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Psychometric Properties and Development of the Brief Adolescent Prosocial Perception Scales (BAPPS)

Peter J. Taylor · Alex M. Wood

Abstract Prosociality represents an important aspect of social functioning in adolescents and is related to the risk of psychological problems. The current paper describes the development and psychometric testing of two new short-form versions of prosocial perceptions named the Brief Adolescent Prosocial Perceptions Scale Self- (BAPPS-S) and Parent-report (BAPPS-P). Parent and child dyads ($N = 3,976$; 89 % White; aged 11–17 years) took part in a large cross-sectional survey. The BAPPS were completed alongside other measures of prosociality, social support and emotional and behavioural problems. Exploratory ($n = 1,988$) and confirmatory ($n = 1,988$) factor analysis supported a single factor solution that is related to, although separate from, conduct disorders. The scales showed good internal consistency and concurrent validity. Moreover, the BAPPS demonstrated incremental validity by accounting for significant variance in clinical outcome measures over and above that explained by existing measures of prosociality. The study demonstrated that the BAPPS have good initial psychometric properties. Potential clinical uses are discussed, including providing valuable information on young people's strengths and resiliencies that can inform clinical formulation and intervention.

Keywords Prosocial · Emotional problems · Conduct problems · Psychometrics · Assessment

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Introduction

The positive clinical psychology movement has drawn attention to the importance of developing measures of positive traits in the prediction and treatment of psychological problems (Joseph and Wood 2010; Tedeschi and Kilmer 2005; Wood and Tarrier 2010). Prosociality (the disposition towards social behaviours that benefit others; e.g., Chen et al. 2000; Eisenberg et al. 1996; Eisenberg and Fabes 1998) may represent such a positive trait for adolescents (defined here as young people aged 11–17 years; e.g., Steinhausen et al. 2006). It is regarded as a core dimension of a young person's social behaviour and competence (Chen et al. 2000; Gresham et al. 2004; Wentzel et al. 2007) and an important factor in determining subsequent adjustment (Carlo et al. 2011; Ladd and Profilet 1996; Scourfield et al. 2004). The importance of measuring this construct has been underscored by research demonstrating an inverse relationship with internalizing and externalizing psychopathology in young people (Bandura et al. 1999; Goodman 2001; Hay and Pawlby 2003; Wentzel et al. 2007; Zimmer-Gembeck et al. 2007), and its positive relationship with peer acceptance (Bandura et al. 1999; Crick 1996; Zimmer-Gembeck et al. 2007).

Two brief scales of prosociality were adapted from two non-validated sets of items regarding "personal strengths" that were included in the "Mental Health of Children and Young People in Great Britain, 2004" survey (Green et al. 2005) to provide information on areas of positive functioning in young people. Specifically there were 19 self-report items, which were derived from adolescents' (aged 11–16 years) responses to open-ended questions regarding their strengths in an earlier survey of young people and their families. Similarly, 24 parent-report items were derived from parents' reports of their children's strengths

(aged 4–16 years). These existing sets of items were relatively long and have not previously been psychometrically evaluated. Brief scales are advantageous in routine clinical practice as they (a) limit the burden to the respondent and clinician, (b) can be more readily used on a session-by-session basis to track changes, (c) can be incorporated into assessment batteries measuring a range of constructs, and (d) be readily completed in a clinic waiting room and quickly scored by a clinician during an initial assessment appointment to yield clinically meaningful data.

Prosociality appears to be a trait-like construct (Eisenberg and Mussen 1989; Hay 1994) representing a general disposition towards a variety of specific prosocial acts and behaviours. In the present study we focus on the assessment of prosociality at this higher-order characterological level (e.g., items concern being "generous", rather than asking about particular sharing/giving-type behaviours), similar to the concept of *prosocial character* used by Oberle et al. (2010). We also refer to prosocial "perceptions" to emphasise the socially-defined and subjective nature of judgments of prosocial character, so that an adolescent's self-perceptions may not necessarily reflect parental perceptions. Indeed, discrepancies in parent and child reports are often the rule rather than the exception (see review by De Los Reyes and Kazdin 2005). Specifically in regards to prosociality, whilst Van Roy et al. (2010) report only small differences between parents and children in mean ratings of prosociality but low inter-rater correlations ($r = .24$), suggesting a lack of substantial systematic differences in reporting but poor overall consistency.

Behaviours traditionally defined as prosocial include those involving helping, sharing with, or supporting others (Hay 1994; Pastorelli et al. 1997; Weir and Duveen 1981). However, another facet of prosociality includes affiliative behaviours demonstrating interpersonal warmth, social cooperation, or inclusiveness (qualities such as being polite, friendly, or easy-going; Bailey 1998; Greener 2000; Scourfield et al. 2004). A further facet of prosocial behaviour may involve a consistency with *prosocial expectations* (e.g., being 'well-behaved', working hard at school; Chen et al. 2000; Wentzel et al. 2007). This final form of 'normative' prosocial behaviour may be more relevant in interactions with adults (Greener 2000). Prosociality has been distinguished from various related factors, including self-efficacy (Bandura et al. 1999), empathy and moral reasoning (Culotta and Goldstein 2008; Fabes et al. 1999), and sociability (Chen et al. 2000).

Focussing on areas of positive functioning like prosociality is valuable because concentrating on psychopathology alone provides only a limited picture of an individual's well-being (Lyons et al. 2012; Park 2004; Suldo et al. 2011). Individuals with no symptoms of psychopathology, whose well-being is still impaired in other ways, could be excluded if areas of positive functioning are ignored. Prosociality has been recognised as an important area of a young person's social competence, which may play a central role in the development of their peer relationships and the navigation of their social world (Hay et al. 2004; Zimmer-Gembeck et al. 2007). Low levels of prosociality may therefore be an important indicator of impaired overall well-being.

The importance of considering positive functioning is also apparent in the growing interest in resilience, which focuses on those factors which may protect or buffer individuals against the impact of stressful or aversive experiences (Johnson et al. 2011; Olsson et al. 2003). There is evidence that considering positive protective factors can explain additional variance in outcomes over and above what is accounted for by considering areas of impaired functioning alone (Wood and Joseph 2010). Prosociality likely interacts with the stressors young people face (Blechman and Culhane 1993; Fabes et al. 1999). For example, prosociality is associated with greater use of more active coping styles (Tam 2008) and prosocial responding may itself provide a means of coping with some stressors (Blechman and Culhane 1993), such as resolving social conflict and maintaining supportive relationships. As such, prosociality may provide a buffer against aversive or stressful experiences, thus representing a source of resilience (Haroz et al. 2013). It has been suggested that greater prosociality may buffer against worsening symptoms in young people facing psychological difficulties (Chen et al. 2000, Haroz et al. 2013). Consequently, the assessment of prosociality may be valuable in providing information concerning resilience.

Assessing this construct is particularly relevant in adolescence. This is a time of numerous transitions (biological, social and academic) and challenges (Blechman and Culhane 1993; Fabes et al. 1999; Wentzel et al. 2007) where for some young people emotional problems may have their first onset (Zahn-Waxler et al. 2008). The ability to assess and monitor positive traits in those individuals who struggle during this period is likely to be helpful, and validated instruments of such traits are necessary. With regards to cognitive development, adolescence is also a time where young peoples' self-concepts become increasingly abstract and open to self-reflection (Harter 1999). This is therefore a time when young people may be more able to reflect upon themselves as having or lacking prosocial characteristics, and so the assessment of perceptions of prosociality becomes pertinent at this age. Adolescence is also a time when peer-relationships are of increasing significance (Harter 1999), and these new pressures may interact with young people's prosociality. Indeed, there is some suggestion that the more affiliative forms of prosocial behaviour become more salient as children reach early

adolescence (12 years old), and these prosocial behaviours may serve a particular function in building social relationships (Greener 2000). For example, it has been shown that inter-personally affiliative behaviours, such as asking questions about the other person, become more a part of prosocial behaviour as children become older (from ages 8 to 12 years; Greener and Crick 1999).

The current paper focuses on the development of two brief scales of prosociality for adolescents. We have named these scales the Brief Adolescent Prosocial Perception Scale (BAPPS), comprising the self-rated BAPPS-S and parent-rated BAPPS-P. The BAPPS has several advantages over existing measures of prosociality. Scales, including the Children's Social Behavior Scale (CSBS; Crick 1996), the Child Behavior Scale (CBS; Ladd and Profilet 1996), the Social Behaviour Questionnaire (SBQ; Tremblay et al. 1991), and the Prosocial Behaviour Questionnaire (PBS; Weir and Duveen 1981), are all limited in more than one of the following ways. (1) They were developed for a school setting (e.g., relying on teacher ratings), limiting applicability to other contexts as items may not reflect the presence (or absence) of prosociality outside of school (e.g., interactions with parents, older and younger siblings, and peers outside of the classroom), which may nonetheless be important to consider in mental health settings. (2) They lack a self-report version. (3) They have not been developed for use with adolescents or older adolescents (the CBS has been validated in ages up to 13 years; Ladd et al. 2009). The social skills rating system (SSRS; Gresham and Elliot 1990) lacks a specific prosocial factor (although the cooperation factor may relate to this construct) and there have been recent failures to replicate its factor structure (Whiteside et al. 2007). The prosocial subscale of the Strengths and Difficulties Questionnaire (SDQ; Goodman 2001) has been validated in adolescents, but its item content appears to exclude elements of prosociality, including affiliative or co-operative behaviours (e.g., "Polite", "Nice personality"), and conformity with prosocial expectations ("Reliable and responsible"), which are covered by the BAPPS initial items. In the current study we use the SDQ prosocial scale as a comparison measure due to its suitability in adolescents and its wide use both in research and in clinical settings (e.g., Ford et al. 2006). Moreover, in a review of the literature on prosociality and well-being we found the SDQ prosocial scale to be the most widely used questionnaire measure of prosociality (Taylor and Wood 2012).

In addition to the SDQ prosocial subscale, we considered various other outcomes against which the BAPPS could be validated. Concurrent validity was assessed in terms of the relationship with emotional and behavioural problems, behavioural indicators of adjustment (school exclusion and self-harm), and positive areas of functioning (social support and peer relationships). Relationships between the BAPPS and these variables were expected considering the relationship between prosociality, well-being and social functioning (Bandura et al. 1999; Goodman, 2001; Hay and Pawlby 2003; Wentzel et al. 2007; Zimmer-Gembeck et al. 2007). Incremental validity (Haynes and Lench 2003) was assessed by exploring relationships between the BAPPS and psychiatric disorders (where a relationship is also expected based on past research, Goodman 2001), whilst controlling for the SDQ prosocial subscale. We focussed on clinically meaningful outcomes, including the presence of psychiatric disorders based upon ICD-10 diagnoses (for tests of predictive and incremental validity) and school exclusion and self-harm for concurrent validity. The latter two variables were included as proxy indicators of psychosocial adjustment. School exclusion represents an outcome that can be reliably assessed and has consequences for a young persons' emotional well-being (e.g., McCrystal et al. 2007). Similarly, self-harm is a pertinent issue for young people that can occur as a manifestation of emotional distress (e.g., Laye-Gindhu and Schonert-Reichl 2005).

Method

Participants

Participants were parent–child dyads recruited as part of the "Mental Health of Children and Young People in Great Britain, 2004" survey (Office of National Statistics 2004). This was a cross-sectional survey assessing a range of psychosocial variables in children and adolescents through a combination of self-report and interview methods conducted with both the young person and their parent (used in reference to any legally recognised parent, including non-biological parents). Details of the survey sampling procedure, variables, and goals are outlined in the survey technical manual (Green et al. 2005). The study protocol involved seeking consent from all participants. Interviews were conducted by trained interviewers employed to work on the survey. The current sample focussed on English speaking children aged 11 years or over ($n = 3,976$). At the analytic stage, the sample was randomly split into exploratory (E; aged $M = 13.49$ years, $SD = 1.70$) and confirmatory (C; aged $M = 13.36$ years, $SD = 1.67$) samples ($n = 1,988$ each). Demographic information is reported in Table 1. The median household income category was £25,000 to £29,999 for both samples. The two groups did not differ in terms of gender, $\chi^2 (1) = .12, p = .73$, ethnicity, $\chi^2 (4) = 5.51, p = .24$, family economic status, $\chi^2 (2) = 4.66, p = .10$, family type, $\chi^2 (2) = 1.81, p = .40$, or the prevalence of emotional and conduct disorder, $\chi^2 (1) \leq .16$,

Table 1 Demographic information for the exploratory and confirmatory samples (both $n = 1,988$)

Demographics	Exploratory sample n (%)	Confirmatory sample n (%)
Gender (female)	951 (47.84)	962 (48.39)
Ethnicity		
White	1,763 (88.68)	1,775 (89.29)
Black	45 (2.26)	30 (1.51)
South Asian	93 (4.68)	94 (4.73)
Mixed	55 (2.77)	46 (2.31)
Other	31 (1.56)	42 (2.11)
Family economic status		
Two parents working	1,390 (69.92)	1,367 (68.76)
One parent working	319 (16.05)	293 (14.74)
No parents working	265 (13.33)	309 (15.54)
Family type		
Married	1,319 (66.35)	1,322 (66.50)
Cohabiting	178 (8.95)	156 (7.85)
Lone parent	491 (24.70)	510 (25.65)
Psychiatric diagnoses		
Emotional disorder	99 (4.98)	100 (5.03)
Conduct disorder	125 (6.29)	119 (5.99)

Ethnicity information was missing for one individual in both samples. Family economic status information was missing for $n = 14$–19 cases across the samples

$p \geq .69$. There was a marginal difference in age, $t(3,974) = 2.44$, $p = .01$, $d = .08$.

Measures

Brief Adolescent Prosocial Perceptions Scale (BAPPS)

Items for the BAPPS were generated from responses to open-ended questions featured in the 1999 version of the survey (for details see Green et al. 2005), asking parents and children to describe their (the child's) strengths. Adolescents' (11–16 years) most frequently self-reported strengths formed the basis of the set of self-report items, whilst parents' most frequently reported strengths for their children (4–16 years) formed the basis of the parental-report items (Goodman, personal communication). These items from the personal strengths scale were then used as the basis for developing the self-report (BAPPS-S) and parent-report (BAPPS-P) scales. Respondents were asked to rate a series of adjectives or descriptions (e.g., Caring/kind-hearted) in terms of their applicability to the adolescent on a three-point scale (0 = 'no', 1 = 'a little', 2 = 'a lot'). Item content varied with substantial overlap between the BAPPS-P and BAPPS-S, with the former having 24 items and the latter 19 items. Initial items are listed in "Appendix 1".

Strengths and Difficulties Questionnaire (SDQ)

The SDQ is a widely used self-report scale with both self-report (for young people aged 11–16 years) and parent-rated versions, which assess emotional and behavioural problems and strengths in young people (Goodman 2001). The 5-item prosocial subscale (concurrent validity; "I am kind to younger children"), 20-item total score (concurrent validity), and 5-item conduct disorder subscale (discriminant validity; "I fight a lot. I can make other people do what I want") were used in this study. The factor structure of the SDQ has been supported by exploratory (Goodman 2001) and well-fitting confirmatory factor analysis (CFA; Van Roy et al. 2008). However, it is important to note that this factor structure has not been replicated elsewhere (e.g., Dicky and Blumberg 2004). Scores on the SDQ are predictive of psychiatric diagnoses (specificity = 85 %; sensitivity = 80 %; from Goodman et al. 2004). Internal reliabilities for the current confirmatory sample were between $\alpha = .67$ and $\alpha = .70$ for the prosocial subscale and between $\alpha = .79$ and $\alpha = .85$ for the total scale score.

Development and Well-Being Assessment (DAWBA)

The DAWBA is a structured interview that assesses the presence of behavioural and emotional problems in young people (Goodman et al. 2000). This measure combines closed (e.g., "How often does his/her fear of social situations result in him/her becoming upset like this?") and open questions (e.g., "What else has s/he worried about?") across parent and young-person informants. Psychiatric diagnoses (ICD-10) are provided by clinically-trained raters with the assistance of a computer algorithm. DAWBA diagnoses converge with other independent clinical judgments and can distinguish young people involved in mental health services from those who are not [specificity = 89 %; sensitivity = 92 %; from Goodman et al. (2000)].

Social Support Scale (SSS)

The SSS was employed in the survey as a measure of social support availability completed by the young person (Green et al. 2005). This scale consists of ten items ("There are people I know who accept me just as I am", "How many good/close friends do you have") which are rated on a scale from 0 ("Not true", "None") to 2 ("Certainly true" "Two or more"). The items are summed to produce a total score, with higher scores indicating greater availability of social support. Children with lower scores on this scale had higher rates of emotional and behavioural problems (Green et al. 2005). The scale had an internal reliability of $\alpha = .68$ in the current confirmatory sample.

Behavioural Outcomes

Two behavioural outcomes linked to emotional dysfunction were used to determine concurrent validity. The first was school exclusion, based upon a single dichotomous parent-rated item "has your child ever been excluded from school?" The second was lifetime self-harm. This variable was scored positive if parents responded affirmatively to any of four items regarding self-harm that were included in the survey (e.g., "Over the whole of (child's) lifetime, has (child) ever tried to harm or kill him/herself?"). Two parent-rated items assessed peer relationships. Parents rated whether their child found making friends ("What is X like at making friends?") and keeping friends ("What it X like at keeping the friends he/she has made?") "Harder than average", "About average" or "Easier than average".

Psychometric Procedure

Scale development involved four steps. First, items from the full length scales were reviewed by independent judges and items deemed unrelated to prosociality were excluded. Second, we examined the structure of responses to the items using exploratory factor analysis (EFA; using a randomly selected half of the sample). The scale items were selected based on loadings. Third the structure of these scales was tested through CFA (using the second half of the sample). The progression from exploratory to CFA represents best practice in scale development (Worthington and Whittaker 2006). Conducting the factor analyses on different samples is important. The EFA may fit the particular idiosyncrasies (e.g., random error) of one dataset but not generalise to others. The CFA in a separate sample helps test if the model can generalise to a different dataset (Howell 2007). Fourth, we then tested the validity and reliability of these scales. We assessed discriminant validity by testing whether our prosocial scale items exist on the same continuum as items representing conduct problems, or whether it formed a separate although correlated factor (McCullough et al. 2002).

Analyses were undertaken via SPSS version 20.0 (IBM/SPSS, Chicago, IL, USA), unless otherwise stated. Missing data was handled using multiple imputation (five imputed datasets; Schafer and Graham 2002), except for CFA where maximum likelihood with missing values (MLMV) was used (StataCorp 2011). As the EFA command in SPSS does not support the pooling of multiple imputed datasets, this analysis was undertaken separately on each imputed dataset, and discrepancies were explored. The proportion of missing data per variable in the exploratory sample was ≤1.4 and ≤16.2 %, for the BAPPS-P and -S data, respectively. The proportion of missing data per variable in the confirmatory sample was ≤1.9 and ≤17.9 %, for the

BAPPS-P and -S data, respectively. The discrepancy in missing data for the BAPPS-P versus -C was due to young people showing greater rates of missing data than parents. Examination of missing data patterns revealed that this missingness was largely due to young people not completing any of the self-report variables used in the study, rather than being due to any systematic non-completion of certain variables (non-completion of all self-report items represented the largest pattern of missing data in both samples involving 300–323 cases). This may have been attributable to factors such as young people not being home at times when the interviewers visited or not wishing to complete measures at the time.

The exploratory sample correlation matrix was analysed via principle axis EFA. The principal axis method was used as this often gives comparable results to maximum likelihood methods but with a lower risk of improper solutions (Fabrigar et al. 1999). Velicer's minimum average partial (MAP) test was employed to determine how many factors to extract, as this has been shown in simulation studies to more accurately identify correct factors solutions than other approaches such as the scree plot or Kaiser criterion (Zwick and Velicer 1986). This analysis employs an incremental approach, exploring how partialing out successive components in the data affects inter-correlations between variables. Through this process, the number of factors extracted is decided based on whether or not there is systematic variance remaining in the data, with no further factors being extracted at the point where only non-systematic variance remains. Promax rotation was employed to allow for inter-correlated factors. These analyses were undertaken using the syntax developed by O'Connor (2000). CFA was conducted in Stata version 12 (StataCorp 2011). Adequate fit was associated with residual (SRMR) ≤.10, comparative fit index (CFI) ≥.90 (Weston and Gore 2006), and root mean square error of approximation (RMSEA) ≤.08 (this was not available with MLMV estimation) (Byrne 2001). Good fit was associated with CFI ≥.95, SRMR <.09, and RMSEA ≤.06 (Hu and Bentler 1999). The change in the χ^2 statistic was used as a means of comparing nested models. A significant reduction in χ^2 favours the more complex model.

Results

Item Screening

Items were initially screened to exclude those that were unrelated to the concept of prosocial perceptions. Three judges independently reviewed items. Two had achieved PhD level qualifications in psychology, with over 12 and

3 years previous experience working with young people, both within clinical and research contexts. The third judge had a masters-level qualification relating to research involving scale development with children and had received specific training in the use of parenting interventions. One judge was also parent to an adolescent boy. Judges were provided with a brief definition of prosociality (see "Appendix 2"), and asked to identify items from the BAPPS that they believed were unrelated to this concept. Items were excluded if two or more judges agreed it was unrelated to prosociality. This led to the exclusion of five items from the BAPPS-S and six items from the BAPPS-P (excluded items indicated in "Appendix 1").

Exploratory Factor Analysis

The BAPPS-S and -P items were subjected to separate EFAs. Bartlett's test ($p < .01$) and the Kaiser–Meyer–Olkin statistic ($\geq .89$) indicated that the data were appropriate for factor analysis in both cases. For the BAPPS-P items (initial eigenvalues = 5.61, 1.57, 1.28, 1.05, .92, .78, .77, .68, .66, .63) the MAP test supported a two factor solution (smallest average squared correlation = .01), explaining 27.66 and 5.76 % of the variance. For the BAPPS-S items (initial eigenvalues = 4.21, 1.42, 1.04, .96, .82, .79, .73, .66, .66, .60), the MAP test supported a single factor solution (smallest average squared correlation = .01), explaining 25.01 % of the variance. These results were replicated across all five imputed datasets. The factor loadings for the BAPPS items are reported in Table 2. A review of factor loadings for the BAPPS-P suggested that the first factor represented general prosocial perceptions, with items reflecting an inclusive and supportive interpersonal style (e.g., "Affectionate", "Easy-going") and consideration of others (e.g., "Generous", "Caring/kind hearted"). In contrast, the second factor appeared to represent consistency with expectations around school (e.g., "Good at school", "Keen to learn"). Consequently, whilst these items may have some relation to the concept of prosociality, as they were not screened out by the independent judges, they also

Table 2 Factor loadings from exploratory factor analysis of BAPPS items

BAPPS-S				BAPPS-P				
Item	EFA loading	CFA loading	Skewness	Item	EFA loading (F1)	EFA loading (F2)	CFA loading (F1)	Skewness
Caring/kind hearted	**.65**	**.64**	**−.79**	Caring/kind hearted	**.76**	−.12	**.76**	**−2.58**
Nice personality	**.63**	**.55**	**−1.15**	Affectionate	**.67**	−.14	**.59**	**−1.71**
Polite	**.59**	**.64**	**−.90**	Gets on well with rest of family	**.59**	−.01	**.52**	**−1.79**
Generous	**.58**	**.58**	**−.07**	Grateful/appreciative	**.57**	.08	**.55**	**−1.08**
Well behaved	**.55**	**.57**	**−.41**	Generous	**.56**	−.06	**.61**	**−1.34**
Reliable and responsible	**.54**	**.56**	**−.83**	Easy-going	**.53**	.01	**.51**	**−1.69**
Good at school work	.51			Good fun/good sense of humour	.53	.02		
Good with friends	.46			Likes family activities	.51	.01		
Easy-going	.46			Well behaved	.47	.27		
Good fun/good sense of humour	.44			Polite	.44	.23		
Out-going/sociable	.44			Reliable and responsible	.43	.33		
Raising money for charity/helping others	.38			Good with friends	.39	.12		
Helpful at home	.32			Helps around the home	.27	.11		
Independent	.30			Good at school work	−.15	.89		
				Does homework without needing to be reminded	−.11	.69		
				Keen to learn	.11	.60		
				Independent	.20	.25		
				Keeps his/her bedroom tidy	.08	.18		

Values in bold relate to items included in the final BAPPS scales;

BAPPS-S self-rated, *BAPPS-P* parent-rated, *EFA* exploratory factor analysis, *CFA* confirmatory factor analysis; factor loadings are standardized; loadings for EFA reported for first imputed dataset; comparable loadings replicated across four remaining imputed datasets

appeared to load onto a second factor, distinct from the initial, more general, prosociality factor. It was not an aim of the research to develop a measure specific to a school context, and for this reason we decided to focus on the first factor only in developing the BAPPS-P. Following the same reasoning, the item "Good at school work" was also excluded from the BAPPS-S.

BAPPS Development

The aim of the study was to develop a brief measure of prosocial perceptions. Only items with factor loadings $\geq$.50, equating to $\geq$25 % overlapping variance with the construct, were included in the scale ($\geq$10 % overlapping variance has been recommended in the context of longer scales; Costello and Osborne 2005). This led to the six highest loading items being chosen (excluding the school-specific item) for the BAPPS-S. This six-item format was also employed for the BAPPS-P. Items included in the final measure are indicated by bold type in Table 2. The skewness for these items is also reported in Table 2. Ordinal alpha coefficients (Gaderman et al. 2012; computed with $n = 1,665$–$1,961$ as could not be conducted on the multiply imputed dataset) for the scales were respectively $\alpha = .85$, and, $\alpha = .88$, for the BAPPS-S and BAPPS-P indicating good internal consistency reliability. Moreover, the inclusion of a further item to the scales made only a trivial difference to the internal consistency, $\Delta\alpha \leq .02$, suggesting the improvement in reliability did not justify the increased response burden. Cronbach's α coefficients were similar, at $\alpha = .77$, and, $\alpha = .75$, for the BAPPS-S and -P. On the basis of this, total scores for both the BAPPS-S and -P were formed through summing the relevant items.

Confirmatory Factor Analysis (CFA)

The selected items were modelled as indicators of two separate but correlated BAPPS-P and -S factors using MLMV estimation. These two factors were estimated within the same model to allow a calculation of their latent correlation. Twenty-two all-missing cases were excluded as this degree of missingness cannot be handled by MLMV. This model fit the data well; χ^2 (53, $n = 1,966$) = 241.14, $p < .01$, $CFI = .96$, $RMSEA = .04$. The BAPPS-P and BAPPS-S were correlated at $r = .44$. The associated path coefficients for the final model are reported in Table 2. All path coefficients were significant ($p < .05$).

The MLMV estimation method, whilst suitable for managing missing values, also makes assumptions about normality that may not be tenable with the ordinal-type items of the BAPPS. Therefore, we repeated the CFA using weighted least squares (WLS) estimation on the non-imputed data. This method is a form of asymptotic distribution free estimation that makes less restrictive distributional assumptions and so is more appropriate where normality assumptions are not met (StataCorp 2011). This model fell slightly below our criteria for good fit. χ^2 (53, $n = 1,620$) = 157.31, $p < .01$, $CFI = .89$, $RMSEA = .04$, $SRMR = .06$. Modification indices suggested that allowing the error-term for the BAPPS-S item "Well-behaved" to covary with the error terms for the BAPPS-S items "Polite" and "Reliable and responsible", and with the error term for the BAPPS-P item "Generous". These items all appear to share a common theme of compliance with prosocial (and likely authority-orientated) expectations, accounting for their inter-correlation. Allowing these error terms to covary (3 fewer parameters), led to a well-fitting model χ^2 (50, $n = 1,620$) = 99.39, $p < .01$, $CFI = .95$, $RMSEA = .03$, $SRMR = .05$.

This model was also analysed using maximum likelihood estimation and a polychoric correlation matrix as input as this approach is also recommended for ordinal-type data (Holgado-Tello et al. 2010). Results were similar with fit remaining adequate, χ^2 (50, $n = 1,620$) = 424.70, $p < .01$, $CFI = .96$, $RMSEA = .07$, $SRMR = .04$.

Concurrent Validity

Planned correlations, performed to test the concurrent validity of the BAPPS, are reported in Table 3. Concurrent

Table 3 Results of correlations between BAPPS-S, -P and SDQ subscale score

	BAPPS-S	BABBS-P	1	2	3	4
1. SDQ prosocial score—self-rated	.57	.26				
2. SDQ prosocial score—parent-rated	.34	.57	.34			
3. Social support—self-rated	.34	.17	.31	.21		
4. SDQ total score—self-rated	−.43 (−.35[a])	−.22	−.29	−.21	−.32	
5. SDQ total score—parent-rated	−.32	−.39 (−.24[b])	−.19	−.39	−.30	.49

BAPPS-S self-rated, BAPPS-P parent-rated, SDQ Strength and Difficulties Questionnaire; Spearman's correlations used; all correlations significant, $p < .001$

[a] Partial correlation controlling for self-rated SDQ prosocial score

[b] Partial correlation controlling for parent-rated SDQ prosocial score

validity was shown through the large correlations (Cohen 1988) between the child-rated prosocial subscale of the SDQ and the BAPPS-S ($r = .57$), and between the parent-rated SDQ prosocial subscale and BAPPS-P ($r = .57$), showing that the BAPPS correlated with existing scales assessing a similar construct. Further concurrent validity was shown with the theoretically related construct of social support, which correlated with the BAPPS-S ($r = .34$) and BAPPS-P ($r = .17$), and emotional and behavioural problems (SDQ total), which correlated negatively with the BAPPS-S (child-rated SDQ: $r = -.43$) and BAPPS-P (parent-rated SDQ: $r = -.39$). Moreover, meaningful correlations remained between the BAPPS and SDQ total scores even after adjusting for the shared relationship with SDQ prosocial score, providing initial evidence of incremental validity.

Concurrent validity was also assessed by comparing scores on the BAPPS between young-people displaying self-harm at some point in their lifetime, and who have previously been excluded from school. Young-people who had been excluded ($n = 155$; BAPPS-S: $M = 7.53$, $SD = 2.13$; BAPPS-P: $M = 8.74$, $SD = 2.82$) had significantly lower scores on the BAPPS than those who had not been excluded (BAPPS-S: $M = 9.41$, $SD = 2.06$; $t = 10.48$, $p < .01$, $d = .91$; BAPPS-P: $M = 10.48$, $SD = 1.83$; $t = 7.23$, $p < .01$, $d = .90$). Young-people who had self-harmed ($n = 65$; BAPPS-S: $M = 8.61$, $SD = 2.14$; BAPPS-P: $M = 9.72$, $SD = 2.15$) had significantly lower scores on the BAPPS than those who had not self-harmed (BAPPS-S: $M = 9.28$, $SD = 2.12$; $t = 2.24$, $p = .04$, $d = .32$; BAPPS-P: $M = 10.37$, $SD = 1.97$; $t = 2.07$, $p = .05$, $d = .33$). Effect sizes were small for self-harm and large for school exclusion (Cohen 1988). Whilst t tests are based on pooled imputed datasets, descriptive statistics are reported from the first imputed dataset, since standard deviations cannot be estimated for the pooled dataset.

Finally, concurrent validity was assessed by comparing scores on the BAPPS between young-people who differed in terms of their ability to make and maintain friendships. Descriptive statistics relating to this analysis are reported in Table 4. Kruskall-Wallis tests revealed significant differences in both BAPPS-S and -P scores for ability to make and maintain friendships (all $p < .01$). The results of pairwise comparisons using Bonferroni-corrected ($p = .017$) t tests are reported in Table 4. Young-people classified as finding making and maintaining friendships easier than average scored significantly higher on the BAPPS than those who found making and maintaining friendships harder than average, with moderate to large effect sizes emerging for the BAPPS-P and small to moderate effect sizes for the BAPPS-S.

Discriminant Validity

We tested whether prosocial perceptions existed on the same factor as conduct problems, or whether prosocial perceptions were a separate although correlated factor. Following McCullough et al. (2002), the latter possibility would be taken as evidence of the discriminant validity of the scale. A CFA model (MLMV estimation) whereby the BAPPS and SDQ conduct problems subscale loaded onto a single common factor was compared with a model where the SDQ and BAPPS items loaded onto two distinct but correlated factors. The child-rated SDQ items were used in conjunction with the BAPPS-S, and parent-rated SDQ items used in conjunction with the BAPPS-P. The two factor model demonstrated a better fit for both the BAPPS-S [$\Delta\chi^2$ (1) $= 176.66$, $p < .01$] and the BAPPS-P [$\Delta\chi^2$ (1) $= 492.40$, $p < .01$]. In both cases the two factors were correlated ($r = -.70$ and $r = -.66$, for the BAPPS-S and -P, respectively) suggesting the factors are strongly

Table 4 Descriptive statistics and pairwise comparisons

| | BAPPS-P | | | | | BAPPS-S | | | | |
| | Descriptives | | Pairwise comparisons | | | Descriptives | | Pairwise comparisons | | |
	M	SD	Comparison	t	d	M	SD	Comparison	t	d
Ability to make friendships										
1. Harder than average ($n = 226$)	9.35	2.46	1 versus 2	4.76*	.41	8.82	2.25	1 versus 2	2.05	.17
2. About average ($n = 741$)	10.23	2.05	1 versus 3	7.40*	.69	9.18	2.09	1 versus 3	3.16*	.28
3. Easier than average ($n = 1,021$)	10.65	1.72	2 versus 3	4.53*	.23	9.41	2.10	2 versus 3	2.18	.11
Ability to maintain friendships										
1. Harder than average ($n = 118$)	8.24	2.59	1 versus 2	7.67*	.89	8.28	2.36	1 versus 2	3.99*	.43
2. About average ($n = 692$)	10.15	2.05	1 versus 3	10.03*	1.35	9.20	2.12	1 versus 3	4.45*	.53
3. Easier than average ($n = 1,178$)	10.67	1.71	2 versus 3	5.61*	.28	9.39	2.07	2 versus 3	1.99	.09

Descriptives based on single imputed dataset, t values based on pooled imputed datasets

* $p < .017$

associated but distinct. Equivalent findings emerged with WLS estimation.

Incremental Validity

Incremental validity was determined by assessing whether BAPPS scores could significantly predict the presence of psychiatric diagnoses (*ICD-10*) when controlling for SDQ prosocial score, via logistic regression. The BAPPS-P demonstrated a bivariate relationship with diagnoses, OR .67 (95 % CI .62–.71), that remained when adjusting for parent-rated SDQ prosocial score, OR .72 (95 % CI .66–.78). Likewise, the BAPPS-S demonstrated a bivariate relationship with diagnoses, OR .74 (95 % CI .69–.80), that remained when adjusting for self-rated SDQ prosocial score, OR .73 (95 % CI .66–.80). Both measures therefore demonstrated incremental validity. The unadjusted odds ratios indicated that there was a 33 or 26 % reduction in the odds of receiving a psychiatric diagnosis per unit change in the BAPPS-P or -S, respectively.

Discussion

The current study described the development and psychometric testing of two brief clinical tools for assessing prosocial perceptions in adolescents. A single factor structure was supported for both scales through exploratory and CFA in two separate large samples of adolescent-parent dyads. The scales were also determined to load onto a separate factor to conduct problems. Concurrent validity was supported via the pattern of correlations between the BAPPS and existing measures of prosociality, social support, peer relationships and emotional and behavioural problems. Concurrent validity was also demonstrated by significantly lower BAPPS scores in adolescents who had been excluded from school or self-harmed. The size of these effects was in the large range for school exclusion, suggesting a particularly strong relationship here. Large effect sizes have been described as "grossly perceptible" (equivalent to the height difference between 13 and 18 year old girls; Cohen 1988, pp. 26–27). The BAPPS were associated with psychiatric diagnoses over and above an existing measure of prosociality, the widely used SDQ. As such the added clinical value of the BAPPS in providing information untapped by existing measures was supported.

The BAPPS provide an assessment both of young peoples' self-perceptions and their parents' perceptions of the extent to which they are disposed towards prosocial behaviour and acts. Consistent with previous research into prosociality, greater scores on these measures were associated with better social functioning and peer relationships

(e.g., Bandura et al. 1999; Crick 1996; Hay et al. 2004; Zimmer-Gembeck et al. 2007) and a lower risk of psychological or behavioural problems (Bandura et al. 1999; Goodman 2001; Hay and Pawlby 2003; Wentzel et al. 2007; Zimmer-Gembeck et al. 2007). The relationship between prosociality and psychological difficulties may be mediated by the role prosociality plays in the development of social relationships (Greener 2000; Hay et al. 2004; Zimmer-Gembeck et al. 2007) and coping with difficult experiences (Blechman and Culhane 1993; Tam 2008). In the current study, prosociality had a particularly strong relationship with school exclusion. This may be due to young people low in prosociality being at a higher risk of behavioural problems that could contribute to the likelihood of school exclusion.

The medium sized association observed between the BAPPS-S and -P is consistent with the wider literature on informant discrepancies (De Los Reyes and Kazdin 2005). Research into such discrepancies has suggested they may be clinically meaningful phenomena, as oppose to methodological nuisances (e.g., Kim and Chiu 2011; Taylor and Wood 2012). Consequently, the provision of both parent and self-rated forms of the BAPPS is important. The difference in item content between the scales reflects the likelihood that parental and adolescent perceptions of what is prosocial vary in subtle but potentially meaningful ways, which may have been picked up in the initial generation of items and subsequent item inter-correlations. Forcing the scales to have matching item content may therefore have impaired their individual validity. It was also notable that whilst the results indicated that prosocial perceptions and conduct problems lay on two distinct continuums, the correlation between these factors was very high. Such high correlations between separate factors have been known to occur between other positive psychological constructs, and therefore do not necessarily challenge the conceptualisation of prosocial perceptions and conduct problems as distinct factors (Linley et al. 2009). Moreover, the presence of distinct prosocial and externalizing factors parallels the factor structure of other measures (e.g., Goodman 2001).

A number of limitations of the present study require mention. The data were cross-sectional and for this reason it was not possible to obtain test–re-test reliability statistics. Further prospective research would be needed to address this issue. The current study also employed a single existing scale of prosocial behaviour against which to assess concurrent validity. The SDQ prosocial subscale was suited for this purpose due to its established psychometric properties and common use as a clinical tool. Other measures of prosocial behaviour, such as the SBQ (Tremblay et al. 1991) or PBS (Weir and Duveen 1981) were inappropriate for the current study as they were developed for younger children

and lack self-report versions. Further research is needed contrasting the BAPPS with other measures of prosocial behaviour and related constructs (e.g., empathy, moral development). The current study only included young people aged 11–17 years old. The suitability of using the BAPPS outside this age range will need to be determined via future research. Similarly, the suitability of using the BAPPS within different cultures and with ethnic minority groups requires further exploration. The parental version of the original "Personal Strengths" items from which the BAPPS-P was developed (Green et al. 2005) was based on parents' responses concerning their child's strengths. This included children aged between 4 and 16 years and so these original items were not developed specifically in regards to adolescence. Whilst this may have limited the specificity of BAPPS-P items to an adolescent population, the psychometric testing undertaken in the current paper supports the reliability and validity of the BAPPS-P for use with adolescents. The current paper focuses on a dispositional measure of prosocial perceptions. A potential limitation of this measure is that it relies on subjective ratings, which may be confounded by various forms of personal bias and so provide an unclear picture of an individual's actual levels of prosociality. This is different from a measure that attempts to assess actual observed prosocial behaviours, for example via behavioural observation by trained raters. However, such measures may also be criticised by being overly influenced by situational and contextual factors (e.g., Eisenberg et al. 1996) and so may say little about an individual's overall disposition towards prosociality. Moreover, it is important to recognise that prosocial behaviour is socially-defined and that even situational observations rely on someone's (e.g., the raters) interpretational frame.

The BAPPS were designed to be quick to complete, allowing them to be readily incorporated into clinical research and practice. Possible uses include incorporation into screening batteries in health and educational settings, to provide additional information concerning the risk of emotional and behavioural problems in young people. The BAPPS may improve the prediction of disorder in this context as they may explain variance in emotional problems untapped by existing, deficit-focussed measures (Wood and Joseph 2010; Wood and Tarrier 2010). Despite their brevity, the BAPPS appear to have good psychometric properties (e.g., good internal reliability) and so they could also be employed in future research as a means of assessing prosocial traits in young people with minimal participant burden.

The BAPPS could be used in clinical assessments of adolescents with identified psychological problems, where they may provide information on social functioning and resilience, which may become pertinent for formulation and subsequent interventions with that individual (Padesky and Mooney 2012; Tedeschi and Kilmer 2005). For example, where prosociality appears low, this may represent a target for intervention, particularly where this absence of prosociality appears to contribute to other problems such as peer rejection and conflict. Brief interventions that involve the modification of prosocial behaviour have shown benefits in increasing peer acceptance and well-being in pre-adolescents (9–11 years; Layous et al. 2012). Alternatively, for some young people, prosocial behaviour may be present in spite of their other difficulties and thus represent an important resource and resilience factor that could be drawn upon in therapy, for example, by developing coping strategies based around using prosocial behaviour. It has also been noted that positively-orientated assessment instruments may generally foster a more positive and productive relationship between clients and clinicians, which may aid therapy (Tedeschi and Kilmer 2005).Various interventions have been developed with the goal of developing positive social behaviours including prosociality (Gresham et al. 2004; Kim and Leve 2011). The brief nature of the BAPPS lends them to use on a session-by-session nature in these contexts. Ideally, BAPPS scores should be interpreted in the context of a wider clinical assessment.

In conclusion, this initial test of validity and reliability of the BAPPS suggests that these measures have good psychometric properties. The BAPPS may therefore provide a brief and effective means of assessing prosociality in young people and thus provide valuable information about this area of positive functioning in young people.

Appendix 1: Initial BAPPS Item Set

BAPPS-S	BAPPS-P
Caring/kind hearted	Reliable and responsible
Nice personality	Well behaved
Generous	Keen to learn
Well behaved	Grateful/appreciative
Polite	Good at school work
Good at school work	Interested in many things[a]
Reliable and responsible	Polite

Appendix 1 continued

BAPPS-S	BAPPS-P
Raising money for charity/ helping others	Caring/kind hearted
Good with friends	Gets on well with rest of family
Good fun/good sense of humour	Good fun/good sense of humour
Easy-going	Likes family activities
Out-going/sociable	Easy-going
Helpful at home	Affectionate
Good at music[a]	Does homework without needing to be reminded
Good at drama/acting[a]	Good with friends
Independent	Generous
Good at art/making things[a]	Independent
Good with computers[a]	Bounces back quickly after set-backs[a]
Good at sport[a]	Takes care of appearance[a]
	Helps around the home
	Creative activities: art, acting, music, making things[a]
	Keeps his/her bedroom tidy
	Lively[a]
	Good at sport[a]

[a] Items excluded by judges from analysis

Appendix 2: Definition of Prosociality

Prosociality can be generally understood as a positive orientation towards ones social context. Prosociality involves a number of facets, representing dispositions towards particular patterns of behaviour. These include the following:

a. Behaviours involving helping, caring for, sharing with or supporting others.
b. Affiliative behaviours demonstrating interpersonal warmth, social co-operation or inclusiveness. These may include adopting a pleasant, warm or friendly demeanour, or adopting a supportive style of interaction with others.
c. In some ways, prosocial behaviour can be seen as the opposite of anti-social behaviour. Anti-social behaviour can involve acts that are not directed at a specific individual, but jar against societal norms and values, for example, the young person who is untidy and disorganized, or uninterested and disruptive at school. Therefore, a further facet of prosocial behaviour may involve a consistency with 'prosocial expectations'. This involves the extent to which young people meet the expectations and norms that are set by their parents, caregivers or other authority figures (e.g., teachers).

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