

Siblings of Disabled Children: Birth Order and Age-Spacing Effects¹

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Whereas older siblings of children with congenital disability have lived their earliest years in a "normal" family environment, younger siblings, especially those in a close age-spacing relationship, were born into families marked by the presence of a disabled child. In this paper, 237 siblings of disabled children are compared to 248 siblings from a random sample of families to examine whether the early family environment of siblings of disabled children, as indexed by relative birth order and age-spacing, has a unique influence on psychological functioning. The findings partially confirmed the expected relationships: Younger male siblings, specifically those in close age-spacing relationship to the disabled child, scored higher on psychological impairment than older male siblings. Among female siblings, a similar influence was not in evidence: Younger female siblings were psychologically better off than older female siblings and their age-spacing was not significantly related to psychological functioning. However, the results suggest that siblings' later response to early life experience may be sex-contingent, with males demonstrating interpersonal aggression and females experiencing depressive-anxious feelings.

The impact of childhood disability on family members is a relatively new focus of research reflecting recent increases in the proportion of severely disabled children and the trend toward care in the home. The altered family environment attendant on the birth of a disabled child and the onset of

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severe chronic illness in a child has been examined with respect to effects on the psychological development of normal siblings (Breslau, Weitzman, & Messenger, 1981; Farber, 1959, 1960; Gath, 1973; Lavigne & Ryan, 1979; Shere, 1956; Tew & Laurence, 1973). One hypothesis is that a sibling's birth order in reference to the disabled child has an effect on psychological functioning. While some investigators have suggested that the problems of younger siblings are different from, but not necessarily more severe than, those of older siblings (Burton, 1975), others examined the proposition that siblings younger than the disabled child are at greater risk of maladjustment than those older (Lavigne & Ryan, 1979; Tew & Laurence, 1973).

The grounds for the relative-birth-order hypothesis have not been systematically explicated, although clinical observations have suggested that, because of the disproportionate care that a disabled child receives, younger siblings may show regressive and attention-seeking behavior (Tew & Laurence, 1973) and may be uprooted and displaced as their ill brother or sister assumes a more dependent role in the family (Jordan, 1962; Lavigne & Ryan, 1979). Implicit in these explanations is a model in which attention, care, or dependency are divided among siblings according to birth order, with the youngest in the family receiving the most attention and care and being the most dependent, and the oldest having the fewest benefits and the least dependency. A disabled child in the family would tend to disturb this order, by requiring more than what the child's ordinal position entitles him or her to receive. This model would be more applicable when the disability is acquired rather than congenital (Lavigne & Ryan, 1979).

Empirical evidence is scanty and inconsistent. One study found younger siblings of children with spina bifida at no greater risk than older siblings (Tew & Laurence, 1973). A study (Lavigne & Ryan, 1979) of siblings of children with a variety of congenital and acquired disabilities found no main effect of birth order on psychological adjustment. Instead, this study found a significant interaction effect between birth order and sex.

In this paper an alternative model of the effect of relative birth order on the adjustment of siblings is proposed and tested. Since *congenitally* disabled children are born with their disabilities, their age relationship to siblings indexes a pertinent factor in the early family environment of the siblings: Older siblings have lived their earliest years in a "normal" family, whereas younger siblings were born into families marked by the presence of a disabled child. Since parental response to the birth of a disabled child is likely to change with time, the early biography of a younger sibling should be further differentiated by the age-spacing between the sibling and the disabled child. It is therefore hypothesized, that (1) younger siblings of congenitally disabled children are more psychologically impaired than older siblings and (2) among younger siblings, those in close age-spacing

relationship would be worse off than those who are not. Siblings' sex is controlled in the analysis on the grounds that children's response to environmental influences may vary by sex (Rutter, 1970, 1974). Data come from a comprehensive study conducted in 1978-1979 of families of disabled children and a randomly selected sample of families. Siblings of disabled children are compared to siblings from the random sample to examine whether the early family environment of siblings of disabled children, as indexed by relative birth order and age-spacing, has a unique influence beyond the influence that such family structure variables generally have.

METHOD

Subjects and Procedure

Sample of Children with Disabilities. Families of children with cystic fibrosis, cerebral palsy, myelodysplasia, and multiple handicaps were selected from four pediatric specialty clinics in two teaching hospitals in Cleveland, Ohio, whose case loads provide relatively representative samples of area children in these diagnostic categories.

All families of patients 3 to 18 years of age in these diagnostic categories, who resided in the Cleveland area, were asked to participate in the study. In all, 369 (80%) complete and usable interviews were obtained from 460 eligible families. In families in which there were normal siblings 6 to 18 years old, data were obtained on the psychological functioning of a randomly selected sibling in this age group. Of the total of 237, 49 were siblings of cystic fibrosis patients, 77 of cerebral palsy, 54 of myelodysplasia, and 57 of multiple handicaps.³

Sample of Children in the Community. A three-stage probability sample was designed to represent all Cleveland area families with one or more children 3 to 18 years old. The 1977 Cleveland Area Survey (CAS) sampling scheme and lists of blocks and addresses were used for drawing this sample. From 534 eligible families, 459 (86%) complete interviews were obtained. In families in which there were additional children 6 to 18 years old, data were gathered on the psychological functioning of a randomly selected sibling in this age group.

³Although all four disease categories in this study are congenital, in two of them, cerebral palsy and cystic fibrosis, the diagnosis may not always be made at birth. In this study, 85% of the disabled children were either diagnosed at birth or were suspected of having a serious medical problem during the 1st year of life.

The Mother's Interview. Mothers were interviewed in their homes using a structured questionnaire including several self-administered instruments. Trained female interviewers, matched according to respondent race, conducted the interviews. Every fifth interview was verified by telephoning and asking the respondent a standard set of questions about the conduct of the interview and several factual items from the questionnaire. A wide range of variables was covered, including the health status of several individuals in the family, sociodemographic characteristics, social ties and relationships, family structure, and social environment.

The Measurement of Psychological Functioning. Psychological functioning of siblings 6 to 18 years old was measured by the Screening Inventory developed by Langner, Gersten, McCarthy, Eisenberg, Greene, Herson, and Jameson (1976). The Inventory purports to measure child functioning in major social contexts: at home, with peers and at school. The measure is based on mothers' answers to 35 dichotomously coded items and comprises seven subscales, each with five items, measuring seven areas of child behavior: Self-Destructive Tendencies, Mentation Problems, Conflict with Parents, Regressive-Anxiety, Fighting, Delinquency and Isolation. In addition, the sum of the 35 items provides a composite measure of psychological impairment. A cutoff point of six on this measure distinguishes those severely impaired (scoring six and over) from those moderately impaired or well. Results from the extensive validation studies conducted by Langner and his associates (Langner, Gersten, Greene, Eisenberg, Herson, & McCarthy, 1974; Langner et al., 1976) provide some assurance of the validity of the scale.

The analysis reported below employed three indexes of psychological functioning based on the Screening Inventory: (1) the total 35-item Inventory Score, (2) Aggressive Behavior, which combined the 15 items of Conflict with Parents, Fighting, and Delinquency, and (3) Depression-Anxiety, which combined the 15 items of Self-Destructive Tendencies, Regressive-Anxiety, and Isolation. Internal consistency reliabilities (Cronbach's alpha) of Aggressive Behavior was .79 and of Depression-Anxiety, .82.

RESULTS

Siblings in the disabled as well as in the community sample were nearly equally distributed among the three age cohorts: latency (6-9), preadolescence (10-13), and adolescence (14-18). Among siblings in the disabled sample, females slightly outnumbered males, whereas the reverse was true for siblings in the community. Mean number of children per family

was approximately three in both samples, and approximately 20% of each group were single-parent families. Median income of community families was higher than that of the disabled, \$20,000 and \$16,000, respectively. median level of maternal education was the same in both groups, with the majority in each group having completed high school.

Siblings of disabled children scored higher on the total Screening Inventory than siblings in the community, 3.2 and 2.4, respectively, $t(483) = 2.344, p < .02$. The difference between the samples was confined, however, to Aggressive Behavior, on which siblings of disabled children had a mean score of 1.51, whereas the mean score of siblings in the community was 1.07; $t(483) = 2.459, p < .02$. The difference between the two samples' means on Depression-Anxiety was not statistically significant. The proportion of siblings of disabled children classified as psychologically severely impaired (scoring 6 and above on the total Inventory) was not significantly different from that of siblings in the community, 16% and 13%, respectively. Analysis reported elsewhere (Breslau et al., 1981) indicated that type of disability and severity bore no relationship to the psychological functioning of the siblings, nor did siblings' sex and age have statistically significant main or interaction effects on their level of psychological functioning.

The effects of relative birth order on the psychological functioning of male and female siblings were examined separately for siblings of disabled children and siblings of the community sample. Among siblings of disabled children, neither relative birth order nor sex had a statistically significant main effect on overall level of psychological functioning as measured by the total Inventory. However, relative birth order had a significant interaction effect ("crossed") with sex on psychological functioning. Among males, those younger than the disabled child scored higher than those older, 4.5 and 2.9, respectively, whereas among females, younger siblings scored lower than older, 2.0 and 3.7, respectively, $F(1, 233) = 8.39, p < .005$. Analysis of data on siblings in the community revealed only a statistically significant main effect of sex, with males scoring higher than females, $F(1, 244) = 6.66, p < .02$. Among community siblings, relative birth order bore neither a uniform nor a sex-contingent relationship with psychological functioning.

Similar analyses were used also to examine the effect of relative birth order on Aggressive Behavior and Depression-Anxiety. The results of these analyses replicated the findings on the overall level of psychological functioning: In both areas, there were statistically significant interaction effects of relative birth order and sex for siblings of disabled children, but not for community siblings. In both areas, male siblings younger than the disabled child were psychologically worse off than older, whereas among

female siblings those older were worse off than those who were younger. On Aggressive Behavior, mean scores for younger and older male siblings were 2.3 and 1.5, respectively, whereas for younger and older female siblings they were .8 and 1.5, respectively, $F(1, 233) = 6.29, p < .02$. On Depression-Anxiety, mean scores for males were 1.3 and .7 and for females .8 and 1.3, for corresponding birth-order categories, $F(1, 233) = 6.31, p < .02$. On Aggressive Behavior, there was also a significant main effect of sex in both samples, with male siblings scoring on the average significantly higher than female counterparts.

These results are in disagreement with findings reported by Lavigne and Ryan (1979). They also reported an interaction effect of relative birth order and sex, but in the reverse direction. In a previous paper (Breslau et al., 1981) we suggested that since their sample included siblings of children with *congenital* and of children with *acquired* disabilities, any effect of relative birth order might have been obscured. Furthermore, in their data relative birth order might have been confounded with age and thus the reported interaction effect may actually reflect an interactive effect of siblings' *age* and *sex*, which was not otherwise reported in their paper.⁴

The effect of age-spacing on the psychological functioning of siblings younger than the disabled child was examined by a series of sex-specific comparisons between those less than 2 years and those 2 or more years younger than the disabled child. In Table I appear the comparisons by age-spacing for male and female younger siblings of disabled children and corresponding comparisons of siblings from the community sample. The statistical significance of the difference between each pair of means was tested by the student's *t* test of the difference between two independent means. A one-tailed probability was used, since it was hypothesized that the difference would be in a specified direction, namely, that those in the close age-spacing category would show a greater effect. Among male siblings, overall level of psychological functioning and Aggressive Behavior were markedly worse for those less than 2 years younger than the disabled child, compared to those 2 or more years younger. On the total Inventory the mean scores were 7.6 and 2.8, respectively ($p < .005$) and on Aggressive Behavior they were 4.6 and 1.0, respectively ($p < .005$). While those in the close age-spacing category had dramatically high mean scores, the means of those in the wide age-spacing category were not higher than those of male

⁴In this study there was neither a main effect of age nor an interaction effect between age and sex, as reported above. Furthermore, analysis reported elsewhere (Breslau et al., 1981) replicated the interaction effect between relative birth order and sex on a subset of the sample, holding age fixed.

Table I. Comparison of Psychological Functioning of Two Age-Spacing Categories for Younger Male and Female Siblings in the Disabled and Community Samples

	Disabled				Community			
	< 2 years		2+ years		< 2 years		2+ years	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
			<i>t</i>					<i>t</i>
	Males							
Total inventory	(N = 12)		(df = 32)	(N = 22)		(df = 50)	(N = 13)	(df = 61)
Aggressive behavior	7.6 (6.1)		3.125 ^b	2.8 (2.9)		3.0 (3.4)	4.1 (3.6)	1.036
Depression-anxiety	4.6 (3.8)		3.571 ^b	1.0 (2.0)		1.3 (2.0)	1.7 (1.8)	.696
	1.7 (2.2)		1.081	1.1 (.9)		.9 (1.3)	1.2 (1.4)	.736
	Females							
Total inventory	(N = 12)		(df = 52)	(N = 42)		(df = 43)	(N = 9)	(df = 50)
Aggressive behavior	2.2 (2.2)		-.468	1.9 (2.4)		1.8 (2.3)	3.0 (3.5)	1.276
Depression-anxiety	.6 (.9)		-.874	.9 (1.3)		.6 (1.2)	1.0 (1.3)	.753
	1.2 (1.0)		1.655 ^a	.7 (1.0)		.8 (1.2)	1.1 (1.4)	.757

^a*p* < .10.

^b*p* < .005.

siblings older than the disabled child (means of older males were 2.9 for the Total Inventory and 1.5 for Aggressive Behavior). Age-spacing bore no relationship to Depression-Anxiety of younger male siblings of disabled children. The mean scores of those in the close and wide age-spacing categories, 1.7 and 1.1, respectively, were not significantly different.

For female siblings younger than the disabled child, the impact of age-spacing was not in clear evidence. None of the three comparisons between the two age-spacing categories yielded results that were statistically significant at a conventional level. However, in regard to Depression-Anxiety, the data did suggest a trend. Female siblings younger than the disabled child by less than 2 years scored higher on Depression-Anxiety than those 2 or more years younger than the disabled child, 1.2 and 0.7, respectively, a difference nearly reaching statistical significance ($p < .10$).⁵

Among younger siblings in the community, age-spacing had no effect on either males or females. Although both male and female siblings less than 2 years younger than the reference child in their family had higher mean scores than those 2 or more years younger, none of the differences reached statistical significance (see Table I).⁶

Additional analysis indicated that age-spacing had no effect on the psychological functioning of siblings older than the disabled child. Sex-specific comparisons by age-spacing—less than 2 years, or 2 or more years older than the disabled child—revealed neither statistically significant differences nor consistent trends for either males or females. With respect to these negative results, older siblings of disabled children were not different from siblings in the randomly selected households of the community sample.

CONCLUSIONS

Relative birth order had opposite effects on the psychological functioning of male and female siblings of disabled children: Among males,

⁵Although, as reported earlier, no effect of age on siblings' psychological functioning was observed in these data, further assurance that age-spacing effects are not likely to be confounded with age can be found in the fact that the four sibling subsets by age-spacing and sex in the disabled sample had similar mean age, approximately 10 years. Means of the four subsets in the community sample were somewhat unequal, especially for males, where the difference in age between those less than 2 years younger and those 2 or more years younger was close to 2.5 years.

⁶The age-spacing hypothesis was examined also by testing whether age-spacing differences in the disabled group were significantly greater than in the community sample. *T* tests of the difference between mean differences indicated that for male siblings differences in age-spacing effects between the two groups were statistically significant for the total Inventory, $t(94) = 1.859$, $p < .05$, and Aggressive-Behavior, $t(94) = 3.018$, $p < .005$. Results for females, including those for Depression-Anxiety, failed to show significant differences.

those younger than the disabled showed greater psychological impairment than those older, whereas among females, those younger than the disabled were better off than those older. In contrast, among comparable siblings from a random sample of families, relative birth order had neither a main effect nor an interaction effect with sex on psychological functioning.

Analysis of differences by age-spacing provided further specification of the relative birth order and sex interaction effect such that among male siblings younger than the disabled child, those in the close age-spacing category had markedly high mean scores on overall level of psychological impairment and aggressive behavior, whereas those in the wide age-spacing category were not different from older male siblings (the low-risk birth-order category for male siblings). Although among younger female siblings of disabled children (a generally low-risk group) age-spacing did not produce reliable results, the data suggest that in the area of depression those in the close age-spacing category might be worse off than those in the wide age-spacing category. Age-spacing had no effects on siblings in the random sample of families. Nor did it influence the psychological functioning of older male or female siblings of disabled children.

These findings taken together indicate that a normal male sibling born into a family with a disabled infant less than 2 years of age is at risk for psychological impairment later on, i.e., between 6 and 18 years of age. The finding that age-spacing did not make a difference for older siblings of disabled children suggests that the observed impact is of the earliest life experience. That analogous patterns were not found among comparable siblings from a random sample of families should dispel any suspicion that the risk observed was merely an instance of a general age-spacing effect. Thus, the expectation that younger siblings of disabled children, especially those in close age-spacing, would be at risk for psychological impairment was in part borne out by these results. For male siblings there was clear evidence that the presence of a disabled infant influenced the level of later functioning. It is unclear, however, why a similar influence was not in evidence for female siblings.

It should be pointed out, moreover, that the sex difference observed here is consistent with previous findings on children's responses to adverse life experiences (Bentzen, 1963). In a review of research findings on this point, Rutter (1974) concluded that, although many studies found no sex differences, where there has been a sex difference, both in young subhuman primates and in children, the male has usually been found to be the more vulnerable. He suggests that "young males may be more susceptible than females to psychological stress, as certainly they are to biological stress" (Rutter, 1974, p. 31; see also Rutter, 1970).

Data from this study may suggest a different interpretation: It could be that males are not more vulnerable than females, but instead that their vulnerability manifests itself differently. It will be recalled that, whereas for

younger male siblings an age-spacing effect was found on aggressive behavior, among younger females age-spacing affected Depression-Anxiety. Although the age-spacing difference in Depression-Anxiety among younger females did not reach an acceptable level of statistical significance, its interpretation must take into account some pertinent methodological considerations. The measurement of psychological functioning used in this study is based on a conceptualization of children's mental health that emphasizes interpersonal and conduct problems in contrast to intrapsychic states, such as anxiety and depression. Furthermore, there is evidence that mothers underreport their children's anxious-depressive symptoms, presumably because such moods are not always communicated to them (Langner, Gersten, & Eisenberg, 1977; Lapouse & Monk, 1958).⁷

It could be speculated that younger female siblings of disabled children are in fact not immune to the effects of their early environment. While males would show later consequences of problems in their early environment in aggressive actions, females might show them in the form of depressive-anxious feelings. Early socialization, which shapes sex differences in children's behavior, may also determine the manner in which they experience and respond to inadequacies or distortions in their early family environment.

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⁷There also may be grounds for the expectation that the consequences of adverse early life experiences in females become apparent at a later age than in males. Epidemiological data indicate that among children under 15 years of age, males have higher rates of psychiatric disorder than females, but that among children 15 to 18 years old, the rates of females are higher than those of males (Gove & Herb, 1974). Since most younger siblings of disabled children in this study were under 15, the effect on females of the early environment, as measured by age-spacing, may not have received an adequate test on this count as well.

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