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ABSTRACT

This study examined the similarity among 45 sibling pairs in the third through fifth grade, in their social and academic adaptation to the school setting as evaluated by multi-agent and multi-method assessment of adjustment. Measurements included teacher ratings and rankings of academic skills, social behavior, and peer acceptance; peer sociometric ratings by all classmates; and direct observations of children on the playground with peers and in the classroom with teachers and peers. Comparisons were made with a set of randomly selected unrelated subject pairs matched with each sibling on sex, grade, and classroom. Significant correlations were found only among sibling pairs on peer ratings of social preference, teachers' judgments of academic competence (math and reading), popularity, social behavior and school adjustment, positive behavior with peers on the playground, and teachers' disapproving behavior in the classroom. Results provided support for a social interactional perspective of shared environmental influences on sibling similarity, and underscored the need for more multi-agent and method research on sibling concordant and discordant adjustment. (Author/MM)

SIMILARITY IN SIBLINGS' SCHOOL ADJUSTMENT: A COMPARISON OF TEACHER AND PEER RATINGS AND DIRECT OBSERVATION

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We examined the similarity among 45 sibling pairs in the third through the fifth grade, in their social and academic adaptation to the school setting. Measures included: (a) teacher ratings and rankings of academic skills, social behavior, and peer acceptance; (b) peer sociometric ratings by all classmates; and (c) direct observations on the playground with peers and in the classroom with teachers and peers. Comparisons were made with a set of randomly selected unrelated subject pairs matched with each sibling on sex, grade, and classroom. Significant correlations were found only among sibling pairs on peer ratings of social preference, teachers' judgments of academic competence (math and reading), popularity, social behavior and school adjustment, positive behavior with peers on the playground, and teachers' disapproving behavior in the classroom. The results provide support for a social interactional perspective of shared environmental influences on sibling similarity and underscore the need for more multi-agent and -method research on sibling concordant/discordant adjustment.

The similarity in siblings' social behavior is a question of interest to clinicians and developmentalists alike (Boer & Dunn, 1992). Two contrasting perspectives can be seen in the behavior genetics and social interactional models. The view of behavior geneticists (e.g., Plomin & Daniels, 1987) is that more differences than similarities are expected among siblings due to their "nonshared environment," such as birth order and differential parental treatment. Ahern et al. (1982) found an average correlation of 0.16 on personality questionnaires.

A social interactional perspective (e.g., Patterson, Reid, & Dishion, 1992) predicts higher levels of sibling similarity, due to common parenting practices that establish family interaction patterns. Early empirical support has been noted in treatment outcome studies of parent training (Arnold, Levine, & Patterson,

1975), in observations of aversive behavior between siblings in families with problem children (Patterson, 1986), and in a nonclinical sample of fourth and seventh grade boys (Patterson, Dishion, & Bank, 1985).

Inconsistent findings in the literature may also be directly related to the type of measures used. Hoffman (1991) has argued that observation measures would show greater similarity because behavior that can be directly observed is more likely to be influenced by child rearing practices compared to the global trait variables assessed with personality tests. Furthermore, evidence from extra-familial settings would be helpful in determining the degree of similarity among siblings in settings with dissimilar stimuli.

The current study examined, for the first time, the similarity among primary grade siblings' social status and behavior at school as evaluated by multi-agent and -method assessment of adjustment. As a comparison group of unrelated children, we randomly selected children matched by subject on sex, grade, and classroom.

METHOD

Subjects

Subjects were 45 pairs of siblings in elementary school who participated in a larger study of the behavioral correlates of sociometric status (see Table 1). 87% of siblings were in different grades and none were in the same classroom.

Procedures

Thirty minutes of observation data for each subject were collected over a six-week period, 15 minutes each in the classroom and playground. During Week 4, teachers completed ratings and rankings while sociometrics were administered by classroom.

Classroom observations. Three sets of daily observations during an academic period were made using a variation of the CLASS code (Hops et al., 1978). Student behaviors recorded were: (a) positive peer social behavior; (b) negative peer social behavior; (c) on-task behavior; and (d) off-task behavior. Teacher behaviors recorded were: (a) approval, (b) disapproval, (c) other verbalizations, (d) attending, and (e) no response. Only positive and negative behavior to peers, on-task behavior, and teacher disapproval and verbal interaction were used.

Playground observations. Different observers recorded the behavior of children in one-minute intervals during the three sets of observations. A six-second interval, six-behavior category interactive coding system recorded children's behavior along two dimensions, verbal-nonverbal-physical and positive-negative (Hops & Stevens, 1987). Noninteractive peer social behavior was also recorded: (a) noninteractive in social play (e.g., waiting in line to play a group game), (b) parallel play, (c) observing peers, (d) uninvolved, and (e) inter-

TABLE 1. SAMPLE DEMOGRAPHICS

	# of pairs	% of entire sample
Same-sex siblings	N = 25	56%
Male-male	N = 7	40%
Female-female	N = 7	16%
Opposite-sex siblings	N = 20	44%
Siblings in same grade	N = 6	13%
Siblings in different grade	N = 39	87%
Same-sex/Same-grade	N = 4	9%
Opposite-sex/Same-grade	N = 2	4%
Same-sex/Different-grade	N = 21	47%
Opposite-sex/Different-grade	N = 18	40%

action with an adult. Positive and negative social behavior to peers and time spent alone were used.

Observer training and reliability. Four observers were hired for the classroom and nine for the playground. Training procedures included memorizing the codes, reading of the manual, oral and written quizzes, coding from videotapes, and coding in situ. Eighty-eight agreement checks were made on the playground with a mean agreement of 83% (range 45% to 100%) and a mean kappa of 0.90 (range .74 to 1.00). In the classroom, 31 agreement checks were conducted with a mean agreement of 73% (range 50% to 92%) and a mean kappa of 0.78 (range .65 to 1.00).

Measures

Peer sociometrics. Children rated each of their classmates on how much they "liked to play with" them on a 5-point scale from "1" (not at all) to "5" (very much) (Asher & Dodge, 1986). Peer preference was the frequency of 5 ratings minus the frequency of 1 ratings received.

Teacher measures. (1) Academic competence was rated by teachers on a scale of 1 (failing) to 9 (excellent) (Dodge, Coie, and Brakke, 1982). (2) Peer-group popularity was measured by teachers rank-ordering their students (Greenwood, Walker, Todd, & Hops, 1979). (3) The Walker-McConnell Scale of Social Competence and School Adjustment (WMC; Walker & McConnell, 1988) is a 43-item scale that produces three subscales: (a) teacher-preferred social behavior, (b) peer-preferred social behavior, and (c) school adjustment behavior. (4) The Pupil Evaluation Inventory (PEI; Pekarik, Prinz, Liebert, Weintraub, & Neal, 1976) contains three subscales: (a) aggression, (b) withdrawal, and (c) likability and has been found to be valid and reliable for use by teachers (Ledingham, Younger, Schwartzman, & Bergeron, 1982; McConnell & Odom, 1986).

RESULTS

Analytic Plan

The 18 selected measures, representing four measurement domains (i.e., peer ratings, teacher ratings and rankings, and direct observations on the playground and in the classroom), were chosen for their distributional properties, and for their inclusion in the development of constructs for the larger study (Hops, Lewin, Dishion, & Davis, in preparation). The constructs, developed through confirmatory factor analyses, represented four domains of interest: (a) positive peer relations, (b) social withdrawal/isolation, (c) behavioral adjustment/aggression, and (d) academic skills. Each construct was a composite of variables derived from direct observation and either peer ratings (positive peer relations), teacher variables (academic skills and behavioral adjustment/aggression), or all three (social withdrawal/isolation).

Siblings versus Matched Sample

Individual indicators. Of the 18 correlations computed for each set of subjects, 10 were significant for the sibling pairs and none for the matched sample (see Table 2). Significant effects were found within each set of variables based on peer ratings, teacher ratings and rankings, and direct observation of behavior on the playground and in the classroom. Tests of the differences between the correlations for the sibling pairs and the matched comparison group showed significant effects for eight variables that were also distributed across the four variable categories. Only on-task behavior had not shown a significant effect for the sibling pairs in the previous analysis.

TABLE 2. CORRELATIONS BETWEEN SIBLING PAIRS AND MATCHED PAIRS ON PEER RATINGS, TEACHER RATINGS AND RANKINGS, AND DIRECT OBSERVATIONS

Variable	Sibling Pairs r_1	Sibling Pairs z_1	Matched Pairs r_2	Matched Pairs z_2	t
Peer ratings					
Peer social preference[a]	.50*	.5493	-.01	-.0100	2.54*
Teacher ratings					
PEI likability scale	.43*	.4599	.05	.0500	1.86
PEI aggression scale	.13	.1307	.23	.2342	-.47
PEI withdrawal scale	.18	.1820	.06	.0601	.55
WMC school adjustment scale	.63*	.7414	.01	.0100	3.32*
WMC peer-preferred behavior scale	.40*	.4236	.32	.3316	.42
WMC teacher-preferred behavior scale	.33	.3428	.34	.3541	-.05
Math ability	.64*	.7582	-.29	-.2986	4.80*
Reading ability	.60*	.6831	-.14	-.1409	3.79*
Teacher popularity rating	.55*	.6184	.24	.2448	1.70
Direct observations					
Playground behaviors					
Positive behavior displayed[b]	.42*	.4477	-.36	-.3769	3.75*
Negative behavior displayed[b]	-.19	-.1923	-.28	-.2877	.43
Time spent alone	.31	.3205	.06	.0601	1.18
Classroom behaviors					
Positive peer social behavior	.36	.3769	.19	.1923	.84
Negative peer social behavior	-.17	.1717	-.10	-.1003	1.24
On-task behavior	.34	.3541	-.09	-.0902	2.02*
Teacher disapproval	.64*	.7582	-.11	-.1104	3.95*
Teacher verbal interaction	.42*	.4477	-.01	-.0100	2.08*

* $p < .05$.

[a] Number of positive peer nominations minus number of negative peer nominations. [b] Composite scores based on verbal, nonverbal, and physical contents.

Construct scores. Significant correlations were found for three of the four constructs but only among sibling pairs (see Table 3). The most striking correlations were those with the positive peer relations and academic skills constructs. Note that behavioral adjustment/aggression had the highest correlation with positive peer relations.

To examine the multivariate relationship among subject pairs, a canonical correlation was computed using the four constructs. A significant canonical correlation was found only for the relation between sibling pairs ($R^2 = .80$, $\chi^2(16) = 33.84$, $p < .01$). With one exception, the canonical loadings on each of the factors were similar for the older and younger siblings, respectively, positive peer relations (.53 vs. .80), social withdrawal/isolation (-.11 vs. -.60), behavioral adjustment/aggression (.35 vs. .31), and academic functioning (.84 vs. .83). Positive peer relations and academic functioning made the strongest contribution to the canonical variates for both the older and younger siblings, whereas social withdrawal/isolation contributed only for the latter.

TABLE 3. CORRELATIONS AMONG CONSTRUCT SCORES BETWEEN OLDER AND YOUNGER SIBLINGS

	Positive peer relations	Social withdrawal/ isolation	Behavioral adjustment/ aggression	Academic skills
	Sibling pairs			
Positive peer relations	.519*	-.293	.237	.649*
Social withdrawal/isolation	-.579*	.455*	-.225	-.605*
Behavioral adjustment/aggression	.619*	-.606*	.333	.523*
Academic skills	.498*	-.246	.293	.653*
	Matched sample			
Positive peer relations	.159	-.070	-.231	.155
Social withdrawal/isolation	-.273	.145	.206	-.279
Behavioral adjustment/aggression	.096	-.059	-.024	.092
Academic skills	.039	-.012	-.222	.018

* $p < .05$.

DISCUSSION

In general, the findings provide clear and dramatic evidence of similarities among siblings in their peer relations, their academic performance, and behavioral adjustment in the school setting. None of the correlations for the matched pairs were significant, despite the likelihood that some correlations could occur by virtue of chance alone. Similarity among siblings was greatest on the constructs of peer relations and academic skills, followed by behavioral adjustment. In the absence of a family study design, the level of similarity, of course, cannot be neatly parceled into heritability versus environment. From behavior genetics studies, we acknowledge that genetic pedigree accounts for some aspect of similarity in academic functioning in school (Rowe & Plomin, 1981) as well as sociability and extraversion underlying positive peer relations (Plomin & Daniels, 1987).

The correlations in the school adjustment among siblings is also consistent with a social interactional model of development (Patterson et al., 1992). The high covariation among siblings on peer relations and academic skills is consistent with the idea that adaptation to school is promoted by children having learned skills at home that generalize to academic and peer relations. Obviously we need more research that examines the contexts that promote generalizability of parent-child interaction to teacher-child interaction. Herein we find the key focus for interventions aimed to improve the adjustment of the at-risk child, regardless of the source of the problems vis-a-vis nature versus nurture issues.

An important methodological advantage of the current study is its use of multiple types of information in independent settings outside the home and independent of interaction between siblings. There is an increasing awareness of the importance of the form of assessment as a determinant of study outcomes (Braungart, Plomin, DeFries, & Fulker, 1992; Newcomb, Bukowski, & Pattee, 1993). As Hoffman (1991) has argued, findings of similarities in siblings are dependent upon the concepts studied and the methods used to assess them. Data from the current study provide some support for Hoffman's assertions. Significant relations, outside the family setting, were found for posi-

tive peer social relations and social withdrawal, constructs based in part on direct observation and those more likely to be influenced by child rearing practices.

Data from multiple agents and with multiple methods in different settings with siblings interacting with significant others both independently and together are needed. Only then will the simple effects as well as the interactions between these factors be determined.

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