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Cognitive status as a risk factor for maladjustment in children with a physical disability (*)

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Children with a physical disability are at increased risk for adjustment problems. This has been substantially verified both in a recent empirical meta-analysis (Lavigne & Faier-Routman, 1992) and a traditional comprehensive review (Wallander & Thompson, 1995) of the large body of relevant literature. However, because not all children with a physical disability experience problems, it is important to identify those factors which may put them at increased risk. Identifying these risk factors may suggest which children are in particular need of prevention and intervention services.

To facilitate this effort, Wallander and Varni have proposed a conceptual model identifying both risk and resistance factors for adjustment problems in children with chronic physical conditions (Wallander & Varni, 1992; Wallander, Varni, Babani, Banis, & Wilcox, 1989). Hypothesized risk factors are (a) characteristics of the condition, such as ambulation status, the visibility of the condition, and cognitive functioning; (b) functional implications of the condition; and (c) psychosocial stress both in general terms and as related to the child's condition. Because of its intuitive appeal, much attention has been focused on condition characteristics explaining differences in the child's adjustment. At this time, however, there is a lack of consensus regarding their relationship with adjustment problems.

On the one hand, Lavigne and Faier-Routman (1993), in their meta-analysis found support for a significant contribution of the set of condition characteristics to adjustment in children with chronic conditions. Within this set, significant specific correlates of adjustment were the factors of severity, functional status, and prognosis. In contrast, Wallander and Thompson's (1995) traditional comprehensive review of research conducted in the past 10 years on this issue found the vast majority of the studies not to support a relationship between behavior problems and severity of the condition, when it was investigated. Findings from our own research program are consistent with Wallander and

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Thompson's conclusions. We find that various medical parameters, disability status, or functional ability of the child do not explain significant variation seen in his or her behavioral adjustment (e.g., Wallander, Feldman, & Varni, 1989; Wallander, Varni, Babani, Banis, DeHaan, & Wilcox, 1989).

Given the divergent findings regarding condition characteristics, further research is warranted. This research may be guided by investigation of risk factors for maladjustment in general child development research and theory. Brain damage and cognitive problems have received substantial support as a general risk factor (cf. Anthony & Cohler, 1987; Rutter, 1988) and appear relevant to children with chronic physical disability because a portion of these manifest cognitive deficits. For example, Rutter (1978, 1980, 1981, 1982) has published a series of epidemiological analyses supporting a relationship between brain functioning and development of adjustment problems. Indeed, Wallander and Thompson (1995) cited as the most consistent finding from the research on condition characteristics that children with «conditions that involve the brain have more behavioral problems...than children with conditions that do not» (p. 129). Furthermore, level of intellectual functioning, as one index of brain functioning, has been shown to be associated with psychosocial adjustment (DeMaso, Beardslee, Silbert, & Fyler, 1992) and to interact in complex ways with health status, maternal attitudes, and child adjustment (Perrin, Ayoub, & Willett, 1993) in children with chronic physical conditions. However, aside from these few studies, there has been little recent research into the specific association between cognitive status and adjustment in children with chronic physical conditions. Given the specific pediatric as well as general child development findings, this relationship warrants further examination in the pursuit of risk factors for maladjustment for this population.

Thus, the general goal of this study was to investigate the relationship between cognitive status and adjustment in children and adolescents with a chronic physical disability. Because of the paucity of research on this topic with children with a physical disability, it was important to conduct a series of studies to attempt to replicate any findings with different samples and methodologies. In fact, replication has too often been lacking in research on adjustment in children with chronic physical conditions (Wallander & Thompson, 1995). Furthermore, because of the frequently generally disabling nature of physical impairments, it would also be important to evaluate the relationship between cognitive status and maladjustment independent of the role of the severity of the physical disability. Based on Wallander and Varni's Disability-Stress-Coping model and previous research on pediatric populations as well as in developmental psychopathology more generally, it was hypothesized that cognitive problems would be positively associated with adjustment problems in children and adolescents with a physical disability, independent of any relationship existing between the severity of the physically disabling condition and adjustment.

1. STUDY 1

1.1. *Method*

1.1.1. Subjects

Three clinics in Los Angeles providing services to children with either spina bifida, cerebral palsy, or hearing problems cooperated in providing information about this study to patients' mothers. Public announcements were placed in local Los Angeles newspapers. Finally, referrals from subjects were pursued. Interested mothers were invited to contact the research program by returning a pre-addressed and stamped postcard or by calling directly. A total of 131 mothers volunteered to participate, all of whom had a child between 2-18 years of age with a disability resulting in handicapped motor and/or sensory functioning, which had occurred prior to the child's second birthday. Completed research material was returned by 119 (91%). A broad range of demographic characteristics were represented in the sample: *M* age of mothers = 36 years (*SD* = 7), *M* age of child = 9 years (*SD* = 4), and *M* family size = 4 (*SD* = 1); *Mdn* level of education completed by the mother = trade or community college, and

Mdn family income = $30,000 - $39,000; 87% of the mothers were married, and 13% belonged to an ethnic minority (6% Hispanic, 4% African American, 3% Asian-Pacific).

Based on a 29-item child disability checklist developed for this study, which the mother was instructed to complete relying as much as possible on official diagnostic information, the disabling conditions present in the children were classified by the investigators as follows: (a) 33% had a cognitive impairment, (b) 31% had brain damage, (c) 34% had an orthopedic impairment, (d) 19% had a medical-systemic condition, (e) 15% had a visual problem, (f) 21% had a speech problem, (g) 61% had a hearing problem, (h) 15% had a genetic condition, (i) 8% had a progressive condition, and (j) 63% had a congenital condition. Most children were classified into two or three of these categories (e.g., an orthopedic and cognitive impairment often cooccur in cerebral palsy).

1.1.2. Procedure

An informed consent form and the measures were compiled into a questionnaire and mailed to the mothers who had volunteered. An addressed, stamped envelope was provided for returning the material and a reminder was sent every two weeks for two months. Embedded in a larger data collection, the measures of relevance to this study are described below.

1.1.3. Measures

Physical disability was assessed with the *Vineland Adaptive Behavior Scales* (VABS; Sparrow, Balla, & Cicchetti, 1984) Communication, Daily Living Skills, and Motor scales administered to the mothers. Made up of 39, 57, and 29 items, respectively, the scales have adequate reliability and validity (Sparrow et al., 1984). Because the Socialization scale was not administered, as this would be confounded with measures of adjustment problems, a prorated composite standard score, which is age-normed, was calculated on the basis of these three scales following standard procedure.

Cognitive status was measured indirectly in this study by having the mother report on a checklist which of the following conditions were present to her knowledge: mental retardation, learning disability, brain damage, seizure disorders, hydrocephalus, microcephalus, and cerebral palsy. From this information, four categorical variables were derived: mental retardation (reported mental retardation); cognitive handicap (reported mental retardation or learning disability); brain damage (reported brain damage); and inferred brain damage (reported brain damage, seizure disorder, hydrocephalus, microcephalus, or cerebral palsy).

Adjustment problems were assessed by administering the 118-item *Child Behavior Checklist* (CBCL; Achenbach, 1991a) to the child's mother. Large-scale factor analyses have supported numerous subscales and the two second-order scales of Internalizing Behavior Problems and Externalizing Behavior Problems. These second-order scales and the Total Behavior Problems scale were the primary dependent measures, each expressed as a normalized T-score. Satisfactory psychometric properties have been reported for the assessment of child adjustment with this instrument (Achenbach, 1991a), supporting its widespread use today. Normative data are available on over 2,300 community residing children representative of the U.S. population and 1,800 mental health clinic referred children, stratified by age group and sex.

1.2. *Results*

1.2.1. Preliminary Analyses

Correlations were computed between demographic variables and adjustment problems measures to identify any covariates that needed to be entered as control variables in the main analysis. The following variables were found to be significantly correlated: family size with Externalizing Behavior Problems (r = .33, $p < .01$) and Total Behavior Problems (r = .23, $p < .05$), mother's level of education with Externalizing Behavior Problems (r = -.25, $p < .05$) and Internalizing Behavior Problems (r = -.30, $p < .01$), and child's age with Internalizing Behavior Problems (r = .23, $p < .05$).

Child Disability. Results from the VABS, measuring the child's functional independence as a negative index of disability, revealed a *M* stan-

TABLE 1

Correlations among Cognitive Status and Adjustment

Study	Cognitive Status Index	Parent-Reported Behavior Problems			Self-Reported Behavior Problems		
		Total	Externalizing	Internalizing	Total	Externalizing	Internalizing
1	Mother-Reported MR[a]	-.11	19	-.24	–	–	–
	Mother-Reported Cognitive Handicap[a]	-.23	-.01	-.36*	–	–	–
	Mother-Reported Brain Damage[a]	-.12	-.04	-.12	–	–	–
	Inferred Brain Damage[a]	-.23	-.04	-.32*	–	–	–
2	Estimated IQ Level	-.11	.00	.19	–	–	–
	Estimated MR [a]	-.17	-.13	-.18	–	–	–
3	IQ	-.03	.05	-.03	.05	.17	-.02
	Mental Age	-.06	.03	-.08	.00	.14	-.03
	Mother-Reported MR[a]	-.08	-.12	-.17	-.08	-.03	-.06
	Mother-Reported Brain Damage[a]	-.10	-.07	-.12	.23	.23	.20
	Mother-Reported Cognitive Handicap[a]	-.17	-.12	-.17	-.06	.05	-.09

[a] Coded as 0 = No, 1 = Yes

* $p < .05$ study-wise, after Bonferroni correction.

TABLE 2

Adjustment Regressed on Cognitive Status While Controlling for Severity of Physical Disability in Study 1 and Study 2

			R^2 - change		
Study	Step	IV	Total	Externalizing	Internalizing
1	1	Demographic covariates	.08	.09	.11
	2	Physical disability severity	.01	.02	.02
	3	Mother-reported MR	.00	.01	.02
	1	Demographic covariates	.08	.09	.11
	2	Physical disability severity	.01	.02	.02
	3	Mother-reported cognitive handicap	.05	.00	.11
	1	Demographic covariates	.08	.09	.11
	2	Physical disability severity	.01	.02	.02
	3	Mother-reported brain damage	.05	.00	.00
	1	Demographic covariates	.08	.09	.11
	2	Physical disability severity	.01	.02	.02
	3	Inferred brain damage	.05	.00	.07
2	1	Physical disability severity	.02	.01	.00
	2	Estimated IQ Level	.00	.01	.04
	1	Physical disability severity	.02	.01	.00
		Estimated MR status	.01	.01	.04

dardized score = 97 (*SD* = 26, range = 20-142). This indicates that these children were reported to display an age appropriate skill level in activities of daily living on the average, but with an extremely wide range of skills relative to age mates. Correlations between the VABS and the indices of cognitive status revealed the following significant associations, all in the expected direction: mental retardation ($r = -.57$), cognitive handicap ($r = -.45$), reported brain damage ($r = -.60$), and inferred brain damage ($r = -.59$) (all *p*s < .01).

1.2.2. Cognitive Status and Adjustment Problems

Pearson product-moment correlations were computed between the four indices of cognitive status and parent-reported Total, Externalizing, and Internalizing Behavior Problems. As can be seen in Table 1, when a Bonferroni correction is applied to these 12 dependent tests, by setting $p < .004$, to maintain a study-wise $p < .05$, only reported Internalizing problems remained significantly correlated with cognitive handicap and inferred brain damage.

To further evaluate these relationships, multiple regression analyses were conducted, where the different measures of adjustment problems were regressed on different indices of cognitive status, while controlling for severity of disability as well as those demographic variables found to be significant covariates. For each of the three measures of adjustment problems, sets of four multiple regression analyses were thus completed. In each, the index of cognitive status in question was entered on the final step, after controlling for the specific demographic covariate(s) and severity of disability. To control for Type I errors in these regression analyses, the Bonferroni correction was used again to maintain a study-wise $p < .05$ ($.05/12 = .004$) in determining the significance of R^2 - change for the hierarchically entered cognitive status variable. As can be seen in Table 2, none of these regression analyses yielded significant effects for any index of cognitive status. Cognitive handicap accounted for the most unique variance in Internalizing Behavior Problems (R^2- change = .11), however only reaching a significance level of $p = .014$.

2. STUDY 2

Given the lack of association found between cognitive status and maladjustment in Study 1, we wanted to investigate this relationship further in a more focused manner. Cognitive status would be measured objectively and directly for children with more limited ranges of conditions and ages.

2.1. *Method*

2.1.1. Subjects

Subjects were identified from rosters of ambulatory clinics of a hospital in Los Angeles. Children, ages 6 to 11 years, with either spina bifida or cerebral palsy were eligible to participate. The research project was introduced to the mothers by mail, followed by a phone call to request her and her child's participation. Of the 78 mothers contacted, 50 consented to come to the hospital for a two-hour session.

The *M* age of the children = 7.9 years (*SD* = 1.6 years) and their mothers = 35.1 years (*SD* = 7.3 years). Forty-six percent of the children were diagnosed with spina bifida, 54% were boys, and 61% were independently ambulatory. High school education had been completed by 47% of the mothers, 52% reported a yearly family income at or above $20,000, and 90% were of ethnic minority (63% Hispanic, 20% African American, 8% Asian-Pacific Islanders).

2.1.2. Procedure

After written consent was obtained from the mother and assent from the child, they were separated and assistants administer the procedure to each independently. After completing a demographic checklist, a number of instruments were administered in a standardized order to the mother. The questionnaires relevant to this study are described below. The child's intellectual functioning was estimated as detailed below. With the mother's consent, the child's primary teacher was also sent a request to complete several instruments, with those of relevance listed below. The mother and child were paid $20 plus travel expenses.

2.1.3. Measures

Physical disability was assessed by a research assistant completing the 5-point *Severity of Physical Handicap* (SPH; Rutter, Tizard, & Whitmore, 1970) rating scale based on information obtained from an interview with the mother and interacting with the child for 1 hour. This scale describes the degree of the child's physical handicap (0=none, 4=total) in objectively defined terms. For validation purposes, Pearson product-moment correlations were computed between this rating scale and several scales of the *AAMD Adaptive Behavior Scale - School Edition* (ABS; Lambert, 1981) completed by the child's primary teacher for 38 of the subjects. The SPH ratings correlated -.72 with the Independent Functioning domain score, -.90 with the Physical Development domain score, and -.87 with the Personal Self-Sufficiency factor score, supporting its concurrent validity. The significantly lower correlation of -.40 with the Personal-Social Responsibility Factor score lends some support also for the divergent validity of this rating scale.

Cognitive status was assessed based on four sources: performance on the WISC-R Block Design, WISC-R Picture Arrangement, and the Peabody Picture Vocabulary Test – Revised (Form L) administered directly to the child by an assistant, and any school-administered intelligence test reported by the child's teacher. Standardized administration procedures could not always be followed because of the children's disability. Consequently, the child's intellectual functioning range was estimated by considering all relevant test data and the physical ability of the child to meet the demands of these tests in the manner typically done in clinical evaluations of children with physical disabilities (Sattler, 1988). In addition, based on estimated IQ range, a classification of mental retardation (MR) status was made if estimated IQ range < 70.

Adjustment problems were assessed by administering the CBCL (Achenbach, 1991a) to the child's mother, as described in Study 1. Again, Internalizing, Externalizing, and Total Behavior Problems scores were used.

2.2. *Results*

2.2.1. Preliminary Analyses

Demographic variability. Three series of t-tests were conducted on the three adjustment problems scores from the CBCL to determine whether the sample needed to be divided for subsequent analyses. One series compared groups formed by the child's diagnosis (spina bifida or cerebral palsy); a second series compared groups formed by the child's sex; and a third series compared groups formed by the child's age (6 – 8 years vs. 9 – 11 years). None of the three CBCL scores yielded significant ($p < .05$) differences for any of these scores. Furthermore, the demographic variables of maternal age, family income, and family size did not correlate with any of the adjustment measures. Consequently, all subsequent analyses were conducted on the full sample without any covariates.

Child Disability. Results from the SPH, measuring the degree of the child's physical disability, indicated that 30% of the children were rated with «slight», 32% «moderate», 22% «severe», and 16% «total» disability. Based on the estimation of children's intellectual functioning, 52% were considered to function in the average or above, 18% in the borderline, 8% in the mildly retarded, 6% in the moderately or severely retarded, and 16% in the profoundly retarded range of ability. As expected, physical disability severity was significantly associated with estimated intellectual functioning ($r = -.67$, $p < .001$).

2.2.2. Cognitive Functioning and Adjustment Problems

Correlations were first computed between indices of cognitive functioning and parent-reported problem behaviors. As can be seen in Table 1, neither estimated IQ level nor estimated MR status was correlated with parent-reported Total, Externalizing, or Internalizing Problem Behaviors.

To further evaluate the relationships between cognitive functioning and adjustment, multiple regression analyses were conducted where the different measures of child adjustment problems were regressed separately on the two measures of cognitive functioning, while controlling for the severity of the child's physical disability. As can be seen in Table 2, neither estimated IQ level nor MR status accounted for a significant proportion of variance in the child's adjustment problems, as measured by Total, Externalizing, and Internalizing Behavior Problems, beyond that accounted for by severity of physical disability.

3. STUDY 3

Thus far, we had employed indirect and direct measures of cognitive status in different studies, finding these not to be associated with adjustment in a broadly as well as narrowly defined sample of children with physical disabilities. In Study 3 we employed both direct and indirect measures, while extending the methodology to include self-report of adjustment problems in addition to maternal report. We also extended this research to a different geographic region and a heavier representation of African Americans and focused on adolescents.

3.1. *Method*

3.1.1. Subjects

Subjects were identified through Children's Rehabilitation Services in Alabama and the Children's Hospital of Alabama Neurosurgery specialty clinic. Responding to mailed invitations as in Study 2, 66 mother-adolescent pairs volunteered to participate. The adolescents had to be 11 – 18 years old and have a life-long physical disability interfering with gross motor functioning at least at a «mild» level as defined by the SPH (see Study 2). There were 32 males and 30 females with a *M* age of 14.2 years (*SD* = 1.9). The mothers' *M* age = 41.6 years (*SD* = 9.2), *Mdn* education level = High School Diploma, and *Mdn* family income = $10,000 - $20,000, and 60% reported being married or living as such. The sample was 42% African American and 58% Caucasian. The most common diagnoses among the adolescents were spina bifida (39%), hydrocephalus (32%), and cerebral palsy (18%); a range of other diagnoses constituted the remainder.

3.1.2. Procedure

After written consent was obtained from the mother and assent or consent from the adolescent, measures were administered to each privately, as described below. Participant pairs were paid $25 plus travel expenses.

3.1.3. Measures

Physical disability was assessed by a research assistant completing the SPH (Rutter et al., 1970) as described in Study 1.

Cognitive status was assessed both directly and indirectly. First, the *Slosson Intelligence Test for Children and Adults* (SIT; Slosson, 1983), a verbally based age-scale test of intelligence for ages 2-18, was administered to the adolescent. This measure was selected because it does not require any physical skills on the part of the child, is brief, and is easily administered without advanced training. It has excellent internal consistency and test-retest reliability and correlates .95 with the Stanford-Binet: Form L-M. Criterion-referenced concurrent and predictive validity is supported by *Mdn* correlation coefficients of .62 – .82 with the WISC Full Verbal and Performance Scales (Slosson, 1983). Both IQ and Mental Age (MA) scores were derived. Second, an indirect measure of cognitive functioning was obtained by requesting each mother to report her adolescent's cognitive status using the following non-exclusive categories: mental retardation, brain damage, and learning disability. Because of the experience that mothers often describe their children with mental retardation as having a learning disability, perceiving this to be a more socially desirable label (Hastings, 1994), this category was combined with mental retardation by the investigators into a classification of cognitive handicap. This was used together with the categorizations of reported mental retardation and brain damage, thus, making this classification system highly similar to that of Study 2.

Adjustment problems were assessed by administering the CBCL (Achenbach, 1991a) to the adolescent's mother as described in Study 1. In addition, each adolescent provided information on his or her adjustment using the Youth Self-Report Form (Achenbach, 1991b), which is structured the same way and provides the same scores as the CBCL parent report form: Total, Externalizing, and Internalizing Problem Behaviors.

3.2. *Results*

3.2.1. Preliminary Analyses

Correlations were computed between seven demographic variables (sex, age, ethnicity, mother's age, mother's educational level, family income level) and the six adjustment measures. Because only one significant association was obtained from 42 tested, which could not be deemed beyond chance occurrence, all subsequent analyses were conducted without any demographic covariates.

Child Disability. Results from the SPH indi-

TABLE 3

Adjustment Regressed on Cognitive Status While Controlling for Severity of Physical Disability in Study 3

			Parent-Reported			Youth Self-Reported		
Study	Step	IV	Total	Externalizing	Internalizing	Total	Externalizing	Internalizing
3	1	Physical Disability Severity	.03	.01	.03	.01	.00	.00
	2	IQ	.00	.01	.01	.01	.04	.00
	1	Physical Disability Severity	.03	.01	.03	.01	.00	.00
	2	Mental Age	.00	.01	.00	.00	.03	.00
	1	Physical Disability Severity	.03	.01	.03	.01	.00	.00
	2	Mother-Reported MR	.01	.02	.03	.00	.00	.00
	1	Physical Disability Severity	.03	.01	.03	.01	.00	.00
	2	Mother-Reported Brian Damage	.01	.00	.00	.00	.00	.00
	1	Physical Disability Severity	.03	.01	.03	.01	.00	.00
	2	Mother-Reported Cognitive Handicap	.01	.01	.01	.01	.00	.02

cated that 42% were rated with «mild», 27% «moderate», 10% «severe», and 10% «total» disability. Based on SIT performance, 39% were considered to function in the average or above, 18% in the low average, 19% in the mildly retarded, 8% in the moderately retarded, and 0% in the severely or profoundly retarded range of intellectual ability.

3.2.2. Cognitive Status and Adjustment Problems

Pearson product-moment correlations were computed between the five indices of cognitive functioning (SIT IQ and MA and classifications of mental retardation, brain damage, and cognitive handicap) and the six adjustment problems measures. All correlations were $\leq .17$ and none were significant at the Bonferroni corrected study-wise $p < .05$ significance level (.05/30 = .002).

To further evaluate the relationship between these variables, multiple regression analyses were completed where the different measures of child adjustment problems were regressed on the different ideas of cognitive status while controlling for the severity of the child's physical disability. For each of the six measures of adjustment problems, sets of multiple regression analyses were conducted, entering in separate analyses each index of cognitive status on the second step, after controlling for severity of physical disability. As can be seen in Table 3, none of the measures of cognitive status accounted for a significant increment in the variance in any measure of adjustment problems beyond that accounted for by severity of physical disability.

4. DISCUSSION

This series of studies failed to find a relationship between cognitive status and maladjustment in children with a physical disability. This lack of support for this relationship is remarkably consistent across the quite varied samples and methods used herein. That is, the three studies employed independent samples representing the age range from two through 18, different specific conditions, and varied severities of the disability and cognitive functioning. The samples were recruited in two quite disparate geographic regions to include considerable ethnic and other demographic diversity. In terms of the methods used, these studies collectively employed both direct, psychometric assessment and indirect, parent reports of cognitive status as well as both parent and adolescents report of adjustment. The target relationship was tested both with and without controlling for the severity of the disability, which was measured using two different approaches. Regardless, the finding was the same: no relationship between cognitive status and adjustment problems.

While consistent findings emerged across three studies, limitations are present in this research. All studies relied on volunteer samples from undocumented populations. This makes it challenging to identify the population to which the results can be generalized. However, the consistency in findings across three diverse samples representing wide backgrounds decreases this problem. The measurement methodology is limited in Studies 1 and 2. In each only parental report of child adjustment was obtained, due to the inclusion of children too young or disabled to self-report. However, when self-reported adjustment was obtained in Study 3, results were the same as for maternal report. In a similar vein, single methods were used to index cognitive status in Studies 1 and 2, that is parental report in the former and test data in the latter. Again, when both methods were used in Study 3, interchangeable findings emerged.

That our finding of no relationship between cognitive status and adjustment appears inconsistent with a couple of other studies (DeMaso et al., 1990; Perrin et al., 1993) bears closer consideration. However, DeMaso et al. (1990) in reporting an association between IQ and adjustment in children with cyanotic heart defects, confounded health and cognitive status. That is, both IQ and adjustment was significantly lower in those with heart defects than the healthy controls. Perrin et al. (1993) reported interactions suggesting that the child's verbal intelligence protected against adjustment problems depending on specific health status and maternal health locus of control in children with a variety of chronic conditions. Although these are very intriguing findings, they cannot be replicated in the current research. However, Perrin et al. also reported a zero-order correlation between verbal intelligence and adjustment of less than .17 across reporting sources, much in line with our findings.

Our finding of no relationship is consistent with findings from our prior research. We find that various condition parameters, such as for example number of surgeries, ambulation status, functional independence, and diagnosis, do not explain significant variation in behavioral adjustment (cf. Wallander & Varni, 1992, 1995). To this list can now be added cognitive functioning and classification. In contrast, we find strong support that psychosocial stress is a risk factor for maladjustment in children with chronic physical conditions (Wallander & Bachanas, 1995; Wallander, Aikens, & Keith, 1995). Furthermore, Varni and Setoguchi (1991a, 1991b, 1991c) independently find associations between perceived physical appearance and adjustment in children with limb deficiencies. Based on this research, we are proposing that psychosocial outcomes in children with chronic physical conditions are best understood in light of psychosocial processes (cf. Wallander & Varni, 1992, 1995). We feel efforts are best spent investigating psychsocial risk (as well as resilience) factors. While some progress has been made at identifying these factors, much of the variance in the adjustment of children with chronic physical conditions remains unexplained. Furthermore, empirical progress needs to be translated into clinical practice.

To this end, the current finding is probably best used clinically to identify those children at risk for experiencing maladjustment. It suggests that there is no prediction possible from knowledge of cognitive function. Although children with a physical disability present with a wide range of cognitive functioning, this is not associated with psychsocial adjustment. Likely to better inform the clinician would be an assessment of the child's self-perceptions and daily interactions with his or her environment, based on our research.

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ABSTRACT

Investigated the association between cognitive status and adjustment in children who have a physical disability, in three independent studies. In Study 1, 119 mothers reported on the cognitive status and behavioral adjustment of their children, ages 2-18, who had varying physical or sensory impairments. In Study 2, the intellectual level of 50 children, ages 6-11, with either spina bifida or cerebral palsy, was estimated from cognitive test information while mothers reported on the children's behavioral adjustment. In Study 3, 66 adolescents, ages 11-18, with a physical disability completed an IQ test and reported on their behavioral adjustment, as did their mothers. Severity of physical disability was also assessed in each study. No relationships could be found between any index of cognitive status and any adjustment measure when controlling for severity of physical disability. The overwhelming majority of zero-order relationships were also not significant. These findings were discussed in relation to Wallander and Varni's Disability-Stress-Coping model of adjustment in children with chronic physical conditions.

Key words: Children, physical disability, adjustment, cognitive functioning.

RESUMO

Este artigo descreve investigações sobre a associação entre o estatuto cognitivo e o ajustamento em crianças com deficiência física, em três estudos independentes. No Estudo 1, 119 mães prestaram informação acerca do estatuto cognitivo e do ajustamento comportamental dos seus filhos, com idades entre os 2 e os 18 anos, e com graus variáveis de deficiência física ou sensorial. No Estudo 2, o nível intelectual de 50 crianças, com idades entre os 6 e os 11 anos e com *spina bifida* ou com paralisia cerebral, foi estimado a partir de testes cognitivos e de relatos maternos sobre o seu ajustamento comportamental. No Estudo 3, 66 adolescentes, com idades entre os 11 e os 18 anos e com deficiência física, realizaram um teste de QI e prestaram informação sobre o seu ajustamento comportamental, relato que também foi feito pelas suas mães. Em cada estudo, a gravidade da deficiência física foi também avaliada. Controlando a variável «gravidade da deficiência física», não foi possível encontrar relações entre qualquer índice de estatuto cognitivo e qualquer medida de ajustamento. A grande maioria de relações de ordem zero também não era significativa. Estes resultados são discutidos em função do modelo de Wallander e Varni «Disability-Stress-Coping» sobre o ajustamento em crianças com deficiências físicas crónicas.

Palavras-chave: Crianças, deficiência física, ajustamento, funcionamento cognitivo.