Depressive Symptoms and Self-Concept in Young People with Spina Bifida[1]

Peter L. Appleton[2]
Clwydian Community Care NHS Trust

Nick C. Ellis
University of Wales, Bangor

Philip E. Minchom and Val Lawson
Wrexham Maelor Hospital NHS Trust

Vicki Böll and Pat Jones
Clwyd County Council

Examined self-reported depressive symptoms in 72 young people with spina bifida, ages 9 to 18:11, and matched able-bodied comparison subjects, using the Dimensions of Depression Profile for Children and Adolescents (Harter & Nowakowski, 1987). Independent variables included gender, self-perceptions (including physical appearance), and perceived social support. Young people with spina bifida were at greater risk of depressive mood, low self-worth, and suicidal ideation. Girls, independent of disability, were at greater risk of depressive mood, low self-worth, and self-blame. Multiple regression analyses suggest that global self-worth serves as a mediating variable for the effect of physical appearance self-concept on depressed mood (particularly in young people with spina

bifida), and that perceived parental social support has a direct effect on depressed mood (particularly in girls).

There is widespread concern about depression and suicidal ideation among young people (Rutter & Smith, 1995). Prevalence rises rapidly during adolescence, with a higher rate of increase in girls (Angold & Rutter, 1992). Chronically ill adolescents experience a slightly elevated risk of depressive symptoms (Bennett, 1994). If there is neurological involvement, risk of depressive symptoms is raised still further (Breslau, 1990). However, studies of self-reported depressive symptoms in neurologically impaired young people have been sparse (Wallander, Feldman, & Varni, 1989) and are important because parents may underreport adolescent internalizing symptoms (Dorner, 1975; Verhulst & van der Ende, 1992). Angold et al. (1987) have argued that, for adolescent depressive symptoms, self-report (as distinct from parent or teacher report) should be regarded as the "gold standard." The present study is concerned with self-reported depressive symptoms in a defined population of young people with spina bifida, compared with an able-bodied community sample.

Studies of adolescent self-reported depressive cognitions show that at least five constructs (derived from factor analysis) are important: depressive mood, low self-worth, low energy/low interest, self-blame, and suicidal ideation (Harter & Nowakowski, 1987; Renouf & Harter, 1990). These constructs are measurable using the Dimensions of Depression Profile for Children and Adolescents (DDPCA). The instrument, which is used in the present study, has been subject to extensive reliability and validity analyses, in clinical and community samples, and has been used in theoretically based studies of depressive symptoms and their correlates (Harter & Nowakowski, 1987; Renouf & Harter, 1990; Harter, Marold, & Whitesell, 1992). Harter and Nowakowski (1987) regard each of the five constructs as conceptually close to essential or cardinal features of depression, but the instrument is not diagnostic of clinical depression. It was expected that the DDPCA would be of particular value in this present study. First, it is theoretically based and allows independent measurement of self-worth and depressive mood (see below). Second, the construct of energy (i.e., energy to participate in age-appropriate activities) is measured separately from other depressive symptoms, allowing the confound of physical disease symptoms and depressive lack of energy to be controlled (Perrin, Stein, & Drotar, 1991). Third, we were interested in whether young people with spina bifida experienced elevated levels of suicidal ideation (Breslau, 1990). From previous research we expected that young people with spina bifida would experience higher mean levels of self-reported depressive symptoms than able-bodied young people (Breslau, 1990).

Gender appears to be a powerful moderating variable on depression in able-bodied teenagers (Angold & Rutter, 1992), girls being at greater risk than boys. Less is known about gender and depression in disabled young people. Although some studies have found disabled girls to be at higher risk of depressive symptoms (Dorner, 1975), others have found no gender effects (Breslau, 1990). We are interested in whether girls with spina bifida experience higher mean levels of self-reported depressive symptoms than boys with spina bifida.

Developmental studies of depression in able-bodied children and adolescents have shown that depressive mood is strongly associated with negative self-evaluation (Cicchetti & Toth, 1995; Rehm & Carter, 1990; Renouf & Harter, 1990). What specific components of self-evaluation might be directly implicated by depressive feelings in young people with spina bifida? First, perceived physical appearance may be of particular import, because of its key role in self-worth (Harter, 1987), its relevance to depressive symptoms (Allgood-Merten, Lewinsohn, & Hops, 1990), and its defining significance in physical disability (Harper, 1991). Second, low perceived peer acceptance and support is associated with low self-esteem and depressive symptoms in children with limb deficiencies (Varni, Setoguchi, Rappaport, & Talbot, 1991). Is the same true for young people with spina bifida? Third, what is the role of perceived parent acceptance and support in the self-evaluations of young people with spina bifida, given the centrality of this association in able-bodied children (Harter, 1987) and given the potentially stressful circumstances parents are placed in by caring for a disabled child (Sloper & Turner, 1993)?

Because of its multidimensional basis the theoretical model of self-worth developed by Harter (1986, 1987, 1990) could be of considerable value in understanding the sociocognitive risk factors for depressive symptoms in children with particular functional impairments, such as spina bifida. Harter's model posits two independent sources of global self-worth: perceived competence (or self-evaluations) in psychological domains of importance, and perceived social acceptance and support. Perceived competence has been a major area of psychological research (Skinner, 1995), drawing attention to the developmental importance of a child's effective engagement with the environment. Recent research has emphasized that self-judgments of personal worth may be contingent on certain personally valued levels of traits or abilities (Burhans & Dweck, 1995). For instance, some adolescents may view their own physical appearance as somehow determining their value as a person (Harter, 1987). Similarly, attainment of specific academic tasks at school may be valued and associated with global self-worth. Children age 8 or over are able to rate themselves in the discrete self-concept domains of intellectual competence, academic competence, social acceptance, athletic competence, behavioral conduct, and physical appearance. Physical appearance is the domain that has the greatest impact on self-worth, both in middle childhood and in adolescence

(Harter, 1987). However, for children with spina bifida, other domains of competence are compromised, including intellectual, academic, and locomotor skills (Anderson & Spain, 1977). The role of each self-concept domain in determining global self-worth in children with multiple impairments is poorly understood at the present time (Appleton et al., 1994).

According to Harter (1987), the second major source of global self-worth is perceived social support from parents, friends, classmates, and teachers. This construct refers to the value or esteem a child feels he or she is held in by significant others. A number of different scholarly traditions have drawn attention to the impact of the "reflected" self, such as symbolic interactionism, object relations theory, and attachment theory (Baldwin, 1992). A central tenet of attachment theory is that a child's self-worth and resilience has its developmental origins in a secure relationship with a parent figure (Main, 1996). Equally, the perceived expectations of peers are known to be important, if partial, determinants of children's self-conceptions (Cairns & Cairns, 1994). Harter (1987) has shown that perceived support from parents and peers (classmates) is predictive of global self-worth, independent of perceived competence, and that these two sources of support are more important for global self-worth than support from friends and teachers.

More recently Harter has extended the model of self-worth to include depressive symptoms, building on classic observations concerning the cardinal role of negative self-evaluation in depression (Rehm & Carter, 1990). Harter and Nowakowski (1987) used structural equation modeling to show that, in able-bodied young people, global self-worth acts as a *mediating* variable between (a) specific self-evaluations and perceived social support (exogenous variables), and (b) depressive mood (endogenous variable). Applying this model to our own research questions, it would be predicted that global self-worth would act as a mediating variable between (a) perceived physical appearance (a specific self-evaluation), and perceived peer acceptance and parent support (specific components of perceived social support), and (b) depressive mood.

In summary, negative self-evaluation is regarded as a key component of depression in children as well as adults. Harter's model of self-worth posits two major sources of global self-worth, perceived competence (especially physical appearance) and perceived social support (especially from parents and peers). In turn the model suggests that global self-worth mediates the association between these sources of self-evaluation and depressed mood. In the present study Harter's theoretical model is extended to young people with spina bifida.

Our hypotheses were as follow: (a) that young people with spina bifida would report higher mean levels of all categories of self-reported depressive symptoms, when compared with able-bodied controls; (b) that girls with spina bifida would report higher mean levels of depressive symptoms than boys with spina bifida; and (c) that self-evaluation of physical appearance, and perceived social support from peers and parents, would be associated with depressive

symptoms, and that global self-worth would mediate these associations in both able-bodied and disabled young people.

METHOD

Participants

For the purposes of this study spina bifida was defined as open or closed myelomeningocele, with or without associated hydrocephalus, with or without ventricular drainage. All patients had measurable functional impairment of loco-motion, continence, intellect, or physical parameters associated with the spina bifida (Appleton et al., 1994).

Subjects satisfying the definition, age between 7 years and 18 years 11 months, and living in a defined geographical area (mixed urban/rural), were identified from a comprehensive range of agency sources. Of the 104 families approached, 17 declined to participate (reasons were not given), and a further 8 children were excluded due to either apparent severe cognitive impairment or severe family distress. This left 79 cases (76% participation rate) who received psychological interviews (Appleton et al., 1994).

Because of restrictions in age for administration of the DDPCA (see below), data in this current report are provided on 72 young people with spina bifida age 9 years and over. Mean age was 14:0; there were 35 boys and 37 girls. Mean IQ (assessed using a four subtest short form of the Wechsler Intelligence Scale for Children and Wechsler Adult Intelligence Scale) was 78.6 (SD = 17.9); 45 young people were in mainstream school, 14 in special school, and the rest in further education or work settings. Full medical, intellectual, and physical details of partici-pants have been reported previously (Appleton et al., 1994; Minchom et al., 1995).

For each subject with spina bifida a comparison subject individually matched for age (±6 months), gender, classroom, and housing neighborhood was obtained. Comparison subjects were selected from the same mainstream classroom as that attended by the student with spina bifida or in the case of older subjects from the same/similar workplace, college, or employment training scheme. Where the child with spina bifida was not in mainstream education, the comparison subject was chosen from an appropriate local school. Comparison subjects had no known chronic illness, disability, or special educational need. Mean IQ, assessed using the same tests as for the disabled group, was 100.5, SD = 15.3.

Measures

Depressive Symptoms. The Dimensions of Depression Profile for Children and Adolescents (DDPCA; Harter & Nowakowski, 1987) assesses five depres-sive dimensions: Mood, Global Self-Worth, Energy/Interest, Self-Blame, and

Suicidal Ideation.[3] Validity and reliability data on large able-bodied normative samples were reviewed by Renouf and Harter (1990). As recommended by the authors, all subscales except Suicidal Ideation were administered to children 9 years and over, and the Suicidal Ideation subscale was administered to those 12 and over. Suicidal ideation subscale data are provided on 102 young people age 12 and over. All subscales were scored in the direction of high scores representing the positive pole (e.g., cheerful Mood; low Suicidal Ideation). All physical and energy symptoms are contained in the Energy subscale. Whole scale internal consistency (Cronbach alpha) exceeded .89 across group and IQ ($<>75$), and exceeded .69 in all such analyses by subscale.

Self-Concept. The Self-Perception Profile for Learning Disabled Students (Renick & Harter 1988), a self-report instrument based on the Self-Perception Profile for Children (Harter 1985a) was administered. It is designed for the assessment of learning-disabled and normally achieving children's domain-specific judgments of their competence or adequacy in 9 self-concept domains, and their feelings of global self-worth. The 10 subscales independently tap childrens' self-perceptions in the following domains: (a) general intellectual ability, (b) reading competence, (c) spelling competence, (d) writing competence, (e) maths competence, (f) social acceptance, (g) athletic competence, (h) behavioral conduct, (i) physical appearance, and (j) global self-worth. The instrument (Renick & Harter, 1988) has well-established validity and reliability. Internal consistency (Cronbach alpha) in this study was 0.91. Global Self-Worth was measured twice, as part of both the Self-Perception Profile for Learning Disabled Students (Appleton et al., 1994) and the DDPCA. In the present report we utilize the DDPCA Global Self-Worth data in order to maintain direct comparablity with Harter's studies of depressive symptoms in able-bodied populations (Renouf & Harter, 1990).

Perceived Social Support. The Social Support Scale for Children (Harter, 1985b), of well-established reliability and validity, assesses the degree to which others like the self the way one is, treat one like a person, care about one's feelings, and act as if they feel that the person matters. There are four subscales: parent support, teacher support, classmate support, and close friend support. Scores range from 1–4, with 4 representing the highest level of support. Internal consistency (Cronbach alpha) in this study was .90.

Procedure

The research was agreed to by the Research Ethics Committees of all participating Health Districts, and Directors of Education gave their consent to the research being conducted in participating schools. Following case-finding

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[3]The revised six-factor DDPCA (Harter, Marold, & Whitesell, 1992) was not available at the time the present study was planned.

and case-note diagnostic confirmation, letters inviting participation in the research were sent to parents and young people. If the family was willing to take part in the study, written consent was then obtained both from the child/young person and from the parent/guardian. The majority of psychological interviews were conducted in confidential school/workplace settings. Medical examinations were conducted at local child health clinics or hospitals.

RESULTS

The first two hypotheses were that young people with spina bifida would report higher mean levels of all categories of self-reported depressive symptoms when compared with able-bodied controls, and that girls with spina bifida would report higher mean levels of depressive symptoms than boys with spina bifida. To address these hypotheses group and gender differences on the depression symptom clusters (DDPCA dimensions) were analyzed using a repeated measures ANOVA with disability groups as the within factor (taking into account matching), and gender effects as the between factor (Table I). Young people with

Table I. Group by Gender Scores on the Dimensions of Depression Profile for Children and Adolescents

| | Group × Gender | | | | ANOVA F | | |
| | Able-bodied | | Spina bifida | | | | Group × gender |
Dimension	Male	Female	Male	Female	Group	Gender	
Mood/affect[a]							
M	3.50	3.28	3.35	3.00	5.43[c]	8.55[d]	0.57
SD	0.46	0.39	0.59	0.79			
Self-worth[a]							
M	3.47	3.19	3.20	2.88	7.61[d]	8.88[d]	0.03
SD	0.48	0.44	0.67	0.82			
Energy/interest[a]							
M	3.23	3.19	2.86	2.72	14.32[d]	0.56	0.23
SD	0.62	0 51	0.90	0.75			
Self-blame[a]							
M	2.71	2.37	2.81	2.58	1.95	7.42[d]	0.30
SD	0.61	0.47	0.76	0.67			
Suicidal ideation[b]							
M	3.71	3.81	3.63	3.39	5.85[c]	0.35	2.87
SD	0.41	0.27	0.61	0.81			

[a]n = 35, 37, 35, 37, respectively.
[b]n = 25, 26, 25, 26, respectively.
[c]$p < .05$.
[d]$p < .01$.

spina bifida reported greater Depressive Mood, lower Global Self-Worth, lower Energy, and more Suicidal Ideation than did controls. The difference in Self-Blame, which was in the opposite direction to that predicted, was not statistically significant.

There were significant gender main effects for Mood, Global Self-Worth, and Self-Blame, but not for Energy and Suicidal Ideation. In each of these significant differences the females fared worse. None of the group by gender interactions were statistically significant. Thus, in summary, there were additive effects of disability and gender on Depressive Mood and Global Self-Worth, with the disabled girls showing higher levels of symptoms.

Of the five depressive dimensions assessed by the DDPCA, three (Depressive Mood, Global Self-Worth, and Suicidal Ideation) discriminated significantly, and without potential confounding of physical and psychological symptoms, between young people with spina bifida and matched able-bodied controls. Table II shows zero-order correlations between the three depressive dimensions, and the self-concept and perceived support variables, for both groups.

The third hypothesis was that self-evaluation of physical appearance, and perceived social support from peers and parents, would be associated with depressive symptoms, and that global self-worth would mediate these associations in both able-bodied and disabled young people. Data reported in Table II show

Table II. Correlates of the DDPCA Dimensions Shown Separately for the Spina Bifida and Able-Bodied Groups

DDPCA Dimension	Spina bifida			Able-bodied		
	Mood	Global self-worth	Suicidal ideation	Mood	Global self-worth	Suicidal ideation
Self-concept						
Physical appearance	.66[b]	.68[b]	.47[b]	.41[b]	.60[b]	−.01
Behavioral conduct	.30[b]	.38[b]	.03	.46[b]	.35[b]	.36[b]
Reading competence	.20[a]	.11	.17	.12	.26[a]	.11
Writing competence	.10	.03	14	.27[a]	.35[b]	.14
Spelling competence	.18	−.09	.21	.08	.22[a]	.11
Math competence	.18	.16	−.08	.07	.12	.20
Athletic competence	.36[b]	.37[b]	.01	13	.07	.30[a]
Social acceptance	.36[b]	.28[b]	.11	.19	.11	.03
General intellectual	.45[b]	.40[b]	18	.29[b]	.41[b]	.36[b]
Social support						
Parents	.57[b]	.45[b]	.43[b]	.43[b]	.39[b]	.47[b]
Classmate	.37[b]	.32[b]	.38[b]	36[b]	.18	.30[a]
Teachers	.39[b]	.44[b]	.32[b]	.23[a]	.23[a]	.35[b]
Friends	.29[b]	.17	.20	−.02	−.12	.03

[a] $p < .05$.
[b] $p < .01$.

Table III. Regression Equations for Variables Predicting Depressed Mood
in All Subjects (n = 144)

Predictor	Equation 1: Global self-worth β	Equation 2: Depressed mood β	Equation 3: Depressed mood β
Adjusted R^2	.51	.50	.61
Self-concept domains			
Physical appearance	.47[b]	.32[b]	.10
Behavioral conduct	.17[a]	.14[a]	.06
Academic competence	−.04	−.01	.01
Athletic competence	.05	.08	.05
Social acceptance	.07	.13	.10
General intellectual	.17[a]	.11	.03
Social support domains			
Parents	.19[b]	.34[b]	.25[b]
Classmates	.02	.09	.08
Teacher	.03	−.03	−.05
Friends	−.13	−.04	.02
Global Self-Worth	—	—	.48[b]

[a]$p < .05$.
[b]$p < .01$.

that Physical Appearance was strongly associated with Depressed Mood and low
Global Self-Worth, and, for young people with spina bifida, was the only self-
concept domain significantly associated with Suicidal Ideation. Perceived Par-
ent, and Classmate support were associated with Mood, Global Self-Worth, and
Suicidal Ideation dimensions. In addition other self-concept and perceived social
support categories showed significant associations with depressive dimensions.
Multivariate analysis was therefore used to statistically control for collinearity
and confounding, and to test the specific mediation model set out in the third
hypothesis. Judd and Kenny (1981) and Baron and Kenny (1986) recommend
that to test for mediation the following three regression equations should be
calculated: Equation 1 regressing the mediator (global self-worth) on the inde-
pendent variable(s), Equation 2 regressing the dependent variable (depressed
mood) on the independent variable(s), and Equation 3 regressing the dependent
variable on both the independent variable(s) and on the mediator. These three
regression equations provide the tests of the linkages of the mediational model.

Table III shows the three regression equations for the whole group of sub-
jects. It can be seen (a) that physical appearance, behavioral conduct, and gener-
al intellectual self-concept and parental social support are all significant predic-
tors of global self-worth in Equation 1, (b) physical appearance and behavioral
conduct self-concept and parental social support are significant predictors of
depressed mood in Equation 2, (c) there is a strong effect of global self-worth

on depressed mood, and (d) the effect of physical appearance and behavioral conduct self-concept on depressed mood is much less in Equation 3 than in Equation 2.

In summary, in the analysis of all subjects, global self-worth serves as a mediating variable for the effect of physical appearance on depressed mood, and parental social support has a considerable direct effect on depressed mood. There is no evidence for an independent association between perceived classmate support (or social acceptance) and global self-worth or depressed mood.

The differential effects of disability and gender on depressive mood and global self-worth (see Table I) led us to estimate separately these effects for male and female able-bodied and spina bifida groups. Since these subsequent analyses were performed on a quarter of the original sample, the number of variables in the models for the separate quadrants was reduced by eliminating the classmate,

Table IV. Regression Equations for Variables Predicting Depressed Mood in Spina-Bifida Females and Males

Predictor	Equation 1: Global self-worth β	Equation 2: Depressed mood β	Equation 3: Depressed mood β
	Spina bifida females ($n = 36$)		
Adjusted R^2	.64	.58	.63
Self-concept domains			
Physical appearance	.51[b]	.50[b]	.29
Behavioral conduct	.11	−.09	−.14
Academic competence	−.17	−.14	−.07
Athletic competence	−.10	−.06	−.02
Social acceptance	.18	−.00	−.08
General intellectual	.27[a]	.22	.10
Social support domains			
Parents	.18	.43[b]	.36[b]
Global self-worth	—	—	.41[a]
	Spina bifida males ($n = 36$)		
Adjusted R^2	.44	.61	.70
Self-concept domains			
Physical appearance	.43[b]	.40[b]	.22
Behavioral conduct	47[a]	.46[b]	25
Academic competence	−.07	.33[a]	.36[b]
Athletic competence	.37[a]	.25	.09
Social acceptance	− 18	.18	.25[a]
General intellectual	−.06	−.26	−.23
Social support domains			
Parents	−.00	−.02	−.02
Global self-worth	—	—	.43[a]

[a] $p < .05$.
[b] $p < .01$.

Table V. Regression Equations for Variables Predicting Depressed Mood
in Able-Bodied Females and Males

Predictor	Equation 1: Global self-worth β	Equation 2: Depressed mood β	Equation 3: Depressed mood β
	Abled-bodied females (n = 37)		
Adjusted R^2	.37	.21	.47
Self-concept domains			
Physical appearance	.55[b]	.22	−.14
Behavioral conduct	.06	.04	.00
Academic competence	.05	.24	.20
Athletic competence	−.26	−.18	−.01
Social acceptance	.07	.21	.17
General intellectual	.23	−.13	−.28
Social support domains			
Parents	.22	.45[b]	.31[a]
Global self-worth	—	—	.66[b]
	Able-bodied males (n = 35)		
Adjusted R^2	.39	.53	.71
Self-concept domains			
Physical appearance	.26	−.07	−.22
Behavioral conduct	.13	.61[b]	.54[b]
Academic competence	.19	− 02	−.13
Athletic competence	.00	.25	.25[a]
Social acceptance	−.14	.13	.20
General intellectual	.06	−.02	−.05
Social support domains			
Parents	.39[a]	.30[a]	.08
Global self-worth	—	—	.56[b]

[a]$p < .05$.
[b]$p < .01$.

teacher, and friend social support subscale variables. Our justification for this was that parental support was the only significant social support variable in the all subjects analysis (see Table III). In addition we grouped reading, writing, spelling, and math competence as Academic competence, in line with the Harter's (1987) theoretical model of the self-concept. These separate analyses are shown in Table IV (spina bifida subjects) and Table V (able-bodied subjects).

It can be seen (a) that physical appearance self-concept is a consistently strong predictor of global self-worth in Equation 1 for all subject groups; general intellectual, behavioral conduct, and athletic self-concept, and parental social support show inconsistent patterns of association with self-worth across groups, (b) that physical appearance self-concept is a significant predictor of depressed mood in Equation 2 for the disabled young people (Table IV), and parental social support is a significant predictor of depressed mood in girls and able-bodied

boys; in addition behavioral conduct self-concept is a significant predictor of depressed mood in boys, (c) that there is a strong effect of global self-worth on depressed mood across groups, and (d) that the significant effect of physical appearance self-concept on depressed mood in young people with spina bifida is less in Equation 3 than in Equation 2.

Thus with respect to the third hypothesis, it appears that global self-worth serves as a mediating variable for the effect of physical appearance self-concept on depressed mood, particularly in young people with spina bifida, and that perceived parental social support has a direct effect on depressed mood, particularly in girls. There is no evidence for an independent association between perceived peer support and either global self-worth or depressed mood.

DISCUSSION

The first hypothesis, that young people with spina bifida would be at greater risk than able-bodied controls of all categories of self-reported depressive symptoms, is partially confirmed. The finding of group differences in depressive mood, self-worth, and suicidal ideation, but not self-blame, is unlikely to be due to confounding or systematic bias. The groups were well matched, and the spina bifida sample was drawn from a register developed from a comprehensive range of agency sources. The results are in line with Breslau's (1990) study of depression in children with neurodisabilities using standardized child psychiatric interview. Adolescents are regarded as indispensable informants for their own emotional problems (Dorner, 1975; Verhulst & van der Erde, 1992), and it is, therefore, of interest that self-blame does not appear to be a feature that distinguished between groups. It would be useful to know whether this finding reflects parental efforts to communicate to their children that they are not to blame for their illness.[4] The highly significant group difference in Energy, reflecting a confounding of physical and psychological variables, suggests that further research into lack of energy in physical disability could be fruitful. The group difference in suicidal ideation draws attention to the need to understand more about hopelessness and difficulties in social problem-solving (Macleod, Williams, & Rose, 1993) in teenagers with chronic physical impairments (Thomas, Bax, & Smyth, 1989). Finally, young people with spina bifida showed more diversity (as measured by standard deviations) than their able-bodied counterparts, in each of the depression symptom clusters.

The second hypothesis, that girls with spina bifida would report higher mean levels of depressive symptoms than boys with spina bifida, is partially confirmed. The effects of gender were evident for the low self-worth, depressed mood, and self-blame dimensions. The fact that disabled girls' vulnerability in the domains of self-

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[4]We are grateful to an anonymous reviewer for this suggestion.

worth and depressed mood comprises gender *and* disability effects raises important questions about psychological processes in depressive mood in adolescence. Two processes are highlighted in the present study: physical appearance and perceived parent support. Both the group and gender findings are in line with a previous British study of adolescents with spina bifida (Dorner, 1975), but Breslau (1990) found no gender differences in depression in a neurodisability sample.

The first part of the third hypothesis, that self-evaluation of physical appearance would be associated with depressive symptoms, and that global self-worth would mediate this association in both able-bodied and disabled young people is largely confirmed. First, the regression analyses show that the young person's self-evaluation of physical appearance is a key determinant of global self-worth (Harter, 1986) and depressive mood, and that a mediational role for global self-worth is supported, particularly for young people with spina bifida. What specific cognitive mechanisms might be implicated in self-evaluation of physical appearance in young people with spina bifida? One possibility is that negative body perceptions may be more frequently cued in the disabled child by daily mobility, self-care, and toileting difficulties. Another possibility is that negative self-evaluations of the body may become more salient in the context of mainstream school through social comparison with able-bodied peers. In a previous report we presented evidence that young people with spina bifida in mainstream school settings place importance on physical appearance, use social comparison processes to evaluate their own physical appearance, and feel less attractive when comparing themselves with able-bodied peers, than when comparing themselves with other physically disabled young people (Appleton et al., 1994). For girls with spina bifida these two putative processes may be of greater psychological significance because of the higher importance placed by girls (especially those with spina bifida) on physical appearance (Appleton et al., 1994), and the stronger association between self-esteem and perceived physical appearance in girls (Allgood-Merten et al., 1990).

Although Harter's (1987) model suggests that perceived physical appearance causally contributes to global self-worth, a reciprocal causation model is equally plausible. Cognitions of low general self-worth may be interconnected with negative self-evaluations of the body, and other negative cognitions, in a schematic mental model (Sheppard & Teasdale, 1996), characterized by mutual implicit association between specific cognitions.

The second part of the final hypothesis predicted that perceived peer and parent support would be associated with depressive symptoms, and that global self-worth would mediate these associations. In the regression equations for all subjects Classmate Support and peer Social Acceptance were not associated with either depressive symptoms or global self-worth. This may be a valid finding, but other studies have drawn attention to the association between low peer acceptance and depressive symptoms both in able-bodied children (Parker,

Rubin, Price, & DeRosier, 1995) and in children with limb deficiencies (Varni et al., 1991). Measurement of peer acceptance and of friend support in the present study would have been strengthened by independent peer nomination and friendship nomination procedures (Cairns & Cairns, 1994; Parker & Asher, 1993).

In contrast to the insignificant finding for peers, perceived parent support was significantly associated with depressed mood and global self-worth. However, in contrast to the mediation hypothesis, perceived support from parents appears to have a direct effect on Mood, especially in girls. The suggestion that perceived parent support may be *directly* associated with depressive mood (rather than just indirectly, through global self-worth) again raises questions about mechanisms and pathways of effect. Harter and Nowakowski (1987) proposed a linear causal model, with the direction of effects going from perceived support through global self-worth to depressive mood. There may be limitations to this model. First, for some populations (e.g., in the present study) there may be a primary pathway between perceived parental support and depressive mood. Second, pathways may not be linear and may involve reciprocal cognitive and social causation. For instance, the young person may protect the parent by not disclosing distress (Dorner, 1975). In turn the young person may receive less emotional support than is warranted, thus directly maintaining depressive feelings. Murch and Cohen (1989) found that low levels of perceived family conflict and control acted as protective factors for depressive symptoms in children with spina bifida. Qualitative studies could help delineate the processes that may be occurring in family interactions of teenagers with spina bifida.

A limitation of the study was sample size. Subject numbers were not sufficient to do developmental analyses. Similarly, the samples in the regression subgroup analyses are too small for firm estimates and suggestive subgroup differences must be taken as exploratory, awaiting confirmation from a larger sample. For instance, there is a suggestion that behavioral conduct is associated with depressed mood in boys, a finding that may echo gender differences found in peer-nominated competence and depressive symptoms in an able-bodied sample studied by Cole (1991). A further limitation is the reliance on single-informant pencil-and-paper measures. Independent measures of social support, and impaired functioning, would have strengthened the study.

What is the relevance of the findings to practice? It seems clear that preventively oriented services for physically disabled children should provide routine assessment of self-concept, especially body and physical appearance self-schemata (Harter, 1990), and family relationships. In addition, preventive cognitive-behavioral interventions for depression in young people (e.g., Clarke et al., 1995) could be adapted to accommodate the comorbid neuropsychological impairments found in children with spina bifida (Breslau, 1990; Wills, Holmbeck, Billon, & McLone, 1990). In the light of the present findings, prevention of depressive symptoms in young people with spina bifida requires three categories of intervention: First, help the child discover personally important developmental opportunities in which he or

she felt competent (Harter, 1987; Skinner, 1995). Second, help the child manage negative body self-schemata, both through cognitive and behavioral self-management interventions. Third, provide family interventions aimed at promoting parent–child communication, and at negotiating child independence and autonomy in the context of disability (Murch & Cohen, 1989).

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