



Changes in quality of life and psychological need satisfaction following the transition to secondary school

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Background. Quality of life (QoL) is an important area for research during adolescence, due to its associations with (1) physical and mental health and (2) the emergence of health risk behaviours. A time that poses a particular threat to QoL is the transition from primary to secondary school.

Aims. This study aimed to investigate changes in QoL immediately following the transition to secondary school. Using Self-Determination Theory (SDT) as a conceptual foundation, the relationship between QoL and satisfaction of the three basic psychological needs advanced by SDT (autonomy, competence and relatedness) was explored.

Sample. The sample comprised 63 Year 7 students (age 11–12 years) attending a UK coeducational secondary school.

Method. Data were collected using self-report questionnaires on three occasions over 10 weeks, starting on the second week of term. Change in need satisfaction was used to predict change in QoL, and the possible reciprocal relationship explored using regression analysis.

Results. A meaningful improvement in QoL was recorded for 21% of students. Improvements in QoL were predicted by satisfaction of the needs for autonomy and relatedness, but not by competence, explaining 36% of the variance. QoL showed a weaker, but reciprocal effect on need satisfaction.

Conclusions. The findings suggest that support for the needs for autonomy and relatedness would provide the most likely route to the enhancement of student QoL over the transition to senior school.

Quality of life (QoL) is defined by the World Health Organization as ‘an individual’s perception of their position in life in the context of the culture and value systems in

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which they live and in relation to their goals, expectations, standards and concerns . . . incorporating in a complex way the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of the environment' (WHOQOL Group, 1995, p. 1403). QoL is commonly used as an outcome measure in health research with children and adolescents (Eiser & Morse, 2001; Department of Health, 2001), and effort is currently being made to promote its use also in clinical practice (Greenhalgh, Long, & Flynn, 2005). The assessment of QoL has also been incorporated into routine social practice as part of the UK Every Child Matters white paper (DfES, 2003), representing a credible way of assessing the effects of social policies and interventions (e.g. Greenhalgh *et al.*, 2005; Zekovic & Renwick, 2003). However, an important next step to putting such QoL information into practice lies in establishing the factors which underpin good QoL and, in particular, in identifying mechanisms that may be malleable to intervention. Such information would provide a basis on which to attempt to increase the QoL of those reporting the lowest levels.

QoL goes beyond objective indicators of income, socio-economic or health status, providing a multidimensional holistic indicator of how well life is going, and its meaning. Past work looking specifically at QoL in children and adolescents has identified quintessential domains such as physical health, psychological well-being, social relationships and the environment (Eiser, 1997; Wallander, Schmidt, & Koot, 2001). These domains are highly interdependent, such that when global QoL changes, the various domains within QoL reflect similar response patterns, regardless of the nature of the trigger for change (Dogra, Parkin, Gale, & Frake, 2002). QoL has been shown to be relatively stable in adolescence (Gerhardt, Britto, Mills, Biro, & Rosenthal, 2003), and to be associated with factors such as perceived physical health, perceptions of personal control and opportunities (Meuleners & Lee, 2003). Although no predictive path has been formally established, there is also an association between QoL and common adolescent health risk behaviours such as inconsistent condom use, smoking and alcohol use (Gerhardt *et al.*, 2003).

A time period that poses a particular challenge or threat to adolescent well-being and QoL across several domains is the transition from primary to secondary school (Seidman, Allen, Aber, Mitchell, & Feinman, 1994; Sirsch, 2003). This transition represents a significant life-event for many children (Sirsch, 2003), and is linked to increased stress and depressive symptoms (Rudolph, Lambert, Clark, & Kurlakowsky, 2001), poorer self-esteem (Seidman *et al.*, 1994) and low academic achievement (Otis, Grouzet, & Pelletier, 2005). However, school transition is not always a negative event; while some perceive the move as a threat, others perceive it positively, as a challenge or opportunity (Sirsch, 2003). Thus, intra-individual differences between students play an important part in the process. Several factors contribute to how well an individual deals with this transition, including self-regulatory beliefs regarding control over academic success (Rudolph *et al.*, 2001; Seidman *et al.*, 1994), self-concept and social anxiety (Sirsch, 2003). Most British schools take steps to reduce the perceived threat and smooth the transition through simple means, such as arranging for school visits with peers in the year before moving, and allocating older students as mentors (Graham & Hill, 2003; Sirsch, 2003). In the present study, we sought to examine the extent of change in QoL following the move from primary to secondary school, and the consistency of direction and degree of the response across different QoL domains.

A second aim of our study was to examine the relationship between QoL and the satisfaction of three basic psychological needs advanced by SDT (Deci & Ryan,

1985, 1991; Ryan & Deci, 2000a). SDT is a theory of human motivation based on the premise that there are three basic psychological needs that must be satisfied by the social environment in order for human beings to thrive. These needs are for autonomy (i.e. a person's need for agency and to perceive oneself as the origin of one's own behaviour), competence (i.e. the perception that one is effective and has opportunities to demonstrate these capabilities) and relatedness (i.e. the feeling that one is connected to and cared for by others) (Ryan & Deci, 2000a). SDT predicts that the satisfaction of these needs will result in positive outcomes, such as well-being and enjoyment (Ryan & Deci, 2000b), but will also have a pivotal role in underpinning a person's motivation. Through this association, need satisfaction will have an impact on behaviour, cognitions and psychological well-being. A wealth of practical research supports the hypothesis that the satisfaction of all three needs corresponds closely to variations in psychological well-being (e.g. Gagne, Ryan, & Bargmann, 2003; Standage, Duda, & Pensgaard, 2005). For example, well-being is reported to correspond to the degree of need satisfaction facilitated by a single sports training session (Gagne *et al.*, 2003), and in school physical education classes, need satisfaction has been reported to result in a positive indirect effect on positive affect and a negative indirect effect on 'unhappiness' (Standage, Duda, & Ntoumanis, 2005).

Although past work using constructs allied to those embraced by SDT has suggested that aspects of school transition may have a significant impact, the satisfaction of the three basic needs set out by SDT during the transition to secondary school has, to date, not received empirical research attention. For example, relatedness has been likened to the concept of a sense of school belonging (Allen, 2003), which, along with other elements of school connectedness, has been linked to more prosocial behaviour (Battistich, Schaps, & Wilson, 2004), fewer problem behaviours (e.g. drug and alcohol use; Harrison & Narayan, 2003) and better academic performance (Battistich *et al.*, 2004). It is plausible that relatedness may deteriorate initially during school transition due to the disruption of prior friendship groups and teacher relationships (Sirsch, 2003). Moreover, it is likely that it will take a period of time for social opportunities at the new school to emerge. Competence may be expected to decrease due to increasing academic demands (Alspaugh, 1998). Both relatedness and competence would be expected to improve once the school term is underway and as students adjust to their new environment, form new relationships and become familiar with teachers' demands. Finally, perceived autonomy may be compromised if the autonomy permitted at senior school is very different (whether greater or less so) from that permitted at primary school (Stoll, Stobart, Martin, Freeman, Freedman *et al.*, 2003). Similar to the changes in competence and relatedness, such changes are likely to require a period of adjustment. Work from a motivational perspective, comparing a student's academic motivation towards school over three yearly time points also supports this proposal (Otis *et al.*, 2005), finding self-determined motivation to be lower, and amotivation (i.e. a lack of motivation) to be greater for children changing schools than for a cohort of same-aged students remaining at the same school.

Although psychological well-being is a well-established outcome of need satisfaction (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon & Elliot, 1999), no direct link has yet been drawn to the more stable measure of QoL. QoL not only encompasses an assessment of global elements of well-being, but also includes an evaluation of a person's satisfaction with their life as a whole, of which school life is considered one important element for children (e.g. PEDSQoL; Varni, Seid, & Rode, 1999). Though closely related to QoL, well-being has been shown to be highly responsive to daily mood and life-events,

and as such too volatile for the global assessment of how a student feels their life is going that was sought for this study.

To summarize, it was predicted that the transition to secondary school would result in a temporary deterioration of QoL for a significant proportion of children. It was anticipated that the quickest trajectory of change (improvement) would be immediately after the school transition, and thereafter the rate of adjustment would level out. This effect was expected to be consistent across all QoL domains. We also hypothesized that QoL changes over this period would be predicted by changes in need satisfaction. Consistent with the theoretical tenets of SDT, we tested the proposition that a good QoL results from the satisfaction of needs, rather than vice versa. Finally, most QoL research has been undertaken to monitor health and health care interventions, but school transition provides a good example of a trigger for change in QoL in a healthy community population, providing evidence of the measure's responsiveness in a non-clinical setting.

Method

Participants

Participants comprised a single year group (Year 7) of a small coeducational comprehensive secondary school (331 students) in south-west England. Pupils for the school are drawn from four local Primary schools serving pupils of a similar profile, all providing for populations of below average socio-economic status, but with a low proportion (<1%) of students from ethnic minorities.

Baseline data were obtained for 76 students (57% male; mean age 11.5 years, $SD = 0.31$, range 11.1–12.0 years). Complete data for three repeated measures were obtained for 83% of the sample ($N = 63$). Missing data were due to absence from class, or partial completion of the measures. Mann-Whitney U tests were conducted to establish whether there were differences in baseline scores for QoL or need satisfaction between those who did, or did not, provide complete data. No significant differences emerged (U scores ranged from 258 to 303, all $p > .05$); therefore, all analyses were conducted using data from students providing complete data only.

Measures

Quality of life

Quality of life was assessed using the KIDSCREEN self-report questionnaire (Ravens-Sieberer *et al.*, 2005). The KIDSCREEN is a recently devised generic QoL measure developed using a participatory approach across 13 European countries, for use by children and adolescents aged 8–18 years, whether healthy or with chronic illness. It consists of 52 items encompassing 10 dimensions of QoL: physical well-being, psychological well-being, mood and emotions, self-perceptions, autonomy, family relationships, relationships with friends, school environment, bullying and financial resources. Items are presented as questions, such as 'Have you felt full of energy?', and responses recorded on a 5-point anchored Likert scale ranging from *not at all* or *never* to *extremely* or *always*. Cronbach's alpha for the 10 domains when evaluated with over 20,000 European children and adolescents, ranged between .76 for bullying and .89 for financial support (Ravens-Sieberer *et al.*, 2005). The measure's authors propose calculation of scores based on the Rasch model. However, as the scoring

protocol has yet to be published, negatively worded items were reversed, and in contrast to the Rasch model procedure, but in line with the conventional scoring of existing QoL measures, domain scores calculated as the mean of items within that domain. QoL is considered a multidimensional construct; therefore, change in each domain was first considered separately. Subsequently, for purposes of parsimonious analysis, an overall score was computed as a mean of all domains, linearly transformed into values between 0 and 100.

Need satisfaction

Need satisfaction was measured using an adapted version of the need satisfaction in the workplace questionnaire (Deci *et al.*, 2001; Kasser, Davey, & Ryan, 1992). The original scale consists of 21 items, loading on to three factors corresponding with the three basic needs of SDT. The autonomy subscale consisted of seven items (e.g. 'When I'm at school, I have to do what I'm told'); the competence scale contained six items (e.g. 'I don't feel very good at things at school') and the relatedness scale included eight items (e.g. 'People at school are pretty friendly towards me'). Responses were recorded on a 7-point Likert scale, anchored by (1) *not true at all* to (7) *very true*.

While some aspects of need satisfaction and QoL are similar, need satisfaction items are presented at a contextual level, whereas QoL items are presented at a global level, which prevented duplication or overlap between the measures.

Procedure

Ethical approval for this research was granted by the Local Research Ethics Committee. Written consent was provided by the Head Teacher, and letters sent to all parents providing information and seeking passive consent. Parents of 3 of the 82 students opted out. The study took place during Personal and Social Education lessons (50 minutes duration), in three groups of 25–30. Students were informed that participation was optional, and that they could withdraw at any time without any negative repercussions. It was explained that we would ask them to complete the same questionnaires on a number of occasions, and did not expect them to remember previous answers, but to complete the items thinking just about the past week. It was emphasized that there were no right or wrong answers. To ensure that the items were clear to children of all reading abilities, each questionnaire was read aloud to the whole class by the researcher. All eligible students opted to participate, although only 76 pupils were present at the baseline data collection.

The first data collection (Time 1) took place on the second week of the first term at secondary school; as soon after the start of the new school term as was practical, allowing time to establish parental consent. Further data collection was repeated on week 4 (Time 2), and again at week 10 (Time 3), at the same time of day, and on the same day of the week on each occasion. A 2-week interval after Time 1 was judged sufficient for students not to recall their initial answers, yet close enough to detect a QoL response (Skevington, Sartorius, & Amir, 2004).

Analysis

Repeated measures analyses of variance (ANOVAs) with *post hoc* Bonferroni tests were used to assess the significance of change for each variable over the three time points, adopting a conservative significance level ($p < .01$) in view of the repeated analyses

(Sheldon, Elliot, Kim, & Kasser, 2001). Bivariate correlations were calculated to examine whether there was evidence of an association between measures of need satisfaction and QoL, and subsequently, linear regression analysis was carried out to predict the dependent variable (change in QoL score) from the three independent variables (change in autonomy, competence and relatedness). In line with the basic needs hypothesis incorporated into SDT, which states that the satisfaction of all three needs to be necessary for optimal functioning and well-being (Ryan & Deci, 2002), all three independent variables were entered together into the regression analysis. In order to compare the explanatory power of this model with the possible, yet atheoretical, alternative that QoL predicts need satisfaction, three regression analyses were also conducted with the dependent variables of each psychological need, with change in QoL as the independent variable.

Effect sizes (d) of change in ratings were calculated (small effect: $d > 0.2$; moderate effect: $d > 0.5$; large effect: $d > 0.8$; Cohen, 1988) as a method of assessing responsiveness (Fitzpatrick *et al.*, 1998) and the presence of meaningful change across the sample (Osoba, 1999). Additionally, to assess whether the reported increases in QoL were meaningful at an individual level, the proportion of students reporting a clinically significant change of more than 10% was calculated (Osoba, Sprangers, Wyrwich, Patrick, Gorkin, & Richardson, 2003; Iyer, Haley, Watkins, & Dumas, 2003). A change of 10 points or more on the conventionally calculated composite score was considered to be clinically significant and meaningful to the individual concerned.

Results

Performance of measures

The conventionally calculated composite score for the KIDSCREEN (reliability of the linear combination of domain scores as calculated using the formula of Nunnally & Bernstein, 1994; $\alpha = .82$) and all individual domains ($\alpha = .71$ school domain to $\alpha = .87$ financial domain) demonstrated acceptable internal consistency. Alphas were lower for the need satisfaction measures; autonomy ($\alpha = .48$), competence ($\alpha = .55$) and relatedness ($\alpha = .70$). Internal reliability, however, was improved for all three subscales following the deletion of four items with low item-total scale score correlations ($< .2$) (two from autonomy, and one from each of the competence and relatedness subscales); autonomy ($\alpha = .63$), competence ($\alpha = .57$) and relatedness ($\alpha = .73$).

Change in ratings over time

In line with our predictions, all measures of need satisfaction improved over time. Table 1 shows mean values at each time point and the effect size (d) of these changes. Changes did not appear meaningful between Times 1 and 2, however by Time 3, there were small to moderate changes in all three needs; $d = 0.23$ for autonomy, $d = 0.29$ for relatedness and $d = 0.45$ for competence. This change was only statistically significant for competence ($F(2, 124) = 6.54, p < .005$). *Post hoc* tests revealed that there were significant increases from Time 1 to both subsequent time points.

Overall QoL also improved over time in line with the predictions (Table 2), which, consistent with our expectations, was reflected by similar increases in mean scores across all 10 domains. The degree of change was significant for two individual domains; psychological well-being ($F(2, 124) = 8.03, p < .005$) and financial concerns ($F(2, 124) = 6.38, p < .005$).

Table 1. Mean values for, and need satisfaction scores at each time point

		Range	Mean	SD	Effect size (from Time 1)
Autonomy	Time 1	2.20–7.00	4.99	1.17	
	Time 2	2.20–6.60	5.10	0.97	0.10 (no effect)
	Time 3	3.20–7.00	5.23	0.92	0.23 (small)
Competence	Time 1	1.00–7.00	4.99	1.08	
	Time 2	3.00–7.00	5.16	0.91	0.17 (no effect)
	Time 3	3.40–7.00	5.46	0.99	0.45 (small to moderate)
Relatedness	Time 1	2.00–7.00	5.25	1.02	
	Time 2	2.86–7.00	5.42	0.84	0.18 (no effect)
	Time 3	2.14–7.00	5.53	0.92	0.29 (small)

Table 2. Mean values for QoL (overall score and domains) at each time point

	Time 1 Mean (SD)	Time 2 Mean (SD)	Effect size (from Time 1)	Time 3 Mean (SD)	Effect size (from Time 1)
Overall quality of life score	80.35 (9.64)	82.57 (10.24)	0.12	83.30 (9.35)	0.30*
Physical well-being	3.67 (0.76)	3.74 (0.67)	0.10	3.89 (0.75)	0.29*
Psychological well-being	4.05 (0.63)	4.10 (0.58)	0.09	4.34 (0.61)	0.46**
Mood and emotions	4.08 (0.61)	4.26 (0.61)	0.29*	4.04 (0.66)	0.06
Self-perceptions	4.01 (0.72)	4.12 (0.74)	0.14	4.19 (0.73)	0.25
Autonomy	3.99 (0.75)	4.11 (0.80)	0.15	4.12 (0.78)	0.17
Family relationships	4.27 (0.79)	4.33 (0.80)	0.07	4.38 (0.70)	0.15
Relationships with friends	3.96 (0.70)	4.07 (0.80)	0.15	4.16 (0.67)	0.28*
School environment	3.98 (0.58)	4.01 (0.61)	0.04	4.02 (0.75)	0.05
Bullying	4.34 (0.82)	4.45 (0.67)	0.14	4.38 (0.83)	0.04
Financial resources	3.82 (0.98)	4.08 (0.97)	0.27*	4.15 (0.80)	0.37*

* indicates a small effect size; ** indicates a small to moderate effect size

Predicting QoL from need satisfaction

Bivariate correlations between need satisfaction and QoL showed a positive relationship on all three measurement occasions (Table 3). The strongest relationships were observed between measures taken on the same occasion; however, correlations were statistically significant between all time points (all p values < .01).

In line with our initial hypothesis, regression analyses showed that an improvement in QoL from baseline to Time 2 was significantly predicted by an increase in need satisfaction ($R^2 = .32$, $F(3, 59) = 9.40$, $p < .001$).¹ Both autonomy ($\beta = 0.34$, $p < .05$) and relatedness ($\beta = 0.25$, $p < .05$) were significant positive predictors of change. Change in QoL from baseline to Time 3 was also predicted by change in need satisfaction ($R^2 = .36$, $F(3, 59) = 10.91$, $p < .001$), which accounted for 36% of the variance. Again, autonomy ($\beta = 0.27$, $p < .05$) and relatedness ($\beta = 0.31$, $p < .05$), but not competence emerged as significant positive predictors.

¹ Correlations and beta weights were examined to assess the presence of a suppressor effect. Since the correlation values pertaining to the association among the three needs and the QoL assessments at Times 2 and 3 were higher than the regression weights, the present findings are not consistent with suppression (cf. Cohen et al., 2003; Tabachnick & Fidell, 2007).

Table 3. Correlations between need satisfaction variables and QoL.

		Correlation with QoL score		
		Time 1	Time 2	Time 3
Time 1	Autonomy	.64*	.50*	.37**
	Competence	.51*	.27**	.27**
	Relatedness	.76*	.56*	.38**
Time 2	Autonomy	.41**	.65*	.45*
	Competence	.45***	.46*	.45*
	Relatedness	.49***	.58*	.43*
Time 3	Autonomy	.25**	.43***	.46*
	Competence	.43***	.48***	.57*
	Relatedness	.52***	.60***	.53*

* Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed); ***Correlation is significant at the 0.001 level.

As the associations between Time 1 QoL and need satisfaction variables at subsequent time points were also significant (Table 3), reverse analyses of change in QoL regressed against change in each of the three basic needs were conducted. The regression models were significant; however, the amount of variance explained by each model (R^2 values) was smaller than in the initial theoretically derived analyses. For change in autonomy from Time 1 to Time 3 $R^2 = .25$ ($F(1, 61) = 20.25, p < .001$), for change in competence $R^2 = .15$ ($F(1, 61) = 10.89, p < .005$) and for change in relatedness $R^2 = .24$ ($F(1, 61) = 20.25, p < .001$). Thus, need satisfaction measures were stronger predictors of QoL, than QoL was of need satisfaction.

Meaningfulness of change in QoL

Table 4 shows the frequency of clinically significant change ($\geq 10\%$) from the first to third time points. Twenty one percentage of participants ($N = 13$) reported a clinically significant improvement in QoL over this period, and a small proportion ($N = 4$; 6%) reported a clinically significant deterioration in QoL.

To investigate whether the increase in QoL ratings could be attributed to large gains by a small number of individuals with little change for the majority, students were split into quartiles, according to baseline QoL level (see Table 5). The effect size was assessed separately for each quartile. Meaningful improvements were revealed for all quartiles; the upper two quartiles reported a low to moderate degree of change ($d = 0.37$ [quartile 3] and $d = -0.34$ [quartile 4]); the second quartile a moderate to large change ($d = 0.78$); but the largest improvement was reported by those with the poorest baseline QoL ($d = 1.30$).²

² An anonymous reviewer raised the question that these findings may imply a regression to the mean effect. As Cohen, Cohen, West, and Aiken (2003) point out, regression towards the mean always occurs when the same measures are taken in the absence of a perfect linear relationship (i.e. $r = 1.0$), which is highly unlikely in research employing multifaceted self-report measures. While we do acknowledge that 'regression to the mean' is a necessary corollary of the imperfect correlation that exists in our work, the effects (e.g. $d = 1.30$) and changes over time (Table 2) suggest that the findings are not merely accountable to an improvement in low scores and a reduction in high scores.

Table 4. Frequency of participants reporting meaningful change in QoL

	Frequency (%)	Baseline QoL		Time 3 QoL	
		Group Mean (SD)	Group Minimum	Group Mean (SD)	Group Minimum
Decrease > 10%	4 (6)	89.81 (7.2)	79.55	73.19 (7.2)	66.78
Decrease > 5%	4 (6)	76.16 (4.5)	72.90	69.80 (4.7)	65.44
Within 5%	34 (54)	83.37 (8.1)	69.30	84.30 (8.6)	68.47
Increase > 5%	8 (13)	79.76 (7.6)	68.08	87.10 (8.6)	73.21
Increase > 10%	13 (21)	71.20 (9.8)	55.87	85.64 (8.6)	69.64

Table 5. Change in QoL scores by starting quartile

	Minimum change	Maximum change	Mean change	SD	Effect size of change
Lowest quartile	-7.46	23.12	7.57	9.0	1.30
Second quartile	-6.35	13.47	4.44	1.0	.78
Third quartile	-12.77	14.18	2.17	6.3	.37
Highest quartile	-29.11	8.06	-2.37	9.4	-.38

Discussion

The results of the present study demonstrate that over the first 10 weeks of secondary school, there was meaningful improvement in QoL and psychological need satisfaction for the majority of students. Thus, even within a healthy population, QoL as measured by the KIDSCREEN is responsive to a significant, if normative, environmental change. One-fifth of students reported an increase of 10% or more in their QoL rating (and 6%, a decrease of 10% or more), denoting a clinically significant change. The short period of time between the start of term and the observed increase in QoL ratings for this cohort is encouraging. It implies that psychological adjustment to school transition takes place relatively quickly, and that the negative impact on QoL observed for some children is short lived. These results corroborate previous findings indicating that school transition can be a significant and stressful life-event for children (e.g. Rudolph *et al.*, 2001; Seidman *et al.*, 1994), but that most adolescents adjust quite rapidly to their new environment in terms of these dimensions of well-being (e.g. Walls & Little, 2005).

Consistent with SDT and our study hypothesis, the findings also suggest that need satisfaction may provide a useful foundation on which to base interventions designed to improve and maintain QoL, by extending previous research and identifying a relationship between need satisfaction and QoL in the school context. Improvements in QoL were predicted by improvements in perceived relatedness (feeling that one is connected to and cared for by others) and perceived autonomy (the need for personal agency). As the transition to secondary school involves a significant disruption of friendship groups (Seidman *et al.*, 1994), and an adjustment in social status from most senior to most junior, the salience of social relationships, and thus importance of the need for relatedness at this time makes inherent sense. Peer relations are crucial during adolescence, as personal attributions such as self-esteem, perceived competence and acceptance are all based on peer judgements (Craft, Pfeiffer, & Pivarnik, 2003; Smith, 2003). Thus, a student's perception of the quality of their peer relationships and sense of

belonging would be expected to have an impact on a broad number of QoL domains. An improvement in the perception of autonomy would also be expected on starting senior school, as it is at this stage of education that students are given more choice of what to study, and take on greater personal responsibility for their work, performance and conduct (Stoll *et al.*, 2003).

Despite the significant associations between competence and QoL at each time point, the regression analysis revealed that it was not a significant predictor of change. This finding is at odds with SDT, which predicts that all three needs would have an effect on QoL. It is plausible that this may be due to the success of the school's existing transition strategy in promoting perceived competence. Alternatively, it may suggest that each of the three basic needs has a discernible and independent effect on QoL, and that it is autonomy and relatedness that are more salient during this particular life-event. Future empirical work could delineate in greater detail the role that each of the three needs plays in the process of secondary school transition.

Past work has shown need satisfaction to be a malleable construct through manipulation of the social environment (Deci, Eghrari, Patrick, & Leone, 1994; Vansteenkiste, Simons, Soenens, & Lens, 2004). For example, focusing lessons on cooperative learning styles rather than competitive environments enhances satisfaction of the need for relatedness (Standage, Duda, & Pensgaard, 2005), facilitating learning climates that focus on personal improvements of skills against self-referenced standards, rather than emphasizing interpersonal comparisons can enhance satisfaction of the need for competence (Ntoumanis, 2001), and increasing opportunities for student input, choice and decision making can enhance perceived autonomy. Environments manipulated to support need satisfaction lead to increased perseverance and indices of well-being such as positive mood and enjoyment (Ryan & Deci, 2000a; Standage, Duda, & Pensgaard, 2005).

Although past work has linked need satisfaction to well-being at both the situational level (e.g. individual gymnastic training sessions; Gagne *et al.*, 2003) and contextual level (e.g. towards sport in general; Reinboth, Duda, & Ntoumanis, 2004), in the present study we were able to extend our investigations to the global level through measuring QoL. Support was found for the proposed theoretical direction of relationships between need satisfaction and QoL. However, we also tested the possibility that a good QoL might in-turn lead to satisfaction of the needs in a reciprocal relationship. We found a significant, but weaker relationship between the constructs analysed in this manner. These results are consistent with the hierarchical model of motivation proposed by Vallerand (1997), which embraces need satisfaction as a mediator of the relationship between social context and motivation at three levels of generality; situational (state), contextual (life domain) and global (trait or personality). Vallerand argues that through their influence on our cognitions, information feeds both from the top down (i.e. from global to contextual, or contextual to situational levels) and from the bottom up. Our findings provide support to the proposal that need satisfaction at the contextual level of school can influence the global-level construct of QoL. To a slightly lesser extent, our results support the 'top down' proposition that good QoL at a global level may incline a child to interpret many different contextual situations, including school, positively.

A useful secondary finding was that the KIDSCREEN QoL measure was responsive to change within this healthy population. Existing health-related QoL measures often show ceiling effects with healthy children (e.g. KINDL; Ravens-Sieberer & Bullinger, 1998), so there is a need for a measure which can discriminate within this population. The responsiveness of QoL measures to significant events beyond health settings has rarely

been tested in the community in general, or education in particular, where well-being is an important issue. A wide range of responses (43 percentage points) were reported in this sample in a group of largely healthy individuals. The instrument was sensitive enough to record meaningful effect sizes for change regardless of participants' baseline level of QoL.

Limitations

The study was carried out with a modest sample of students within a single school; therefore, the generalization of results and their application to other groups may be limited. The challenges of transition faced by those in a small school may be very different from those posed by a large inner city comprehensive school, to take just one example. While the findings of a gradual increase in QoL concur with previous research (Alspaugh, 1998), firmer conclusions could have been drawn if it had been possible to obtain pre-transition ratings from students while they were still at primary school. Such a prospective longitudinal design would allow the assessment of the degree to which QoL ratings recover to a pre-transition level after a period of adjustment, or whether a new baseline is achieved.

Although clear relationships were demonstrated between the satisfaction of the three basic needs advanced by SDT, the measures used were found to have lower reliability than is desirable. While recent work has been carried out to develop valid and reliable assessments of need satisfaction for adults (e.g. Wilson, Rogers, Rodgers, & Wild, 2006; Vlachopoulos & Michailidou, 2006), future work would do well to devise such measures for use with child and adolescent populations.

A further limitation is that in analysing the results of this study, it has been presumed that the improvement in QoL reported solely reflects a genuine improvement in students' subjectively judged circumstances. However, improvements in QoL following a negatively perceived event (e.g. chronic illness, disability) are often reported in the absence of objective change, due to the phenomenon described as response shift. The theory of response shift proposes that after a period of adjustment, individuals experiencing negative events are able to re-evaluate their lives to construct a more positive view, through means such as rating oneself against different comparison groups (i.e. people worse off than oneself), prioritizing different domains of life (e.g. social domains above work or physical domains) and/or recalibrating their scales of self assessment (i.e. reducing the standard of performance deemed 'acceptable' or 'good') (Sprangers & Schwartz, 1999).

Response shift was not directly assessed in this study as it was anticipated that any differences in QoL ratings would be a genuine effect for two main reasons. Firstly, the timeframe in which the study was undertaken was likely to be during this process of adjustment rather than after its completion (i.e. response shift would be yet to develop). Secondly, unlike the adjustment to a permanently poorer objective status in which response shift is typically reported (e.g. adjusting to disability), it is likely that social and academic threats really do reduce as students acclimatize to the new school and form new friendships, which would thus be reflected in improving need satisfaction and QoL without the need for adjustment. However, it cannot be discounted that the improvement in scores occurred due to a shift in values, expectations or in comparison group, as a result of the process of adjusting to a new, older, environment. The inclusion of a measure of response shift would be a valuable addition to future work, for example through using retrospective 'then-tests'

(Schwartz *et al.*, 2004) or through statistical means such as structural equation modelling (Oort, 2005).

References

- Allen, J. B. (2003). Social motivation in youth sport. *Journal of Sport and Exercise Psychology*, 25(4), 551–567.
- Alspaugh, J. (1998). Achievement loss associated with the transition to middle school and high school. *Journal of Educational Research*, 92, 20–25.
- Battistich, V., Schaps, E., & Wilson, N. (2004). Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school. *Journal of Primary Prevention*, 24(3), 243–262.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillside, NJ: Erlbaum.
- Cohen, J., Cohen, P., West, S. G., & West, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.
- Craft, L. L., Pfeiffer, K. A., & Pivarnik, J. M. (2003). Predictors of physical competence in adolescent girls. *Journal of Youth and Adolescence*, 32, 431–438.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, 62, 119–142.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.) *Nebraska symposium on motivation: Perspectives on motivation* (Vol. 38, pp. 237–288). Lincoln, NE: University of Nebraska Press.
- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country. *Personality and Social Psychology Bulletin*, 27, 930–942.
- Department of Health (2001). *Patient-assessed health outcomes programme. Instruments for children and adolescents: A review*. London: National Centre for Health Outcomes Development.
- DfES (Department for Education and Skills) (2003). *Every child matters*. London: HMSO.
- Dogra, N., Parkin, A., Gale, F., & Frake, C. (2002). *A multidisciplinary handbook of child and adolescent mental health for front-line professionals*. London: Jessica Kingsley Publishers.
- Eiser, C. (1997). Children's quality of life measures. *Archives of Disease in Childhood*, 77(4), 350–354.
- Eiser, C., & Morse, R. (2001). The measurement of quality of life in children: Past and future perspectives. *Journal of Developmental and Behavioral Pediatrics*, 22, 248–256.
- Fitzpatrick, R., Davey, C., Buxton, M. J., & Jones, D. R. (1998). Evaluating patient-based outcome measures for use in clinical trials. *Health Technology Assessment*, 2, 1–74.
- Gagne, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology*, 15, 372–390.
- Gerhardt, C. A., Britto, M. T., Mills, L., Biro, F. M., & Rosenthal, S. L. (2003). Stability and predictors of health-related quality of life of inner-city girls. *Journal of Developmental and Behavioral Pediatrics*, 24(3), 189–194.
- Graham, C., & Hill, M. (2003). *Negotiating the transition to secondary school*. Glasgow: The SCORE Centre, University of Glasgow.
- Greenhalgh, J., Long, A. F., & Flynn, R. (2005). The use of patient reported outcome measures in routine clinical practice: Lack of impact or lack of theory? *Social Science and Medicine*, 60(4), 833–843.
- Harrison, P. A., & Narayan, G. (2003). Differences in behavior, psychological factors, and environmental factors associated with participation in school sports and other activities in adolescence. *Journal of School Health*, 73(3), 113–120.

- Iyer, L. V., Haley, S. M., Watkins, M. P., & Dumas, H. M. (2003). Establishing minimal clinically important differences for scores on the pediatric evaluation of disability inventory for inpatient rehabilitation. *Physical Therapy, 83*(10), 888–898.
- Kasser, T., Davey, J., & Ryan, R. M. (1992). Motivation, dependability, and employee-supervisor discrepancies in psychiatric vocational rehabilitation settings. *Rehabilitation Psychology, 37*, 175–187.
- Meuleners, L. B., & Lee, A. H. (2003). Adolescent quality of life: A school-based cohort study in Western Australia. *Pediatrics International, 45*(6), 706–711.
- Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology, 71*, 225–242.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Osoba, D. (1999). Interpreting the meaningfulness of changes in health-related quality of life scores: Lessons from studies in adults. *International Journal of Cancer Supplement, 12*, 132–137.
- Osoba, D., Sprangers, M., Wyrwich, K., Patrick, D., Gorkin, L., & Richardson, J. (2003). The use of health-related quality-of-life data to support medical decision making. *Clinical Therapeutics, 25*, D8–D8.
- Otis, N., Grouzet, F., & Pelletier, L. G. (2005). Latent motivational change in an academic setting: A 3-year longitudinal study. *Journal of Educational Psychology, 97*(2), 170–183.
- Ravens-Sieberer, U., & Bullinger, M. (1998). Assessing health-related quality of life in chronically ill children with the German KINDL: First psychometric and content analytical results. *Quality of Life Research, 7*(5), 399–407.
- Ravens-Sieberer, U., Gosch, A., Rajmil, L., Erhart, M., Bruil, J., Duer, W., *et al.* (2005). KIDSCREEN-52 quality-of-life measure for children and adolescents. *Expert Review of Pharmacoeconomics and Outcomes Research, 5*(3), 353–364.
- Reinboth, M., Duda, J. L., & Ntoumanis, N. (2004). Dimensions of coaching behavior, need satisfaction, and the psychological and physical welfare of young athletes. *Motivation and Emotion, 28*, 297–313.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419–435.
- Rudolph, K. D., Lambert, S. F., Clark, A. G., & Kurlakowsky, K. D. (2001). Negotiating the transition to middle school: The role of self-regulatory processes. *Child Development, 72*, 929–946.
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67.
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Ryan, R. M. & Deci, E. L. (Eds.), (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.
- Schwartz, C. E., Sprangers, M. A., Carey, A., & Reed, G. (2004). Exploring response shift in longitudinal data. *Psychology and Health, 19*(1), 51–69.
- Seidman, E., Allen, L., Aber, J. L., Mitchell, C., & Feinman, J. (1994). The impact of school transitions in early adolescence on the self-system and perceived social context of poor urban youth. *Child Development, 65*, 507–522.
- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self concordance model. *Journal of Personality and Social Psychology, 76*, 482–497.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*(2), 325–339.
- Sirsch, U. (2003). The impending transition from primary to secondary school: Challenge or threat? *International Journal of Behavioral Development, 27*, 385–395.

- Skevington, S. M., Sartorius, N., & Amir, M. (2004). Developing methods for assessing quality of life in different cultural settings: The history of the WHOQOL instruments. *Social Psychiatry and Psychiatric Epidemiology*, 39(1), 1-8.
- Smith, A. L. (2003). Peer relationships in physical activity contexts: A road less traveled in youth sport and exercise psychology research. *Psychology of Sport and Exercise*, 4(1), 25-39.
- Sprangers, M. A., & Schwartz, C. E. (1999). Integrating response shift into health-related quality of life research: A theoretical model. *Social Science and Medicine*, 48(11), 1507-1515.
- Standage, M., Duda, J. L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology*, 75, 411-433.
- Standage, M., Duda, J. L., & Pensgaard, A. M. (2005). The effect of competitive outcome and task-involving, ego-involving, and co-operative structures on the psychological well-being of individuals engaged in a co-ordination task. *Motivation and Emotion*, 29, 41-68.
- Stoll, L., Stobart, G., Martin, S., Freeman, S., Freedman, E., Sammons, P., et al. (2003). *Preparing for change: Evaluation of the implementation of the key stage 3 strategy pilot*. London: Department of Education and Skills.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271-360). New York: Academic Press.
- Vansteenkiste, M., Simons, J., Soenens, B., & Lens, W. (2004). How to become a persevering exerciser? Providing a clear, future intrinsic goal in an autonomy-supportive way. *Journal of Sport and Exercise Psychology*, 26, 232-249.
- Varni, J. W., Seid, M., & Rode, C. A. (1999). The PedsQL: Measurement model for the pediatric quality of life inventory. *Medical Care*, 37(2), 126-139.
- Vlachopoulos, S. P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The basic psychological needs scale. *Measurement in Physical Education and Exercise Science*, 10(3), 179-201.
- Wallander, J. L., Schmitt, M., & Koot, H. M. (2001). Quality of life measurement in children and adolescents: Issues, instruments, and applications. *Journal of Clinical Psychology*, 57, 571-585.
- Walls, T. A., & Little, T. D. (2005). Relations among personal agency, motivation, and school adjustment in early adolescence. *Journal of Educational Psychology*, 97(1), 23-31.
- WHOQOL Group (1995). The World Health Organisation Quality of Life Assessment (WHOQOL): Position paper from the World Health Organisation. *Social Science and Medicine*, 41, 1403-1409.
- Wilson, P. M., Rogers, W. T., Rodgers, W. M., & Wild, T. C. (2006). The psychological need satisfaction in exercise scale. *Journal of Sport and Exercise Psychology*, 28, 231-251.
- Zekovic, B. R., & Renwick, R. (2003). Quality of life for children and adolescents with developmental disabilities: Review of conceptual and methodological issues relevant to public policy. *Disability and Society*, 18, 19-34.