NW over OW = Number of normal weight choices in a normal weight/overweight preference selection task

NW over UW = Number of normal weight choices in a normal weight/underweight preference selection task

Table B - 3

Cronbach Alpha Statistics: Number of Prop-based Affiliation-Preference Choices

Items	Corrected item-total Correlations	Alpha if item deleted
2	.24	.68
3	.53	.28
4	.43	.42

Conservation Measure

The internal reliability was assessed using Cronbach alpha. The score correlated exceptionally well with individual scores on the measure (Cronbach alpha = .94). Therefore, it was judged extremely internally consistent.

The collection of data on developmental trends in children's conservation scores allows the validity of the conservation score as a measure of cognitive development to be assessed. On the basis of cognitive-developmental theory it would be expected that there would be no sex differences in children's conservation scores, but a strong developmental trend toward increasing scores with age. Therefore, a grade by sex analysis of variance was conducted on this score. The grade by sex means are presented in Table B - 4. As expected, there was a significant main effect of grade, F (3, 144) = 33.44, $p < .001$. As can be seen in the table, children's mean conservation scores increased with advancing age. The omega squared test for strength of effect revealed that 38.33% of the variance in these scores can be attributed to children's grade level. This represents a very large effect (Keppel, 1982). A scheffe post hoc test revealed that the significant grade differences in conservation scores exist between kindergarten and grades 1, 2 and 3, as well as between grades 1 and 3. There were no significant effects by sex, F (1, 144) = 1.23, $p > .05$, or by the sex by grade interaction, F (3, 144) = .27, $p > .05$. The anova summary table can be found in Table B - 5.

Table B - 4

Grade by Sex Means: Total Conservation Score

Group	n	Mean	Standard Deviation
Kindergarten	38		
boys	23	6.22	6.95
girls	15	6.80	6.95
Grade 1	36		
boys	16	16.94	8.16
girls	20	15.20	8.12
Grade 2	41		
boys	22	20.73	6.50
girls	19	18.63	7.62
Grade 3	37		
boys	17	22.24	7.08
girls	20	20.60	5.99

Table B - 5

Grade by Sex Anova Summary Table for Total Conservation Score

Effect	SSQ	df	MSQ	F	p
Sex	58.01	1	58.01	1.23	.29
Grade	5161.70	3	1720.57	33.44	.001
S X G	41.26	3	13.75	.27	.85
Residual	7409.10	144	51.45		
Total	12613.05	151	83.53		

Thus, the analyses conducted on the conservation score demonstrated that it is both internally consistent and a valid measure of cognitive development.

Parental Questionnaire

Weight status measures. All three scores derived from this section represent the mother's perceptions. These data are straight forward pieces of information, and thus do not require complex analyses to determine their reliability. Instead, all that is desired is a wide enough range of responses to allow the statistical comparison of parents of different weight categories. These results are summarized for the 51 mothers in Table B - 6. As can be seen in the table, there are both currently overweight parents and previously overweight mothers in the present sample. The sample sizes are also sufficient to compare the two groups using univariate analyses (Ferguson, 1981). Therefore, these data will allow further subdivision of the parent sample for analyses of both the child and parent data.

Attitude measures. The internal reliability of the two attitude scores was assessed by calculating Cronbach Alpha coefficients. The Cronbach alpha coefficient for the negativity score (.76) was acceptable for experimental measures (Walker, 1985). However, the alpha coefficient of the second score, internality/externality, was only .41. An exploration of the Cronbach alpha statistics for this score revealed that the reliability of this score can be increased to .51 by deleting one of the least correlated items (see

Table B - 6

Parental Weight Status Results

Item	Number of Mothers
Current Weight Status	
Normal weight	37
Underweight	0
Overweight	13
Obese	1
Past Weight Status	
Overweight	22
Not Overweight	29
Spouse's Weight Status	
Normal Weight	34
Underweight	2
Overweight	15
Obese	0

Table B - 7

Cronbach Alpha Statistics: Internality/Externality Score

Item	Item-Total Correlations	Alpha if Item Deleted
1	.24	.34
2	.36	.28
4	.14	.40
6	.26	.33
9	-.04	.51
10	.30	.30

Table B - 7). Since the deletion of a second item did not increase the reliability, and a great deal of variability would be lost if three of the original six items were deleted, the five item score was judged most appropriate. It was accepted for further analyses despite its limited internal consistency due its nearness to an acceptable level of reliability, and the exploratory nature of the present study.

Trait attribution measures. Cronbach alpha coefficients were also calculated between each of the three trait attribution scores and the items from which they were derived. The Cronbach alpha coefficients all met the .6 or .7 level of internal consistency Walker (1985) recommended for experimental measures. The coefficient for the number of positive traits attributed to the normal weight figure was .72. The coefficient for the number of negative traits attributed to the overweight figure was .69. Finally, the coefficient of the number of traits attributed to both figures was .80.

Appendix C

Rationales for the Selection of Statistical Analyses

A set of analyses was conducted on each variable to determine the most appropriate statistical techniques. This section summarizes the results of these analyses, and describes the selection of the statistical analyses reported in the results section.

Children's Weight Attitudes

Categorizing by Weight

A grade by sex analysis of variance would typically be the statistic of choice to determine grade and sex differences in one independent score. The suitability of the body responses score for univariate analysis was assessed by examining homogeneity of variance in each grade X sex cell using the Bartlett-Box F test. This test revealed heterogeneity of variance, F (13, 29891) = 3.23, p = .001. As a result, tests for univariate outliers and skewness or non-normality were carried out. Although there were no outliers, the variable was severely positively skewed (skewness = 1.36). The skewness coefficient was significantly different from the standard error for skewness with N = 244, z = 8.66, p < .001.

Tabachnick & Fidell (1983) state that the best procedure for correcting positive skewness is simple logarithmic transformation. Following this transformation the body responses score was relatively normally distributed, z = 2.84, N.S, and the variance because homogeneous between cells within groups, F (13, 29891) = 1.36, p N.S. Therefore, the transformed body responses score was judged appropriate for a univariate analysis of variance.

Trait Attributions

Manova. Once again, the desire to explore grade and sex differences in these variables suggests the need for an analysis of variance statistic. In order to determine whether each variable was suitable for this type of analysis, homogeneity of variance between cells in the design was examined. A Bartlett-Box F test revealed that the variance between grade X sex cells was homogeneous for the attribution of traits to both figures, F (13, 31904) = .84, p N.S., the attribution of positive traits to normal weight figures, F (13, 31904) = .83, p N.S., and the attribution of negative traits to overweight figures, F (13,31904) = .67, p N.S. Since the Bartlett-Box F test is also sensitive to normality violations (Tabachnick & Fidell, 1983), the variables were also judged to be normally distributed. Thus, all three variables were judged to be suitable for analysis.

In order to determine whether a univariate or multivariate approach was appropriate the relationships between the three variables were explored with Pearson product moment correlation coefficients. As can be seen in Table C - 1, the variables were highly correlated, reaching statistical significance with the Bonferroni's corrected test of significance. Correlations in excess of .80 might be considered to represent redundant variables; however, since it is not necessary to minimize the number of variables for an analysis of variance, none of the variables were eliminated on the grounds of redundancy. On the other hand, these

Table C - 1

Pearson Correlations for Trait Attribution Variables

Variables	PosNW	NegOW	Flexibility
PosNW	----	----	----
NegOW	.678*	----	----
Flexibility	-.815*	-.699*	----

Variable Names

PosNW = Number of positive traits attributed to the normal weight figure
NegOW = Number of negative traits attributed to the overweight figure
Flexibility = Number of traits attributed to both figures

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

correlations strongly suggest that conducting univariate analyses of variance on each variable would be misleading (Tabachnick & Fidell, 1983).

Therefore, the assumptions for the multivariate analysis of variance were assessed for these variables. Bartlett's test of Sphericity demonstrated that the three variables were strongly related enough to be entered in one analysis, F (3) = 402.58, $p < .001$. The determinant of the within cell correlation matrix was also sufficiently different from zero (.18) that multicollinearity or singularity was ruled out. Finally, although Box's M revealed mild heterogeneity of variance-covariance matrix, F (78, 42857) = 1.50, $p < .01$, Tabachnick & Fidell (1983) suggest that only a significance level of .001 be considered evidence of heterogeneity. Therefore, the three scores were judged suitable for a multivariate analysis of variance.

Despite the lack of significant heterogeneity, an attempt was made to eliminate all heterogeneity by testing for the presence of multivariate outliers. One multivariate outlier was discovered. A re-test of multivariate heterogeneity revealed some improvement following deletion of this subject, F (78, 42857) = 1.50, $p < .05$. Therefore, the sample size was 250 subjects for these analyses.

Post-manova techniques. Manova results are often explained by referring to the results of univariate analyses of the variables entered into the manova. However, the correlations between variables make interpretation of these

results suspect, and there are more rigorous ways of determining which variables contribute to the significant multivariate effects (Gabriel, 1979). The lack of a theoretical basis for ordering the entry of the three variables in the present study's analysis rules out the possibility of a step down analysis. In contrast, the use of a discriminant function analysis does not require entering the variables in any particular order, and the present study meets its required 10-20 subjects per variable (Tabachnick & Fidell, 1983). Therefore, a direct entry discriminant function analysis was chosen to determine which variables were responsible for each significant effect in the manova.

Analyses of traits attributed to both figures. The two new variables created for these analyses, the number of positive traits attributed to the normal weight figure and the number of negative traits attributed to the overweight figure, were examined to determine if they were suitable for a grade by sex analysis of variance. The results of Bartlett-Box F test of homogeneity of variance revealed that both variables were relatively normally distributed and the variance within each cell was relatively homogeneous, F (13, 31904) = .81, p N.S., F (13,31904) = .77, p N.S. Therefore, they were judged appropriate for analysis of variance statistics.

The choice of univariate versus multivariate statistics was made on the basis of the Pearson product moment correlation between the number of positive traits attributed to both figures and the number of negative traits attributed

to both figures (r = .63, $p < .001$). A correlation of this magnitude does not warrant the elimination of one score, but suggests that the scores be analyzed multivariately.

Three tests were conducted on data from all 251 subjects to determine if these variables were appropriate for a multivariate analysis of variance. Box's M, a multivariate test of homogeneity of variance indicated homogeneity, F (39, 79676) = .80, p N.S. Bartlett's test of sphericity indicated a strong enough inter-relationship between variables, F (1) = 115.44, $p < .001$. Finally, the determinant of the within cells correlation matrix was greater than zero (.61) indicating a lack of multicollinearity. Therefore, a multivariate analysis of variance (N = 251) was selected for the analysis of these results. The decision to follow the significant multivariate grade effect with a direct entry discriminant function analysis was made on the same basis as previously described.

Preferences

The selection of a statistical analysis for the three variables derived from the preference measure and the one variable derived from the affiliation-preference measure is restricted by their limited four point ranges. Such a restricted range of scores makes the selection of any type of analysis of variance questionable. However, these data are suitable for Chi Square analyses. First, the scores are essentially frequency counts. Secondly, the cells in a grade or sex analysis would be independent of each other. Thirdly, the sample size is sufficient that the expected values in each

cell are in excess of a value of 5. Finally, theory and previous pilot research suggest there is no reason to expect any interactions in these data. This fact was informally confirmed by running a grade by sex analysis of variance on each variable. Therefore, the grade and sex variables in the design were examined with Chi Square analyses.

Predicting Children's Weight Attitudes

Several analyses were conducted to determine the appropriateness of a regression design to address the hypotheses regarding the factors contributing to the development of attitudes about weight. First, the relationship between the potential independent and dependent sets of variables was explored using canonical correlation. One significant variate was extracted, X^2 (56) = 87.48, $p < .01$. The shared variance between the two sets of variables was 85.64%. In other words, one set of variables may be used to predict the other in a regression design. The canonical correlation coefficients are presented in Table C - 2.

Specific independent and dependent variables were selected for inclusion in the analyses designed to determine the factors affecting children's attitudes about weight (see Appendix H for a discussion of the rationale for variable selection and the design of individual regression equations). In order to determine the suitability of these data for regression analyses, a number of correlational analyses were undertaken. First, previous analyses indicated appropriately small relationships between the four dependent variables (see

Table C - 2

Canonical Correlation Results

	Canonical Coefficients
Dependent Variables	
Body responses	-.001
Prop-based	.10
UW over OW	-.69
Flexibility	.15
Independent Variables	
Conservation	-.43
Mother's Weight Status	-.75
Father's Weight Status	.16
Mother's Past Weight Status	-.62
Negativity Score	-.15
Internality/Externality Score	-.34
Mother's Flexibility	-.40

Child Attitude Variable Names

Body Responses = Number of matches on the basis of weight

Flexibility = Number of traits attributed to both figures

UW over OW = Number of underweight choices in the underweight/overweight preference selection task

Prop-based = Number of prop-based choices of playmates on the affiliation-preference task

Table C - 3

Child Attitude and Conservation Correlations

	N	Total Conservation Score
Child Attitude Variables		
Body Responses	141	-.29*
Prop-based	150	.17
UW over OW	150	.03
Flexibility	147	.18

Variable Names

Body Responses = Number of matches on the basis of weight

Flexibility = Number of traits attributed to both figures

UW over OW = Number of underweight choices in the underweight/overweight preference selection task

Prop-based = Number of prop-based choices of playmates in the affiliation-preference task

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

Appendix D). Furthermore, there were sufficiently strong relationships between the dependent and independent variables (see Tables C - 3 and C - 4). As can be seen in Table C - 3, the transformed body responses score from the Body Salience task was significantly correlated with the child's conservation score. Trends toward significant correlations were also found between conservation and the flexibility score from the trait attribution task and the number of prop-based affiliation-preferences from the Affiliation-Preference task.

There were no truly significant relationships between the parent variables and children's weight attitudes using Bonferroni's alpha level (see Table C - 4). However, there were a number of trends toward significance: the number of prop-based affiliation preferences was negatively related to maternal internality/externality and flexibility scores. Finally, there was also a negative trend in the child's tendency to prefer normal weight figures over overweight figures and the mother's externality score.

Taken together, these correlational analyses suggest that the variables in the present study are appropriate for regression analyses designed to predict the child attitude variables from the independent variables. However, it is also necessary to further demonstrate that the particular regressions conducted on these data are reliable and interpretable. Therefore, each of the regressions was examined to determine if it met the multi-variate assumptions of normality, linearity, homoscedasticity and the absence of

Table C - 4

Child Attitude Variables and Parent Variables (n=48 or 51)

	Parent Variables					
	Neg	Int/Ext	Flex	Weight	SpWt	PtWt
Child Attitude Variables						
Body Responses	.18	-.12	-.26	.18	.26	.09
Prop-based	.03	-.34	-.32	.03	-.05	-.03
UW/OW	.00	.04	-.11	-.14	-.15	-.07
Flexibility	-.12	.01	.06	-.05	-.03	-.13

Variable Names

Body Responses = Number of matches on the basis of weight
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
Prop-based = Number of prop-based choices of playmates on the affiliation-preference task
Neg = Mother's Negativity Score
Int/Ext = Mother's Internality/Externality Score
Flex = Mother's Flexibility Score
Weight = Mother's present weight status
SpWt = Father's present weight status
PtWt = Mother's past weight status

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

multivariate outliers. The residuals were plotted, and in each case the scattergrams indicated that the assumptions had been satisfied. No outliers were detected. As a result, it was concluded that the particular regressions designed for the present study were appropriate for interpretation.

Appendix D

Correlations Between Measures

Table D - 1

Inter-correlations Between Body Salience and Other Child Attitude Variables

Variables	Body Responses Score Coefficient	Significance
Trait Attribution		
NegOW	-.03	.69
PosNW	.10	.13
Flexibility	-.07	.28
Preference		
UW over OW	.00	.96
NW over OW	-.05	.42
NW over UW	-.11	.10
Affiliation-Preference		
Prop-based	.03	.63

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
NW over OW = Number of normal weight choices in the normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

Table D - 2

Inter-correlations Between Trait Attribution Variables and Other Child Attitude Variables

Variables	Trait Attribution Variables		
	NegOW	PosNW	Flexibility
Body Salience			
Body Responses	-.03	.10	-.07
Preference			
UW over OW	.07	.08	-.04
NW over OW	-.01	.06	-.05
NW over UW	-.03	-.09	.09
Affiliation-Preference			
Prop-based	-.01	-.03	.01

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
NW over OW = Number of normal weight choices in the normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

Table D - 3

Inter-correlations Between Affiliation-Preference Variables and Other Child Attitude Variables

Variables	Affiliation-Preference Variables Prop-based
Body Salience	
Body Responses	.03
Trait Attribution	
NegOW	-.01
PosNW	-.03
Flexibility	.01
Preference	
UW over OW	-.16
NW over OW	-.17
NW over UW	-.09

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
NW over OW = Number of normal weight choices in the normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

Table D - 4

Inter-correlations Between Preference Variables and Other Child Attitude Variables

Variables	Preference Variables		
	UW over OW	NW over OW	NW over UW
Body Salience			
Body Responses	.001	-.05	-.11
Trait Attribution			
NegOW	.07	-.01	-.03
PosNW	.08	.06	-.09
Flexibility	-.04	-.05	.01
Affiliation-Preference			
Prop-based	-.16	-.17	-.09

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
NW over OW = Number of normal weight choices in the normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

Bonferroni-adjusted Significance Levels

* .05
** .01
*** .001

Appendix E

Statistical Tables for Categorizing By Weight Results

Table E - 1

Analysis of Variance Summary Table for Transformed Body Responses Score

Source	SSQ	df	MS	F	p
Sex	.32	1	.32	2.36	.13
Grade	7.42	6	1.24	9.01	.001
S X G	.86	6	.14	1.04	.40
Residual	31.54	230	.14		
Total	40.13	243	.17		

Appendix F

Statistical Tables for Preference Results

Table F - 1

Mean Number of Underweight Choices in an UW over OW Preference Selection Task

Group	n	Mean	Standard deviation
Kindergarten	39	1.56	1.07
boys	23	1.65	1.07
girls	16	1.44	1.09
Grade 1	34	1.82	1.09
boys	16	1.50	1.15
girls	18	2.11	.96
Grade 2	41	1.49	1.19
boys	22	1.18	1.18
girls	19	1.84	1.12
Grade 3	37	1.86	.95
boys	17	1.76	1.03
girls	20	1.95	.89
Grade 4	37	1.81	1.08
boys	16	1.75	1.06
girls	21	1.86	1.11
Grade 5	32	1.31	.90
boys	19	1.21	.92
girls	13	1.46	.88
Grade 6	34	1.44	.86
boys	14	1.29	.73
girls	20	1.55	.94

Table F - 2

Mean Number of Normal Weight Choices in a NW over OW Preference Selection Task

Group	n	Mean	Standard deviation
Kindergarten	39	1.74	1.02
boys	23	1.78	1.00
girls	16	1.69	1.08
Grade 1	34	2.00	1.10
boys	16	1.88	1.20
girls	18	2.11	1.02
Grade 2	41	2.07	1.06
boys	22	1.77	1.19
girls	19	2.42	.77
Grade 3	37	2.05	.97
boys	17	1.59	1.00
girls	20	2.45	.76
Grade 4	37	1.92	.92
boys	16	1.50	.89
girls	21	2.24	.83
Grade 5	32	1.91	.92
boys	19	1.68	.89
girls	13	2.23	.83
Grade 6	34	2.09	.87
boys	14	2.07	.92
girls	20	2.10	.85

Table F - 3

Mean Number of Normal Weight Choices in a NW over UW Preference Selection Task

Group	n	Mean	Standard deviation
Kindergarten	39	1.67	.90
boys	23	1.65	.93
girls	16	1.69	.87
Grade 1	34	1.88	.95
boys	16	2.25	1.00
girls	18	1.56	.78
Grade 2	41	2.22	.99
boys	22	2.50	.91
girls	19	1.89	.99
Grade 3	37	2.16	.99
boys	17	2.00	1.06
girls	20	2.30	.92
Grade 4	37	2.38	.89
boys	16	2.69	1.06
girls	21	2.14	.92
Grade 5	32	2.31	.90
boys	19	2.32	.89
girls	13	2.31	.95
Grade 6	34	2.38	.74
boys	14	2.36	.84
girls	20	2.40	.68

Table F$_c$ - 4

Grade by Sex Means for Prop-based Affiliation-Preference Choices

Group	n	Mean	Standard deviation
Kindergarten	39	2.26	.97
boys	23	2.09	1.00
girls	16	2.50	.89
Grade 1	34	2.44	1.02
boys	16	2.75	.77
girls	18	2.17	1.15
Grade 2	41	2.44	1.02
boys	22	2.59	.73
girls	19	2.26	.93
Grade 3	37	2.62	.79
boys	17	2.47	.94
girls	20	2.75	.64
Grade 4	37	2.35	.89
boys	16	2.38	.81
girls	21	2.33	.97
Grade 5	32	2.56	.72
boys	19	2.74	.56
girls	13	2.31	.85
Grade 6	34	2.29	.84
boys	14	2.29	.83
girls	20	2.30	.86

Appendix G

Statistical Tables for Trait Attribution Results

Table G - 1

Summary Table of Grade by Sex Manova on Trait Attribution Variables

Effect	Pillais	SS	MS	F	df	p
Grade:						
All variables	.24	--	--	3.46	18,708	.000
NegOW	--	32.70	5.45	1.40	6,236	.220
PosNW	--	306.89	51.15	6.56	6,236	.000
Flexibility	--	728.15	121.36	4.84	6,236	.000
Sex:						
All variables	.04	--	--	3.27	3,234	.020
NegOW	--	.02	.02	.01	1,236	.940
PosNW	--	42.22	42.22	5.42	1,236	.020
Flexibility	--	20.72	20.72	.83	1,236	.360
Grade X Sex:						
All Variables	.05	--	--	.65	18,708	.860
NegOW	--	9.53	1.59	.41	6,236	.870
PosNW	--	7.17	1.19	.16	6,236	.990
Flexibility	--	68.45	11.41	.46	6,236	.840

Variable Names

NegOW = number of negative items to overweight figure
PosNW = number of positive items to normal weight figure
Flexibility = number of traits sorted to both figures

Table G - 2

Statistics From The Direct Discriminant Function by Sex: Variable-Function Correlations, F to Enter, Wilk's Lambda and its Significance Level for Each Variable

Variable	Variable-Function Correlation	F to enter	Wilk's Lambda	Significance
PosNW	.73	4.86	.98	.02
Flexibility	-.29	.77	1.00	.38
NegOW	-.02	.01	1.00	.94

Variable Names

NegOW = number of negative items to overweight figure
PosNW = number of positive items to normal weight figure
Flexibility = number of traits sorted to both figures

Table G - 3

Statistics From The Direct Discriminant Function by Grade: Variable-Function Correlations, F to Enter, Wilk's Lambda and its Significance Level for Each Variable

Variable	Variable-Function Correlation	F to enter	Wilk's Lambda	Significance
PosNW	-.85	6.83	.86	.00
Flexibility	.74	4.99	.89	.00
NegOW	-.20	1.43	.97	.21

Variable Names

NegOW = number of negative items to overweight figure
PosNW = number of positive items to normal weight figure
Flexibility = number of traits sorted to both figures

Table G - 4

Manova Summary Table: Traits Attributed to Both Figures

Effect	Pillais	SS	MS	F	df	p
Grade:						
All variables	.17	--	--	3.74	12,474	.001
Positive	---	349.53	58.25	5.47	6,237	.001
Negative	---	95.42	15.90	3.11	6,237	.010
Sex:						
All variables	.02	--	--	2.09	2,236	.126
Positive	---	24.41	24.41	2.29	1,237	.132
Negative	---	.10	.10	.02	1,237	.888
Grade X Sex:						
All Variables	.02	--	--	.45	12,474	.940
Positive	---	14.33	2.39	.22	6,237	.969
Negative	---	23.82	3.97	.78	6,237	.590

Table G - 5

Statistics From The Direct Discriminant Function on the number of Negative and Positive Traits Attributed to Both Figures

Variable	Variable-Function Correlation	F to enter	Wilk's Lambda	Significance
Positive	.99	5.72	.88	.001
Negative	.51	3.13	.93	.006

Appendix H

Detailed Discussion of the Variable Selection and Design for the Regressions

Selection of Variables for Regression Analyses

One of the goals of the present study was to explore the effect of the child's level of conservation and various parental factors on the development of their attitudes about weight. Therefore, all seven possible independent or predictor variables were used in the regression analyses. However, the selection of dependent variables was made on the basis of several analyses. While predicting each of the eight dependent variables independently is possible since none were correlated to the point of redundancy, a more parsimonious approach was sought. The possibility that these eight dependent variables may be grouped into a few general factors was explored with a principle components analysis. These data were judged suitable for such an analysis because there were no univariate outliers, the variables were normally distributed, the sample size (n=239) was adequate, and there were several correlations over .30.

Both varimax (orthogonal factors) and oblique (correlated factors) rotations were carried out in order to rule out correlations between the factors and to compare the results. One significant correlation between two factors was discovered, $r = .22$, $p < .01$. However, since both types of rotation yielded identical variable loading patterns on four factors, and oblique rotations are more difficult to interpret, the varimax rotation was interpreted.

The factor structure derived from the varimax rotation was judged to be relatively stable. First, eigenvalues above

1.0 for each factor suggested the absence of multi-collinearity. In addition, similar eigenvalues in the rotated and unrotated solutions suggested stability. Finally, the communality scores for each variable were all high enough to each indicate consistency across factors. These results are presented in Tables H - 1 and H - 2.

The presence of four factors roughly corresponding to the four measures was confirmed (see Table H - 3). The total amount of variance explained by the four factors was 74.9%. The first factor accounted for 29.9% of the variance. High loadings were obtained for flexibility, the number of positive traits attributed to the normal weight figure, and the number of negative traits attributed to the overweight figure. The second factor accounted for 17.6% of the variance. The two variables which loaded heaviest on this factor were the underweight/overweight and normal weight/underweight Preference task choices. The third factor accounted for 14.3% of the variance. High loadings were obtained for the number of normal weight over overweight choices on the Preference task and the number of prop-based affiliation-preferences. The final factor accounted for 13.1% of the variance. The only variable which loaded heavily on it was the body responses score.

The presence of four general factors suggests that predicting each of the eight variables in turn would be redundant. However, predicting the four factor scores was ruled out because too much information would be lost through

Table H - 1

Reliability of Variables in the Principle Components Analysis

Variables	Communality	
	Unrotated	Rotated
Body Responses	.88	.88
Affil-Pref	.83	.83
UW/OW	.68	.68
NW/OW	.51	.51
NW/UW	.69	.69
Flexibility	.87	.87
PosNW	.85	.85
NegOW	.76	.76

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
NW over OW = Number of normal weight choices in the normal weight/overweight preference selection task
NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

Table H - 2

Reliability of Factors Derived from Varimax Principle Components Analysis

Factors	Solutions			
	Unrotated		Rotated	
	Eigenvalue	% Variance	Eigenvalue	% Variance
Factor 1	2.50	31.2	2.39	29.9
Factor 2	1.57	19.6	1.41	17.6
Factor 3	1.09	13.7	1.14	14.3
Factor 4	.89	11.2	1.05	13.1

Table H - 3

Factor Matrix from Varimax Principle Components Analysis

Variables	Factors			
	1	2	3	4
Body Responses	-.04092	.06991	-.01489	.93555
Prop-based	-.00976	.00881	.90223	-.10806
UW over OW	.04488	.78475	-.21785	-.10802
NW over OW	.01976	.39693	-.51881	-.28457
NW over UW	-.03929	-.79078	-.09231	-.22686
Flexibility	-.93092	-.05091	.01452	.08767
PosNW	.91119	.06698	-.05259	.08767
NegOW	.86567	-.00605	.03148	-.07901

Variable Names

Body Responses = Number of matches on the basis of weight
NegOW = Number of negative traits attributed to overweight figure
PosNW = Number of positive traits attributed to normal weight figure
Flexibility = Number of traits attributed to both figures
UW over OW = Number of underweight choices in the underweight/overweight preference selection task
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NW over UW = Number of normal weight choices in the normal weight/underweight preference selection task
Prop-based = Number of prop-based choices of playmate

combining variables. Therefore, the highest loading score on each factor was simply considered representative of the factor, and only these four strongest variables were predicted.

Designing the Regressions

The regression analyses were also designed to meet the goals of the study and to conform to the statistical restrictions on these analyses (Tabachnick & Fidell, 1983).

Relationships between the predictor variables were examined to determine how these variables could be combined to predict children's weight attitudes (see Table H - 4). One goal of the study was to identify the unique effects of cognitive level and parent variables on children's weight attitudes. As can be seen in the table, there were no significant correlations between the parent and conservation variables. Therefore, separate direct regressions predicting the four child weight attitude variables from conservation alone and parent variables alone was judged to be an appropriate way of meeting this goal.

However, a second goal of the present study was to compare the relative effects of conservation and parent variables. The absence of high Pearson product moment correlations between the conservation and parent variables was also taken to indicate that combining all the predictors in one analysis would not yield a set of redundant predictors. Therefore, the relative importance of both child cognitive and parent variables in predicting child attitudes are determined

Table H - 4

Conservation and Parent Variable Correlations

Parent Variables	Total Conservation Score
Negativity	-.12
Externality	-.10
Flexibility	.06
Mother's weight	-.21
Father's weight	-.15
Mother's past weight	-.32

by combining both types of predictors in one direct regression.

Although there were no significant relationships between conservation and the parent variables, the existence of interactions between predictors was possible. Since there was no theoretical basis for expecting particular interactions, every possible two way interaction was modelled in to a preliminary regression including conservation and all the parent variables. Very few significant interactions were found. Those which had significant t values in the preliminary regressions were included as predictors in the final regressions. Interactions were added to the regressions in a second block after the original variables (Tabachnick & Fidell, 1983).

The final consideration regarding the design of regressions was that there be at least five times as many subjects as variables (Tabachnick & Fidell, 1983). There were different sample sizes depending on the measures included in a regression. However, regressions using only conservation to predict each child attitude variable, and those using only the six parent variables, were well within the requirement of five subjects per variable. The regressions using all 7 parent variables and conservation was problematic. Two variables had to be eliminated from these analyses in order to meet the minimum ratio. In order to identify dispensable variables, a preliminary regression including all significant interactions, conservation and the six parent variables was conducted. The

two least predictive parent variables were discarded, and only the five most useful variables were included in final regression.