

DOMINANCE: AN OBJECTIVE MEASURE
IN PRESCHOOLERS

By

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CHAPTER I

STATEMENT OF THE PROBLEM

Social concern relating to the roles and behaviors of females and males has rapidly developed during the past decade. Because of this awareness concerning female and male differences, academicians have directed their attention to this area of study. Psychology has reflected this awareness through an increased focus upon research dealing with the psychology of sex differences.

The focus of the present proposal is an examination of the behavior of dominance and possible sex differences relating to that behavior. Dominance, in the present study will be operationally defined as time needed to complete the experimental task and amount of M & Ms taken in the present experimental situation. In the literature one can find studies examining dominance; however, there are problems inherent in previous research. First, there are problems with the methodologies used: the majority of the studies utilize observational measures of the behavior. One can question the objectivity of such measures. Maccoby and Jacklin (1974) deal extensively with the topic of the difficulty of using raters in sex differences research. The authors point out that often raters "see" more or less stereotypic behaviors in an experimental situation than these behaviors actually occur. Biases can act in a negative or positive fashion. Obviously, since the sex of the subject cannot be hidden from observation, raters may notice behavior that is

contrary to what is sexually appropriate. Other raters will compare a subject only against others of his or her sex, leading to statements such as: "For a girl, she is very aggressive." Such biases in observational measurement do little to advance our knowledge of sexual differentiation, and clearly point to the need for objective measures. Secondly, with previous research, most measures of dominance give single independent scores to each subject, reflecting in essence, an absence of the importance of the social interactive nature of dominance. In an article published in a book dealing with the psychology of women, Weisstein (1976) points out a specific new direction that psychological theory and research should take. Citing classical studies in which social context plays a major and distinctive role, and in which behavior is clearly dependent, Weisstein concludes that the psychology of "inner traits" is becoming obsolete. She states that:

. . . one must understand the social conditions under which humans live if one is going to attempt to explain their behavior . . . Until psychologists begin to respect evidence and until they begin looking at the social context within which people move, psychology will have nothing of substance to offer in this task of discovery (p. 102-3).

The purpose of the present investigation, therefore, is to measure dominance in a social interactive situation. Dominance is defined and then operationalized in such a fashion that the following two requirements are taken into account: 1. The measure will be objectified. A technique will be used in defining, describing and delineating behaviors that will not bias the measurement on the basis of sex. The method is one that is less contaminated by culture or social reinforcement of sexually appropriate behaviors than observational measures. 2. Behavior will be measured in an interactive situation. Within this framework of social context, the proposed technique cannot and does not desire to

split that which cannot be split. In a situation with two interacting individuals, a measure reflecting the dominance of both individuals will be used. It is impossible to break down the effects of both people hoping the sum of the scores will equal the whole.

In conclusion, it is believed that the proposed methodology will eliminate many of the problems mentioned above which plague research in this area. By introducing a new and sound methodology, it is hoped that knowledge will be gained related to the issue of sex differences in dominance which, in addition, will serve as a model for investigating sex differences related to other behaviors.

CHAPTER II

REVIEW OF THE LITERATURE

Inspection of the literature related to the measurement of dominance in preschoolers yields a wide variety of measurement techniques with underlying conflicting definitions. Dominance can be defined as directing others, toughness, manipulative abilities, aggression, a combination of all these definitions, and possibly others. Using a simplistic definition of dominance, leadership in a natural nursery school setting, Parten (1933) found no sex differences among four-year-olds who were observed during free play. Anderson (1937), utilized a multiple definition of dominance, the definition including such behaviors as verbal demands to secure materials, forceful attempts to secure materials and success in securing materials. He then measured the interaction patterns of the preschoolers when placed with same and opposite sex pairs. His findings were as follows: Girls, when paired with other girls were significantly more dominative than all boy pairs; no significant differences were found with cross sex pairs. Dominance, as measured in this study, did not correlate with mental age, or weight, but related significantly with height. Using a similar technique, Anderson (1939) found kindergarten boys were more dominant than kindergarten girls across situations.

Other researchers have examined dominance using hierarchies. Hanfmann (1935) used a method of paired comparisons in kindergarteners

to develop a dominance hierarchy. He observed pairs of children playing freely with colored blocks. The four children who ranked highest in dominance as rated by observers were found to actively control all the other children. Hanfmann defined the four highest positions as "the destroyer", "gangster", "social leader", and "objective leader", these being stable social positions within the kindergarten. Unfortunately, the data were not analysed for sex differences. Unlike Hanfmann (1935), Gellert (1962) did not find a stable social order for four-and five-year-olds. Gellert defined dominance as attempts to direct behavior or to take the lead in play. He found the ratings by trained observers varies as a function of the child's play partner. When interacting, the dominant behavior of one child tended to increase as the dominance status of his/her partner decreased. Significant correspondance was found between dominance observed in an experimental situation and that indicated by teachers' ratings of dominance. This finding implies that casual observation and experimental observation retrieve similar data concerning dominance, yet in this study no objective measures were related to the two observational techniques employed. The conflicting results presented above would indicate that the dominance hierarchy is not a defined phenomenon for a stable social structure for preschoolers.

An issue to be raised here is the distinct possibility that in some studies dominance is confounded conceptually with aggression. As these two types of social interactions often bring about a similar end, control, they may be confused with one another. Maccoby and Jacklin (1974) cite aggression as one of the four sex differences that has been fairly well established in research.

Boys are more aggressive both physically and verbally.

They show attenuated forms of aggression (mock-fighting, aggressive fantasies) as well as the direct forms more frequently than girls. The sex difference is found as early as social play begins— at ages 2 or $2\frac{1}{2}$ (p. 352).

Whether sex differences can be found in dominance, however, is still classified as an open question, according to Maccoby and Jacklin (1974). The literature reviewed by them reveals no consistent findings with regard to sex differences in dominance. Contradictory evidence can be attributable to the following: a) The varying theoretical definitions of dominance, b) The use of differing techniques, and c) The possibility of confounding dominance with other dimensions of behavior such as aggression.

More recent studies have introduced multidimensional variables in their observation of dominance. Baumrind and Black (1967) employed a pair of psychologists to observe and rate four- and five-year-olds on a multitude of variables: uses vs has mind of own, bullies vs avoids, managerial and bossy vs tactful and modest, permits self to be dominated vs will not submit. Utilizing a Q sort, no sex differences were found. Although this study reflects the many possible manifestations of dominant behavior, it is difficult to extrapolate what truly happens with interacting children because of the complexity of the dependent variables. Some cross-cultural work has been performed examining sex differences in dominance, the most extensive one being Whiting and Pope (1973). They examined the ratings made by observers of children aged three to eleven in order to investigate the validity of several stereotypes related to sex differences in behavior. Their results indicated that both boys and girls aged three to six showed equal compliance to prosocial (changing behavior in a way as to meet or serve the welfare of the group) dominance and to egoistic (changing behavior in a way to meet

another's own egoistic desires) dominance. The authors found egoistic dominance more frequently in boys and girls in the three to six age group, but no sex differences in the seven to eleven age group. Pro-social dominant behavior was not compared in this fashion. A problem with this study and many others mentioned here is the assignment to each child of an absolute value, independent "score" of dominance. Experience leads us to believe that a particular behavior is, in part, a reflection of the situation in which the person finds himself and not an independent, individualized measure of the behavior. The need is seen for use of a measure that reflects the interactive nature of dominance—the total effect of children dominating and willingness to be dominated in a certain social situation.

To summarize the above literature is difficult. The reported results seem dependent upon the operational definitions of dominance. Many results from multidimensional definitions are complex and difficult to interpret. What the literature lacks can be summarized easily. a) There is a notable absence of experimental techniques of measurement. As stated previously, objective measures in the study of sex differences are desperately needed. b) There is a lack of social interactive measures. Clearly, dominance studies use pairs of subjects, but each child receives a separate and individual score. If psychology is to seriously consider social context as an important variable, the measurements of research must reflect this.

A study utilizing experimental measures in a social interaction situation was performed by Green-Nealey and Novak (1976). Using a measure of dominance developed with subhuman primates by Harlow and Yudin (1936), Green-Nealey and Novak looked at the dominance relationship

between two preschoolers in two competitive situations. Each child was paired with two other children and the pair was confronted with first two then three bowls of M & Ms, each child being told s/he could take as many M & Ms as s/he wanted. The dependent measures utilized in this study were total amounts of M & Ms each child received as well as a latency measure, the time it took for each pair to take all the M & Ms. Note that this latter measure is determined by the social interactive behavior of the pair and therefore, the pair receives one score, while the former is the individual measure. For comparison purposes, teacher's ratings on seven dominance measures were also obtained.

For only one teacher's rating were sex differences established. Females were rated higher on passive dominance (Appendix A contains the observational instrument used in the present study as well as definitions of all observational variables employed). Findings for the experimental measures were as follows: No significant relationships were found for the amount measure, but compared to male pairs, female pairs have shorter latencies (are more dominant) but only for the three-bowl situation. Potential confounding may have taken place, however, it is not clear whether the three-bowl situation is inherently more competitive or if some other factor, such as adjustment to the experimental situation was effective here. The latency measure was also found to correlate with three of the teacher's ratings. High dominance ratings on positive verbal dominance, negative verbal dominance, and tease showed a significant relationship with low latencies (high dominance) in all experimental situations, except one.

This previous study indicated that dominance can be defined experimentally in an objective fashion. Interestingly, what the authors

considered to be a measure of dominance (amount of M & Ms) did not reflect the discriminatory capacity of a social interactive measure (latency) and did not prove to discriminate significantly among children or between sexes. It would appear, therefore, that a measure of dominance defined in an objective fashion, reflecting the interpersonal essence intrinsic to the behavior of dominance itself, can be utilized to examine a possible sex difference.

The proposed study is an attempt to expand on the findings of Green-Nealey and Novak. Because the former study's primary purpose was exploratory in nature, an original attempt at objectifying dominance in preschoolers, the author feels that replication, with expansion and control of important variables is necessary. Therefore, the proposed study incorporates the following major points: 1. Control of the three-bowl, second pairing situation and 2. Each child being randomly paired with three other children. Hypotheses to be tested are the following: 1. No sex differences will be found in cross-sex pairs, but all female pairs will be more dominant, have shorter latencies, than all male pairs. 2. Teacher's ratings will discriminate on the basis of sex, that is, teachers will rate differentially by sex each characteristic on the rating scale. 3. Three of the ratings will be related to high dominance in the experimental situation. These are : positive and negative verbal dominance, and tease. 4. Age trends will be present in that data. That is, the three-year-olds, four-year-olds and five-year-olds groups will differ from each other.

In conclusion, the present study will be an important step forward in objectifying dominance in preschoolers. More broadly, however, the research dictates what hopefully will be the trend of psychological

studies of the future, namely, an increased importance in objective measures together with social context playing a major and determining role in human interactions.

CHAPTER III

METHOD

Subjects

Sixteen three-year-olds (eight males, eight females, mean age = 43.93 months), sixteen four-year-olds (seven females, nine males, mean age = 55.31 months) and ten five-year-olds (four females, six males, mean age = 59.00 months) were used as subjects. All children were currently enrolled in the Oklahoma State University Child Laboratories. These children were on a waiting list for approximately three years. The population was mainly white middle-class. The laboratory assistants were approached and agreed to the present methodology. Consent of the parents of the children was obtained prior to initiation of experimentation.

Procedure

Each child was randomly paired, through use of a table of random numbers, with one other child from his/her age group a total of three times. For each pairing, the children were taken to a separate room in the nursery school in order to minimize distractions. The pair of children were told to stand in front of two cups placed on a child-sized table. At this point, the experimenter told the pair:

Let's pretend I've invited you to a party! This party is different from other parties you have been to because I'm going to put some bowls of M & Ms in front of you and you

can take as many M & Ms as you wish. There is only one rule at this party. You cannot eat any M & Ms now. You must place all of your M & Ms in the cup you have in front of you. After the party, you may take all of your M & Ms home. Remember, you may not eat any M & Ms now — but, you may take as many M & Ms as you like.

At this point, the experimenter placed either two bowls (15 M & Ms in each) or three bowls (15 M & Ms in the side bowls, with 30 in the bowl forming the apex of the triangle) depending on the randomly assigned condition obtained from a table of random numbers. The bowls were equidistant from both children. Timing began immediately after the bowls were placed on the table and continued until all the M & Ms were placed in the children's cups. At this point the experimenter said: "You both played this game very well! Let's put each of your M & Ms into a bag with your name on it." The experimenter then counted and recorded the M & Ms for each child, together with the time measurement, for the pair. The experimenter then said: "Because you each played this game so well, let's play it again! Remember, you may take as many M & Ms as you wish, but put them into your own cup. Don't eat any now, let's save them for later." At this point, the experimenter placed either the two or three bowls of M & Ms on the table, depending on the number that had not been used in the previous situation. Each pair, therefore, received both conditions, the order of presentation being randomized. The same recording and counting procedure followed. The experimenter then measured both the height and arm length of the two children.

Four female teachers from each laboratory (one graduate head teacher, one graduate assistant, and two undergraduate assistants) were asked to fill out a rating sheet for each child. This sheet consisted of seven items in which the teacher was asked to rank each child on a continuum of "always" to "never" (See Appendix A).

CHAPTER IV

RESULTS

The independent variables were:

1. Age of subject in months (AGE)
2. Age group of subject (GRP)
3. Sex of subject (SEX)
4. Arm length of subject in inches (ARM)
5. Height of subject in inches (HGT)
6. Sex of partner in trials 1 and 2 (ST1)
7. Number of bowls presented in trial 1 (BT1)
8. Number of bowls presented in trial 2 (BT2)
9. Sex of partner in trials 3 and 4 (ST3)
10. Number of bowls presented in trial 3 (BT3)
11. Number of bowls presented in trial 4 (BT4)
12. Sex of partner in trials 5 and 6 (ST5)
13. Number of bowls presented in trial 5 (BT5)
14. Number of bowls presented in trial 6 (BT6)
15. Teacher #1 rating of subjects on physical dominance (PD1)
16. Teacher #2 rating of subjects on physical dominance (PD2)
17. Teacher #3 rating of subjects on physical dominance (PD3)
18. Teacher #4 rating of subjects on physical dominance (PD4)
19. Teacher #1 rating of subjects on positive verbal dominance (PV1)
20. Teacher #2 rating of subjects on positive verbal dominance (PV2)
21. Teacher #3 rating of subjects on positive verbal dominance (PV3)
22. Teacher #4 rating of subjects on positive verbal dominance (PV4)
23. Teacher #1 rating of subjects on negative verbal dominance (NV1)
24. Teacher #2 rating of subjects on negative verbal dominance (NV2)
25. Teacher #3 rating of subjects on negative verbal dominance (NV3)
26. Teacher #4 rating of subjects on negative verbal dominance (NV4)
27. Teacher #1 rating of subjects on boast (BO1)
28. Teacher #2 rating of subjects on boast (BO2)

29. Teacher #3 rating of subjects on boast (BO3)
30. Teacher #4 rating of subjects on boast (BO4)
31. Teacher #1 rating of subjects on tease (TE1)
32. Teacher #2 rating of subjects on tease (TE2)
33. Teacher #3 rating of subjects on tease (TE3)
34. Teacher #4 rating of subjects on tease (TE4)
35. Teacher #1 rating of subjects on passive dominance (PA1)
36. Teacher #2 rating of subjects on passive dominance (PA2)
37. Teacher #3 rating of subjects on passive dominance (PA3)
38. Teacher #4 rating of subjects on passive dominance (PA4)
39. Teacher #1 rating of subjects on "crying" (CR1)
40. Teacher #2 rating of subjects on "crying" (CR2)
41. Teacher #3 rating of subjects on "crying" (CR3)
42. Teacher #4 rating of subjects on "crying" (CR4)

The dependent measures were:

1. Amount of M & Ms taken by each subject in trial #1 (AT1)
2. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #1 (TT1)
3. Amount of M & Ms taken by each subject in trial #2 (AT2)
4. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #2 (TT2)
5. Amount of M & Ms taken by each subject in trial #3 (AT3)
6. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #3 (TT3)
7. Amount of M & Ms taken by each subject in trial #4 (AT4)
8. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #4 (TT4)
9. Amount of M & Ms taken by each subject in trial #5 (AT5)
10. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #5 (TT5)
11. Amount of M & Ms taken by each subject in trial #6 (AT6)
12. Time in seconds taken by each pair of subjects to retrieve all of the M & Ms in trial #6 (TT6)
13. Amount taken for each subject across all 2 bowl situations (AB2)
14. Total time across all 2 bowl situations (TB2)
15. Amount taken for each subject across all 3 bowl situations (AB3)
16. Total time across all 3 bowl situations (TB3)

(See Table I for summary of all means and standard deviations for all variables.)

The Pearson Product-Moment Correlation was utilized to assess the relationship among the following variables:

TABLE I
MEANS AND STANDARD DEVIATIONS FOR ALL VARIABLES

| Variable | Mean | Standard Deviation |
|----------|--------|--------------------|
| AGE | 51.880 | 7.591 |
| ARM | 16.310 | 1.137 |
| HGT | 42.429 | 2.026 |
| ST1 | 1.452 | 0.504 |
| AT1 | 22.143 | 10.513 |
| TT1 | 41.620 | 22.237 |
| AT2 | 22.857 | 10.278 |
| TT2 | 35.857 | 22.725 |
| AT3 | 21.143 | 8.581 |
| TT3 | 22.809 | 13.357 |
| AT4 | 23.571 | 10.716 |
| TT4 | 18.428 | 7.467 |
| AT5 | 22.143 | 10.753 |
| TT5 | 18.905 | 9.111 |
| AT6 | 22.857 | 9.406 |
| TT6 | 17.190 | 10.650 |
| PD1 | 5.809 | 2.549 |
| PD2 | 6.119 | 1.941 |
| PD3 | 6.190 | 2.482 |
| PD4 | 5.333 | 2.044 |

TABLE I (Continued)

| Variable | Mean | Standard Deviation |
|----------|-------|--------------------|
| PV1 | 4.524 | 2.412 |
| PV2 | 5.786 | 1.760 |
| PV3 | 4.881 | 1.699 |
| PV4 | 4.881 | 1.902 |
| NV1 | 4.452 | 2.287 |
| NV2 | 5.833 | 1.899 |
| NV3 | 4.738 | 2.176 |
| NV4 | 4.381 | 1.975 |
| BO1 | 4.857 | 2.665 |
| BO2 | 5.619 | 1.834 |
| BO3 | 5.381 | 2.152 |
| BO4 | 4.952 | 2.141 |
| TE1 | 6.048 | 2.518 |
| TE2 | 6.452 | 1.824 |
| TE3 | 6.571 | 1.836 |
| TE4 | 5.929 | 1.702 |
| PA1 | 7.071 | 2.041 |
| PA2 | 7.048 | 1.396 |
| PA3 | 7.167 | 2.129 |
| PA4 | 6.143 | 1.733 |
| CR1 | 6.238 | 2.895 |
| CR2 | 6.452 | 2.039 |
| CR3 | 6.928 | 2.235 |
| CR4 | 6.405 | 2.296 |

TABLE I (Continued)

| Variable | Mean | Standard Deviation |
|----------|--------|--------------------|
| AB2 | 45.262 | 3.486 |
| TB2 | 56.476 | 24.772 |
| AB3 | 89.690 | 16.815 |
| TB3 | 97.619 | 34.138 |

| | | |
|---------|---------|---------|
| 1. GRP | 11. AT2 | 21. BT5 |
| 2. AGE | 12. TT2 | 22. AT5 |
| 3. SEX | 13. ST3 | 23. TT5 |
| 4. ARM | 14. BT3 | 24. BT6 |
| 5. HGT | 15. AT3 | 25. AT6 |
| 6. ST1 | 16. TT3 | 26. TT6 |
| 7. BT1 | 17. BT4 | 27. AB2 |
| 8. AT1 | 18. AT4 | 28. TB2 |
| 9. TT1 | 19. TT4 | 29. AB3 |
| 10. BT2 | 20. ST5 | 30. TB3 |

The results of the correlational analyses are found in Table II.

The independent measures of age, arm length and height correlate significantly with each other. Age was found to correlate significantly with the dependent measures of amount of M & Ms and time to take M & Ms. As separate analyses were run for each age group it was decided not to correct for age.

The first hypothesis tested was: No sex differences will be found comparing same sex and cross-sex pairs, but all female pairs will be more dominant, have shorter latencies, than all male pairs. In addition, it was hypothesized that the pairs would not differ on the amount of M & Ms they take. One-way ANOVAs were utilized to assess cross-sex pairs versus same sex pairs differences. No significant main effects were found for either amount or time measures (See Tables III - IV). Consistent results were found when separate analyses were run for the 2 bowl and 3 bowl situations (See Tables V - VIII). Thus as predicted, there were no significant differences between same and cross-sex pairs in the time it took these pairs to complete the task or in the amount of M & Ms they took. However, the prediction relating to female pair dominance was not supported: No significant differences were found between male pairs and female pairs in the time it took to complete the task or in the amount of M & Ms taken.

TABLE II
CORRELATION OF VARIABLES

| | GRP | AGE | SEX | ARM | HGT | ST1 | BT1 | AT1 |
|-----|-------|--------|-------|--------|--------|-------|-------|--------|
| GRP | 1.000 | .817** | -.079 | .462** | .516** | -.079 | -.070 | -.050 |
| AGE | | 1.000 | -.139 | .573** | .627** | .085 | -.017 | .059 |
| SEX | | | 1.000 | -.336* | -.218 | -.249 | .187 | -.174 |
| ARM | | | | 1.000 | .714** | .048 | -.008 | .190 |
| HGT | | | | | 1.000 | -.051 | -.085 | .025 |
| ST1 | | | | | | 1.000 | .187 | .443** |
| BT1 | | | | | | | 1.000 | .721** |
| AT1 | | | | | | | | 1.000 |
| TT1 | | | | | | | | |
| BT2 | | | | | | | | |
| AT2 | | | | | | | | |
| TT2 | | | | | | | | |
| ST3 | | | | | | | | |
| BT3 | | | | | | | | |
| AT3 | | | | | | | | |
| TT3 | | | | | | | | |
| BT4 | | | | | | | | |
| AT4 | | | | | | | | |
| TT4 | | | | | | | | |
| ST5 | | | | | | | | |
| BT5 | | | | | | | | |
| AT5 | | | | | | | | |
| TT5 | | | | | | | | |
| BT6 | | | | | | | | |
| AT6 | | | | | | | | |
| TT6 | | | | | | | | |
| AB2 | | | | | | | | |
| TB2 | | | | | | | | |
| AB3 | | | | | | | | |
| TB3 | | | | | | | | |

TABLE II (Continued)

| | TT1 | BT2 | AT2 | TT2 | ST3 | BT3 | AT3 |
|-----|---------|---------|---------|---------|---------|--------|---------|
| GRP | -.392** | .052 | -.182 | -.132 | -.213 | -.164 | -.511** |
| AGE | -.331* | .017 | .028 | -.176 | -.340** | .566** | .515** |
| SEX | .196 | -.187 | -.237 | -.175 | .131 | -.115 | -.062 |
| ARM | -.128 | .008 | -.029 | .038 | -.263 | -.239 | -.222 |
| HGT | -.240 | .085 | .060 | -.021 | -.014 | -.209 | -.090 |
| ST1 | .196 | -.187 | -.039 | -.175 | -.100 | -.207 | -.156 |
| BT1 | .329* | 1.000 | -.738** | -.716** | -.241 | .138 | .113 |
| AT1 | .237 | -.721** | -.474** | -.516** | -.320* | -.090 | -.067 |
| TT1 | 1.000 | -.329* | -.243 | .135 | -.094 | .052 | -.018 |
| BT2 | | 1.000 | .738** | .716** | .241 | -.138 | -.113 |
| AT2 | | | 1.000 | .528** | .088 | -.139 | -.160 |
| TT2 | | | | | .269 | -.065 | -.179 |
| ST3 | | | | | 1.000 | .523** | .377* |
| BT3 | | | | | | 1.000 | .837** |
| AT3 | | | | | | | 1.000 |
| TT3 | | | | | | | |
| BT4 | | | | | | | |
| AT4 | | | | | | | |
| TT4 | | | | | | | |
| ST5 | | | | | | | |
| BT5 | | | | | | | |
| AT5 | | | | | | | |
| TT5 | | | | | | | |
| BT6 | | | | | | | |
| AT6 | | | | | | | |
| TT6 | | | | | | | |
| AB2 | | | | | | | |
| TB2 | | | | | | | |
| AB3 | | | | | | | |
| TB3 | | | | | | | |

TABLE II (Continued)

| | TT3 | BT4 | AT4 | TT4 | ST5 | BT5 | AT5 |
|-----|---------|---------|---------|---------|-------|-------|--------|
| GRP | -.511** | .213 | .149 | -.498** | -.070 | .176 | .124 |
| AGE | .308* | -.566** | -.361* | -.221 | -.005 | .187 | .093 |
| SEX | -.400** | .115 | .109 | -.518** | -.042 | .034 | .128 |
| ARM | -.195 | .239 | .215 | -.062 | .119 | -.220 | -.151 |
| HGT | -.357* | .209 | .187 | -.267 | -.014 | .010 | .099 |
| ST1 | -.233 | .207 | .172 | -.033 | -.196 | -.100 | .104 |
| BT1 | .003 | -.138 | -.096 | -.275 | -.050 | -.050 | -.192 |
| AT1 | -.194 | .091 | .047 | -.134 | -.238 | -.178 | -.245 |
| TT1 | .130 | -.522 | .038 | .278 | .116 | -.133 | -.196 |
| BT2 | -.003 | .138 | .096 | .275 | .050 | .050 | .192 |
| AT2 | -.238 | .139 | .047 | .129 | .112 | -.076 | .113 |
| TT2 | .160 | .065 | .052 | .518 | .059 | -.056 | .008 |
| ST3 | .277 | -.522** | -.384* | -.172 | -.241 | .141 | .238 |
| BT3 | .603** | -1.000 | -.701** | -.272 | -.151 | .041 | .016 |
| AT3 | .440** | -.837** | -.605** | -.267 | -.168 | .125 | .083 |
| TT3 | 1.000 | .603** | -.423** | .398** | .014 | .068 | -.048 |
| BT4 | | 1.000 | .701** | .272 | .151 | -.041 | -.016 |
| AT4 | | | 1.000 | .191 | .088 | -.137 | .066 |
| TT4 | | | | 1.000 | .196 | -.145 | -.189 |
| ST5 | | | | | 1.000 | .236 | .238 |
| BT5 | | | | | | 1.000 | .705** |
| AT5 | | | | | | | 1.000 |
| TT5 | | | | | | | |
| BT6 | | | | | | | |
| AT6 | | | | | | | |
| TT6 | | | | | | | |
| AB2 | | | | | | | |
| TB2 | | | | | | | |
| AB3 | | | | | | | |
| TB3 | | | | | | | |

TABLE II (Continued)

| | TT5 | BT6 | AT6 | TT6 | AB2 | TB2 | AB3 | TB3 |
|-----|--------|---------|---------|---------|--------|---------|--------|---------|
| GRP | -.296 | -.176 | -.142 | -.605** | .022 | -.497** | .028 | -.624 |
| AGE | .206 | -.034 | -.060 | -.556** | -.004 | -.527** | .166 | -.522** |
| SEX | -.346* | -.187 | -.001 | .047 | -.125 | .059 | -.150 | .129 |
| ARM | .244 | .220 | .068 | -.170 | .028 | -.149 | .081 | -.190 |
| HGT | -.329* | -.010 | -.145 | -.488 | -.155 | -.356* | .143 | -.356 |
| ST1 | -.027 | .100 | .194 | .142 | .042 | .017 | .437 | -.044 |
| BT1 | -.239 | .050 | .081 | .005 | -.058 | -.429** | -.082 | -.051 |
| AT1 | -.383* | .178 | .188 | -.057 | -.022 | -.367* | .275 | -.134 |
| TT1 | .191 | .133 | .074 | .525** | -.030 | .451** | -.058 | .735 |
| BT2 | .239 | -.050 | -.081 | -.005 | .059 | .429 | .083 | .051 |
| AT2 | .193 | .076 | .043 | .056 | .307* | .263 | .306* | -.008 |
| TT2 | .299 | .055 | .001 | .308 | .034 | .738** | -.028 | .524 |
| ST3 | .413** | -.141 | -.123 | .119 | -.280 | .158 | -.042 | .199 |
| BT3 | .287 | -.041 | -.002 | .103 | -.108 | .015 | -.114 | .241 |
| AT3 | .316* | -.124 | -.081 | -.115 | -.189 | -.126 | .035 | .118 |
| TT3 | .378* | -.068 | -.103 | .266 | -.122 | .411** | -.373* | .554** |
| BT4 | -.287 | .041 | .002 | -.103 | .108 | -.014 | .114 | -.241 |
| AT4 | -.287 | .137 | .026 | -.018 | .082 | .034 | .415** | -.153 |
| TT4 | .225 | .146 | .014 | .373* | -.130 | .726** | -.114 | .562 |
| ST5 | .217 | -.236 | -.303* | .014 | -.100 | .221 | -.120 | .086 |
| BT5 | .317* | -1.000 | -.754** | -.516** | -.321* | -.095 | -.099 | -.116 |
| AT5 | .224 | -.705** | -.519** | -.363* | -.137 | -.062 | .366 | -.174 |
| TT5 | 1.000 | -.317 | -.241 | .233 | -.187 | .476** | -.072 | .480 |
| BT6 | | 1.000 | .755 | .516 | .322* | .095 | .099 | .116 |
| AT6 | | | 1.000 | .403** | .429** | .110 | .258 | -.007 |
| TT6 | | | | 1.000 | .237 | .563** | -.119 | .686** |
| AB2 | | | | | 1.000 | .015 | .074 | -.058 |
| TB2 | | | | | | 1.000 | -.088 | .675** |
| AB3 | | | | | | | 1.000 | -.215 |
| TB3 | | | | | | | | 1.000 |

*p < .05

**p < .01

TABLE III

ANALYSIS OF VARIANCE.- TIME IN 2 AND 3 BOWL
SITUATIONS COMBINED WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Pair | 2 | 372.438 | 1.146 |
| Residual | 249 | 324.832 | |

TABLE IV

ANALYSIS OF VARIANCE - AMOUNT IN 2 AND 3 BOWL
SITUATIONS COMBINED WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Pair | 2 | 0.222 | 0.002 |
| Residual | 249 | 100.886 | |

TABLE V

ANALYSIS OF VARIANCE - TIME IN ALL 2 BOWL
SITUATIONS WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|---------|
| Pair | 2 | 0.372 | 0.073 |
| Residual | 123 | 5.109 | |

TABLE VI

ANALYSIS OF VARIANCE - AMOUNT IN ALL 2 BOWL
SITUATIONS WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|---------|
| Pair | 2 | 0.372 | 0.073 |
| Residual | 123 | 5.109 | |

TABLE VII

ANALYSIS OF VARIANCE - TIME IN ALL 3 BOWL
SITUATIONS WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Pair | 2 | 304.404 | 0.775 |
| Residual | 123 | 392.703 | |

TABLE VIII

ANALYSIS OF VARIANCE - AMOUNT IN ALL 3 BOWL
SITUATIONS WITH SEX OF
PAIR OF SUBJECTS

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Pair | 2 | 1.431 | 0.017 |
| Residual | 123 | 86.279 | |

A second hypothesis tested was related to age differences. One-way ANOVAs were applied to assess the effects of age upon the time it took to complete the task. Significant effects were found for the time measures in the two and three bowl situations combined and with each situation analysed separately (See Tables IX - XI). T-tests showed significant differences between the 3 and 4 year old groups ($t=4.885$, $p<.001$) and the 3 and 5 year old groups ($t=4.271$, $p<.001$) in the two and three bowl situations combined. When analysing the two bowl situation separately, t-tests showed significant differences between the 3 and 4 year old groups ($t=4.772$, $p<.001$). When analysing the three bowl situation separately, t-tests showed significant differences between the 3 and 4 year old groups ($t=3.78$, $p<.001$) and the 3 and 5 year old age groups ($t=4.039$, $p<.001$). Pairs of children from the 4 and 5 year old groups were faster in completing the task than those from the 3 year old group.

A third hypothesis tested was: Teacher's ratings will discriminate on the basis of sex, that is teachers will rate each characteristic behavior differentially for children of different sexes. A Pearson Product-Moment Correlation was utilized to assess the relationship between teacher's ratings and sex. Results did not support the hypothesis (See Table XII). Only two out of the seven types of dominance rated, passive dominance and negative verbal dominance, related to sex and only by one teacher. For two teachers only one rating, tease, was significantly correlated with sex.

A fourth hypothesis was: Three of the teacher's ratings will be related to high dominance (short latencies) in the experimental situation: positive and negative verbal dominance together with tease. The Pearson Product-Moment Correlation was utilized to assess the relation-

TABLE IX
ANALYSIS OF VARIANCE - TIME IN 2 AND 3 BOWL
SITUATIONS COMBINED WITH
AGE GROUP

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|-----------|
| Group | 2 | 4625.194 | 15.912*** |
| Residual | 249 | 290.673 | |

TABLE X
ANALYSIS OF VARIANCE - TIME IN ALL 2 BOWL
SITUATIONS WITH AGE GROUP

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|---------|
| Group | 2 | 1472.229 | 9.878** |
| Residual | 123 | 149.033 | |

**p < .001

***p < .0001

TABLE XI
ANALYSIS OF VARIANCE - TIME IN ALL 3 BOWL
SITUATIONS WITH AGE GROUP

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|----------|
| Group | 2 | 3509.926 | 10.306** |
| Residual | 123 | 340.581 | |

**p < .001

TABLE XII

CORRELATION OF TEACHERS' RATINGS WITH ALL
OTHER VARIABLES WITH SEX OF SUBJECT

| | PD1 | PD2 | PD3 | PD4 | PV1 | PV2 | PV3 | PV4 |
|-----|---------|--------|--------|--------|--------|--------|--------|--------|
| GRP | -.270 | -.004 | .265 | .533** | -.037 | -.120 | .024 | .381 |
| AGE | -.209 | -.129 | .334* | .559** | -.078 | -.243 | -.025 | .354* |
| SEX | .012 | .118 | .261 | -.078 | -.059 | .084 | .178 | -.146 |
| ARM | -.131 | -.238 | -.177 | .290 | -.051 | -.270 | -.107 | .265 |
| HGT | -.163 | -.186 | .114 | .495** | -.186 | -.281 | -.084 | .254 |
| ST1 | -.045 | -.331* | -.285 | -.197 | -.240 | -.356* | -.106 | -.070 |
| BT1 | .261 | .164 | .101 | -.086 | .150 | .090 | .011 | -.041 |
| AT1 | .204 | .024 | -.106 | .005 | .172 | .061 | -.073 | .128 |
| TT1 | .283 | .093 | -.092 | -.320 | .073 | -.010 | .023 | -.098 |
| BT2 | -.261 | -.164 | -.101 | .086 | -.150 | -.090 | -.010 | .041 |
| AT2 | -.327 | -.191 | -.156 | .078 | -.236 | -.097 | .049 | -.057 |
| TT2 | .069 | -.117 | -.163 | -.079 | -.003 | -.144 | -.121 | -.051 |
| ST3 | .129 | .040 | .198 | -.039 | .170 | .062 | .266 | .060 |
| BT3 | .123 | .097 | .266 | -.199 | .112 | .217 | .205 | -.201 |
| AT3 | .128 | .072 | .227 | -.064 | .100 | .192 | .178 | -.102 |
| TT3 | .237 | .085 | -.006 | -.340* | .236 | .238 | -.089 | -.219 |
| BT4 | -.122 | -.097 | -.266 | .119 | -.112 | -.217 | -.205 | .201 |
| AT4 | -.065 | -.036 | -.093 | .135 | .018 | -.166 | -.103 | .164 |
| TT4 | .203 | .044 | -.269 | -.297 | .110 | .089 | -.182 | -.067 |
| ST5 | -.212 | .040 | .023 | -.110 | -.069 | -.019 | -.074 | .035 |
| BT5 | -.306 | -.133 | .062 | -.015 | -.029 | -.211 | -.046 | .085 |
| AT5 | -.454** | -.310* | .021 | -.075 | -.197 | -.356* | .066 | .007 |
| TT5 | .012 | -.041 | -.136 | -.386* | .047 | -.038 | .053 | -.008 |
| BT6 | .306* | .134 | -.062 | .016 | .029 | .211 | .046 | -.086 |
| AT6 | .204 | -.027 | -.092 | -.101 | -.070 | .097 | .009 | -.249 |
| TT6 | .226 | .053 | -.274 | -.478 | .062 | .080 | .042 | -.301* |
| PD1 | 1.000 | .675** | .330* | .199 | .540 | .594 | .304 | .312 |
| PD2 | | 1.000 | .623** | .432** | .560** | .800** | .507** | .513** |
| PD3 | | | 1.000 | .607** | .203 | .456** | .421** | .413** |
| PD4 | | | | 1.000 | .251 | .325* | .299 | .713 |
| PV1 | | | | | 1.000 | .630** | .289 | .492** |
| PV2 | | | | | | 1.000 | .464** | .349* |
| PV3 | | | | | | | 1.000 | .335* |
| PV4 | | | | | | | | 1.000 |
| NV1 | | | | | | | | |
| NV2 | | | | | | | | |
| NV3 | | | | | | | | |
| NV4 | | | | | | | | |
| BO1 | | | | | | | | |
| BO2 | | | | | | | | |
| BO3 | | | | | | | | |
| BO4 | | | | | | | | |
| TE1 | | | | | | | | |

TABLE XII (Continued)

| | NV1 | NV2 | NV3 | NV4 | BO1 | BO2 | BO3 | BO4 |
|-----|--------|---------|--------|---------|---------|---------|--------|--------|
| GRP | -.113 | -.148 | -.008 | .635** | -.372* | -.565** | .554** | .563** |
| AGE | -.194 | -.199 | -.097 | .584** | -.407** | -.420** | .572** | .447** |
| SEX | -.118 | .055 | .311* | -.202 | .413** | .006 | .107 | .156 |
| ARM | -.064 | -.292 | -.134 | .304* | -.347* | -.316* | .169 | .096 |
| HGT | -.148 | -.260 | -.040 | .476** | -.499** | -.197 | .330* | .285 |
| ST1 | -.161 | -.302 | -.245 | -.275 | -.059 | -.152 | -.118 | -.228 |
| BT1 | .210 | .085 | .094 | -.137 | .088 | .016 | .053 | -.046 |
| AT1 | .222 | .042 | -.071 | -.094 | -.022 | .056 | -.039 | -.138 |
| TT1 | .111 | .032 | .067 | -.442** | .380* | .090 | -.318* | -.179 |
| BT2 | -.210 | -.084 | -.094 | .137 | -.087 | -.016 | -.053 | .046 |
| AT2 | -.235 | -.074 | -.070 | .180 | -.079 | -.070 | -.146 | -.036 |
| TT2 | -.020 | -.108 | -.022 | -.100 | -.100 | -.022 | -.296 | -.104 |
| ST3 | .147 | .034 | .227 | -.137 | .124 | .016 | .098 | .224 |
| BT3 | .103 | .077 | .217 | -.194 | .229 | .235 | .138 | .042 |
| AT3 | .101 | .057 | .211 | -.157 | .213 | .239 | .093 | .081 |
| TT3 | .228 | .068 | .094 | -.392** | .308* | .382* | -.189 | -.307* |
| BT4 | -.103 | -.076 | -.217 | .193 | -.229 | -.235 | -.138 | -.042 |
| AT4 | .013 | -.115 | -.217 | .204 | -.142 | -.143 | -.211 | -.040 |
| TT4 | .178 | .052 | .087 | -.340 | .332 | .215 | -.496 | -.418 |
| ST5 | -.127 | .034 | .050 | -.015 | .160 | -.088 | -.081 | -.091 |
| BT5 | -.148 | -.271 | -.017 | -.088 | -.111 | -.167 | .098 | .021 |
| AT5 | -.329* | -.416** | -.136 | -.012 | -.177 | -.240 | -.054 | -.044 |
| TT5 | -.051 | -.118 | .202 | -.426** | .363* | -.040 | -.289 | -.026 |
| BT6 | .149 | .271 | .017 | .088 | .111 | .167 | -.098 | -.021 |
| AT6 | .051 | .086 | -.078 | -.012 | .042 | .022 | -.144 | -.134 |
| TT6 | .110 | .110 | -.018 | -.541** | .288 | .109 | -.471 | -.370 |
| PD1 | .638** | .588** | .440** | .116 | .426** | .354* | .017 | .168 |
| PD2 | .587** | .852** | .533** | .338* | .423** | .438** | .322* | .412** |
| PD3 | .182 | .421** | .344* | .512** | .026 | .220 | .534** | .534** |
| PD4 | .212 | .310* | .157 | .843** | -.219 | .197 | .669** | .600** |
| PV1 | .898** | .525** | .273 | .172 | .380* | .239 | .083 | .274 |
| PV2 | .667** | .865** | .431** | .290 | .388* | .556** | .209 | .224 |
| PV3 | .353* | .485** | .651** | .246 | .330* | .181 | .246 | .354* |
| PV4 | .360* | .372* | .299 | .551** | .059 | .119 | .410** | .603** |
| NV1 | 1.000 | .568** | .333* | .177 | .391* | .280 | .009 | .204 |
| NV2 | | 1.000 | .532** | .271 | .434** | .493** | .273 | .322* |
| NV3 | | | 1.000 | .052 | .565** | .054 | .173 | .463** |
| NV4 | | | | 1.000 | -.263 | .061 | .608** | .547** |
| BO1 | | | | | 1.000 | .233 | -.109 | .101 |
| BO2 | | | | | | 1.000 | .093 | -.110 |
| BO3 | | | | | | | 1.000 | .581** |
| BO4 | | | | | | | | 1.000 |
| TE1 | | | | | | | | |
| TE2 | | | | | | | | |
| TE3 | | | | | | | | |
| TE4 | | | | | | | | |

TABLE XII (Continued)

| | TE1 | TE2 | TE3 | TE4 | PA1 | PA2 | PA3 | PA4 |
|-----|---------|--------|--------|--------|---------|---------|---------|--------|
| GRP | -.318* | -.176 | .159 | .084 | -.665** | -.395** | -.395** | .231 |
| AGE | -.409** | -.186 | .259 | -.010 | -.610** | -.480** | -.553** | .157 |
| SEX | .290 | .170 | .320* | .238 | .181 | .038 | -.117 | -.355* |
| ARM | -.337* | -.292 | -.227 | -.152 | -.409** | -.147 | -.223 | .311* |
| HGT | -.439** | -.318* | -.008 | -.005 | -.367* | -.430** | -.356* | .034 |
| ST1 | -.152 | -.148 | -.207 | -.246 | -.080 | -.135 | -.004 | .148 |
| BT1 | .058 | .104 | -.064 | .097 | -.034 | -.102 | .106 | -.190 |
| AT1 | -.022 | .045 | -.300 | -.025 | -.057 | .006 | .153 | .189 |
| TT1 | .227 | .137 | .006 | .079 | .295 | .087 | .325* | .001 |
| BT2 | -.058 | -.105 | .064 | -.097 | .034 | .102 | -.106 | .191 |
| AT2 | -.153 | -.155 | .050 | -.077 | .082 | .080 | -.056 | .119 |
| TT2 | -.077 | -.141 | .008 | -.151 | .086 | .081 | .138 | .114 |
| ST3 | .020 | -.028 | .225 | .012 | .250 | .071 | .106 | .060 |
| BT3 | .099 | .129 | .284 | -.049 | .374* | .109 | .023 | -.240 |
| AT3 | .187 | .070 | .267 | .072 | .330* | -.014 | -.048 | -.210 |
| TT3 | .291 | .146 | .064 | -.155 | .441 | .228 | .198 | -.183 |
| BT4 | -.099 | -.129 | -.284 | .049 | -.374* | -.109 | -.023 | .241 |
| AT4 | .019 | .102 | .226 | .136 | -.104 | -.098 | -.005 | .156 |
| TT4 | .270 | .028 | -.176 | -.034 | .316* | .313* | .390* | .125 |
| ST5 | .135 | -.080 | .041 | .068 | .037 | -.032 | -.166 | .004 |
| BT5 | -.056 | -.265 | .015 | -.016 | -.104 | -.378* | -.189 | -.135 |
| AT5 | -.158 | -.264 | -.001 | -.112 | -.057 | -.335* | -.377* | -.116 |
| TT5 | .367* | -.054 | .064 | .136 | .399** | .155 | .198 | -.021 |
| BT6 | .056 | .265 | -.015 | .016 | .104 | .378* | .189 | .135 |
| AT6 | -.079 | .010 | .050 | -.095 | .111 | .225 | .061 | .136 |
| TT6 | .136 | .171 | -.187 | -.117 | .295 | .414** | .385* | -.024 |
| PD1 | .347* | .501** | .133 | .289 | .190 | .304* | .469** | .073 |
| PD2 | .453** | .722** | .295 | .527** | .109 | .286 | .273 | .060 |
| PD3 | .049 | .390* | .484** | .436** | -.008 | -.115 | -.329* | -.131 |
| PD4 | -.041 | .299 | .350* | .386* | -.216 | -.031 | -.215 | .131 |
| PV1 | .434** | .455** | .289 | .360* | .081 | .195 | .415** | .378* |
| PV2 | .492** | .700** | .242 | .377* | .283 | .481** | .303* | .138 |
| PV3 | .252 | .569** | .343* | .461** | .073 | .321* | .107 | .138 |
| PV4 | .230 | .339* | .236 | .472** | -.149 | .085 | .053 | .486** |
| NV1 | .420** | .441** | .210 | .347* | .129 | .230 | .445** | .322* |
| NV2 | .446** | .719** | .252 | .404** | .148 | .436** | .279 | .215 |
| NV3 | .434** | .405** | .270 | .581** | .120 | .261 | .215 | .107 |
| NV4 | -.117 | .256 | .321* | .248 | -.334* | -.086 | -.230 | .176 |
| BO1 | .680** | .505** | .316* | .466** | .316* | .317** | .430** | .052 |
| BO2 | .358* | .563** | .160 | .179 | .542** | .341* | .217 | -.136 |
| BO3 | -.039 | .097 | .425** | .181 | -.378* | -.079 | -.206 | .064 |
| BO4 | .186 | .280 | .466** | .675** | -.239 | -.081 | -.143 | .193 |
| TE1 | 1.000 | .548** | .216 | .541** | .474** | .506** | .358* | .049 |
| TE2 | | 1.000 | .263 | .498** | .175 | .451** | .307* | .064 |
| TE3 | | | 1.000 | .403** | .028 | -.230 | -.112 | -.042 |
| TE4 | | | | 1.000 | .184 | .135 | .111 | .012 |

TABLE XII (Continued)

| | CR1 | CR2 | CR3 | CR4 |
|-----|--------|--------|---------|---------|
| GRP | -.038 | .286 | -.089 | .304* |
| AGE | -.113 | .166 | -.081 | .222 |
| SEX | -.143 | -.133 | -.101 | -.268 |
| ARM | .125 | .264 | .047 | .371* |
| HGT | .115 | .100 | -.015 | .213 |
| ST1 | -.193 | -.038 | -.166 | -.268 |
| BT1 | .021 | .094 | -.012 | -.002 |
| AT1 | .020 | .181 | -.093 | .177 |
| TT1 | -.147 | -.221 | .034 | -.189 |
| BT2 | -.021 | -.094 | .012 | .002 |
| AT2 | -.200 | -.124 | -.170 | -.005 |
| TT2 | -.063 | -.025 | .143 | -.037 |
| ST3 | .004 | -.190 | .204 | -.296 |
| BT3 | -.005 | -.075 | .050 | -.027 |
| AT3 | -.095 | -.070 | -.076 | -.135 |
| TT3 | .096 | -.094 | .234 | -.015 |
| BT4 | .005 | .075 | -.050 | .027 |
| AT4 | -.026 | -.051 | .102 | -.040 |
| TT4 | .193 | .013 | .337* | .054 |
| ST5 | .104 | .046 | -.034 | .082 |
| BT5 | -.280 | -.332* | -.401** | -.401** |
| AT5 | -.311* | -.270 | -.359* | -.474** |
| TT5 | -.240 | -.287 | -.089 | -.490** |
| BT6 | .279 | .332* | .401** | .401** |
| AT6 | .230 | .305* | .255 | .260 |
| TT6 | -.071 | -.062 | .167 | -.156 |
| PD1 | .281 | .092 | .451** | .159 |
| PD2 | .338* | .300 | .418** | .263 |
| PD3 | .163 | .118 | .881* | .179 |
| PD4 | .114 | .191 | .219 | .267 |
| PV1 | .083 | .065 | .247 | .128 |
| PV2 | .355* | .289 | .430** | .306* |
| PV3 | .150 | .213 | .120 | .013 |
| PV4 | .045 | .178 | .222 | .095 |
| NV1 | .208 | .296 | .312* | .215 |
| NV2 | .389* | .304* | .405** | .307* |
| NV3 | .355* | .313* | .397** | .188 |
| NV4 | .120 | .259 | .128 | .406** |
| BO1 | .156 | .174 | .146 | -.114 |
| BO2 | .247 | .015 | .190 | .009 |
| BO3 | .110 | .327* | .107 | .240 |
| BO4 | .147 | .301* | .229 | .193 |
| TE1 | .039 | .019 | .170 | -.079 |
| TE2 | .164 | .252 | .229 | .078 |
| TE3 | .079 | .086 | .040 | .002 |
| TE4 | .182 | .206 | .185 | -.011 |

TABLE XII (Continued)

| | PV1 | PV2 | PV3 | PV4 | NV1 | NV2 | NV3 | NV4 |
|-----|-------|-------|-------|-------|-------|-------|--------|---------|
| AB2 | -.031 | -.070 | -.036 | -.242 | -.046 | -.144 | -.390* | .106 |
| TB2 | -.005 | -.065 | -.121 | -.170 | -.013 | -.077 | .054 | -.449** |
| AB3 | -.129 | -.163 | .098 | .028 | -.140 | -.258 | -.160 | .021 |
| TB3 | .194 | .082 | -.052 | -.194 | .222 | .055 | .081 | -.558** |

| | BO1 | BO2 | BO3 | BO4 | TE1 | TE2 | TE3 | TE4 |
|-----|--------|-------|---------|--------|-------|-------|-------|-------|
| AB2 | -.177 | -.015 | -.166 | -.152 | -.110 | -.027 | -.054 | -.091 |
| TB2 | .445** | .096 | -.474** | .279 | .187 | .013 | .003 | -.025 |
| AB3 | -.101 | -.129 | -.271 | -.144 | -.134 | -.111 | -.123 | -.045 |
| TB3 | .379* | .213 | -.483** | -.348* | .291 | .071 | -.053 | -.102 |

| | PA1 | PA2 | PA3 | PA4 | CR1 | CR2 | CR3 | CR4 |
|-----|---------|--------|--------|-------|-------|---------|--------|--------|
| PA1 | 1.000 | .487** | .300 | -.079 | .175 | -.149 | .263 | -.136 |
| PA2 | | 1.000 | .506** | .189 | .226 | .215 | .353* | .154 |
| PA3 | | | 1.000 | .086 | .112 | .066 | .167 | .001 |
| PA4 | | | | 1.000 | .139 | .285 | .198 | .279 |
| CR1 | | | | | 1.000 | .754** | .595** | .620** |
| CR2 | | | | | | 1.000 | .398** | .648** |
| CR3 | | | | | | | 1.000 | .381* |
| CR4 | | | | | | | | 1.000 |
| AB2 | -.075 | .058 | .007 | -.119 | -.258 | -.045 | -.213 | .067 |
| TB2 | .353* | .234 | .365* | .078 | .076 | -.087 | .205 | -.165 |
| AB3 | .143 | -.107 | -.170 | .217 | -.197 | -.063 | -.171 | -.146 |
| TB3 | -.456** | .256 | .365* | -.047 | -.190 | -.429** | .152 | -.252 |

*p < .05

**p < .01

ship between teacher's ratings and the time measurements. Results did not consistently support the hypothesis (See Table XII). One of the four teachers' ratings significantly related negative verbal dominance with the dependent variable of time, while other ratings of tease and positive verbal dominance were inconclusive. As these data are related to the hypothesis one, which was not supported, the lack of significance is understandable.

The interreliability of teachers' ratings was also examined for all seven behaviors rated (See Table XII). A Pearson Product-Moment Correlation was applied to these data. The following behaviors were fairly consistently rated by at least three of the teachers (the most experienced teachers): crying, physical dominance, positive verbal dominance, tease and passive dominance. Boast, was the most difficult behavior to rate reliably.

Post-hoc Results

Previous hypotheses dealt exclusively with examination of the data using the social interaction model. A post-hoc analysis looked at any differences in either the experimental measure of time or amount across sex of subjects. There is some question as to the interpretation of such an analysis as indicated in the review of literature, but because this analysis was utilized in Green-Nealey and Novak (1976), it was applied here for the purposes of replication. One-way ANOVAs were applied to the data (See Tables XIII - XVIII). No sex differences were found in the dependent measures of time and amount across both the 2 and 3 bowl situations. No significant differences were found utilizing Fisher's Exact Test between rankings above and below the median for

TABLE XIII

ANALYSIS OF VARIANCE - TIME IN THE 2 AND 3 BOWL
SITUATIONS COMBINED WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|---------|
| Sex | 1 | 185.522 | 0.569 |
| Residual | 250 | 325.770 | |

TABLE XIV

ANALYSIS OF VARIANCE - AMOUNT IN THE 2 AND 3 BOWL
SITUATIONS COMBINED WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|--------------------|-------------|---------|
| Sex | 1 | 43.314 | 0.432 |
| Residual | 250 | 100.311 | |

TABLE XV

ANALYSIS OF VARIANCE - TIME IN ALL 2 BOWL
SITUATIONS WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Sex | 1 | 8.597 | 0.050 |
| Residual | 124 | 171.507 | |

TABLE XVI

ANALYSIS OF VARIANCE - AMOUNT IN ALL 2 BOWL
SITUATIONS WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Sex | 1 | 2.328 | 0.460 |
| Residual | 124 | 5.055 | |

TABLE XVII

ANALYSIS OF VARIANCE - TIME IN ALL 3 BOWL
SITUATIONS WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Sex | 1 | 266.685 | 0.680 |
| Residual | 124 | 392.295 | |

TABLE XVIII

ANALYSIS OF VARIANCE - AMOUNT IN ALL 3 BOWL
SITUATIONS WITH SEX OF SUBJECT

| Source | Degrees of Freedom | Mean Square | F Ratio |
|----------|-----------------------|----------------|---------|
| Sex | 1 | 60.555 | 0.711 |
| Residual | 124 | 85.118 | |

males and females in all the age groups (See Table XIX). As indicated in an analysis discussed above, no sex differences were found using the population of the present study.

TABLE XVIX
RESULTS OF FISHER'S EXACT TEST MEASUREMENT
OF MEDIAN POSITION BETWEEN AGE AND SEX

| AGE | SEX | BM | AM | SL |
|-----|---------|----|----|------|
| 3 | Males | 3 | 5 | N.S. |
| 3 | Females | 5 | 3 | N.S. |
| 4 | Males | 4 | 4 | N.S. |
| 4 | Females | 4 | 4 | N.S. |
| 5 | Males | 2 | 4 | N.S. |
| 5 | Females | 3 | 1 | N.S. |

BM = Below the median

AM = Above the median

N.S. = Not statistically significant

CHAPTER V

DISCUSSION

The hypothesis that all female pairs would have shorter latencies, be more dominant, than all male pairs was not supported. It could be stated that there are no differences in dominance between male and female pairs. However, one should be cautious in considering the applicability and possible replicability of these findings. Some possible explanations for the specific results found are: One, because pairing of subjects was determined randomly, a greater proportion of male-male and female-female pairs was found in the 3 year old group as opposed to the 4 and 5 year old groups. Since there is a significant age group effect, it cannot be determined whether or not the results of this hypothesis are an artifact of the age group effect or truly representative of the sex of the pair findings. As sample size was small and all cell numbers were not equal, it was impossible to analyze for interaction effects.

Two, the task designed to measure dominance was an experimental technique and as such should be considered independent of previous findings related to sex differences in dominance. Historically, dominance had been measured using primarily observational techniques (Parten, 1933; Anderson, 1937, 1939; Hanfmann, 1935; Gellert, 1962; Baumrind & Black, 1967). Using the present experimental measure, Green-Nealey and Novak (1976) report same sex pair (all female versus all male pairs) dif-

ferences in dominance in a middle class preschool. What must be taken into consideration is, however, the exploratory nature of the experimental measure, together with the theoretical position of Maccoby and Jacklin (1974) that sex differences in dominance remains an open question. In summary, dominance may or may not be differentiated on the basis of sex, individually or in a socially interactive situation. Replication with a larger population, maximizing the opportunity for equal same and opposite sex pairs, is recommended.

Two hypotheses of the present study dealt with teacher's ratings. One hypothesis predicted that the behaviors to be rated by each teacher would be rated differentially by sex. Only three behaviors, passive dominance, boast and tease were related to sex of subject. These ratings were, however, very inconsistent across teachers. In Green-Nealey and Novak (1976) only one behavior, passive dominance, was observed to be related to sex, this relationship was consistent across all teachers. The focus of interest is, therefore, on the possible explanations for the lack of consistency in ratings in one study and consistent ratings of one measure in the previous study. One possible explanation is that the teachers hired and trained by the various nursery schools are different. The nursery school employed in the first study is a traditional school, while the school used in the present study is a university laboratory where there are strong influences towards nonsexist childhood education. As most sex differences research is observational, a major direction for future research would be an explanation of the effects of teacher's views and training upon the ratings of sex differences in behavior. Are observed sex differences a direct reflection of sexist teachers?

The teachers' ratings themselves are interesting. Characteristically, the teacher with the most experience in dealing with children in general and with the specific subjects yielded the highest reliability with the other teachers. The observation that the more accurate or consistent ratings are found with more experienced, or in some cases trained observers, is an important one.

The observational ratings were also examined in their relationship to the experimental variable of time. The specific predictions concerning the ratings of tease, positive and negative verbal dominance were based on the results found by Green-Nealey and Novak (1976). In the Green-Nealey and Novak study, female pairs were different than male pairs as measured by the time variable - this was not so for the present study. It was not surprising that this hypothesis was not supported.

The present study examined the relationship of age to dominance. The data supported the hypothesis that age trends were present. As age of the groups increased, the dependent measure of time significantly decreased, resulting in higher dominance in the pairs of subjects tested. These results replicated the findings of Green-Nealey and Novak (1976). Several possible explanations can be considered in explaining why older children are more dominant. The first is the relationship of age (in months) of each child, arm length and height. As noted previously, all 3 of the above independent measures were highly correlated. One possible explanation for the shorter latencies in the higher age groups could be the increasing of arm length and height making all of the bowls more easily accessible to the older children, since tables and bowl distances were standard across all situations and age groups. In other words the bigger child is more capable of being dominant.

Another possible explanation for the age effect could be socialization. A child entering school is taught both explicitly and implicitly the importance of politeness and taking turns. However, when dealing with a preschool population, it would seem presumptuous to assume that same phenomenon occurs. Observations indicate that in the experimental task egocentrism prevailed for most children. It is assumed that with 3,4 and 5 year olds, size and increased capacity to perform may explain the age group effects found in the present study. Recommendations for future study would include expansion of the age groups, possibly to 9 and 10 year olds, where the effects of socialization could be more accurately assessed. If the age effect is a true result of the experimental task, an interesting question to be raised is when does socialization effect dominant behavior? Which sex is more affected by this process? The present experimental technique would appear to be useful to assess the affects of socialization and how it differentially changes the behavioral manifestations of dominance. Other experimental measures might also be explored in an attempt to gather information relating to this area.

In summary, the present study was seen as an exploratory step in using objective measures for the investigation of sex differences. The measure utilized was socially interactive in nature. Using the experimental technique, no sex differences in terms of dominant behavior were found. Considering these results are contradictory to those found previously (Green-Nealey & Novak, 1976), differences in the populations employed must be considered. Of major importance is the fact that these populations were obtained from 2 very different preschools, one being more traditional, the other a more nonsexist one. Significant age dif-

ferences were found. In contrast, no significant findings and little reliability was obtained by the use of observers ratings. Observers consistency in ratings, where found, were dependent upon the experience of the rater. These findings reinforce the concerns of Maccoby and Jacklin (1974) that observational measures are suspect.

As social concern relating to sex roles increases, the need for empirical research as a scientific basis for social change is growing. If science is to be a foundation of cultural change, especially in the area of changing sex roles, techniques such as those used in the present research must become part of a standard methodology. Objectivity of results must be the basis for the psychology of sex differences.

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APPENDIX

TEACHER'S BEHAVIOR CHECKLIST

CHILD'S NAME _____

TEACHER'S NAME _____

Please rate the above child according to behavior directed toward other children. Please put an X on one of the line intersects. Please do not mark between the line intersects.

PHYSICAL DOMINANCE

always |-----| sometimes |-----| never

EXAMPLES:

Attempts to gain control in play; pushes others out of the way; grabs toys from others in order to use for himself.

VERBAL DOMINANCE

Positive:

always |-----| sometimes |-----| never

Spontaneous order or suggestion which does not emerge in the course of play.

EXAMPLES:

"Come here!"; "Let me take it!"; "Put it down."

VERBAL DOMINANCE

Negative:

always |-----| sometimes |-----| never

"Don't"; "Stop!", etc. when used as an order rather than in the context of a defense against another. Negation verbalized.

EXAMPLES:

Children are in different part of play area. X attempts to control Y's play by saying Don't do, No, that's mine, etc.

BOAST

always |-----| sometimes |-----| never

Favorable comparison of self with other child, with regard to prowess, property, creation, appearance, etc.

EXAMPLES:

"Mine is bigger", "I can jump way up to the sky", "My father can do it better than yours", etc.

TEASE

always |-----| sometimes |-----| never

M initiates a threatening gesture "in fun", that is without carrying out implied threat; name calling.

EXAMPLES:

You didn't make it good! Ha, Ha, you can't catch me, Stinker! I don't like your

PASSIVE DOMINANCE

always |-----| sometimes |-----| never

Sometimes, children try to dominate in a nonphysical, manipulative fashion. These children are often called "charmers".

EXAMPLES:

"Look at the fun I'm having." "I bet you could do this very well."

"CRYING"

always |-----| sometimes |-----| never

Sometimes children dominate through physical illness, guilt, or "crying" behavior.

EXAMPLES:

"I'm hurt"; alligator tears; "See my hurt finger". "My stomach hurts, can you come and sit with me".

Please comment: In what other ways do you think children try to dominate other children?

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