Emotional self-efficacy, conduct problems, and academic attainment: Developmental cascade effects in early adolescence

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Abstract

The study is amongst the first of its kind to utilise developmental cascade modelling in order to examine the inter-relations between emotional self-efficacy, conduct problems, and attainment in a large, nationally representative sample of English adolescents (*n* = 2,414, aged 11 years). Using a 3-wave, longitudinal, cross lagged-design, we tested three cascading hypotheses: adjustment erosion, adjustment fortification, and academic incompetence. A fourth hypothesis considered the role of shared risk. Results supported small effects consistent with the cascade hypotheses, and a small but significant effect was found for shared risk. Strengths and limits of the study are considered alongside a discussion of the implications for these findings.

Keywords: emotional self-efficacy; conduct problems; attainment; developmental cascade

Introduction

Developmental cascades are, “the cumulative consequences for development of the many interactions and transactions occurring in developing systems that result in spreading effects across different levels, among domains at the same level, and across different systems or generations” (Masten & Cicchetti, 2010, p.491). Drawing on ecological and developmental systems theories (e.g. Bronfenbrenner, 2005; Lerner & Castellino, 2002), the body of work in this area predicts that functioning in different domains, levels, or systems are developmentally related. Namely, successful accomplishment of developmental tasks in a given domain provides a scaffold for later functioning in the same and other domains; equally, failures in these tasks can trigger negative cascade effects. In this paper we use a developmental cascade model to examine longitudinal inter-relationships between emotional self-efficacy, behaviour problems, and academic attainment in early adolescence. The model is used to test three key hypotheses in the study of developmental cascades – adjustment erosion, academic competence, and shared risk (Moilanen, Shaw, & Maxwell, 2010) – and a fourth prediction drawing on the positive youth development perspective (Lewin-Bizan, Bowers, & Lerner, 2010), which we term ‘adjustment fortification’.

Developmental cascades in adolescence

Our focus on adolescence is driven by the fact that this period is marked by major physical, psychological, behavioural, and contextual changes, including the onset of puberty, the transition to secondary school, and substantial neurological reorganisation (Coleman, 2011). Adolescence is a captivating, critical life stage that has important repercussions for later life (Hagell, Coleman & Brooks, 2013). This is particularly true of the domains of functioning that we examine in the current study. For example, we know that up to 50% of adult mental health problems have their first onset in adolescence (Belfer, 2008). Similarly, academic competence in adolescence predicts future academic success and transition to the workplace (Ek, Sovio, Remes & Jarvelin, 2005). What is less known currently is the nature of inter-relationships between these domains during this important period. We also know relatively little about the potential role played by adolescents' emotional self-efficacy in interrupting symptom-driven pathways and promoting positive adjustment.

Extant research on developmental cascades typically tests one or more of three key hypotheses. First, the *adjustment erosion* model predicts that mental health problems lead to later academic difficulties (Moilanen et al., 2010). For example, aggressive and disruptive behaviour can undermine academic progress because of its effect on relationships with school staff and peer acceptance. This is particularly salient in early adolescence because of the increased emphasis on academic ability and reduced tolerance for disruption seen in secondary education (Humphrey & Ainscow, 2006). Research by Moilanen et al (2010) offers support for this hypothesis, with high

levels of externalising difficulties in middle childhood predicting low academic competence in early adolescence. Second, the *academic incompetence* model suggests that difficulties relating to academic competence can trigger or exacerbate mental health problems (Moilanen et al., 2010). Youth who are less academically able may experience considerable frustration and disaffection that eventually manifests as aggressive and disruptive behaviour. As above, this is a particularly critical consideration in adolescence given the increasingly high stakes nature of academic assessments in secondary education. By way of illustration, Vaillancourt, Brittain, McDougall, and Duku's (2013) recent study evidenced clear cascade effects of low academic grade point average on later externalising behaviour problems in the late childhood-early adolescence period. Finally, the *shared risk* model stipulates that cascade effects such as those outlined above are a function of other variables that affect multiple domains of development more generally. For instance, economic disadvantage (often categorised in education research as eligibility for free school meals (Gorard, 2012)) is a well-known risk factor for lower academic attainment (Department for Education, 2015) and higher social-emotional difficulties (Bradley & Corwyn, 2002). This has been attributed to a number of factors including a lack of ease or unwillingness to access resources and associated parental beliefs and behaviours around education (Davis-Kean, 2005). Also, research consistently demonstrates that being identified as having special educational needs (an expanse term in education, denoting particular needs or disabilities beyond a school's resource capabilities) puts a child at risk of experiencing significantly worse academic and psychosocial outcomes through the course of schooling (e.g. Department

for Education, 2013, Van Cleave & Davis, 2006). This is attributable to a number of causes, including an over-representation as victims of bullying (Monchy et al., 2004; Van Cleave & Davis, 2006) and poor social relationships (Frostad & Pijl, 2007, Pijl et al., 2008; Valäs, 1999). These outcomes are, of course, deeply inter-related (Frederickson & Furnham, 2004; Kaukiainen et al., 2002). However, these factors have not been fully explored within a developmental cascades framework. Deighton et al.'s (under review) recent study provides some confirmatory evidence, demonstrating that pathways from academic attainment to later internalising and externalising problems were rendered insignificant once socio-economic and disability status was taken into account in their late childhood sample, warranting further investigation.

The aim of the current study was to extend understanding of developmental cascade processes by addressing several gaps, limitations, and inconsistencies in the existing evidence base. First, sample sizes are often modest (e.g. *n* =85 in Bornstein, Hahn, & Suwalsky, 2013b) and drawn from highly specified populations (e.g. McCarty et al.'s (2008) study of adolescent girls from low-income households). This reduces test sensitivity (Masten et al., 2005) and limits generalizability and comparability of findings (Deighton et al., under review). Hence, we drew upon a large, representative sample of adolescents. Second, most studies in this area have been carried out in North America. Transferability of findings cannot be assumed because the cultural context is a primary component of the developmental eco-system. For example, socialisation practices relating to emergent behaviour problems

138 can vary across countries and cultures (Chen, Huang, Chang, Wang, & Li,
139 2010). The current study is among the first of its kind in England. Third,
140 following Deighton et al (under review), we took the opportunity to extend
141 assessment of shared risk to include disability status, which has been
142 neglected in previous research despite its associations with both academic
143 achievement (Department for Education, 2013) and conduct problems (Green,
144 McGinnity, Meltzer, Ford, & Goodman, 2005). Fourth, developmental
145 cascade research has traditionally focused on symptom-driven pathways, with
146 less attention paid to the potential fortifying effects of positive adjustment in
147 key developmental domains (Lewin-Bizan et al., 2010). Thus, we sought to
148 integrate a positive youth development perspective by assessing the cascade
149 pathways emanating from and to adolescent emotional self-efficacy.
150 Emotional self-efficacy as a positive adjustment marker caries considerable
151 intuitive appeal; emotion regulation and social problem-solving skills are likely
152 to influence both behaviour and learning in the school context (Qualter,
153 Gardner, Pope, Hutchinson, & Whiteley, 2012; Qualter, Dacre-Pool, Gardner,
154 Ashley-Kot, Wise, & Wols, 2015). Accordingly, emotional self-efficacy forms a
155 key aspect of many non-cognitive school based interventions (Durlak,
156 Weissberg, Dymicki, Taylor, & Schellinger, 2011; Sklad, Diekstra, Ritter, &
157 Ben, 2012; Wigelsworth et al., in press). Both its hypothetical presence and
158 empirical measurement have typically assumed a linear development (as
159 proposed above), but our understanding of this relationship is incomplete with
160 further consideration of the potential inter-relations within a cascade model.
161 For instance, to what extent do conduct problems mediate the relationship
162 between emotional self-efficacy and academic attainment across time?

Finally and critically, research findings pertaining to the adjustment erosion, academic incompetence and shared risk hypotheses have been inconsistent. For example, in contrast to the findings of Moilanen et al. (2010) outlined above, Romano, Babchishin, Pagani, and Kohen (2010) found no significant links between behaviour problems and later attainment. Thus, the current study confers an opportunity to provide further clarification of the nature and magnitude of developmental cascade effects.

Aims and objectives

The primary aim of the current study was to examine the longitudinal inter-relationships between emotional self-efficacy, behaviour problems and academic attainment in early adolescence. To achieve this aim, we sought to test four hypotheses, as follows:

1. **Adjustment erosion** – early behaviour problems will lead to later academic difficulties (H1a) and lower emotional self-efficacy (H1b).
2. **Adjustment fortification** – early emotional self-efficacy will lead to enhanced academic attainment (H2a) and reduced behaviour problems (H2b).
3. **Academic incompetence** – early academic difficulties will lead to later behaviour problems (H3a) and lower emotional self-efficacy (H3b).

4. **Shared risk** – cascading effects in H1-3 above are attributable to common cause risk markers, specifically socio-economic and disability status.

In each of the above hypotheses, we examine cross-time cascading effects, whilst controlling for cross-time, within-domain stability, and within-time, cross-domain co-variance (see 'analytical strategy').

Method

The study utilizes secondary analysis of data from a government-funded evaluation of a universal social-emotional learning intervention in English secondary schools (Humphrey, Lendrum, & Wigelsworth, 2010). Here we make use of a longitudinal, cross-lagged panel design with 3 annual waves of measurement – T1, T2 and T3 (T1 and T3 only for academic attainment – see below).

Participants

The final sample was made up single cohort of 2,414 children. All children were in their first year of secondary education (year 7, aged 11 years) at T1, drawn from 41 geographically diverse secondary schools in England. One sample *t*-tests confirmed that the study sample mirrored national norms in terms of attainment, attendance, proportion of children eligible for free school meals (FSM) (as a proxy for socio-economic status) and proportion of

children with special educational needs (SEN) (as a proxy for disability status) at the school level, and sex, ethnicity, FSM eligibility and SEN status at the child level. Study schools were shown to be slightly larger than is seen nationally.

Approximately 53.5% (*N*=1291) of the study sample were female, 82.6% (*N*=1994) were classified as 'White British', 9.9% (*N*=239) were identified as eligible for FSM, and 12.9% (*N*=312) were identified with SEN.

Measures

Conduct problems

Conduct problems (CP) were assessed using the relevant subscale in the self-report version of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). This 25-item (5 items in the CP subscale) behavioural screening measure requires respondents to endorse a series of descriptive statements (e.g. 'I get very angry and lose my temper') on a three-point scale (0 = not true, 1 = somewhat true, and 2 = certainly true). The SDQ has robust psychometric characteristics (Goodman, 2001) and is amongst the most widely used measures of its kind (Johnston & Gowers, 2005). In the current sample, α ranged between .611 - .633 across each year the subscale was used. This is approximately consistent to a reported alpha value of .60 for the conduct problems subscale in a community sample of 5-15 year olds (Goodman, 2001).

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237 *Emotional self-efficacy*

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239 Emotional self-efficacy (ESE) was measured using the Emotional
240 Literacy Assessment and Intervention (ELAI) instrument (Southampton
241 Psychology Service, 2003). This is a 25-item self-report survey that assesses
242 emotion-related dispositions and self-perceptions, producing a single,
243 broadband indicator. Traditionally this has been branded 'trait emotional
244 intelligence' but ESE is an increasingly used synonym (Petrides, Furnham, &
245 Mavroveli, 2007). Respondents endorse descriptive statements (e.g., 'I am
246 aware of my own strengths and weaknesses') using a 25-point scale. The
247 ELAI has acceptable psychometric properties (Southampton Psychology
248 Service, 2003). α ranged between .752-.762 across each year the scale was
249 used.

250

251 *Academic attainment*

252

253 Measures of academic attainment were extracted from a governmental
254 database (the National Pupil Database – NPD) and represented compulsory
255 academic testing at the end of Key Stages of education[1]. Key Stage
256 assessments record children's attainment in the core curriculum subjects of
257 English, Math, and Science. These were aggregated in the current study. We
258 utilised children's Key Stage 2 (KS2) and Key Stage 3 (KS3) attainment
259 scores, which aligned with T1 and T3 (but use different scoring scales). No

[1]

compulsory testing occurred at T2 – hence, this is absent from the panel design.

Shared risk

Additional data extracted from the NPD provided indices of socio-economic and disability status. For the former, we used the Income Deprivation Affecting Children Index (IDACI). This gives the deprivation ranking of the neighbourhood in which a child lives; the score represents the proportion of children under 16 in that area who live in a low-income household. Scoring is from 0 to 1, with higher scores representing increased deprivation. For the latter, we drew on information recorded about the nature of any special educational provision made for a given child (known as Special Educational Needs – SEN), and this was used to operationalise a categorical variable as follows: (i) no additional provision (coded 0); (ii) School Action – reasonable adjustments to normal teaching practice (coded 1); (iii) School Action Plus – additional support provided by an external professional (e.g., speech and language therapist) (coded 2); and (iv) Statement of special educational need (coded 3)– a multi-professional assessment provides the foundation of a legal document outlining support needs and securing financial support for appropriate provision.

Procedure

For each wave of data collection participating schools administered paper surveys using a standardised instruction sheet. Survey completion was conducted on a whole-year or whole-class basis. School staff supported any students with literacy difficulties to enable them to access the measures. Completed measures were collected, delivered, scored and input by independent companies. The first author conducted checks on the integrity of the data to ensure accuracy of scoring. Responses were tracked through each wave of data collection and matched to NPD data through the use of a unique reference number. This information was used solely for accurate data matching and was destroyed shortly thereafter.

Analytical strategy

Tabulated pattern analysis showed that less than 1% of missing cases across all three time points were attributable to any of the socio-demographic factors included in the analysis, indicating no discernible pattern to missing data. Therefore, incomplete cases were removed on a list wise basis and analyses were conducted for all complete cases.

Cascade and shared risk effects were tested using manifest structural equation models in MPLus version 7 (Muthen & Muthen, 2012). Consistent with previous work in this area (e.g. Moilanen et al, 2010), we first tested a simple cascade model that assessed cascade pathways across domains over time while accounting for temporal stability and within-time co-variance. A second model was then constructed in which the shared risk variables were

added as predictors of each domain at each time point. These steps are diagrammed in Figure 1. In both instances, model fit was assessed using χ^2 goodness of fit, Comparative Fit Indices (CFI), the Tucker-Lewis Index (TLI) and Root Mean Square Error of Approximation (RMSEA) (including 90% Confidence intervals). Model fit was considered to be acceptable if CFI and TLI were above .95, RMSEA was below .05 (Bollen & Curran, 2006) and SRMR was below .08 (Hu & Bentler, 1999).

<< FIGURE 1 >>

Results

Descriptive statistics

Table 1 presents descriptives and correlations for all of the study variables. Skew and Kurtosis were seen to be within acceptable range ±1.5 (Tabachnick & Fidell, 2013), omitting a very minor violation for IDACI. Almost all variables were at least moderately correlated, with the highest correlations being consistent with a priori expectations (i.e., correlations of the same measure between time points).

***** TABLE 1 ******

Cascades Analyses

All pathways in the model were tested, but in the interests of clarity, only significant pathways are included in Figures 2 and 3. Given the limitations associated with significance testing (Hubbard & Lindsay, 2008), we highlight pathways with a co-efficient of at least .10 in bold; this corresponds to the oft-cited conventions for the smallest effect of interest, deemed to be, “not so small as to be trivial” (Cohen, 1992, p.156). RMSEA and TLI fell below the established thresholds for both models described in the analytical strategy. A partial explanation is offered by the combination of relatively high size of correlations in a longitudinal model over such a short time period and the large sample size. This is supported by a marginal improvement in model fit for the second model (see Figures 2 & 3), supporting the inclusion of IDACI and SEN. However, overall fit is sub-optimal, possibly suggesting the presence of exogenous variables not accounted for in the current model.

*****FIGURE 2*****

Figure 2 shows the developmental cascade modelled to address hypotheses 1 & 2, specifically including the cross lagged pathways across all time points for emotional self-efficacy, conduct problems, and academic attainment (after accounting for temporal stability and concurrent correlations). Aside from the pathways controlling for stability across time, the largest effects were seen between T1 conduct problems predicting T2 emotional self-efficacy, and subsequent T2 emotional self-efficacy predicting T3 conduct problems. This is suggestive of a cascading relationship between these constructs. Regarding hypotheses 1 and 2, there is evidence to support the presence of both adjustment erosion and academic incompetence. Adjustment erosion is indicated by the significant pathway between T1 conduct problems and T3

academic attainment, which although significant and in the direction hypothesised (a rise in conduct problems is associated with a reduction in academic attainment), the resulting effect is comparatively small (-.030) in relation to other pathways in the model. There is arguably a slightly stronger case for the presence of academic incompetence, because the relevant pathway (T1 academic attainment to T3 conduct problems) is significant, in the direction hypothesised (lower academic attainment is associated with a rise in conduct problems), and is of relatively large effect (-.107) in relation to the other pathways in the model. A similar pattern is shown between T1 academic attainment and T2 conduct problems, but to a lesser magnitude (-.073).

*****FIGURE 3*****

In order to test for the effect of shared risk variables on the cascade effects identified in the model above, SEN and IDACI were regressed onto each factor, shown in Figure 3. Results showed a significant contribution of shared risk factors for the majority regressed pathways, across all time points. However, given the established associations of SEN and IDACI with both mental health (Green et al, 2005) and academic achievement (Department for Education, 2011), further significant pathways may have been expected. For instance, there is no significant pathway between SEN and T3 academic attainment. Similarly, associated effect sizes are relatively small, with only T1 shared risk pathways surpassing Cohen's effect of .1.

Regarding the effects of the previously identified pathways in Figure 2, there is an almost identical pattern of findings, with only minor changes to the academic pathways (T1 academic attainment to T2 conduct problems

reduced in strength, T1 academic attainment to emotional self-efficacy increased in strength). This provides partial support for hypothesis 3.

Discussion

The current study sought to examine the development of children's conduct problems, and its association with academic attainment, in order to better understand the cumulative effects over time and interactions across developing systems. We integrated emotional self-efficacy into the developmental cascades model to examine emotional self-efficacy as a process that might explain the relationship between children's conduct problems and academic attainment. Disability and socio-economic status were also examined as shared risk factors. We also used a large, nationally representative dataset in the current study, enhancing the confidence by which results can be generalised to the wider school-based population. Three hypotheses were examined, consistent with developmental cascade theory, especially examination of evidence for adjustment erosion, academic incompetence, and shared risk. We examined adjustment fortification and hypothesized that early high levels of emotional self-efficacy will lead to enhanced academic attainment and reduced behaviour problems.

Consistent with *adjustment erosion* and *academic incompetence* models, there was some evidence to suggest that developmental cascade effects were in effect. Path models suggested that higher levels of conduct problems at age 11 (Time 1) were associated with poorer academic competence at age

13 (Time 3). In turn, poor academic competence at age 11 was related to higher levels of conduct problems at ages 12 and 13. Higher levels of conduct problems at age 11 were also linked to lower levels of emotional self-efficacy at age 12, which then predicted increased conduct problems at age 13. High levels of conduct problems around the time of entry to High school (age 11) were predictive of lower levels of emotional self-efficacy at age 12 and lower levels of academic attainment at age 13. Finally, the *shared risk* analyses suggested that socio-economic adversity and special educational need status played a small role in the link between early externalizing problems and academic competence in middle childhood. The current pattern of results support previous research, which showed path links from conduct (i.e. externalised) problems to academic incompetence in early to middle childhood (e.g. Campbell et al., 2006; Capaldi, 1992; Chen et al., 1997; Moilanen, Shaw, & Maxwell, 2010; Morgan et al., 2008). The inclusion of shared risk variables did little to alter the magnitude or statistical significance of any of the established pathways, suggesting that findings pertain to different groups of academic attainment, including those across a socio-economic spectrum and for those pupils identified with SEND. However, practical limitations prevent a more detailed investigation of these groups (SEND in particular), as the data were restricted to school-based provision. Therefore, in future work, there is an opportunity to examine whether the same patterns of effects can be found for those at the extremely high end of youth externalizing problems, and those with other clinical problems. It is noteworthy that all significant paths emerged after accounting for autoregressive effects of each domain, which were moderately high in

magnitude in all three domains of child adjustment. This is indicative of the comparatively short time scale of the measurements, in comparison to broader developmental cascade literature, which can span up to 20 years (e.g. Masten et al., 2005).

There was evidence to support the adjustment fortification model, with higher levels of emotional self-efficacy at T1 and T2 predicting lower levels of conduct problems at T2 and T3 respectively, and higher academic attainment at T3. These findings support previous work that shows poor emotional competence in adolescence predicts school difficulties associated with subsequent academic underachievement (e.g. school drop-out and persistent antisocial behaviour) (Gagnon, Craig, Tremblay, Zhou, & Vitaro, 1995; Haapasalo & Tremblay, 1994; Kochenderfer & Ladd, 1996; Petrides et al., 2004; Qualter et al., 2012; Vidal Rodeiro, Bell, & Emery, 2009). Our work extends those findings and is the first to highlight the importance of emotional self-efficacy in developmental cascades of conduct problems and academic achievement.

Those findings are in line with Bandura's theoretical model (1986, 1999, 2001) that argues that emotional self-efficacy is likely to influence whether adolescents think in an enabling way when considering social engagement and academic performance. It also affects how much effort adolescents will invest in a particular revision or social strategy, how they persevere in the face of social and academic difficulties, and how resilient they are to social and academic stressors. Our findings provide support for the idea that lower perceived emotional self-efficacy predicts higher levels of externalizing

problems and poor academic attainment. The finding that emotional self-efficacy influences the developmental sequence between conduct problems and academic attainment further supports the thesis that self-efficacies are an indicator of successful development during adolescents and intervention might be well suitable to the targeting of that domain.

Strengths, Limitations, and Future Study

A particular strength of the current study is the use of a large community based sample that is representative of the general population. Also, contrasting previous studies, we used national standardized test scores as our measure of academic attainment at Time 1 and Time 3. These are relatively free from reporter bias when compared to concurrent adolescent self-reported attainment scores (Pataley, Deighton, Fonagy, & Wolpert, 2015). Additionally, the use of standardized test scores permits the results in a national context and supports future attempts at replication of our results.

Regarding limitations: First, the use of self-reported conduct problems by young people could not be avoided in the current study. While the 'gold standard' is to source multiple reporters (De Los Reyes, 2013), it was not practical in this large community based longitudinal studies. Second, the multi-level structure of the data (i.e. children clustered into schools) was not accounted for in the analysis because the group level sample size (41) was below minimal recommendations for analyses of this type (Hox & Maas, 2001). However, mental health outcomes typically feature very small inter-cluster correlations (typically around .02% (Hale et al., 2014)). Third, resultant model

fit was seen to be sub optimal. Although some explanation is likely to be attributable to sample size and the strength of the within-domain correlations, further consideration is required. Failure to capture idiosyncratic or even systemic exogenous variables may be accountable, though this is difficult to substantiate in the current design. We welcome further exploration in this field (both theoretical and empirical) to establish a more accurate representation of the apparent cascade effects.

Fourth, given the established paucity of the application of developmental cascade theory in the current context (i.e. psychosocial and academic measures within relatively short time period), there is a difficulty in establishing 'benchmark' figures for effect sizes. Available literature indicates effects are likely to be small. E.g. Deighton et al. (in press) report comparable effects, however as this study was also conducted over a two-year period, this may also be an artefact of the stability of the within domain correlations. A future direction therefore, is to consider capturing a longer time period, encapsulating more of a child's educational career.

Despite these limitations, the current paper is an early step in demonstrating the usefulness and contribution of developmental cascade theory for understanding the prospective associations between conduct problems, emotional self-efficacy, and academic attainment, and in establishing expectations for relative effects in the field.

This study represents a rigorous test of cascade effects of conduct problems, emotional self-efficacy, and academic attainment in early adolescence. In future cascade studies, it will be important to consider the developmental

timing of these effects. It is possible that there will be differences in the pattern of effects based on the developmental timing of these events. For example, in our sample, emotional self-efficacy contributed to how the adolescents transitioned into High School, but it may become more important during later stages of adolescents when adolescents will have to deal more with peer pressure and also manage the conflicting desire to engage with peers compared to revision. Thus, as peer relations become a more salient domain of social adjustment, the association between academic attainment and emotional self-efficacy is likely to become stronger. Further study is needed to examine changes in the patterns over time and how those can be accounted for by the changing social and academic environments.

Conclusion

The current study offers a valuable contribution to the emergent literature on developmental cascades examining self-efficacy, conduct problems, and academic attainment in an educational setting. Of particular note is the use of a large, representative sample of English adolescents, demonstrating an inclusiveness and rigour currently lacking in the field. Accordingly, new (but tentative) benchmarks are provided for future research.

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Footnote

[1] The Key Stages in the English education system are ages 5-7 (Key Stage 1), 7-11 (Key Stage 2), 11-14 (Key Stage 3), and 14-16 (Key Stage 4).