Children’s Moral Emotions and Negative Emotionality:
Predictors of Early-Onset Antisocial Behaviour

Tyler J. Colasante
University of Toronto

M.A. Thesis
Advisor: Dr. Tina Malti
Subsidiary Advisor: Dr. Joan Grusec

Author Note
This research was supported by a grant from the Social Sciences and Humanities Research Council of Canada (SSHRC). Sincerest thanks to Dr. Tina Malti for her guidance and encouragement, to Dr. Joan Grusec for her advice and thoughtful revisions, to the Laboratory for Social-Emotional Development and Intervention at the University of Toronto Mississauga, and, most notably, to the children and caregivers who participated in the study.
Children’s Moral Emotions and Negative Emotionality:
Predictors of Early-Onset Antisocial Behaviour
Master of Arts: November 2013
Tyler J. Colasante
Department of Psychology
University of Toronto

Abstract
This study examined links between antisocial behaviour, moral emotions (i.e., sympathy and guilt), and negative emotionality in an ethnically diverse sample of 4- and 8-year-old children (N = 79). Primary caregivers reported their children’s antisocial behaviour, sympathy, and negative emotionality through a questionnaire and across a 10-day span via daily diary entries (n = 474 records). In a semi-structured interview, children reported their sympathy levels and guilt feelings. Children with high guilt in harm contexts and low negative emotionality were rated as less antisocial in both questionnaire and diary reports. For children with low guilt in exclusion contexts, low sympathy ratings predicted higher questionnaire-reported antisocial behaviour. For children with high guilt in prosocial omission contexts, high sympathy ratings predicted lower diary-reported antisocial behaviour. Lastly, high sympathy ratings predicted lower questionnaire-reported antisocial behaviour for children with low negative emotionality.

Keywords: antisocial behaviour, guilt, sympathy, negative emotionality, experience sampling
## Table of Contents

Abstract........................................................................................................... ii

Table of Contents............................................................................................. iii

Introduction........................................................................................................ 1

Children’s Moral Emotions and the Development of Antisocial Behaviour........... 2

Negative Emotionality, Moral Emotions, and Antisocial Behaviour....................... 5

The Present Study............................................................................................... 6

Method................................................................................................................ 8

Results................................................................................................................ 14

Discussion......................................................................................................... 19

References......................................................................................................... 25

Appendices......................................................................................................... 33
Children’s Moral Emotions and Negative Emotionality:

Predictors of Early-Onset Antisocial Behaviour

Children’s antisocial behaviour, such as bullying, stealing, and rule breaking, has long been recognized as an issue with individual, familial, and societal implications (Calkins & Keane, 2009; Dodge, Coie, & Lynam, 2006). Moreover, work from Moffitt (1993, 2003) has linked antisocial behaviour in childhood to mental health issues, poor academic performance, and criminality in adolescence and adulthood. With the aim of preventing such issues from developing and persisting, developmental scientists have identified biological, psychological, and social risk factors as antecedents of antisocial conduct (for a review, see Eisner & Malti, in press). Notably, biases in children’s cognitive and emotional processing during social events have been shown to predict antisocial outcomes (Dodge & Pettit, 2003). However, despite the moral relevance of antisocial acts, such as intentional harm, the affective-moral underpinnings of children’s antisocial behaviour remain relatively unexplored (Arsenio & Lemerise, 2004).

Recent findings suggest that moral emotions help children anticipate the outcomes of socio-moral events and adjust their behaviour accordingly (Arsenio, in press; Malti & Krettenauer, 2013). As such, their absence is thought to predict the occurrence of amoral, antisocial behaviour. The present study focused on two moral emotions of particular relevance to children’s antisocial conduct: sympathy and guilt. While past studies have independently linked sympathy and guilt to antisocial outcomes (e.g., Blair, 2010; Dinolfo & Malti, 2013; Miller & Eisenberg, 1988; Malti & Krettenauer, 2013), their joint effects on antisocial behaviour have not been empirically detailed. The present study addressed this research gap, in part, by investigating the main and interactive effects of sympathy and guilt on antisocial behaviour.
Previous research has related intense, negative emotions (e.g., distress, anger) to vicariously induced personal distress and maladaptive responses to socio-moral conflicts (Eisenberg, Bernzweig, & Fabes, 1992; Eisenberg & Fabes, 1992). We therefore considered the potential moderating role of children’s negative emotionality in relations of moral emotions and antisocial behaviour. In light of previous research documenting age-graded changes in moral emotions and antisocial behaviour from early to middle childhood (e.g., Nunner-Winkler & Sodian, 1988; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004), we included 4- and 8-year-old children in our analyses. Finally, to further extend previous literature, we supplemented retrospective assessments common to past studies with diary accounts of children’s actual, day-to-day behaviours and emotions.

**Children’s Moral Emotions and the Development of Antisocial Behaviour**

In developmental literature, antisocial behaviour has been defined as behaviour through which a child intentionally causes physical harm, psychological harm, or distress to others (Malti & Krettenauer, 2013; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). In recent years, moral emotions, or lack thereof, have been inextricably linked to the development of children’s antisocial conduct (Eisenberg, 2000; Tangney, Stuewig, & Mashek, 2007; Malti & Latzko, 2012). Specifically, they are thought to provide children with the intrinsic motivation to engage in prosocial acts and avoid antisocial acts (Hoffman, 2000). For example, a child who pushes a classmate to the ground and feels guilty afterwards may be motivated to seek reparation by helping the classmate to his/her feet.

In the present study, we focused on sympathy and guilt: two moral emotions common to everyday experiences of antisocial behaviour. Sympathy (i.e., other-oriented concern), like empathy (i.e., emotional contagion), stems from the apprehension of another’s emotional state.
However, unlike empathy, sympathy does not require experiencing the same or similar emotions as the other (Eisenberg, 2000). Several studies have documented a negative link between sympathy and antisocial behaviour in childhood (e.g., Frick, O’Brien, Wootton, & McBurnett, 1994; Schultz, Izard, & Bear, 2004; Strayer & Roberts, 2004).

Guilt is commonly referred to as regret over wrongdoing (Malti & Latzko, 2012). With the exception of neurotic guilt (i.e., inappropriate self-blame), guilty individuals rightly accept or anticipate responsibility for causing or associating oneself with a transgression (Hoffman, 2000; Malti, Gummerum, Keller, & Buchmann, 2009; Tangney et al., 2007). In recent years, researchers have utilized children’s self-attributed, negative emotions following hypothetical moral transgressions to assess guilt feelings in an experimental setting (for a review, see Arsenio, in press). Converging results from this approach have associated high levels of anticipatory guilt in contexts of moral transgression with lower levels of antisocial conduct (Arsenio, in press; Krettenauer, Malti, & Sokol, 2008; Malti & Krettenauer, 2013).

Although past research has linked sympathy and guilt respectively to antisocial behaviour, the joint effects of these emotions on antisocial outcomes are comparatively unknown. Literature with prosocial behavioural outcomes, however, has demonstrated moderating effects among sympathy and guilt. For example, Malti and colleagues (2009a) conducted two longitudinal studies in which moral motivation (i.e., a combination of children’s guilt feelings and justifications following moral transgressions) moderated the relation of sympathy and prosocial behaviour. Specifically, increased sympathy predicted more prosocial behaviour, such as helping, for children with low, but not high levels of moral motivation. Children with high levels of moral motivation engaged in high levels of prosocial behaviour regardless of their sympathy levels. In a recent study by Ongley and Malti (2013), similar
findings emerged: Increased sympathy predicted more sharing behaviour for children with low, but not high levels of guilt. Children with high levels of guilt engaged in high rates of sharing regardless of their sympathy levels. Taken together, these findings suggest that high levels of guilt compensate for low levels of sympathy and thus maintain high rates of prosocial behaviour.

Although prosocial and antisocial behaviours have been recognized as distinct phenomena with unique correlates (Krueger, Hicks, & McGue, 2001), research on children’s guilt feelings has demonstrated overlapping and complementary findings for prosocial and antisocial outcomes (see Malti & Krettenauer, 2013). In addition, effect sizes for negatively valenced moral emotions, such as guilt, have been consistently stronger for antisocial versus prosocial outcomes (Krettenauer & Johnston, 2011; Malti & Krettenauer, 2013). Thus, based on previous findings documenting compensatory relations between sympathy and guilt with prosocial outcomes, it is reasonable to assume that similar relations exist, if not stronger, with antisocial outcomes. For example, high levels of guilt may compensate for low levels of sympathy and thus maintain low rates of antisocial conduct.

Alternatively, the effects of sympathy and guilt on antisocial conduct may be additive (i.e., the combination of sympathy and guilt may foster low levels of antisocial behaviour). Indeed, Frick and White (2008) suggest that a callous-unemotional interpersonal style, characterized by the absence of both sympathy and guilt, is associated with particularly high levels of antisocial conduct in middle childhood and beyond. From this perspective, the presence of both high sympathy and high guilt in children may be associated with particularly low levels of antisocial conduct. For the current study, we entertained the possibility of both compensatory and additive relations between sympathy and guilt.
Research on developmental differences in relations of moral emotions and antisocial conduct is largely absent. Early-onset antisocial behaviour seems to emerge in the preschool years and decrease thereafter (Maughan et al., 2004). By contrast, both sympathy and guilt feelings seem to increase from early to middle childhood (Arsenio, in press; Krettenauer et al., 2008; Malti & Krettenauer, 2013). The majority of research linking moral emotions to antisocial conduct has focused on middle childhood and adolescence. However, on theoretical grounds, one might expect developmental differences in these relations to be most prominent from early to middle childhood. Increases in children’s sympathy and guilt towards middle childhood are thought to reflect a gradual internalization of moral norms (Hoffman, 2000; Kochanska & Thompson, 1997). As internalization takes place, children’s newfound readiness to comply with moral rules may dissuade them from antisocial conduct. Likewise, with increased self-relevance, the mitigating, motivational effects of moral emotions on antisocial behaviour may strengthen towards middle childhood.

**Negative Emotionality, Moral Emotions, and Antisocial Behaviour**

Negative emotionality, akin to neuroticism on a measure of the “Big Five” personality factors (McCrae & Costa, 2004), is the degree to which individuals experience negative emotions (e.g., anxiety, distress, anger). Intense, negative emotions in children have been associated with more frequent and severe antisocial acts (Eisenberg, Fabes, Shepard, Murphy, & Guthrie, 1997). In particular, children with high negative emotionality have been shown to engage in disproportionately high levels of violent behaviour (Dodge, Lochman, Harnish, Bates, & Pettit, 1997) and stealing (Vitaro, Brendgen, & Tremblay, 2002). According to Eisenberg and colleagues (1992), children prone to intense, negative emotions are easily overwhelmed in stressful social situations and, as a result, tend to respond in a self-focused, antisocial manner. In
support of this premise, emotional overarousal in children has been shown to elicit self-focused personal distress in social conflict situations (Eisenberg et al., 1992) and personal distress in such situations has been associated with antisocial response tendencies (Eisenberg & Fabes, 1992; Eisenberg et al., 1990).

Given its aggravating effects, negative emotionality may play a moderating role in relations of moral emotions and antisocial behaviour. After perpetrating an antisocial act and apprehending their victim’s suffering, children high in negative emotionality may experience anxiety or discomfort. This personal distress may serve in stark contrast to the mitigating effects of moral emotions on antisocial conduct. Specifically, feelings of anxiety, distress, or anger may override sympathetic or guilty feelings over wrongdoing. In turn, these distressing feelings may thwart otherwise prosocial responses to transgressions, including the avoidance of antisocial responses.

The Present Study

In sum, the present study had two main objectives. First, we aimed to investigate the main and interactive effects of sympathy and guilt on antisocial behaviour. Based on previous findings (e.g., Strayer & Roberts, 2004; Malti & Krettenauer, 2013), we expected high levels of sympathy and guilt, respectively, to predict lower levels of antisocial behaviour. The interactive effects of sympathy and guilt on antisocial conduct are comparatively unknown. We therefore remained open to compensatory and additive perspectives. From a compensatory standpoint, we expected high levels of guilt to offset low levels of sympathy and thus maintain low rates of antisocial behaviour. Indeed, similar relations have been documented with prosocial outcomes (e.g., Malti et al., 2009a; Ongley & Malti, 2013). Alternatively, literature on callous-unemotional traits suggests an additive relationship between sympathy and guilt, as their joint absence has
been linked to severe antisocial outcomes (Frick, 2012). From this standpoint, we expected the combination of high sympathy and high guilt to predict exceptionally low levels of antisocial conduct. We also tested developmental differences in relations of moral emotions and antisocial behaviour. Past research has cited increases in both sympathy and guilt from early to middle childhood (Arsenio, in press; Eisenberg, Spinrad, & Sadowsky, 2006) and the onset of these emotions is thought to reflect a gradual internalization of moral norms (Hoffman, 2000). As such, we expected negative associations between moral emotions and antisocial conduct to be stronger for 8-year-olds than 4-year-olds.

As a second goal, we aimed to investigate the effect of negative emotionality on antisocial behaviour and its potential moderating role in relations of moral emotions and antisocial behaviour. We expected high negative emotionality to predict high levels of antisocial conduct (see Eisenberg, 2000; Eisenberg et al., 1997). In addition, we expected high negative emotionality to counteract the protective effects of moral emotions on antisocial behaviour. This latter hypothesis stemmed from previous work linking high negative emotionality to vicariously induced personal distress (Eisenberg et al., 1992) and maladaptive responses to socio-moral conflicts (Eisenberg & Fabes, 1992).

Thus far, the majority of studies in this area have utilized questionnaires and interviews to assess children’s antisocial behaviour, moral emotions, and emotionality. Whether or not these measurement strategies reflect children’s actual, day-to-day behaviours and emotions remains unclear. On one hand, retrospective accounts might yield different results than proximal, daily assessments. On the other hand, congruity between retrospective accounts and real-time assessments may serve to validate the retrospective techniques utilized in research to date. In the current study, we therefore gathered both retrospective accounts and experience-based diary
reports. Finally, based on previous findings relating socioeconomic status (SES) and gender to moral emotions and antisocial behaviour (e.g., Dodge, Pettit, & Bates, 1994; Eisenberg et al., 2006; Malti, Gasser, and Buchmann, 2009), we controlled for these variables across all analyses.

**Method**

**Participants**

A community sample of 36 4-year-olds ($M$ age = 4.49, $SD$ = .33) and 43 8-year-olds ($M$ age = 8.47, $SD$ = .21) participated in the current study [$N$ = 79, 43 girls (54%)]. All children were fluent in English (speaking and comprehension), as were their primary caregivers (speaking, comprehension, and writing). The sample was drawn from a major Canadian city. Primary caregivers reported their highest level of education as a proxy for SES. The majority were university graduates (53%), while the remainder had obtained college (25%), graduate (17%), or high school (5%) level education. This distribution of attained education was representative of the population from which the sample was drawn (Statistics Canada, 2007).

The ethnic composition of the sample included Western European (39%), Eastern European (13%), South Asian (13%), East Asian (4%), African (4%), West and Central Asian (4%), Caribbean (1%), Central and South American (1%), South East Asian (1%), and other/multiple (17%) origins. A small portion of caregivers chose not to report their ethnicity (4%).

**Procedure**

A pilot study ($N$ = 11) was conducted to ensure ideal interview techniques and age-appropriate interview questions. For the first portion of the current study, children and their primary caregivers attended the research laboratory for a single session. Prior to commencing the child interviews, written informed consent was obtained from caregivers and oral assent was
obtained from children. Children were interviewed separately from their caregivers in a designated interview room. Experimenters were psychology undergraduate students trained extensively in both interview techniques and procedures. Child interviews lasted approximately 30-40 minutes and were filmed for data analysis purposes. While the interviews took place, caregivers remained in a waiting area and completed a questionnaire. Upon completion of their child’s interview, caregivers were debriefed while their child was awarded a certificate and an age-appropriate book.

After completing the initial laboratory visit, all caregivers took part in the second portion of the current study: a 10-day diary assessment. For each day, caregivers completed a single, online diary entry assessing their child’s antisocial behaviour and emotional experiences over the previous 24 hours. To ensure proper assessment, trained research assistants oversaw the timely receipt and content of all diary entries.

Measures

Distinct measures of antisocial behaviour, sympathy, and negative emotionality were obtained at the individual level (i.e., via questionnaire reports and child interviews in the laboratory) and time level (i.e., via daily diary reports in the child’s natural environment). Individual-level measures were “between child” measures, while time-level measures were “within child”, repeated measures. As a lone exception, measures of guilt feelings were obtained at the individual level only via child interview responses.

Antisocial behaviour. Caregiver responses to the Child Behaviour Checklist (CBCL; issued in questionnaire format) and diary entries were used to investigate children’s antisocial behaviour at the individual level and time level, respectively.
**Caregiver reports (individual level).** To assess individual-level antisocial behaviour in 4-year-olds, 19 items pertaining to antisocial conduct from the Child Behaviour Checklist for 1.5- to 5-year-olds (CBCL/1½-5; Achenbach & Rescorla, 2000) were issued in a questionnaire to caregivers. An example item is “My child is disobedient”. To assess individual-level antisocial behaviour in 8-year-olds, 19 items pertaining to antisocial conduct from the Child Behaviour Checklist for 6- to 18-year-olds (CBCL/6-18; Achenbach & Rescorla, 2001) were issued in a questionnaire to caregivers. An example item is “My child gets in many fights”. Caregivers were required to rate, on a 6-point Likert scale ranging from 1 to 6 (i.e., not at all true, often not true, somewhat not true, somewhat true, often true, always true), how well each item described their child. Cronbach’s a for the scale was .85. Mean scale scores were calculated for 4- and 8-year-olds. High scores indicated high levels of antisocial behaviour.

**Caregiver reports (time level).** The diary assessment for children’s time-level antisocial behaviour consisted of four items. The items were selected from the CBCL based on previous research employing brief, overt aggression scales (e.g., Malti, et al., 2009b). For each day, caregivers were asked to rate how much their child displayed the specified antisocial behaviours on a 9-point Likert scale ranging from not at all to very much (e.g., “Was mean to others, fought with others, or bullied them” and “Was disobedient at home or in kindergarten/school”). Mean scale scores were calculated. High scores indicated high levels of antisocial behaviour.

**Sympathy.** Caregiver questionnaire reports, caregiver diary entries, and children’s self-reports were used to investigate children’s sympathy at the individual level and time level.

**Caregiver reports (individual level).** The caregiver-reported scale for children’s individual-level sympathy consisted of five items from Zhou, Valiente, and Eisenberg (2003). An example item is “My child usually feels sorry for other children who are being teased”.
Caregivers were asked to rate, on a 6-point Likert scale ranging from 1 to 6 (i.e., not at all true to always true), how well each item described their child. Cronbach’s a for the scale was .86. Mean scale scores were calculated. High scores indicated high levels of sympathy.

**Caregiver reports (time level).** The diary assessment for children’s time-level sympathy was developed by the research team and investigated the occurrence and intensity of daily sympathy events. Specifically, in a yes or no question, caregivers were asked if their child felt sorry for others on that particular day. If yes, caregivers were prompted to describe the occasion in an open-ended fashion and subsequently rate (on a 9-point Likert scale ranging from not at all to very much) the corresponding intensity of their child’s sympathy event. Two variables were created: a proportional score indicating occurrence and a conditional score representing intensity. Conditional scores were used in analyses. High scores indicated high levels of sympathy.

**Children’s self-reports (individual level).** The child self-reported scale for individual-level sympathy consisted of five sentences from Zhou and colleagues (2003). An example sentence is “When I see someone being picked on, I feel sorry for them”. For each sentence read by the interviewer, children were asked if the sentence was “like them or not”. If the child indicated that the sentence was like them, they were asked if it was “really like them” or “sort of like them”. Children’s responses were coded as follows: “No, this does not sound like me” as 0, “This is sort of like me” as 1, and “This is really like me” as 2. Cronbach’s a for the scale was .81. Mean scale scores were calculated. High scores indicated high levels of sympathy.

**Guilt.** Children’s self-reports were used to investigate individual-level guilt feelings.

**Children’s self-reports (individual level).** Children’s individual-level guilt feelings were assessed as responses to six vignettes depicting three hypothetical domains of moral transgression (i.e., intentional harm, exclusion, and prosocial omission). All vignettes had been
extensively validated by previous research in the happy-victimizer paradigm (see Malti et al., 2009a, b; Malti, Gummerum, Keller, Chaparro, & Buchmann, 2012; Malti & Ongley, in press) and were accompanied by coloured drawings matched by gender. Two questions followed the interviewer’s reading of each vignette: Question 1 asked, “How would you feel if you had done what (hypothetical victimizer’s name) did?” If the child said, “I don’t know”, s/he was then asked, “If you had (behaviour of hypothetical victimizer), would you feel a little good, a little bad, or a little good and bad?” The child’s answer to the latter prompt was recorded verbatim.

For Question 2, children heard, “You said you would feel (emotion attribution from Question 1). How strongly would you feel (emotion attribution from Question 1)?” Children answered this question by pointing to a visual, 3-point Likert scale depicting squares of increasing size. Before using this scale, we ensured that children understood the relationship between different-sized squares and corresponding strengths of emotions. To achieve this, we calibrated children with a similar scale depicting animals of increasing size (i.e., a mouse corresponding to low intensity emotions, a horse corresponding to medium intensity emotions, and an elephant corresponding to high intensity emotions). For data analysis, the six vignettes were collapsed into one of three respective domains of moral transgression (i.e., intentional harm, exclusion, and prosocial omission). Two vignettes represented each domain.

**Recoding.** The recoding method used in the present study was adapted from the procedures of past research on moral emotion attributions (e.g., Malti et al., 2009a, b; Ongley & Malti, 2013). For Question 1, the child’s expressed emotion was recoded as either 1 (guilty) or 0 (not guilty). In particular, bad, a little bad, sad, embarrassed/ashamed, and guilty attributions were coded as 1 (guilty), while neutral, angry, happy, proud, good, a little good, other positive emotion, fearful, and other negative emotion attributions were coded as 0 (not guilty). Due to
minimal occurrence, *psychosomatic complaint* and *other* attributions were coded as missing. To establish inter-rater reliability, two independent raters coded a random subsample ($n = 24$, i.e., 30% of the data) of 4- and 8-year-olds’ responses to *Question 1* from all six vignettes. Cohen’s $k$ was .99. Raters discussed disagreements until a consensus was reached.

For *Question 2*, the strength (i.e., intensity) of children’s guilt feelings was assigned as follows: A score of 0 was assigned to *not guilty* attributions (i.e., *no guilt*). For guilty attributions, a score of 1 was assigned if the child pointed to the smallest square (i.e., *not strong guilt*) following the attribution. A score of 2 was assigned if the child pointed to the middle-sized square (i.e., *somewhat strong guilt*). Lastly, a score of 3 was assigned if the child pointed to the largest square (i.e., *very strong guilt*). Intensity scores for guilt were aggregated within domains to derive overt intensity scores. Overt intensity scores were used in analyses to represent continuous measures of guilt in contexts of intentional harm, exclusion, and prosocial omission. High scores indicated high levels of guilt.

**Negative emotionality.** Caregiver reports and diary entries were used to investigate children’s negative emotionality at the individual level and time level, respectively.

**Caregiver reports (individual level).** The caregiver-reported scale for individual-level negative emotionality consisted of six items (e.g., “When my child gets angry, it is difficult for him/her to still be rational and not overreact”) adapted from Larsen’s Affective Intensity Scale (Larsen & Diener, 1987; see Eisenberg at al., 1993). Responses were indicated on a 7-point Likert scale ranging from *never* to *always*. Cronbach’s $a$ for the scale was .74. Mean scale scores were calculated. High scores indicated high levels of negative emotionality.

**Caregiver reports (time level).** The diary assessment for children’s time-level negative emotionality consisted of three distinct emotions (i.e., angry, cross, and short-tempered). These
items were acquired from previous diary studies employing negative emotionality scales (e.g., Neumann, van Lier, Frijns, Meeus, & Koot, 2011). For each day, caregivers reported the intensity with which their child experienced these emotions on a 9-point Likert scale ranging from not at all to very much. In line with previous research (Neumann et al., 2011), scores across the three emotions were aggregated to derive an overt negative emotionality score. High scores indicated high levels of negative emotionality.

Results

Data Analytic Procedures

Special analytic techniques were needed to accommodate for nested data. At the diary-reported, time level, we collected data for 474 moments in time; however, these moments were nested in 79 children at the individual level, therefore violating assumptions of independence. Hierarchical linear modeling (HLM) is a complex form of linear regression used to analyze variance in an outcome variable when predictor variables are at distinct hierarchical levels (i.e., repeated measures nested within children). HLM is able to assess cross-level data relationships and disentangle the effects of between- and within-individual variance. It remains a preferred method for nested data because it requires fewer assumptions to be met than other statistical methods (Raudenbush & Bryk, 2002). In particular, HLM can accommodate nonindependence of observations, a lack of sphericity, missing data, small and/or discrepant sample sizes, and heterogeneity of variance across repeated measures (Gill, 2003; Osborne, 2000). For the current study, multilevel analyses (i.e., those which involved both individual- and time-level variables) were conducted using HLM 7 software (Raudenbush, Bryk, Cheong, Congdon, & Du Toit, 2011). The default setting of restricted maximum likelihood estimation was used for all models. For analyses confined to the individual level, we used standard linear regressions.
Descriptive Analyses

Table 1 displays the means and standard deviations of study variables and t-tests by age group. At the individual and time level, caregivers reported more antisocial behaviour for 4-year-olds than 8-year-olds. Furthermore, in comparison to 4-year-olds, 8-year-olds reported higher levels of sympathy, as well as guilt in both exclusion and prosocial omission contexts.

Correlations among study variables are displayed in Table 2. Most notably, individual-level antisocial behaviour was negatively associated with caregiver-reported sympathy (individual level), child-reported sympathy, guilt in both harm and exclusion contexts, and age. Time-level antisocial behaviour was negatively associated with child-reported sympathy, guilt in harm contexts, and SES. Both individual- and time-level antisocial behaviour were positively associated with individual- and time-level negative emotionality. Also, individual-level antisocial behaviour and negative emotionality were strongly related to their corresponding measures at the time level.

Predicting Individual-Level Antisocial Behaviour

To predict children’s individual-level (i.e., laboratory-reported) antisocial behaviour from individual-level predictors of sympathy, guilt, and negative emotionality, we ran a hierarchical linear regression in SPSS, version 20. In light of previous research linking antisocial behaviour to gender (e.g., Moffitt & Caspi, 2001) and SES (e.g. Duncan, Brooks-Gunn, & Klebanov, 1994), we entered child gender and primary caregiver’s level of education as control variables at step 1. At step 2, we entered children’s age group, caregiver-reported sympathy, child-reported sympathy, guilt in harm, exclusion, and prosocial omission contexts, and negative emotionality as individual-level predictors. Interaction terms were entered at step 3. These terms were calculated from the products of mean-centered variables (e.g., Aiken & West, 1991). In
preliminary analyses, we tested all possible interactions between predictor variables. Only significant interactions from preliminary analyses were included in our final model. All control variables and predictors were centered at the mean prior to analyses.

As displayed in Table 3, individual-level antisocial behaviour was predicted by child age group, guilt in harm contexts, negative emotionality, and the interactions of (a) child-reported sympathy by guilt in exclusion contexts, and (b) caregiver-reported sympathy by negative emotionality, $R^2 = .56$, $F(11, 66) = 7.74$, $p < .001$. Cohen’s $f^2$ was 1.27, indicating a large effect size (Cohen, 1988). To plot the interactions, we used a worksheet developed by Dawson (n.d.). To probe the interactions, we followed Aiken and West’s (1991) recommendations by calculating four separate regression equations representing high (+1 $SD$) and low (-1 $SD$) levels of our moderating variables (i.e., guilt in exclusion contexts and negative emotionality). We then performed $t$-tests on resulting simple slopes.

For the interaction of child-reported sympathy by guilt in exclusion contexts (Figure 1): Having low versus high levels of sympathy did not affect antisocial behaviour when children were high in guilt (simple slope $b = .17$, ns). However, when children were low in guilt, low sympathy levels predicted higher levels of antisocial behaviour (simple slope $b = -.41$, $p < .01$).

For the interaction of caregiver-reported sympathy by negative emotionality (Figure 2): Having low versus high levels of sympathy did not affect antisocial behaviour when children were high in negative emotionality (simple slope $b = .12$, $ns$). However, when children were low in negative emotionality, high levels of sympathy predicted lower levels of antisocial behaviour (simple slope $b = -.36$, $p < .001$).
Predicting Time-Level Antisocial Behaviour

To predict children’s time-level (i.e., diary-reported) antisocial behaviour, we used two-level hierarchical linear modeling in HLM 7 (Raudenbush et al., 2011) to analyze a data structure with children at level 2 (i.e., the individual level) and time at level 1 (i.e., the time level). Of particular interest were relations between children’s time-level antisocial behaviour and both time- and individual-level predictors of sympathy, guilt, and negative emotionality. As suggested by Woltman and colleagues (2012), model testing proceeded in the following four phases: 1) an unconstrained (null) model, 2) a random intercepts model, 3) a means-as-outcome model, and 4) an intercepts- and slopes-as-outcomes model.

The unconstrained (null) model revealed an intra-class correlation of .22, suggesting that 22% of the variance in children’s time-level antisocial behaviour existed between children (i.e., at the individual level), while 78% of the variance in children’s time-level antisocial behaviour existed within children (i.e., at the time level). With sufficient variance at both levels, multi-level analyses were justified and predictor variables were added at levels 1 and 2.

A random intercepts model was conducted to test for relations between level 1, time-level predictor variables (i.e., time, caregiver-reported sympathy, and negative emotionality) and time-level antisocial behaviour. The regression coefficient relating children’s time-level negative emotionality to time-level antisocial behaviour was positive and significant ($b = .33, p < .001$), suggesting that children engaged in higher levels of antisocial behaviour on days when their negative emotionality levels were also high.

A means-as-outcome model was conducted to account for level 2, individual-level predictor variables (i.e., age group, child-reported sympathy, guilt in harm, exclusion, and prosocial omission contexts). Caregiver-reported sympathy at the individual level was deemed
redundant with its corresponding measure at the time level and thus removed from this model. Guilt in harm contexts was a significant predictor of time-level antisocial behaviour ($b = -.19, p < .05$), suggesting that day-to-day antisocial behaviour was lower for children with high levels of guilt in harm contexts.

As a final step, an intercepts- and slopes-as-outcomes model was conducted to simultaneously test predictor variables at both levels of analysis. Control variables (i.e., child gender and SES) were tested and excluded from the final model due to insignificance. As noted in Table 4, all previously significant level 1 and level 2 main effects remained significant in this final model. In preliminary analyses, we tested all possible within- and cross-level interactions between predictor variables. Significant interactions from preliminary analyses were retained and tested in our final model. Interactions were probed as suggested by Preacher, Curran, and Bauer (2006) and plotted using Preacher’s online web utility described therein. Within level 2, the interaction of guilt in exclusion contexts by age group was significant. Across levels, the interaction of caregiver-reported sympathy (time level) by guilt in prosocial omission contexts was significant.

For the interaction of guilt in exclusion contexts by age group (Figure 3), increased guilt in exclusion contexts predicted lower levels of antisocial behaviour for 8-year-olds (simple slope $b = -.33, p < .01$), but not 4-year-olds (simple slope $b = -.03, ns$). The interaction of caregiver-reported sympathy (time level) by guilt in prosocial omission contexts revealed the following (Figure 4): Having low versus high levels of sympathy did not affect antisocial behaviour when children were low in guilt ($b = .01, ns$). However, when children were high in guilt, high levels of sympathy predicted lower levels of antisocial behaviour ($b = -.07, p < .05$).
Discussion

This study investigated relations of antisocial behaviour, moral emotions, and negative emotionality in a sample of 4- and 8-year-old children. We combined traditional, retrospective measures and novel, experience-based assessments to meaningfully extend clinical-developmental literature on the affective-moral antecedents of antisocial conduct.

In line with our expectations, children’s guilt feelings were negatively associated with laboratory- and diary-reported antisocial behaviour. This corroborates existing findings linking guilt to retrospective accounts of antisocial behaviour (e.g., Arsenio, in press; Malti & Krettenauer, 2013) and extends them to encompass day-to-day antisocial acts. In contrast to existing findings (e.g., Schultz et al., 2004; Strayer & Roberts, 2004), sympathy did not predict antisocial behaviour in our multivariate analyses (despite being negatively correlated with antisocial outcomes). Together, these findings suggest that guilt feelings play a stronger role than sympathy in mitigating children’s antisocial conduct. Guilt feelings are directly tied to the antisocial act. They typically occur after some sort of transgression, primarily, but not exclusively, in the moral domain (Smith et al., 2002). Indeed, antisocial acts such as cheating, stealing, and failing to help another are commonly cited in connection to guilt (Tangney et al., 2007). Sympathy, on the other hand, is related to others’ distress as a result of the antisocial act. When a transgression occurs, such as stealing, there may or may not be a salient victim to sympathize with (e.g., stealing from an independently owned convenience store versus stealing from a multi-national retail corporation). Accordingly, our findings suggest that, in relation to sympathy, self-oriented guilt may be the primary moral emotion felt after committing an antisocial act and therefore the primary affective-moral motivator in asocial situations. Pending the presence of a victim, the other-oriented process of sympathy may occur. In prior studies,
documented associations between sympathy and antisocial outcomes have been relatively weak (Eisenberg et al., 2006). This weakness may be accounted for by the potential secondary role that sympathy plays to guilt in antisocial situations.

In line with our compensatory hypothesis, we found evidence for a compensatory relation between sympathy and guilt in predicting antisocial conduct at the individual level. Low levels of guilt predicted high levels of questionnaire-reported antisocial behaviour when children’s sympathy levels were also low. However, sympathy levels were inconsequential to antisocial conduct when children’s guilt levels were high. The current study is the first to uncover these findings with antisocial outcomes; however, compensatory relations between sympathy and guilt have been documented with caregiver- and teacher-reported prosocial outcomes (e.g., Carlo, McGinley, Davis, & Streit, 2012; Malti et al., 2009a; Ongley & Malti, 2013). According to Carlo and colleagues (2012), guilt motivates prosocial tendencies by encouraging individuals to abide by moral standards, while sympathy-induced prosocial motivation stems from the distress of others. From this perspective, children’s guilt feelings may foster low levels of antisocial conduct in lieu of sympathy. In other words, guilt should function as a moral motivator in lieu of sympathy. If children who anticipate guilt feelings have an internalized sense of accountability to moral standards, this accountability should exist independently of the need to reduce distress in others. This functional independence makes it possible for high levels of guilt to compensate for low levels of sympathy and ultimately maintain low rates of antisocial behaviour.

Interestingly, this compensatory finding did not extend to the level of diary-reported antisocial behaviour. Instead, our findings at this level revealed an additive relationship between sympathy and guilt in predicting time-level antisocial conduct. Specifically, high levels of guilt and time-level sympathy combined to predict lower levels of antisocial behaviour across 10 days.
of study. According to Frick and White (2008), the absence of sympathy and guilt (i.e., a callous-unemotional interpersonal style) in childhood is associated with high levels of antisocial conduct and the risk of developing psychopathic traits. Alternatively, our findings suggest that the presence of high sympathy and high guilt is associated with exceptionally low levels of antisocial conduct. The majority of findings depicting additive relations between sympathy and guilt have been derived from middle childhood and beyond (Frick, 2012; Frick & White, 2008). The current study extends these findings to early childhood with real-time instances of antisocial behaviour.

Nonetheless, it remains unclear why we found compensatory relations between sympathy and guilt with questionnaire-reported antisocial outcomes, yet additive relations with diary-reported outcomes. In comparison to our diary-reported scale for antisocial conduct, our questionnaire-reported scale was relatively static, less time-dependent, and extended to encompass a broader array of asocial behaviours. Both temporally and in scope, our 4-item scale for diary-reported antisocial conduct may have been too brief to capture compensatory interactions of sympathy and guilt. With diary reports, we prompted parents to recount sympathetic and antisocial events for each day. In conjunction with shared variance from having the same informant, these events were likely to be temporally linked as a result of their same-day occurrence. Thus, instead of compensating for low levels of guilt (or being compensated for), sympathy events acted in unison with high levels of guilt to predict less antisocial conduct. Over a span of 10 days, these additive scenarios may have been more probable than compensatory scenarios. Future research should investigate discrepancies in relations of sympathy, guilt, and antisocial behaviour at different levels of analysis.
Our hypothesis regarding developmental differences in relations of moral emotions and antisocial behaviour was partially supported. Specifically, guilt in the context of social exclusion predicted less antisocial conduct for 8-, but not 4-year-olds. Past research (e.g., Hoffman; 2000; Kochanska & Thompson, 1997) suggests that increases in sympathy and guilt toward middle childhood reflect moral norm internalization. Children’s emerging compliance with moral norms and associated moral emotions in middle childhood may discourage them from amoral, antisocial acts. Still, the developmental effect in the current study was for guilt in the context of excluding another child. This context-dependence may be attributed to social exclusion emerging as a common, social experience for children in middle childhood (Killen & Rutland, 2011) and thus holding high importance for antisocial behaviour at this time.

As predicted, high levels of questionnaire- and diary-reported negative emotionality predicted high levels of questionnaire- and diary-reported antisocial conduct. These findings corroborate those of existing research with retrospective accounts (e.g., Eisenberg, 2000) and extend them to the level of day-to-day antisocial conduct. Taken together, they suggest that intense, negative emotions influence children’s antisocial tendencies at a macro, trait level, and micro, daily level.

At the individual level, high caregiver-reported sympathy predicted low levels of antisocial conduct when children’s negative emotionality was low. However, sympathy levels were inconsequential to antisocial conduct when children’s negative emotionality was high. In other words, high levels of negative emotionality nullified the negative association between sympathy and antisocial conduct. In past research, children have been conceptualized based on their responses to others’ distress. Those who respond to others’ negative emotions with personal distress (i.e., anxious responders) have been known to avoid the situation altogether or even act
out aggressively (Eisenberg & Fabes, 1992; Radke-Yarrow & Zahn-Waxler, 1984). By contrast, children who sympathize with others’ distress via other-oriented concern have been known to respond prosocially (Eisenberg et al., 1994). Our findings suggest that the respective elements of these types of responding may not be mutually exclusive. For example, children high in negative emotionality may experience sympathy in response to the needs of others, however, instead of eliciting prosocial behaviour, the sympathetic process may elicit overwhelming personal distress and antisocial response tendencies. Thus, it is important to note that anxious responders may not be devoid of sympathy. Instead, for such children, intense, negative emotions may be counteracting the mitigating effects of sympathy on antisocial conduct.

While the present study meaningfully extends our knowledge of the affective-moral and regulatory antecedents of antisocial conduct in early and middle childhood, it was not without limitations. First, our 10-day period for diary entries may have been too brief to reveal systematic, intra-individual differences in study variables across development. Diary studies spanning significant time periods are therefore warranted. Second, our outcome measures of antisocial conduct were both caregiver-reported. Utilizing multiple informants greatly improves the reliability of childhood psychopathology measures (Horton, Laird, & Zahner, 1999). Future studies of this sort should include teacher-reports and/or observational measures of antisocial conduct. On this note, the present study still employed multiple methodologies to assess antisocial conduct and multiple methodologies/informants to assess moral emotions and emotionality. Finally, we relied on overt measures of antisocial conduct whereas past studies have revealed distinct subtypes of antisocial behaviour, including physical, relational, and verbal aggression (for a review, see Eisner & Malti, in press). Future studies should consider these subtypes in relation to affective-moral development and emotionality.
Despite these limitations, our study employed retrospective assessments and experience-based sampling methods to comprehensively demonstrate the effects of moral emotions and negative emotionality on antisocial conduct in both 4- and 8-year-olds. Future mixed-method research is warranted to further our understanding of early-onset antisocial conduct and its affective-moral antecedents.
References


Frick, P.J. (2012). Developmental pathways to conduct disorder: Implications for future


Kochanska, G., & Thompson, R. A. (1997). The emergence and development of conscience in
toddlerhood and early childhood. In J. E. Grusec & L. Kuczynski (Eds.),

*Parenting and children's internalization of values* (pp. 53–77). New York: Wiley.

Krueger, R. F., Hicks, B. M., & McGue, M. (2001). Altruism and antisocial behavior:


## Table 1

### Means and Standard Deviations of Major Variables for Entire Sample and T-tests by Age Group

| Variable                                | M (SD) | 4-year-olds | 8-year-olds | t     | | d |  
|-----------------------------------------|--------|-------------|-------------|-------|-------|
| Antisocial behaviour (I)                | 2.21 (.77) | 2.61 | 1.88 | 4.66*** | 1.06 |
| Antisocial behaviour (T)                | 2.25 (.78) | 2.63 | 2.30 | 1.79*  | 0.41 |
| Caregiver-reported sympathy (I)         | 4.67 (.87) | 4.58 | 4.75 | -.878  | 0.20 |
| Caregiver-reported sympathy (T)         | 1.79 (1.46) | 2.03 | 1.59 | 1.15   | 0.30 |
| Child-reported sympathy (I)             | 2.00 (.66) | 1.53 | 2.39 | -7.53*** | 1.72 |
| Guilt (harm; I)                         | 1.38 (1.03) | 1.25 | 1.49 | -1.02  | 0.23 |
| Guilt (exclusion; I)                    | 1.14 (.96) | 0.92 | 1.33 | -1.89*  | 0.43 |
| Guilt (prosocial omission; I)           | 1.48 (1.04) | 1.25 | 1.67 | -1.87*  | 0.43 |
| Negative emotional intensity (I)        | 4.30 (1.09) | 4.23 | 4.37 | -0.56  | 0.13 |
| Negative emotional intensity (T)        | 3.09 (.97) | 3.26 | 2.94 | 1.37   | 0.34 |

Note.  *I* = individual level,  *T* = time level.

* *p < .05. ** *p < .01. *** *p < .001
Table 2

*Correlation Matrix of Study and Control Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Antisocial behaviour (I)</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Antisocial behaviour (T)</td>
<td>0.53***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Caregiver-reported sympathy (I)</td>
<td>-0.30**</td>
<td>-0.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Caregiver-reported sympathy (T)</td>
<td>0.06</td>
<td>0.07</td>
<td>0.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Child-reported sympathy (I)</td>
<td>-0.46***</td>
<td>-0.26*</td>
<td>0.17</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Guilt (harm; I)</td>
<td>-0.38**</td>
<td>-0.27*</td>
<td>0.18</td>
<td>0.13</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Guilt (exclusion; I)</td>
<td>-0.24*</td>
<td>-0.19</td>
<td>0.25*</td>
<td>0.07</td>
<td>0.26*</td>
<td>0.39**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Guilt (prosocial omission; I)</td>
<td>-0.14</td>
<td>-0.14</td>
<td>0.21</td>
<td>-0.13</td>
<td>0.23*</td>
<td>0.28*</td>
<td>0.40***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Negative emotionality (I)</td>
<td>0.31**</td>
<td>0.31**</td>
<td>-0.19</td>
<td>0.12</td>
<td>-0.07</td>
<td>-0.03</td>
<td>0.07</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Negative emotionality (T)</td>
<td>0.44***</td>
<td>0.76***</td>
<td>-0.09</td>
<td>0.17</td>
<td>-0.27*</td>
<td>-0.19</td>
<td>-0.12</td>
<td>-0.08</td>
<td>0.44***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Child age</td>
<td>-0.46***</td>
<td>-0.22</td>
<td>0.10</td>
<td>-0.16</td>
<td>0.65***</td>
<td>0.12</td>
<td>0.23*</td>
<td>0.22*</td>
<td>0.09</td>
<td>-0.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Child gender</td>
<td>0.17</td>
<td>0.15</td>
<td>-0.14</td>
<td>-0.03</td>
<td>-0.10</td>
<td>-0.23*</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.06</td>
<td>0.14</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Caregiver education level (SES)</td>
<td>-0.14</td>
<td>-0.23*</td>
<td>-0.22*</td>
<td>-0.12</td>
<td>0.04</td>
<td>0.11</td>
<td>0.07</td>
<td>-0.06</td>
<td>-0.13</td>
<td>-0.22</td>
<td>0.15</td>
<td>0.13</td>
<td></td>
</tr>
</tbody>
</table>

*Note. I = individual level, T = time level. Child gender was dummy-coded (girls = 0, boys =1). Child age was measured in years up until the interview date.*

* p < .05. ** p < .01. *** p < .001.
Table 3

*Hierarchical Multiple Regression Analysis Predicting Individual-Level Antisocial Behaviour from Individual-Level Predictors*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>ΔR²/ ΔF</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child gender</td>
<td>.044/1.746</td>
<td>.27</td>
</tr>
<tr>
<td>Caregiver education level (SES)</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.413/7.387</td>
<td>***</td>
</tr>
<tr>
<td>Child gender</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Caregiver education level (SES)</td>
<td>-.06</td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td>-.56**</td>
<td></td>
</tr>
<tr>
<td>Caregiver-reported sympathy</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>Child-reported sympathy</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>Guilt in harm domain</td>
<td>-.19*</td>
<td></td>
</tr>
<tr>
<td>Guilt in exclusion domain</td>
<td>-.03</td>
<td></td>
</tr>
<tr>
<td>Guilt in prosocial omission domain</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Negative emotionality</td>
<td>.20**</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.106/8.024</td>
<td>***</td>
</tr>
<tr>
<td>Child gender</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Caregiver education level (SES)</td>
<td>-.06</td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td>-.59***</td>
<td></td>
</tr>
<tr>
<td>Caregiver-reported sympathy</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>Child-reported sympathy</td>
<td>-.13</td>
<td></td>
</tr>
<tr>
<td>Guilt in harm domain</td>
<td>-.22**</td>
<td></td>
</tr>
<tr>
<td>Guilt in exclusion domain</td>
<td>-.07</td>
<td></td>
</tr>
<tr>
<td>Guilt in prosocial omission domain</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Negative emotionality</td>
<td>.20**</td>
<td></td>
</tr>
<tr>
<td>Child-reported sympathy x Guilt in exclusion domain</td>
<td>.31**</td>
<td></td>
</tr>
<tr>
<td>Caregiver-reported sympathy x Negative emotionality</td>
<td>.22**</td>
<td></td>
</tr>
<tr>
<td>Total R²</td>
<td>.56</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>79</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. *** p < .001.
Table 4

Two-Level Model Predicting Time-Level Antisocial Behaviour from Individual- and Time-Level Predictors

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Coefficient</th>
<th>t</th>
<th></th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 (time level)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>2.44</td>
<td>30.83***</td>
<td>7.32</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>.01</td>
<td>.81</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>Caregiver-reported sympathy</td>
<td>.01</td>
<td>.57</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Negative emotionality</td>
<td>.33</td>
<td>9.01***</td>
<td>2.05</td>
<td></td>
</tr>
<tr>
<td>Level 2 (individual level)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td>-.03</td>
<td>-.13</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Child-reported sympathy</td>
<td>-.25</td>
<td>-1.37</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>Guilt (harm)</td>
<td>-.18</td>
<td>-2.39*</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>Guilt (exclusion)</td>
<td>-.03</td>
<td>-.46</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>Guilt (prosocial omission)</td>
<td>-.01</td>
<td>-.01</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Guilt (exclusion) x age group</td>
<td>-.30</td>
<td>-2.07*</td>
<td>.49</td>
<td></td>
</tr>
<tr>
<td>Level 1 and Level 2 (cross-level)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver-reported sympathy x guilt (prosocial omission)</td>
<td>-.03</td>
<td>-2.25*</td>
<td>.52</td>
<td></td>
</tr>
</tbody>
</table>

N 79

*p < .05. **p < .01. ***p < .001.
Figure 1. Interaction of child-reported sympathy by guilt in exclusion contexts predicting individual-level antisocial behaviour.
Figure 2. Interaction of caregiver-reported sympathy (individual level) by negative emotionality (individual level) predicting individual-level antisocial behaviour.
Figure 3. Interaction of guilt in exclusion contexts by child age group predicting time-level antisocial behaviour.
Figure 4. Interaction of time-level sympathy by guilt in prosocial omission contexts predicting time-level antisocial behaviour.