

## Temperament and Social Cognitive Scores

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**ABSTRACT** The present study was conducted in Hisar to study relationship between temperament and social competence of preschool-aged children and their mothers participated. To assess children's temperament, the Behavioural Style Questionnaire (McDevit and Carey, 1975) was used. To assess social competence of children two measures were used – the Social Problem-Solving Test – revised (Rubin, 1988) and Preschool Problem-Solving Test developed by Shure and Spivack (1974). Results indicated that there exist relations between temperament dimensions and social competence. Highly active and distractible children were more likely to suggest less number of strategies in object acquisition, friendship initiation and avoiding anger problem-solving tasks. They were less flexible in providing alternate solutions and suggested irrelevant solutions in hypothetical problem-solving tasks.

Easy to adapt, approachable and persistent children were likely to suggest more solutions and generated greater number of different strategies in all the three social problem-solving task areas. These children were also more flexible in providing alternate solutions and were more likely to suggest relevant solutions in all the three task areas.

### INTRODUCTION

Temperament is a biological variable influencing the social behaviour of children. According to Thomas and Chess (1977) there are nine main dimensions of temperament. These are activity level, rhythmicity, approach/withdrawal, adaptability, mood, intensity of reactions, distractibility, persistence, and threshold. It is well documented that temperamental dimensions are related to cognitive style in children. Children who are distractible, non-persistent, non-adaptable, highly active and negative in mood tend to be impulsive in a problem-solving tasks and want to finish the task quickly. Whereas, children who are non-distractible, more persistent, positive in mood, easy to adapt and mildly active tend to be more reflective, and take their own time to solve their problems (Goldstein et al., 1986).

Associations have been found between tem-

perament and mental test scores. The findings depict that children with higher mental test scores tend to be more attentive, persistent, approachable, adaptable and positive in mood (Matheny, 1989). Moller (1983) also observed similar results for intelligence measures and achievement test scores.

With regard to social competence, Denham (1986) reports that children who express negative emotions such as sadness or anger tend to demonstrate deficits in social problem-solving abilities. Rubin and his associates have conducted longitudinal studies on the social problem-solving skills of extremely withdrawn children. Rubin, Daniels-Beirness and Bream (1984) report that withdrawn preschool and kindergarten children tend to suggest fewer relevant strategies and fewer flexible alternatives to hypothetical object acquisition problems. These children are more likely to suggest adult-intervention and abnormal strategies in object-acquisition and friendship initiation hypothetical problems. The authors note that withdrawn children lag behind their more sociable age mates in their social reasoning skills.

In another study, Rubin and Rose-Krasnor (1986) examined the social problem-solving skills of withdrawn, average, and social children in kindergarten and first grade. The authors found that sociable kindergarten children tended to generate more relevant and flexible strategies in object acquisition tasks compared to withdrawn and average children. The authors observe that withdrawn children exhibit less competent behaviour.

Although it is evident that there are individual differences in children's temperament and that children's temperament has impact on children's social competence. Information is very limited in regard to the relationship between the temperament of children and their social

problem-solving skills (Rubin and Coplan, 1992; Rubin and Rose-Krasnor, 1992). Only few researchers (e.g., Billman and McDevitt, 1980; Mobley and Pullis, 1991; Parker-Cohen and Bell, 1988) have examined the relationship between temperament and social interactions of the preschool children. Most research has focused on the effects of temperament on the academic, rather than social achievement of children. In the present research relationship between temperament dimensions and social cognitive scores of preschool-aged children has been examined.

## METHODOLOGY

### Participants

The present study was conducted in Hisar, Haryana. Different schools were visited and principles of seven schools allowed the researcher to conduct research with preschool-aged children. Consent forms and information sheets regarding the research project were sent to the families involved with these schools. Mothers of 178 children agreed to participate in the research project. Finally, 178 children and their mothers constituted the sample for research.

### MEASURES AND PROCEDURE

#### The Behavioural Style Questionnaire

The Behavioural Style Questionnaire (McDevitt and Carey, 1975) was used to assess mothers' perceptions of their children's temperament. Mothers were requested to provide ratings of the temperament characteristics of their children on a 6-point scale ranging from 1 (almost never) to 6 (almost always). Maternal responses to the items in the questionnaire are based on observed behaviour that reflects the children's individual styles of coping with the environment. The measure covers nine main dimensions of temperament - activity level, rhythmicity, approach or withdrawal, adaptability, intensity of reaction, quality of mood, persistence, distractibility and threshold of responsiveness.

The temperament scale was translated into Hindi and was pretested with four mothers. Families were visited personally to conduct interviews

with mothers.

#### Children's Social Problem-solving Skills

To assess children's social problem-solving skills, two measures were used: The Social Problem-solving Test-Revised (Rubin, 1988) was used to assess children's social problem-solving skills in the hypothetical situations with their peers. Two stories were concerned with Object Acquisition and two stories were concerned with Friendship Initiation. The characters in the Object Acquisition stories wish to gain access to a toy or material in another child's possession, in the Friendship Initiation stories the characters wish to meet and become friendly with an unfamiliar child. The stories aim to assess children's cognitive repertoire of strategies for obtaining access to an object and for forming friendship with an unfamiliar child. Picture cards were used to depict the stories.

Two stories from The Preschool Interpersonal Problem-Solving Test developed by Shure and Spivack (1974) were adapted to measure children's social problem-solving skills for avoiding the anger of their mothers. The stories aim to assess children's repertoire of cognitive strategies for Avoiding Anger of an adult after some damage to property. Pictorial cards were used to depict each story.

#### Scoring of Temperament and Social Problem-Solving Measures

##### Scoring of Temperament Scale

For each of the nine subscales (activity level, rhythmicity, approach/withdrawal, adaptability, mood, intensity, distractibility, persistence, and threshold) on the Behavioural Style Questionnaire (McDevitt and Carey, 1975), negative statements were recorded and item responses were then totaled and divided by the number of items rated to get mean value for the subscale. This procedure was repeated for each of the nine categories.

##### Scoring of Social Problem-solving Tasks

From the children's responses, scores were developed for each child for relevancy of strategies, within-story flexibility in use of strategies, total scores across stories for strategy use and

total scores for different strategies used.

**Relevancy of Strategies.** Children's responses were scored for relevancy according to the protocol proposed by Rubin (1988). A relevancy score was given when a child's response could solve the problem as presented in the story. In all six stories, both the first and second responses were coded for relevancy. A score of 1 was given for a relevant solution. A score of 0 was given for an irrelevant response where the response did not suggest a solution to the problem as stated.

The following scores were obtained for relevancy.

**Object Acquisition Relevancy Score.** Total relevancy score for Object Acquisition stories was computed. A child could score a minimum of 0 and a maximum of 4 for relevancy.

**Friendship Initiation Relevancy Score.** Total relevancy score for Friendship Initiation stories was computed. A child could score a minimum of 0 and a maximum of 4 for relevancy.

**Avoiding Anger Relevancy Score.** Total relevancy score for Avoiding Anger stories was computed. A child could score a minimum of 0 and a maximum of 4 for relevancy.

**Within-story Flexibility.** Children's response flexibility was determined by comparing the strategies of their first and second responses to the dilemmas posed in any given story. Flexibility was computed by giving a score of 0 if the child failed to offer a further response to the interviewer's probe following the initial response, or when an irrelevant answer was given for either Response 1 or 2 or both, or when Response 2 was coded as a direct repeat of Response 1. A score of 1 was given if the second response contained the same strategy as in the first response; a score of 2 was given when there were modification of the first response, that is, one or more new strategy from another category was added in Response 2; and a score of 3 was given for a completely novel response where no categories found in Response 1 were repeated in Response 2.

The following scores were obtained for relevancy.

**Object Acquisition within-story Flexibility.** The within-story flexibility scores for Object Acquisition stories were combined. A child could score a minimum of 0 and a maximum of

6 for within-story flexibility.

**Friendship Initiation within-story Flexibility.** The within-story flexibility scores for Friendship Initiation stories were combined. A child could score a minimum of 0 and a maximum of 6 for within-story flexibility.

**Avoiding Anger within-story Flexibility.** The within-story flexibility scores for Avoiding Anger stories were computed. A child could score a minimum of 0 and a maximum of 6 for within-story flexibility.

**Number of Strategies.** Scores were also computed for the total number of strategies identified by each child in three different tasks. Following Rubin's (1988) procedure, scores were computed for Object Acquisition, Friendship Initiation and Avoiding Anger strategies.

**Number of Different Strategies.** These were scores computed for the number of different strategies identified by each child in the three task area - Object Acquisition, Friendship Initiation and Avoiding Anger.

**Total Scores.** Scores were also computed for the total number of social problem-solving strategies identified by each child in all six stories. Scores were computed for:

**Total Number of Strategies.** The total number of strategies found across the six stories was calculated. The sum of Object Acquisition, Friendship Initiation and Avoiding Anger strategies were combined to get a total number of strategies.

**Total Number of Different Strategies.** The total number of different strategies found in all six stories was computed. This was a sum of the different strategies found in Object Acquisition, Friendship Initiation and Avoiding Anger tasks.

**Total Relevancy Score.** The total relevancy score across the six stories was computed. A child could score a minimum of 0 and a maximum of 12 for total relevancy.

**Total within-story Flexibility.** The within-story flexibility scores across the six stories were combined. A child could score a minimum of 0 and a maximum of 18 for total within-story flexibility.

## RESULTS

Correlations were computed to examine

associations between temperament dimensions and social-cognitive scores obtained from children's responses to social problem-solving tasks. Across three problem-solving task areas, significant associations were obtained between five temperament dimensions - activity level, adaptability, approach, distractibility, persistence and social-cognitive scores.

#### Correlations between Temperament Dimensions and Object Acquisition Tasks

As presented in table 1, activity level was marginally negatively associated with number of categories suggested,  $r = -.22$ ; number of different categories suggested,  $r = -.20$ ; within-story flexibility,  $r = -.18$  and relevancy scores,  $r = -.19$ . Adaptability was positively marginally correlated with number of categories suggested,  $r = .19$ ; number of different categories suggested,  $r = .16$ ; within-story flexibility,  $r = .20$  and relevancy scores,  $r = .17$ . Approach was also positively marginally correlated with number of categories suggested,  $r = .17$ ; within-story flexibility,  $r = .18$  and relevancy scores,  $r = .20$ . Distractibility was marginally negatively associated with number of categories suggested,  $r = -.20$  within-story flexibility,  $r = -.16$  and relevancy scores,  $r = -.18$ . Although not significant, a similar trend was also observed for distractibility and number of different categories suggested. Marginal positive correlations were observed between persistence and number of categories suggested,  $r = .21$ ; number of different categories

suggested,  $r = .18$  and relevancy scores,  $r = .19$ . A similar positive trend was observed for persistence and within-story flexibility score.

#### Correlations between Temperament Dimensions and Friendship Initiation Tasks

As presented in table 2, activity level was marginally negatively correlated with number of categories suggested,  $r = -.20$ ; number of different categories suggested,  $r = -.21$  and within-story flexibility scores,  $r = -.19$ . Although not significant, a similar trend was also observed for activity level and relevancy score. Adaptability was positively marginally correlated within-story flexibility scores,  $r = .17$ . A positive trend was observed for adaptability, number of different categories suggested and relevancy score. Approach was also positively marginally associated with number of categories suggested,  $r = .18$ ; number of different categories suggested,  $r = .23$ ; within-story flexibility,  $r = .22$  and relevancy scores,  $r = .21$ . Distractibility was negatively marginally associated with number of categories suggested,  $r = -.19$  and within-story flexibility scores,  $r = -.14$ . Although not significant, a similar trend was also observed for distractibility, number of different categories suggested and relevancy score. Persistence was also positively marginally correlated with number of categories suggested,  $r = .20$ ; number of different categories suggested,  $r = .19$ ; within-story flexibility,  $r = .20$  and relevancy scores,  $r = .18$ .

Table 1: Correlations between Temperament Dimensions and Scores of Object Acquisition Tasks

Variables	Activity level	Adaptability	Approach	Distractibility	Persistent
Number of Categories	-.22*	.19*	.17*	-.20*	.21*
Number of Different Categories	-.20*	.16*	.22*	-.15	.18*
Within-Story Flexibility	-.18*	.20*	.18*	-.16*	.14
Relevancy Score	-.19*	.17*	.20*	-.18*	.19*

Note: Significant at \*  $p < 0.05$

Table 2: Correlations between Temperament Dimensions and Scores of Friendship Initiation Tasks

Variables	Activity level	Adaptability	Approach	Distractibility	Persistent
Number of Categories	-.20*	.16*	.18*	-.19*	.20*
Number of Different Categories	-.21*	.15	.23*	-.14	.19*
Within-Story Flexibility	-.19*	.17*	.22*	-.18*	.20*
Relevancy Score	-.15*	.14	.21*	-.14	.18*

Note: Significant at \*  $p < 0.05$

### Correlations between Temperament Dimensions and Avoiding Anger Tasks

As presented in table 3, activity level was marginally negatively associated with number of categories suggested,  $r = -.19$ ; number of different categories suggested,  $r = -.23$ ; within-story flexibility scores,  $r = -.22$  and relevancy scores,  $r = -.18$ . Adaptability was positively marginally correlated with number of categories suggested,  $r = .17$ . A positive trend existed for adaptability, number of different categories suggested, within-story flexibility and relevancy scores. Approach was positively marginally correlated with number of categories suggested,  $r = .18$  and number of different categories suggested,  $r = .22$ . A similar trend was observed for approach, within-story flexibility and relevancy scores. Distractibility was marginally negatively associated with number of categories suggested,  $r = -.20$  and within-story flexibility scores,  $r = -.17$ . Although not significant, a similar trend was also seen for distractibility, number of different categories suggested and relevancy score. Persistence was marginally positively correlated with number of categories suggested,  $r = .19$ , number of different categories suggested,  $r = .17$  and within-story flexibility,  $r = .18$ . A positive trend was seen for distractibility and relevancy scores.

### Correlations between Temperament Dimensions and Total Scores of Social Problem Solving Tasks

As presented in table 4, activity level was

marginally negatively associated with number of categories suggested,  $r = -.20$ ; number of different categories suggested,  $r = -.22$ ; within-story flexibility,  $r = -.21$  and relevancy scores,  $r = -.17$ . A positive trend was seen for adaptability and number of different categories suggested. Approach was also positively marginally correlated with number of categories suggested,  $r = .16$ ; number of different categories suggested,  $r = .23$ ; within-story flexibility,  $r = .20$  and relevancy scores,  $r = .19$ . Distractibility was marginally negatively associated with number of categories suggested,  $r = -.21$  within-story flexibility,  $r = -.17$  and relevancy scores,  $r = -.16$ . Although not significant, a similar trend was also observed for distractibility and number of different categories suggested. Persistence was also positively marginally correlated with number of categories suggested,  $r = .20$ ; number of different categories suggested,  $r = .17$ ; within-story flexibility,  $r = .16$  and relevancy scores,  $r = .18$ .

## DISCUSSION

The results of this study indicate that highly active and distractible children suggested less number of strategies in object acquisition, friendship initiation and avoiding anger problem-solving tasks. Highly active and distractible children were also less able to suggest different strategies in all the three task areas. These children were also less flexible in providing alternate solutions in all the three task areas - object

**Table 3: Correlations between Temperament Dimensions and Scores of Avoiding Anger Tasks**

Variables	Activity level	Adaptability	Approach	Distractibility	Persistent
Number of Categories	-.19*	.17*	.18*	-.20*	.19*
Number of Different Categories	-.23*	.14	.22*	-.15	.17*
Within-Story Flexibility	-.22*	.12	.13	-.16*	.18*
Relevancy Score	-.18*	.14	.13	-.13	.15

Note: Significant at \*  $p < 0.05$

**Table 4: Correlations between Temperament Dimensions and Total Scores of Social Problem Solving Tasks**

Variables	Activity level	Adaptability	Approach	Distractibility	Persistent
Number of Categories	-.20*	.19*	.16*	-.21*	.20*
Number of Different Categories	-.22*	.15	.23*	-.14	.17*
Within-Story Flexibility	-.21*	.19*	.20*	-.17*	.16*
Relevancy Score	-.17*	.16*	.19*	-.16*	.18*

Note: Significant at \*  $p < 0.05$

acquisition, friendship initiation and avoiding anger. Also, highly active and distractible children were less likely to suggest relevant solutions in hypothetical problem-solving tasks.

Adaptability, approach and persistence dimensions of temperament were positively associated with number of strategies in object acquisition, friendship initiation and avoiding anger problem-solving tasks. Children who were easy to adapt, more approachable and persistent were more likely to suggest different strategies in all the three social problem-solving task areas. These children were also more flexible in providing alternate solutions in all the three task areas - object acquisition, friendship initiation and avoiding anger. Also, they were more likely to suggest relevant solutions in all the three task areas.

These results are in accordance with findings by Goldstein et al. (1986) indicating that there are relations between temperament variables and cognitive style in children. These authors report that distractible, non-persistent, non-adaptable and highly active children with negative mood were poor problem-solvers as they wanted to finish the task quickly. Matheny (1989) and Moller (1983) also found that children with higher mental test scores tend to be more attentive, persistent, approachable, adaptable and positive in mood. With regard to social-cognitive scores, the results of the present study indicating that adaptable and approachable children were more likely to achieve high scores, are highly consistent with the previous research indicating that withdrawn children tend to suggest fewer relevant and flexible alternatives in social problem-solving tasks (Rubin et al. 1984; Rubin and Rose-Krasnor, 1986).

In conclusion, the present study shows that there are relations between temperament dimensions, particularly five dimensions — activity level, adaptability, approach, distractibility and persistence, and social problem-solving skills. Highly active and distractible children are poor problem solvers, whereas, children who are adaptable, approachable and persistent are good

problem solvers.

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