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Predictors of social competence in young adolescents with craniofacial anomalies

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ABSTRACT. This descriptive study shows the development and evaluation of a model of social competence in young adolescents with craniofacial anomalies. Craniofacial patients ($N = 48$, 11-14 years) completed the Social Anxiety Scale for Children, selected subscales of the Self-Perception Scale for Adolescents and the Social Support Scale for Children. Their parents completed the Child Behaviour Checklist. Facial disfigurement was independently rated. Multiple regression analyses suggested a revised model in which one aspect of social anxiety (social avoidance/distress) predicts social competence, with peer support as a mediator, while the other aspect of social anxiety (fear of negative evaluation) predicts social competence, with parental support as a mediator. Severity of facial disfigurement was not related to any psychological variable. While self-worth predicted social competence when considered alone, this relationship disappeared when the other variables were taken into account; self-worth remained closely associated with fear of negative evaluation. Although mean Child Behaviour Checklist scores were in the normal range, almost half the adolescents had psychological problems of clinical concern. The results suggest that young adolescents with craniofacial anomalies require psychological assessment regardless of degree of disfigurement. Interventions to reduce social anxiety and improve social support may be of particular value for promoting social competence.

KEYWORDS. Adolescence. Craniofacial anomalies. Social competence. Descriptive study.

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RESUMEN. Este estudio descriptivo muestra el desarrollo y la evaluación de un modelo de competencia social en adolescentes jóvenes con anomalías craneofaciales. Pacientes de este tipo (*N* = 48, 11-14 años) completaron la *Social Anxiety Scale for Children*, junto con varias subescalas de las *Self-Perception Scale for Adolescents* y *Social Support Scale for Children*. Sus padres completaron la *Child Behaviour Checklist*. La deformidad facial fue valorada independientemente. Los análisis de regresión múltiple sugirieron un modelo revisado, en el que un aspecto de la ansiedad social (evitación social/angustia) predice la competencia social, con el apoyo entre compañeros como mediador, mientras el otro aspecto de la ansiedad social (miedo a la evaluación negativa) predice la competencia social, con el apoyo de los padres como mediador. La severidad de la deformidad facial no resultó asociada a ninguna variable psicológica. Mientras la auto valoración predijo la competencia social al ser considerada por separado, esta relación desapareció cuando las otras variables fueron tomadas en cuenta; la auto valoración permaneció estrechamente asociada con miedo a la evaluación negativa. Aunque las puntuaciones medias en la *Child Behaviour Checklist* estaban en el rango no patológico, casi la mitad de los adolescentes presentaron problemas psicológicos de índole clínica. Los resultados sugieren que los adolescentes jóvenes con anomalías craneofaciales requieren evaluación psicológica con independencia del grado de deformidad. Las intervenciones orientadas a reducir la ansiedad social y mejorar el apoyo social pueden tener un gran valor para promover la competencia social.

PALABRAS CLAVE. Adolescencia. Anomalías craneofaciales. Competencia social. Estudio descriptivo.

RESUMO. Este estudo descritivo mostra o desenvolvimento e a avaliação de um modelo de competência social em adolescentes jovens com anomalias craniofaciais. Pacientes deste tipo (*N* = 48, 11-14 anos) completaram a *Social Anxiety Scale for Children*, juntamente com várias subescalas das *Self-Perception Scale for Adolescents* e *Social Support Scale for Children*. Os seus pais completaram a *Child Behaviour Checklist*. A deformação facial foi avaliada independentemente. As análises de regressão múltipla sugeriram um modelo revisto, em que um aspecto da ansiedade social (evitamento social/angustia) previu a competência social, com o apoio entre companheiros como mediador, enquanto o outro aspecto da ansiedade social (medo da avaliação negativa) previu a competência social, com o apoio dos pais como mediador. A severidade da deformação facial não se mostrou associada a nenhuma variável psicológica. Embora a auto-avaliação prediga a competência social ao ser considerada em separado, esta relação desapareceu quando as outras variáveis foram tomadas em conta; a auto-avaliação permaneceu estreitamente associada com o medo da avaliação negativa. Ainda que as pontuações médias na *Child Behaviour Checklist* estajam no âmbito do patológico, quase metade dos adolescentes apresentaram problemas psicológicos de índole clínica. Os resultados sugerem que os adolescentes jovens com anomalias craniofaciais requerem avaliação psicológica com independência do grau de deformação. As intervenções orientadas para reduzir a ansiedade social e melhorar o apoio social podem ter um grande valor para promover a competência social.

PALAVRAS CHAVE. Adolescência. Anomalias craniofaciais. Competência social. Estudo descritivo.

Introduction

Social adjustment is an area of vulnerability for young people with chronic paediatric conditions (*e.g*., Graetz and Shute, 1995; Noll, Le Roy, Bukowski, Rogosch, and Kulkarni, 1991) and while many with craniofacial anomalies (CFAs) are well-adjusted, as a group they are at increased risk for poor psychosocial outcomes (Broder, 1997). While group comparison studies are helpful in identifying types and level of risk, they say little about variability within the CFA population and the factors that contribute to better or poorer outcomes (Bennett and Stanton, 1993; Speltz, Galbreath, and Greenberg, 1995). Correlational studies within the CFA population can provide such information, thus informing efforts to promote positive social adjustment. Pope and Ward (1997) made a significant contribution in this regard by identifying factors predictive of social competence in young adolescents with CFAs. The present descriptive study (Montero and León, 2005; Ramos-Álvarez, Valdés-Conroy, and Catena, 2006) furthers this work by developing and testing, with a larger sample, a model of predictors of social competence in this population (Figure 1). While most psychosocial studies focus upon the most common CFA diagnosis, cleft lip and palate (CLP), the present study included adolescents with more complex conditions, who may experience a less satisfactory cosmetic outcome and be more vulnerable to negative peer interactions (Carroll and Shute, 2005).

"Social competence" can be broadly viewed as the ability to elicit positive social responses, and avoid negative ones, in a range of social contexts (Mash and Terdal, 1997). Though sometimes operationalised in terms of social skills and behaviours (Dodge and Murphy, 1984), in the present study it was viewed in terms of social success, such as feeling socially accepted and having good friends (Hubbard and Coie, 2006). Social competence deficits predict later psychological adjustment difficulties (*e.g*., Rubin, Hymel, and Mills, 1989). Conditions characterised by factors related to peer relationship problems in the non-paediatric population (*e.g*., those affecting physical appearance) may produce the most social vulnerability (La Greca, 1990). Thus, given the centrality of the face in social interactions, those with CFAs may be especially vulnerable. Although frequent peer teasing of young people with CFAs has recently been shown to occur no more than in matched peers, those with more severe CFAs do experience more frequently behaviours such as being pointed at and stood further away from than others (Carroll and Shute, 2005). Many parents of children with CLP report impaired social relationships as early as age six, such problems persisting into adulthood (Noar, 1991; Tobiasen and Hiebert, 1993).

Early adolescence is a time of particular psychosocial risk (Kapp-Simon, Simon, and Kristovich, 1992) given the shift in importance of social relationships from family towards peers. In the only observational study comparing young adolescents with and without CFAs, Kapp-Simon and McGuire (1997) found that those with CFAs were less likely to begin conversations with classmates, engaged in fewer extended peer conversations and were less likely to respond to others' approaches. Peers were less likely to initiate interactions with them or respond to their approaches. Young adolescents with CFAs therefore appear to be at risk of social competence deficits, at a developmental stage when peer relationships are especially salient.

Research on the psychosocial adaptation of young people with chronic conditions has often relied upon parental report, yet both adult and child perspectives are important (*e.g.*, Hanson, DeGuire, Schinkel, Henggeler, and Burghen, 1992; Shute, 2005). This seems especially so for social competence given that young people experience social contexts to which their parents have limited access; they may also interpret their social experiences differently. In the present study, therefore, both adolescent- and parent-rated social competence measures were used.

We now consider several factors that potentially contribute to social competence, including perceived social support, social anxiety, self-worth and severity of craniofacial disfigurement, to develop a predictive model of social competence (Figure 1).

"Perceived social support" refers to the cognitive appraisal of others as available to provide informational, emotional and practical help and companionship, and is the most powerful social support variable predicting mental health status (Sarason and Sarason, 1985). Children's perceived social support is predictive of adjustment measures, including self-worth (*e.g.*, Shute, De Blasio, and Williamson, 2002). Children with chronic conditions with high support from both family and peers show better adjustment than those with high support from only one source (Wallander and Varni, 1989). No studies have specifically examined social support in relation to social competence in adolescents with CFAs. However, children with CFAs who have difficulties with peer relations are characterised by a history of insecure parental attachment (Rubin and Wilkinson, 1995), and attachment has been conceptually related to social support (Cauce, Mason, Gonzalez, Hiraga, and Liu, 1994). Furthermore, Pope and Ward's (1997) study suggests a relationship between parental support and social competence: parents with more socially competent children with CFAs more actively encouraged peer interactions. Additionally, Brantley and Clifford (1979) found that adolescents with CLP expressed lower levels of perceived parental acceptance at birth than did obese or control group adolescents. Overall, then, it is proposed that social competence in adolescents with CFAs will be predicted by their perceptions of peer and parent social support.

"Social anxiety", or fear of embarrassment or humiliation in relation to social interactions, consists of two factors: fear of negative evaluations by others and social avoidance/distress (La Greca, Kraslow Dandes, Wick, Shaw, and Stone, 1988). It has been suggested as an important mediator of social difficulties (*e.g.*, Asarnow, 1983; Ladd and Mize, 1983) and some evidence suggests that it is associated with greater peer rejection (*e.g.*, Cowen, Zax, Klein, Izzo, and Trost, 1965). Self-reported social anxiety in children is associated with greater feelings of social incompetence (Franke and Hymel, 1985, cited in Hymel, Franke, and Freigang, 1985). In that study, socially anxious females were lonelier and less well accepted by their peers, and perceived by classmates as less sociable and more isolated. A relationship between social anxiety and social competence has also been reported specifically for young adolescents with CFAs (Pope and Ward, 1997). This finding was expected to be reproduced in the current study. Since anxiety about, and avoidance of, social interactions would be expected to impede the development of a sense of having supportive social relationships, it is proposed that social anxiety will be predictive of perceived social support.

"Self-worth" is the evaluative aspect of the self, sometimes referred to as self-esteem or self-concept. It can be considered globally or within specific domains (Harter, 1985). Kapp-Simon (1986) found global self-worth in young children with CLP to be significantly lower than that of peers; they perceived themselves as less socially competent and more frequently sad and angry. Older children and adolescents, however, have tended to demonstrate comparable self-worth to peers (Brantley and Clifford, 1979; Leonard, Brust, Abrahams, and Sielaff, 1991), although there may be specific issues with perceptions of popularity (Leonard *et al.*, 1991) and facial appearance (Richman, 1983).

These studies did not include those with more severe CFAs, and the present study rectified this omission. It also, importantly, examined the role of self-worth in adjustment "within" the CFA population. In testing a model of psychosocial adaptation in children with chronic illnesses, incorporating several child and maternal measures, Gannoni (2003) found self-worth to be the major child variable predicting psychosocial outcome. Within the CFA population, Pope and Ward (1997) found positive self-worth to be associated with higher social competence. Overall, then, it seems important to incorporate self-worth into the present model. Although the evidence is mixed, it generally indicates that the self-worth of children with chronic conditions mediates between other cognitive factors and psychosocial adaptation (Gannoni, 2003). The model therefore shows self-worth as mediating the effects of both perceived social support and social anxiety on social competence.

"Severity of facial disfigurement" may be a factor in psychosocial outcome and, indeed, improving facial appearance for social reasons is an important rationale for the extensive surgery for CFAs (*e.g.*, Munro, 1995). Several studies have found no significant difference between diagnostic groups in psychosocial adjustment and social competence (*e.g.*, Kapp-Simon, 1986; Kapp-Simon *et al.*, 1992; Pertschuk and Whitaker 1985; Pope and Ward, 1997), suggesting that it may be the presence, rather than severity, of the disfigurement that places adolescents at risk. This is consistent with the broader childhood chronic illness literature (Wallander, Feldman, and Varni, 1989; Wallander and Varni, 1989). On the other hand, Pruzinsky (1992) has suggested that those with the most severe forms are at greater risk of psychosocial stress; this is supported by the recent finding that greater disfigurement is associated with a greater likelihood and frequency of young people's being targeted by certain aggressive peer behaviours (Carroll and Shute, 2005). Also, Tobiasen and Hiebert (1993) found that self-ratings of severity of facial cleft impairment strongly predicted psychological adjustment in several areas, including global self-esteem and social competence. Given the uncertainty surrounding the place of disfigurement severity in adaptation, it was included in the present model of social competence. It is possible that more severe disfigurement would be associated with greater fear of negative evaluation and greater social avoidance/distress, therefore it is proposed that severity will indirectly affect social competence, mediated by social anxiety. Furthermore, given the evidence concerning sense of early parental rejection and aggression from peers, it is possible that severity will also affect social competence through level of perceived social support.

Figure 1 captures the paths proposed above through which severity of disfigurement, perceived social support, social anxiety and self-worth may predict social competence.

FIGURE 1. Theoretical model for predicting social competence in young
adolescents with craniofacial anomalies.
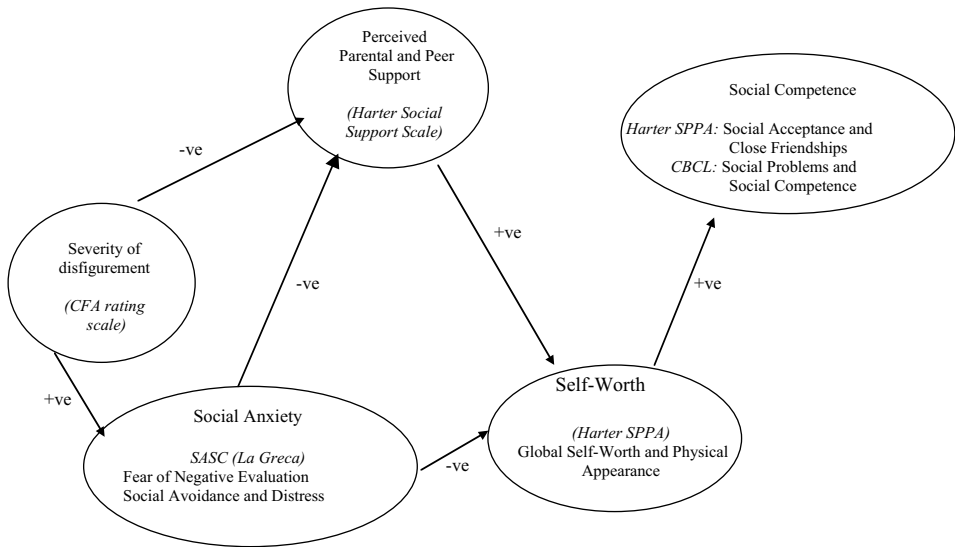
Method

Sample

Participants were 48 young adolescents with various craniofacial diagnoses (and their parents) who were patients of the Australian Craniofacial Unit (ACU) at the Women's and Children's Hospital, Adelaide, South Australia. Over 70% were living in South Australia, with the other participants coming from other Australian states. The sample included 32 boys and 16 girls (11-14 years; $M = 12.6$ years, $SD = 1.1$). The age distribution was as follows: 11 year olds (21%), 12 year olds (27%), 13 year olds (27%), 14 year olds (25%).

The majority (63%) first attended the ACU before their second birthday and 40 (83%) were having ongoing contact. Eighteen (38%) had a cleft of the lip and/or palate and/or alveolus, 13 (27%) had a complex craniofacial syndrome (Treacher-Collins, Crouzon's, Apert's, Saethre-Chotzen, Robinow, Binder, and Van der Woude), 8 (17%) had skull deformities involving craniosynostosis or plagiocephaly with no synostosis, 4 (8%) had hemifacial microsomia, and 2 (4%) neurofibromatosis; the remaining 3 had hemifacial hypertrophy, facial asymmetry and frontonasal dysplasia.

The Child Behaviour Checklist (CBCL) provided general information about psychological adaptation (Table 1) as well as yielding measures of social competence (see discussion under *Measures* concerning the use of the CBCL with those with chronic conditions).

Instruments

For clarity, the scales are first described as presented to participants, while psychometric information and derived scores in relation to the concepts in the model are explained in the *Measures* section. The adolescents completed the following.

–   Four subscales of the Self-Perception Profile for Adolescents (SPPA; Harter, 1988): *Social Acceptance, Close Friendship, Physical Appearance,* and *Global Self-Worth* (GSW) (20 items). The adolescent decides which of two alternative statements best describes him- or herself relative to peers and then indicates whether it is "really true" or "sort of true» for them, yielding a score on a 4-point scale.

–   Three subscales of the Social Support Scale for Children (SSSC; Harter, 1985): *Parental Support, Classmate Support,* and *Close Friend Support* (18 items).
    The various subscales of the SPPA and the SSSC were combined into one questionnaire entitled "What I am Like and People in My Life" as the format and instructions are virtually identical. As the sample was aged 11-14 years, the statements were modified to refer to comparisons with other people their age, rather than other "kids" or "teenagers" to avoid any confusion about their comparison group.

–   The Social Anxiety Scale for Children (SASC; La Greca *et al*., 1988) (10 items). This consists of statements to which the adolescents were asked to indicate their feelings ("never true," "sometimes true" or "always true"). Wording was amended as above and three unscored items added to give a less negative emphasis.

Measures

–   Social Competence. For reasons discussed earlier, it was considered important to use both adolescent and parental indicators. Moderate positive correlations between parent and child reports of psychosocial adaptation are typical, and a composite score can then be created that is a reasonable reflection of both parent and child perspectives (Gannoni, 2003). Pope and Ward (1997) used such a combined outcome measure in their study of social competence in young adolescents with CFAs. Adolescent self-report measures of social competence were the *Social Acceptance* and *Close Friendship* subscales of Harter's SPPA. Pope and Ward (1997) used only the *Social Acceptance* subscale. It was considered that adding the *Close Friendship* subscale would broaden the social competence measure (previous research with young adolescents has suggested that these two scales can be considered together to reflect a more general peer acceptance factor; Trent, Russell, and Cooney, 1994). Internal consistency reliabilities have been reported at .78 to .85 for *Social Acceptance* and .79 to .85 for *Close Friendship* (Harter, 1988). Current Cronbach's alphas were .76 and .86 respectively. The scales were positively correlated ($r = .67, p < .01$)[2]. For the parental assessment of social competence, two subscales were selected from the CBCL, an extensively researched instrument that has excellent reliability and validity (Achenbach, 1991). Concerns exist about the use of the Somatic Complaints scale with children with chronic conditions (Perrin, Stein, and Drotar, 1991); these scores were not

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[2]   2-tailed probabilities are reported throughout this paper.

relevant for testing the model, but are presented in Table 1, along with other CBCL scores, for information about the sample. The CBCL Social Problems Scale was used as a parent-rated negative indicator of social competence, as in Pope and Ward's (1997) study. In addition, the CBCL Social Competence scale (a positive indicator) was included to broaden the measure, as it examines, for example, the level of participation in social activities and how well the child gets along with other people. Concerns about the "unfair" use of this scale with those with chronic conditions (Perrin *et al*., 1991) were considered irrelevant for testing the model as comparisons were not being made with adolescents without CFAs. Internal consistencies reported for CBCL Social Problems lie between .72 and .76 and for Social Competence between .54 and .62. Current Cronbach's alphas were .81 and .60 respectively. The 2 scales were significantly negatively correlated ($r = -.61$ $p < .01$). Social Problems scores were reversed (higher scores indicated greater social competence). As recommended by Achenbach (1991), raw CBCL subscale scores were used. Scores from each of the four subscales (SPPA Social Acceptance, SPPA Close Friendship, CBCL Social Problems, and CBCL Social Competence) were converted to *z*-scores to remove scaling differences. A composite adolescent-derived score and a composite parent-derived score were created to examine their intercorrelation; as expected, this was moderately positive ($r = .49$, $p < .01$). An overall Social Competence measure, used in the analyses, was derived by combining the *z*-scores from all four social competence measures; Cronbach's alpha = .70.

– Social Anxiety. The SASC (La Greca *et al*., 1988) was used to measure social anxiety. It has two subscales: fear of negative evaluation (FNE) and social avoidance and distress (SAD), accounting for 64% and 24% of the variance in Total SASC scores respectively, with a modest but significant correlation between the subscales ($r = .27$, $p < .001$). La Greca *et al*. reported Cronbach's alphas of the SASC Total, FNE and SAD subscale scores as .83, .76 and .63 respectively, and test-retest reliability as $r_{tt} = .70$ for FNE, .39 for SAD and .67 for Total SASC (p's < .001). In the present study the subscale scores were considered separately, according to recommendations by La Greca *et al*. (1988); their correlation was $r = .48$, $p < .01$. Cronbach's alphas were .84 (Total scale and FNE subscale), and .72 (SAD subscale).

– Self-Worth. A self-worth measure was derived from two especially relevant subscales of the SPPA: *Global Self-Worth* and *Physical Appearance* (Harter, 1988). Harter (1988) reported a consistent and strong relationship between these subscales (*r*'s between .66 and .73) and internal consistency reliabilities as .85 to .89 (*Physical Appearance*) and .80 to .89 (*Global Self-Worth*). In the current sample the correlation was .64, $p < .0001$, and Cronbach's alphas were .89 (*Physical Appearance*) and .77 (*Global Self-Worth*).

– Perceived Social Support. Social support measures were derived from the *Parental, Classmate* and *Close Friend Support* subscales of the SSSC (Harter, 1985). Internal consistency reliabilities have been reported as .86 to .88 (*Parental Support*), .74 to .78 (*Classmate Support*) and .77 to .83 (*Close Friend Support*)

(Harter, 1985). Current Cronbach's alphas were .85, .73, and .85 respectively. The correlation between Classmate and Close Friend Support was $r = .53$, $p < .0001$, so these scales were added to give a Peer Support measure. The correlation between Parental and Peer Support was moderate ($r = .42$, $p < .01$); these were considered separately.

– Facial Disfigurement. Facial attractiveness judgements can be reliably made (Tobiasen and Hiebert, 1993). Richman's (1978) five-point Likert rating scale has been used extensively with patients with CLP (Richman, 1997; Richman and Millard, 1997) ranging from 1 (normal facial figurement) to 5 (severe facial disfigurement), with reported intra-class correlation coefficients of .79-.84. It yields a bimodal distribution for those with CLP (Richman, 1978, 1997). The second author rated participants' most recent hospital photographic slides using this scale. An experienced Unit staff member also rated 35% of the photographs. Inter-rater reliability value was .95, $p < .0001$. There was a 77% agreement for facial disfigurement, and where there was a difference, this was only by one point.

Procedure

Relevant ethics permissions were obtained. The Unit database identified 280 patients aged 11-14 who were born with a CFA and currently resided in Australia, as potential study participants.

The Unit mailed information to families and recorded participants' names and study ID numbers enabling cross-matching of diagnostic and treatment information from medical records (with parental consent). The adolescent scales were administered in a counterbalanced order. Parents (mainly mothers) were asked to complete the CBCL 4-18 (Achenbach, 1991). Parents were asked to mail the completed questionnaires and consent form using a reply paid envelope. Of the 280 mailed questionnaires, 37 were undelivered and three sent to patients unsuitable for the study. Of the remainder, who were sent follow-up letters if necessary, 55 were returned (23% response rate). Five were excluded for incorrect questionnaire completion and three because of a moderate intellectual disability, which affects social competence (Wallander and Hubert, 1987). Three previously assessed as having a mild intellectual disability were included. The final sample was therefore 48. Data were analysed using SPSS 14.0.

Results

Overview and preliminary analyses

Perceived parental support was negatively skewed, and this was not improved by transformation; the original scores were therefore retained. Severity of facial disfigurement was positively skewed; recoding on a 3-point scale (no disfigurement, mild-moderate, and severe disfigurement) yielded a distribution that approximated a normal distribution, and the recoded data were used in the analyses. A summary of the CBCL data is presented (Table 1) to provide general information about the sample. Table 2 summarises the data relevant for the model of social competence. Multiple regression analyses were

used to identify which variables predicted social competence, systematically testing the relationships indicated in the proposed model. With 48 cases and six predictor variables, the minimum requirement of five times more cases than independent variables (Coakes and Steed, 2001) was exceeded. A series of *t*-tests for independent samples found no significant gender differences for any of the variables in the model. Pearson's correlations indicated a significant negative relationship between age and self-worth ($r = -.37$, $p < .05$), due to a significant negative relationship between age and perception of physical appearance ($r = -.45$, $p < .01$).

TABLE 1. Summary of Parental Report Data – Child Behaviour Checklist (CBCL) ($N = 48$).

CBCL Scales	M (SD)	Range	n (%)[a]	Clinical Criteria	Cronbach's α
Total Problem Score	54.77 (12.77)	24-77	19 (40)	≥ 64	.96
Internalising Behaviour subscale	54.65 (13.90)	31-79	20 (42)	≥ 64	-
Withdrawn	56.73 (9.51)	50-82	9 (19)	≥ 71	.83
Somatic Complaints	56.88 (8.73)	50-79	9 (19)	≥ 71	.73
Anxious/Depressed	58.73 (8.68)	50-82	11 (23)	≥ 71	.87
Externalising Behaviour subscale	51.38 (11.45)	30-80	11 (23)	≥ 64	-
Delinquent Behaviour	54.58 (7.32)	50-76	7 (15)	≥ 71	.75
Aggressive Behaviour	55.54 (8.35)	50-84	4 (8)	≥ 71	.91
Social Problems	59.83 (10.05)	50-81	16 (33)	≥ 71	.81
Thought Problems	55.73 (8.38)	50-79	8 (17)	≥ 71	.70
Attention Problems	57.48 (8.33)	50-75	10 (21)	≥ 71	.79
Total Competence Score	44.04 (10.45)	24-65	21 (44)	≤ 36	-
Activities	45.75 (7.69)	30-55	3 (6)	≤ 27	.50
Social Competence	42.88 (9.51)	21-55	7 (15)	≤ 27	.60
School Competence	45.19 (9.24)	24-55	7 (15)	≤ 27	.66

Notes. *t*-scores represent standardised scores for CBCL, $M = 50$. [a] In borderline clinical and clinical range.

As a group the adolescents had CBCL problems and competence scores within the normal range (Table 1), although many had problems and competence scores within the clinical and borderline ranges. Of particular relevance to the variables under examination are the percentages with internalising problems (42%) and social problems (over 33%).

TABLE 2. Summary of mean scores of variables for model of social competence.

Variables	M (SD)	Range	Cronbach's α
Severity of Facial Disfigurement	1.91 (.78)	1-3	-
Social Anxiety Scale for Children (SASC)	1.74 (.84)	.25-3.75	.84
Fear of Negative Evaluation	.92 (.49)	0-2	.84
Social Avoidance and Distress	.82 (.49)	0-2	.72
Self-Worth (SPPA)	5.45 (1.44)	2.4-8	.91
Physical Appearance	2.45 (.90)	1-4	.89
Global Self-Worth	3 (.68)	1.4-4	.77
Social Support Scale for Children (SSSC)	9.71 (1.59)	5.4-12	.88
Parental	3.57 (.60)	1.6-4	.85
Peer	6.14 (1.25)	3-8	.85
Classmate	2.94 (.65)	1.5-4	.73
Close Friend	3.2 (.78)	1-4	.85
Total Social Competence [a]	.22 (3.03)	-5.89-4.63	.70
Adolescent Rating (SPPA)	5.84 (1.49)	2.2-8	.88
Social Acceptance	2.88 (.74)	1-4	.76
Close Friendship	2.96 (.93)	1-4	.86
Parent Rating (CBCL) [a]	.15 (1.72)	-3.10-3.07	.76
Social Problems	3.71 (3.36)	0-11	.81
Social Competence	5.95 (2.30)	.5-10.5	.60

Notes. $N = 48$, except for SASC ($N = 45$) and severity of facial disfigurement ($N = 47$). SPPA and SSSC possible range 1 to 4. SASC possible range 0 to 2. To account for missing values mean scores for each participant were used rather than total raw scores. [a] Represents mean z-scores of scale scores.

Correlations

Table 3 summarises intercorrelations for the social competence model variables. Apart from severity of disfigurement (not significantly related to any other variables), most correlations were moderate to high. Multi-collinearity was addressed by examining the tolerances for each of the regression equations; all were within acceptable limits.

The anticipated negative relationship between social anxiety and self-worth was found for FNE but not for SAD. A negative relationship between social anxiety and social support was largely supported, with significant negative correlations between FNE and both parental and peer support, and between SAD and peer support. However, the correlation between SAD and parental support was not significant. Finally, the expected positive self-worth/social competence relationship was found.

TABLE 3. Intercorrelations between variables for social competence model.

Variables	I	II	III	IV	V	VI	VII
I. Severity of Facial Disfigurement	-						
II. Social Anxiety–Fear of Negative Evaluation	.23	-					
III. Social Anxiety–Social Avoidance and Distress	.22	.48**	-				
IV. Parental Support	.01	-.36*	-.20	-			
V. Peer Support	-.07	-.35*	-.46**	.42**	-		
VI. Self-Worth	-.18	-.52**	-.22	.39**	.39**	-	
VII. Social Competence	-.17	-.59**	-.56**	.55**	.78**	.51**	-

Note. $N = 48$, except for correlations involving Social Anxiety ($N = 45$) due to missing values. $*p < .05$, $**p < .01$.

Regression analyses to test proposed model

Each section of the model was considered as a separate regression equation working from right to left (Figure 1). Initially, social competence was the outcome variable, with self-worth as the predictor; as expected, this was found to be a significant predictor (Table 4). Self-worth was then examined as an outcome variable, with SAD, FNE and peer and parental support as predictor variables; FNE was the only significant predictor, which runs counter to the proposed model. Severity of facial disfigurement, SAD and FNE were then entered simultaneously as predictors of both parental and peer support. SAD was the only significant predictor of peer social support, and FNE the only significant predictor of parental support. Finally, severity of facial disfigurement was entered into separate regression equations as a predictor of the two social anxiety variables (FNE and SAD) (Table 4). It was not a significant predictor of either.

TABLE 4. Summary of simultaneous regression analyses to examine model of social competence ($N = 48$).

Outcome Variable	Predictors	R^2	B	β	df
Social Competence		.26			1, 46
	Self-Worth		1.08	.51***	
Self-Worth		.33			4, 40
	SAD		.24	.08	
	FNE		-1.30	-.45**	
	Parental Support		.47	.21	
	Peer Support		.11	.09	
Parental Support		.14			3, 40
	Severity		.05	.06	
	SAD		-.04	-.03	
	FNE		-.44	-.36*	
Peer Support		.24			3, 40
	Severity		.14	.09	
	SAD		-.89	-.38*	
	FNE		-.44	-.19	
Fear of Negative Evaluation		.05			1, 42
	Severity		.15	.23	
Social Avoidance and Distress		.05			1, 42
	Severity		.14	.22	

Notes. SAD: Social Avoidance and Distress; FNE: Fear of Negative Evaluation.
*$p < .05$, **$p < .01$, ***$p < .001$.

Further examination of the data was required, given the failure of social support to predict self-worth, and to examine whether social anxiety and social support were in fact direct predictors of social competence (*i.e.*, testing the "fully recursive model") (Pedhazur, 1982). First, social competence was again considered as an outcome variable, with all other variables as predictors. These five variables accounted for 77% of the variance in social competence scores, with the social support variables reaching significance: peer social support was the strongest predictor (b = .49, $p < .0001$), followed by parental social support (b = .20, $p < .05$). As a further step in testing the fully recursive model, variables prior (in the model) to self-worth were entered as predictors of self-worth. The only significant predictor was FNE (b = -.43, $p = .01$). These results suggested an alternative model (Figure 2). Sobel tests supported the proposal that peer support acts as a mediator between SAD and social competence (Z = -3.13, $p = .002$) and that parent support acts as a mediator between FNE and social competence (Z = -2.10, $p = .04$).

FIGURE 2. Model of social competence suggested by the data.
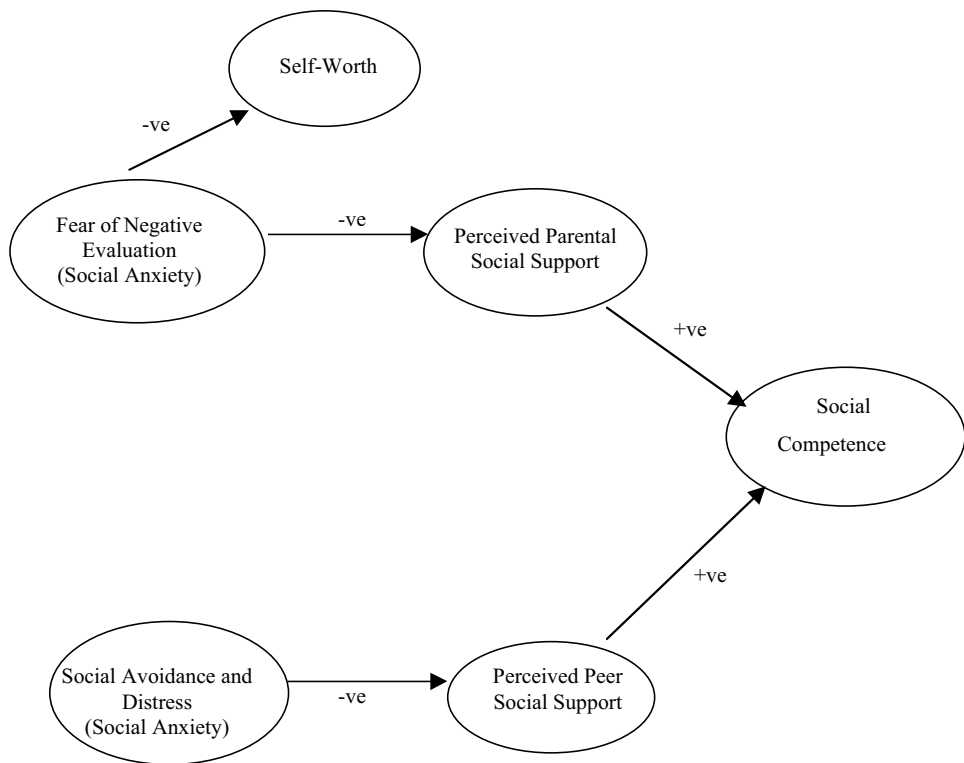
Discussion

The model of social competence

We believe this is the first study to develop and test a specific model of factors predictive of social competence in young adolescents with CFAs. Social competence, broadly defined, was measured through both parent and adolescent reports. While degree of facial disfigurement was not significantly related to social competence, all the psychological variables were indeed predictive of social competence, although not in the manner proposed.

As anticipated, self-worth predicted social competence, but only when considered as a lone variable. The results were not consistent with its having a mediating role in predicting social competence; rather, it is closely associated with fear of negative evaluation from others. This makes sense in the light of the suggestion by Bilboul, Pope, and Snyder (2006), drawing upon work by Leary and Downs (1995, cited in Bilboul *et al*., 2006) on "sociometer theory", that how we view ourselves depends in large part on how far others accept or reject us.

The component of the original model in which social support is the mediator between social anxiety and social competence was in broad terms supported by the

data, although the two different aspects of social anxiety are mediated by different providers of social support. The results are consistent with the notion that the effect of social avoidance and distress on social competence is mediated by peer social support. It may be that those with high levels of social avoidance and distress avoid peer interactions and so do not develop good peer support networks, resulting in lower social competence. However, as the study was cross-sectional the directionality of effects is uncertain, and it is also plausible that higher levels of social support serve to reduce social anxiety, which in turn may improve social competence. Both may be at work, in a reciprocal fashion, and this possibility is suggested by Kapp-Simon and McGuire's (1997) observational study, which found adolescents with CFAs less likely to initiate peer interactions and also less likely to respond to peers' approaches. In the present study, the effect of the other aspect of social anxiety, fear of negative evaluation, on social competence was mediated by parental social support. Those with a low fear of negative evaluation may be easier to parent and so elicit higher levels of parental support or, conversely, and perhaps more plausibly, better parental support may reduce fear of negative evaluation, reducing its effect on social competence.

The present results challenge the assumption that individuals with the most severe facial disfigurement will have the greatest social difficulties. Although there is some evidence in favour of this notion (*e.g*., Carroll and Shute, 2005), the present results are consistent with several previous findings. For example, although Richman (1997) found a significant relationship between independent ratings of facial disfigurement and internalising behaviour at 12 years of age with a CLP sample, facial disfigurement only accounted for 13% of the variance in internalising scores. Also, Richman and Millard (1997), using the same rating scale with a CLP sample (4-12 years), found no relationship between facial disfigurement and behaviour or academic achievement. The present results are also consistent with evidence from the childhood chronic illness literature (Wallander *et al*., 1989; Wallander and Varni, 1989), which suggests that it is the presence of the condition rather than its severity which places a child at risk for adjustment difficulties.

Nevertheless, there could be reliability and validity issues with the use of the facial rating scale developed for CLP (Richman, 1978) when used with the more complex craniofacial syndromes. It should also be borne in mind that these young people had surgical interventions with the aim of improving appearance (as well as function), so that "current" facial appearance would not necessarily be a good reflection of degree of disfigurement at earlier developmental stages, when the scene might have been set for the psychological variables measured in this study. In addition, early clinical intervention and support received from the hospital, by both the adolescents and their parents, may have moderated the severity-outcome relationship.

Limitations of the study

The main limitation, as with other studies in this area, concerns sampling. It is difficult, with this population, to achieve sufficient participants for strong statistical power for multivariate analyses, even when working through a major national centre such as the one in the present study. While minimum sample size requirements were

met, and the sample size was double that in Pope and Ward's (1997) study, increased power would nevertheless be desirable. The significant relationships found in this study can perhaps be considered quite strong as they appear to confirm previous findings from within both the CFA (*e.g*., Pope and Ward, 1997) and chronic illness (*e.g*., Wallander and Varni, 1989) literature, particularly regarding the importance of the relationship between social support and social competence. A larger sample size in future would also enable the use of confirmatory path analysis to test the direction of causality between variables for the proposed model.

The response rate was probably influenced by the ethical requirement that the invitation to families was through the Unit (by mail), so that the researcher was unable to make a personal approach, either in the clinic or by telephone. In addition, both parent and child had to agree to complete and return the questionnaires. Given the many demands on these families (*e.g*., repeated surgical interventions) the sample may therefore have been biased towards those undergoing the least stress at the time of the approach; even so, this sample can certainly not be considered problem-free, given the high incidence of behavioural issues of clinical significance.

Clinical implications of findings

The findings suggest that many young people with CFAs could benefit from further clinical intervention, especially regarding internalising problems, social problems, and social competence. Interventions to reduce social anxiety and improve social support would be of particular value for promoting social competence. Of particular relevance may be cognitive behavioural interventions aimed at increasing opportunities for positive peer interactions, in which adolescents are able to reduce their social anxiety and have rewarding social experiences (*e.g*., Rapee, Spence, Cobham, and Wignall, 2000). For those with low parental support, family interventions (*e.g*., to develop more helpful communication styles) seem to be indicated. It is more difficult to work with peers, as this can further stigmatise a young person who is "different" (Shute and Paton, 1990), although it may be possible to assist them to deal effectively with peer behaviours such as teasing (*e.g*., Field, 1999). Clinicians can also liaise with the school to determine whether there are policies in place to deal with peer harassment and to promote positive social relationships, and to check arrangements for reintegrating adolescents into school following periods of absence for surgical procedures (Shute, 1999).

Perceptions of social support and social anxiety appear to be better predictors of social competence than objective degree of disfigurement. This suggests the importance of routinely assessing all young adolescents with CFAs, regardless of the degree of visible disfigurement, in order to direct clinical intervention towards those at greatest risk. Routine clinical collection of data of the type used in this study, as in a recent study by Bilboul *et al*. (2006), would also increase representativeness of samples in future research (though Bilboul *et al*.'s sample was of similar size to the present one). Finally, the negative relationship found between age and self-perception of physical appearance implies that professionals should be especially aware of these issues as their clients move through early adolescence.

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