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The need to belong and symptoms of acute physical health in early adolescence

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Abstract

This study examined the role of social belonging and self-esteem in acute physical health and mood in 159 young adolescents (aged 11 to 14 years). Standardised self-report measures of belongingness (school, home and community), self-esteem, acute physical symptoms, and affect, were completed for the previous month. Higher levels of inclusive belonging were associated with fewer physical symptoms and better affect. Domain specific belonging was independently linked to acute physical symptoms and level of affect, with pathways between belonging and outcome mediated by self-esteem. Findings emphasise the need for greater recognition of the role of belonging in physical health outcomes.

Keywords: Belonging; self-esteem; acute health; adolescence; mood

The need to belong and symptoms of acute physical health in early adolescence

The importance of an individual's social world on health has long been recognised. This understanding has generated extensive research, placing the role of interpersonal resources to manage social stressors and facilitate coping at its centre (Leventhal, Weinman, Leventhal, & Phillips, 2008). The influence of social support in buffering the effects of stressors on physiological reactivity and immune function is at the forefront of such work (Cohen & Wills, 1985; Miller, Chen, & Cole, 2009). However, only recently has it been advocated that these processes may be driven by a further construct, that of an underlying human need for social belonging (Dickerson, 2008).

According to Baumeister and Leary's (1995; 2000) 'belongingness hypothesis', human beings have a fundamental need to acquire and maintain an optimal number of positive, accepting, and sustained interpersonal relationships, and will experience decrements in functioning resulting from acceptance threat or perceived social rejection. This concept of 'belonging', as a core human need, is recognised from a number of influential theoretical perspectives (Deci & Ryan, 1995; Maslow, 1970). The belongingness hypothesis theorised about the pervasive nature and impact of optimal belongingness levels, perceived belongingness threat and rejection, on both short and long-term health (Baumeister & Leary, 1995). However, this inference was not tested directly with empirical data and Baumeister and Leary (2000) themselves observed that the discipline of psychology has 'underappreciated' the importance of the need to belong. Recent research has begun to directly address the role of social belonging and threats to the social self on health symptoms.

Conceptually rooted within belongingness theory is the role of self-esteem as a 'sociometer' or 'gauge' of social inclusion (Leary & Downs, 1995). The specific role

Running Title: BELONGING AND HEALTH IN EARLY ADOLESCENCE

of self-esteem in mediating the relationship between belonging and aversive responses has rarely been considered with regard to health. In this theory, state self-esteem is viewed as a monitor of current belongingness perceptions, and trait self-esteem as a longer-term gauge of belongingness perceptions over time (Leary, 2005). Evidence and arguments supporting the theory have particular application within a health context, relating to psychophysiological reactivity, and the development of appropriate interventions to re-‘calibrate’ sociometer sensitivity (Murray, Griffin, Rose & Bellavia, 2003, p66; Dandeneau & Baldwin, 2004). The mediating role of self-esteem in linking the social environment to health was supported in one piece of research (Stinson, Logel, Zanna, Holmes et al, 2008); though alternative models were also proposed.

Over the past decade, evidence has emerged in support of a direct relationship between perceived belonging and psychophysiological stress responses to socio-evaluative threat (Kudielka, Hellhammer & Wüst, 2009; Dickerson & Kemeny, 2004), lower cortisol responses to acute social acceptance when compared with rejection (Blackhart, Eckel & Tice, 2007), and the role of individual differences following rejection manipulations (Zoccola, Dickerson & Zaldivar, 2008). Within a naturalistic setting, belonging support has also been implicated in lower mean salivary cortisol levels (Turner-Cobb, Sephton, Koopman, Blake-Mortimer et al, 2000). Based on this research, Kemeny (2009) put forward a conceptual model linking perceived belongingness threat and chronic belongingness levels to longer-term hypothalamic-pituitary-adrenal (HPA) axis dysregulation and immune function. Such findings indicate links between belongingness and health which are of relevance across a wide range of settings and outcomes. The need for greater understanding of the mechanisms by which belongingness may operate to influence health, including the

role of self-esteem as a potential mediator of this relationship warrants further attention, particularly given the implications for inclusion in health promotion and practice.

The vast majority of research to date relating belongingness to health has manipulated belongingness levels through rejection threat or overt rejection within an experimental setting. Much of this work measures negative effects of rejection per se, rather than more positive effects of perceived belonging. Such a focus is reflected in a relative absence of standard scales available to measure the inclusive construct of belongingness. Measures which do exist often reflect alternative theoretical paradigms, such as 'self-determination theory' (Gagné, 2003) or 'social connectedness theory' (Lee, Draper & Lee, 2001). An emphasis on domain-specific scales such as home, or school / work belongingness further compounds this measurement issue, given that each of these components have been recognised as contributing to a more global sense of belonging within diverse populations (Heinrich & Gullone, 2006).

One specific population for whom the role of belongingness has been found to have important outcomes is that of adolescents. Research has linked belongingness perceptions during adolescence to academic achievement and psychological adjustment; and lack of belonging to behavioural dysfunction and substance misuse (Fleming, Catalano, Haggerty & Abbott, 2010; Gregory & Weinstein, 2004). Yet the relevance of belongingness to physical health within this population remains neglected.

The aim of the current study was to assess the impact of domain specific and inclusive belongingness levels on acute physical health symptoms and mood in a sample of young adolescents in a naturalistic, non-laboratory setting. It was

hypothesised that inclusive belongingness levels would be associated with self-reported physical health symptoms and positive/negative mood. Perceived belongingness within different environmental domains ('home', 'school', and 'community') were hypothesised to have both separable and cumulative impact on symptoms and mood. It was anticipated that self-esteem would function as a route through which belongingness levels would impact upon health and mood outcomes.

Method

Participants

A total of 159 adolescents, aged 11-14 years, attending co-educational comprehensive school in England completed the research. Parents were fully informed and given the opportunity to opt their child out of the study. Informed written consent was obtained from all participants. Following approval from the school's head-teacher, n=188 pupils consented to take part out of a possible total sample of n=189. Twenty-nine questionnaire booklets were excluded due to extensive missing data (>5%). Table 1 provides demographic and background characteristics of the sample.

Insert table 1 here

Measures

Participants completed the following self-report measures:

Perceived physical symptoms. Acute physical symptoms experienced over the past four weeks were assessed using a 21-item symptoms checklist derived from the 33-item Cohen-Hoberman Inventory of physical symptoms (CHIPS) (Cohen & Hoberman, 1983). Items included: 'headache', and 'feeling weak all over', rated on a 5-point scale: 0='Didn't bother me at all' to 4='Bothered me a lot'. Reliability in the current sample ($\alpha=.88$) matched that of previously reported samples (Cohen & Hoberman, 1983). As the original CHIPS was designed for use in adult populations, a number of items were excluded as being inappropriate for a young-adolescent population, e.g. 'weight change' and 'poor appetite' (items excluded: 2, 4, 6, 11, 12, 13, 17, 19, 26, 29, 31, and 32).

Positive and negative mood. Participants reported mood experienced over the past four weeks using the 'Positive and Negative Affect Schedule' (PANAS) (Watson, Clark, and Tellegen, 1988). Comprising two 10-item mood scales, 10-items related to positive affect (PA), e.g. 'interested'; and 10-items to negative affect (NA), e.g. 'distressed'. Each item was rated on a 5-point scale: 1='Very slightly or not at all' to 5='Extremely'. PA/NA scales report a reliability of $\alpha=.86$ and $\alpha=.87$ respectively (Watson et al, 1988), and $\alpha=.80$ and $\alpha=.83$ in the current population.

Self-esteem. Self-esteem was assessed using the Rosenberg Self-Esteem Scale (Rosenberg, 1965), a 10-item measure of self-worth answered on a 4-point scale: 3='Strongly agree' to 0='Strongly Disagree', including statements e.g. 'On the whole, I am satisfied with myself', exhibiting a reliability of $\alpha=.73$ (Laible, Carlo & Roesch, 2004) and $\alpha=.88$ in the current sample.

Belongingness. Assessed using three separate measures:

i) School – perceived belonging within the everyday school-setting was measured using Goodenow's (1993) 18-item 'Psychological sense of school membership

(PSSM) scale. Statements such as, 'I feel a real part of.....school', were answered on a 5-point scale: 0='Not at all true' to 4='Completely true'. The measure showed reliabilities ranging from $\alpha=.77$ to $\alpha=.88$ (Maddox & Prinz, 2003) and $\alpha=.89$ in the current sample; ii) Community – perceived belonging within the local community was measured using the 3-item belongingness subscale from Bollen and Hoyle's (1990) 6-item 'Perceived Cohesion Scale (PCS)'. Participants responded to statements such as: 'I feel that I am a member of the local community', on an 11-point scale: 0='Strongly disagree' to 10='Strongly agree'. Previous reliability for the measure was $\alpha=.94$ (Lim, 2007) and $\alpha=.90$ within the current population; iii) Home - taken from the 27-item 'Family Relationships Index' (Moos, 1974), the 9-item 'Family Cohesion Scale (FCS)' assessed participants' perceived belonging within the home environment. Using a 2-point scale (0 =False; 1=True) participants provided responses to statements such as: 'Family members really back each other up'. Previous reliability for the 27-item scale was $\alpha=.89$ (Holahan & Moos, 1986) and $\alpha=.72$ within the current sample.

Inclusive belongingness was assessed by combining scores from the PSSM, PCS, and FCS, to obtain a total belongingness score. As scaling differed between measures, all scores were converted to a 3-point scale. Factor analysis showed that the combined scale retained the original three component factors of 'school', 'community' and 'home' belonging. A reliability of $\alpha=.87$ was shown.

Procedure

Following approval from the departmental ethical review panel, consent was obtained from the school head-teacher acting in loco parentis. Advance arrangements were made to carry out the research prior to contact with parents. Age-appropriate research information was conveyed in verbal and written form prior to participant

consent provision. Confidential questionnaire booklets were completed in mixed-ability groups during two timetabled lesson-slots, administered by the regular class teacher under the guidance of the researcher. All sections of the booklets were read aloud to ensure participant understanding. An age-appropriate debrief sheet was provided, supplying researcher contact details and a list of school support services.

Statistical Plan

Data was screened in order to meet normality assumptions. A small number of missing values and outliers (Z -score >3.29) were corrected via listwise-mean-substitution, and ‘one unit larger than next most extreme score’ (Tabachnick & Fidell, 2001, pp59, 62, 71). No multicollinearity was present, all values being below the recommended level (Tabachnick & Fidell, p84).

Data was analysed via hierarchical regression and mediation analyses. Preliminary correlation analysis indicated associations between gender and both physical symptoms ($r=.234$; $p=.003$) and negative affect ($r=.181$; $p=.022$). Therefore, all further analyses controlled for gender, entered in block 1 of regressions. To highlight the unique contribution of belongingness variables to the outcome variables, these were entered in block 2, followed by self-esteem in block 3. Mediation analyses testing for indirect effects were carried out using bootstrapping (Preacher & Hayes, 2008). A recommended $\times 5000$ estimates (Hayes, 2009, p412) were used and ‘bias-corrected confidence intervals’ (BCCI) assessed. Table 2 provides full descriptive and correlational details of psychosocial variables.

Insert table 2 here

Results

Analyses revealed that higher levels of inclusive belonging were associated with fewer physical health symptoms. Self-esteem was linked to physical symptom reporting, significantly adding to the model. Regression effects are reported in table 3.

Insert table 3 here

Self-esteem mediated the relationship between inclusive belonging and physical symptoms (Indirect effect=-.1528, $SE=.07$, 95% BCCI=-.3043 to -.0301). This effect is illustrated in figure 1. Utilising the domain-specific belongingness variables of 'home', 'school', and 'community' belonging, greater home ($\beta=-.227$; $p=.006$) and community ($\beta=-.175$; $p=.032$) were associated with fewer physical symptoms reported ($R^2=.154$, $F(4,154)=7.026$, $p=.001$).

Insert figure 1 about here

Higher levels of inclusive belonging were associated with lower levels of NA ($R^2=.205$, $F(3,155)=13.309$, $p<.001$). The effects of inclusive belongingness on NA were mediated by self-esteem (Indirect effect=-.1091, $SE=.0302$, 99% BCCI=-.2002 to -.0404). Additional regression analysis revealed that 'home' belonging was the most significant factor driving the effect of belongingness on NA ($\beta=-.233$; $p=.005$) ($R^2=.134$, $F(4,154)=5.933$, $p=.001$).

Higher levels of overall perceived belonging were also associated with higher reported PA ($R^2=.107$, $F(3,155)=6.196$, $p<.001$). The relationship between belongingness and PA was mediated by self-esteem (Indirect effect=.0878, $SE=.0334$, 99% BCCI=.0094 to .1868). Domain specific belongingness variables entered into regression analysis revealed that 'school' belongingness to be specifically associated with PA ($\beta=.282$; $p=.002$) ($R^2=.079$, $F(3,154)=3.281$, $p=.012$).

Discussion

Consistent with previous research relating social belonging with cognitive and behavioural responses, results supported the hypothesis of overall belongingness levels being associated with self-reported acute physical health symptoms and mood. Results were consistent with Baumeister and Leary's (1995) theory and extend the application of belongingness within the health domain. Participants presenting with greater perceived belongingness reported fewer physical symptoms, lower levels of negative mood, and higher levels of positive mood. As such, findings indicate that perceived inadequacy of belongingness was directly related to decrements in health and mood.

Anticipated cumulative effects of belongingness in different social domains were more equivocal. Relating to physical health, combined home and community belonging was associated with physical symptom reporting. However, this was not true of the relationship between domain-specific belonging and mood. Home belonging alone was associated with negative affect, and school belonging with positive affect. Interpreting these results based on Baumeister and Leary's (1995, 2000) contention that individuals require an optimal number of close relationships, an absence of a consistent cumulative effect did not contravene the assumptions of

belongingness theory. Rather, results served to highlight the importance of belongingness within particular settings (for example, home) for the physical health and mood of age-group concerned, which may in turn have protective effects beyond any immediate social environment in which adolescents find themselves.

Recognising the widespread literature linking social support to physical health, it could be argued that the current findings merely replicate such previous research. However, this assumption would serve to underestimate the potential theoretical and practical contributions of the belongingness hypothesis for application within the field of health. In conceptualising belongingness as a fundamental need equating to a salient social stressor when denied, chronic exposure to a perceived lack of belonging has relevant implications for physical health on a number of levels. For example, by framing belongingness within the concept of allostatic load (McEwen, 1998), ongoing perceptions of low belonging or repeated rejection exposure, the psychophysiological mechanisms by which illness can occur are well-recognised (Kemeny, 2009; Dickerson, 2008). Similarly, links between belongingness and self-regulation has implications for both health behaviours and promotion (Blackhart, Nelson, Winter & Rockney, 2010). Therefore, from a health perspective, belongingness represents an important concept warranting further research and with significant potential for inclusion in interventions to promote adolescent health.

Hypothesised links between perceived belonging and self-esteem, with resultant impact upon physical symptoms and mood were also shown, implying support for sociometer theory (Leary and Downs, 1995). Extended in the current research to highlight physical health as an end-point, self-esteem mediated the relationship between inclusive belonging and both physical health and mood. Whilst interpreting results with caution, it could be argued that in influencing levels of self-

esteem, belongingness operates through self-esteem to impact upon physical symptom levels. Though further longitudinal work is required to confirm this relationship, the implications for theoretically-driven, health-related intervention designs are apparent. Use of self-esteem boosting interventions, particularly promoting healthy behaviours in adolescents is widespread (Bos, Muis, Mulken & Schaalma, 2006). However, whether such interventions are directly impacting self-esteem, or acting upon belongingness levels as a determinant of self-esteem has yet to be fully considered. A greater understanding of the mediation processes linking belonging to health has a vital role to play in informing future intervention design.

Despite the novel application of these findings, the data reflect initial associations which require more substantial validation of relationships between belongingness and health. Importantly, it is acknowledged that the study design is cross-sectional and neither causality nor directional predictions can be made. Future research with longitudinal designs capable of making more substantive claims regarding causality and direction of effects is crucial.

Within the study, although physical symptoms and mood were conceptualised as separate outcome variables, this was not to imply that mood and physical health acted independently of one other. There is wide recognition of the links between negative mood and physical health (Cohen, Tyrrell & Smith, 1993), and links between these variables were shown in current findings suggesting that negative mood might underlie symptom-reporting regardless of belongingness. However, inclusive belonging and negative mood were also associated, implying that belonging had partial influence over negative mood levels themselves. Speculatively, the effects of belongingness might contribute to negative mood which in turn carry over these effects to impact upon physical health outcomes. Belongingness alone could not fully

explain negative mood levels however. Other contributing factors and intervening processes would likely explicate negative mood and resultant effects on health in greater detail. Further research, applying more extensive analytical modelling of these inter-relationships is necessary in order to explore these intricacies and the specific implications of belongingness for health more fully.

The use of combined scales to derive an inclusive level of belonging across social domains appeared effective in tapping overall belonging in relation to health. However, whilst school and community measures were rooted in concept of belongingness, home belonging measured the overlapping construct of family cohesion. Reflecting the absence of adequate belongingness measures currently available, the need for development of a theoretically-driven generic measure of global belongingness is apparent. Distinguishing belongingness as a global construct and fundamental need related to health outcome is necessary in considering development of future measures. Whether belonging can be conceptualised as a higher-order structure in which social support is nested and whether all social support carries with it an element of belonging is yet to be fully explored. The potentially differential effects of social support versus inclusive belonging were not tested in this study, and social support as a component of belonging might have contributed to health outcomes reported. Future research is needed to more concretely distinguish between belonging and social support and define these boundaries in order to clearly delineate differences in health outcome. In the present study, lack of belongingness was taken to infer greater physiological stress, but this was not directly measured. Future work would benefit from including direct measures of self-reported and physiological stress in order to test the ability of belongingness to protect against stress and in what way that is distinguishable from the buffering effects of social

support. Furthermore, the use of self-report measures is subject to potential response bias. Use of objective measures such as clinical examination of symptoms (Turner-Cobb & Steptoe, 1998) and other sources (e.g. parents, teachers, peers) are recommended in future research. Similarly, the results are not generalizable beyond the age-group studied and cannot be applied to similarly aged adolescents outside mainstream education (e.g. due to 'home-schooling') (Ystgaard, 1996). Despite these limitations, the current project was effective in highlighting the need for more widespread recognition of the belongingness hypothesis and its relevance to adolescent health symptoms and mood.

In conclusion, this study builds upon previous work investigating the impact of social belonging on psychological functioning, and links between rejection threat and psychophysiological responses. In showing the significant associations of perceived belonging on physical symptom reporting and mood within a naturalistic setting, results reflect a growing awareness of the contribution of belongingness to physical health. Extending this theory to highlight the role of self-esteem in mediating the effects of belongingness, results provide a unique insight into one mechanism by which belongingness might operate. Findings emphasise the relevance of belongingness as a fundamental need and self-esteem's role as a social gauge, with both theoretical and practical applications directly relevant to health-related social and emotional functioning in early adolescence.

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Table 1: Demographic and background characteristics of participants ($n=159$)

Variable	<i>n</i>	%	Mean (<i>SD</i>)	Range
Gender				
Male	70	44.0	-----	-----
Female	89	56.0	-----	-----
Age (yrs & months)			13.45 (.77)	11.81-14.81
Year group				
7	34	21.4	-----	-----
8	62	39.0	-----	-----
9	63	39.6	-----	-----
Number of people living at home	-----	-----	3.33 (.9)	1-7
Days absent from school due to illness (in past 4 weeks)	-----	-----	.60 (1.39)	0-8
Days absent from school for any other reason (in past 4 weeks)	-----	-----	.42 (1.4)	0-10
Club membership within school	-----	-----	.88 (1.22)	0-5
Club membership outside school	-----	-----	.77 (.89)	0-4

Table 2: Correlational and descriptive data for psychosocial variables measured ($n=159$).

Variable	1	2	3	4	5	6	7	8	Mean (SD)
Physical Symptoms	-----								16.36 (13.92)
Negative Affect	.54***	-----							17.72 (6.35)
Positive Affect	.21**	.25**	-----						28.77 (7.62)
Self-esteem	-.32***	-.43***	.31***	-----					19.38 (4.84)
Belonging									
Home	-.27***	-.29***	.10	.35***	-----				6.92 (2.04)
School	-.18*	-.25**	.26***	.45***	.42***	-----			43.46 (11.88)
Community	-.22**	-.15	.05	.29***	.18*	.40***	-----		15.34 (6.22)
Inclusive (total)	-.21**	-.28***	.23**	.49***	.66***	.89***	.47***	-----	59.11 (10.57)

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Controlling for gender, coded: 0=Male; 1=Female

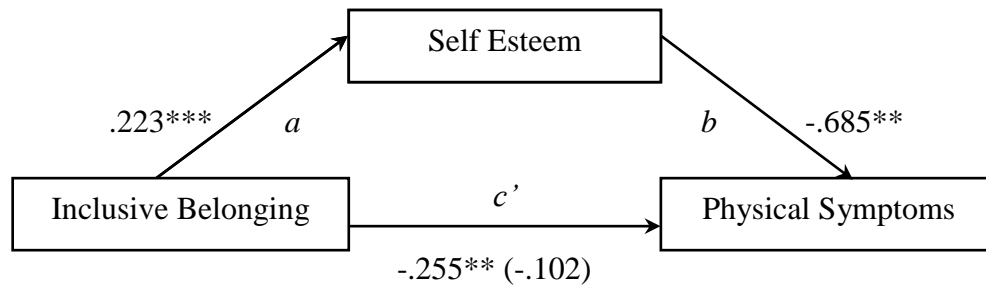
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Table 3: Hierarchical Multiple Regression Analysis Predicting: Physical symptoms; Negative Affect; and Positive Affect, From Inclusive Belongingness and Self-Esteem ($n=159$)

Physical Symptoms					
Predictor	β	R^2	R^2 change	t	F
Step 1			.056	3.066**	9.398**
Gender	.238	.056			
Step 2			.043	-2.732**	8.625**
Inclusive belonging	-.209	.100			
Step 3			.047	-2.910**	8.849***
Self esteem	-.257	.146			
Negative Affect					
Step 1			.030	2.190*	4.794*
Gender	.172	.030			
Step 2			.077	-3.657***	9.272***
Inclusive belonging	-.278	.106			
Step 3			.099	-4.384***	13.309***
Self esteem	-.373	.205			
Positive Affect					
Step 1			.011	-1.315	1.729
Gender	-.104	.011			
Step 2			.052	2.940**	5.229**
Inclusive belonging	.229	.063			
Step 3			.090	2.772**	6.196***
Self esteem	.250	.107			

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Gender coded: 0=Male; 1=Female

Figure 1: Self-esteem as a mediator between inclusive belonging and physical symptoms



* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$ (unstandardised β 's shown)