



Reluctance to express emotion explains relation between cognitive distortions and social competence in anxious children

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Guided by social information processing and affective social competence models, the focal objective of this research was to examine the relations among anxious children's cognitive distortions, social skill competence, and reluctance to express emotion. In addition, we explored whether children's attention control played any meaningful role. Using a sample of 111 anxious children ($M_{\text{age}} = 9.63$, $SD = 0.73$; 75.7% girls; 56% Hispanic/Latino), we found that cognitive distortions were negatively related to social competence. In addition, tests of moderated mediation showed that the negative association between cognitive distortions and social skill competence was indirect via reluctance to express emotion, but this only was the case for anxious children with high attention control and for distortions in the academic domain. The findings of this study may set the stage for new ways to conceptualize the role of higher attention control among anxious youth.

Statement of contribution

What is already known on this subject?

- Cognitive errors are prevalent in anxious youth
- Anxious children show socio-emotion deficits

What does this study add?

- Cognitive errors are related to socio-emotion deficits in anxious youth
- Relations depend on attention control

Anxiety disorders are among the most common psychiatric problems in children with prevalence estimates usually ranging from 3% to 24% (Cartwright-Hatton, McNicol, & Doubleday, 2006; Ford, Goodman, & Meltzer, 2003; Kroes *et al.*, 2001). Typical among anxious children is a tendency to engage in maladaptive ways of regulating and expressing emotions, with some suggesting that anxious children are more reluctant to express their emotions for fear of social rejection (Barlow, 2002; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Jacob, Suveg, & Whitehead, 2014). In addition, several studies have found relations between emotional difficulties and poor social functioning in children (Eisenberg *et al.*, 1995, 2000; Hubbard & Coie, 1994) and data show that anxious children are less socially

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competent than their non-anxious peers (Chansky & Kendall, 1997; Motoca, Williams, & Silverman, 2012).

From a disorder taxonomy perspective, the relations between anxious children's emotion expression and social competencies could be explained in terms of construct overlap relevant to anxiety disorder features (e.g., social anxiety disorder and poor social skills overlap; Cartwright-Hatton, Hodges, & Porter, 2003; Cartwright-Hatton, Tschernitz, & Gomersall, 2005; Spence, Donovan, & Brechman-Toussaint, 1999). However, social information processing and affective social competence models offer an alternative and useful framework to understand emotion and social competence, particularly among anxious children (Crick & Dodge, 1994; Daleiden & Vasey, 1997; Halberstadt, Denham, & Dunsmore, 2001; Kendall & Ronan, 1990; Lemerise & Arsenio, 2000). Hypothetically, and guided by theory (Crick & Dodge, 1994; Daleiden & Vasey, 1997; Halberstadt *et al.*, 2001; Kendall & Ronan, 1990; Lemerise & Arsenio, 2000), children's negative cognitions, emotion expression, and competences may work in a cyclical process, such that cognitive distortions (e.g., negative misinterpretations of ambiguous situations, faulty ways of thinking) could increase motivation to engage in greater suppression of emotion expression relevant to anxiety-provoking situations. In turn, suppressed emotion expression may result in poor competence from the avoidance and perceived low self-efficacy for handling such situations. For example, children who blame themselves for negative social outcomes may develop a reluctance to express emotion to deter negative consequences, which then could interfere with social skill gains and even lower self-efficacy for coping with situations. As such, suppressed emotion expression may serve to downregulate the experience of anxiety and negative cognitive interpretations during social situations. While these relations have been alluded (Butler, Lee, & Gross, 2007; Butler *et al.*, 2003; Jacob *et al.*, 2014; Lemerise & Arsenio, 2000; Schneider, Hempel, & Lynch, 2013; Zeman, Cassano, Perry-Parrish, & Stegal, 2006), no study has examined whether cognitive distortions are related to reluctance to express emotion and social skill competence in anxious children.

With this research, we therefore sought to shed some light on the relations among cognitive distortions, reluctance to express emotion, and social competence. We were focused on two questions: (1) Are cognitive distortions related to reluctance to express emotion and social competence? (2) Are cognitive distortions related to social competence via reluctance to express emotion and high attention control? There are two main reasons why answering these questions are important to extending the anxiety literature and better understanding socio-emotional problems among anxious children. First, this study allowed us to elucidate on 'how' cognitive distortions (a well-established risk factor for anxiety disorder development and maintenance) may negatively influence socio-affective functioning among anxious children, as proposed in socio-affective information processing models, but not yet directly tested. This study is also critical in practical terms, such we are able to identify a potentially important target of change (i.e., reluctance to express emotion or emotional suppression) while treating high anxiety (e.g., cognitive behavioural therapy). Secondly, this study allows us to determine whether this theorized social-affective process is applicable for 'certain' anxious children who may be more capable of suppressing emotions (i.e., higher attention control) and thus would possibly benefit more from weakening the relation between cognitive distortions and a reluctance to express emotion during treatment.

We hypothesized that cognitive distortions are related to reluctance to express emotion, and social skill competence in anxious children. We also hypothesized a moderated mediation model in which anxious children's reluctance to express emotion

would at least partially explain the relation between cognitive distortions and social skill competences, although only for those more capable of suppressing emotional expression (i.e., with higher attention control). Given that past research has shown some social skill deficits may be specifically related to social fears or concerns in highly anxious children (Scharfstein & Beidel, 2015), social anxiety levels were carefully considered in the analyses. To arrive at our hypotheses, we first considered evidence showing cognitive distortions are common among anxious children, as young as 6 years old (Cannon & Weems, 2010; Epkins, 1996; Leitenberg, Yost, & Carroll-Wilson, 1986; Maric, Heyne, van Widenfelt, & Westenberg, 2011) and that anxious children tend to experience more cognitive distortions than their non-anxious peers, with distortions linked to more anxiety symptoms (e.g., Cannon & Weems, 2010; Epkins, 1996; Weems, Berman, Silverman, & Saavedra, 2001). Second, we considered data showing that children with higher anxiety levels generally exhibit deficits in social competency as reported by children themselves, parents, peers, and independent behavioural observers (Brumariu & Kerns, 2013; Chansky & Kendall, 1997; Motoca *et al.*, 2012; Scharfstein & Beidel, 2015; Spence *et al.*, 1999; Strauss, Lease, Kazdin, Dulcan, & Last, 1989). Third, we found some research indicating that higher levels of anxiety among children (from community and clinic samples) are related to a greater reluctance to express emotion (e.g., prefer to keep feelings to themselves; not show their feelings to others when sad or upset; Penza-Clyve & Zeman, 2002; Suveg & Zeman, 2004; Zeman, Shipman, & Penza-Clyve, 2001).

In addition, Jacob *et al.* (2014) reported those children with high anxiety and who are more reluctant to express their emotions also report feeling more socially isolated. However, Jacob *et al.* (2014) did not find a significant relation between anxious youth's reluctance to express emotion and social competence. One possible explanation is that anxious children with higher attention control may be more capable of suppressing their emotion expression. Our thinking that attention control would have such moderating effect is because, as explained by Eisenberg, Hofer, and Vaughan (2007), children may use their ability to control attention processes to achieve socially inappropriate goals, such as suppressing emotional expression during socially demanding situations. Also, our attention control hypothesis is guided by Henderson (2010), the only study that examined and showed positive relations among shyness, negative attribution styles, and social anxiety, but for children showing better performance and fewer errors on the Flanker task. We found no studies examining whether anxious children's reluctance to express emotion explains the relation between cognitive distortions and social skill competences, or any studies evaluating the possible role of attention control. We therefore sought to test whether cognitive distortions across two developmentally appropriate domains (social, academic) would positively predict reluctance to express emotion and negatively predict social skill competence, even after controlling for social anxiety disorder symptoms. We also tested the role of attention control on the concurrent effects from cognitive distortions to reluctance to express emotion and from reluctance to express emotion to social skill competence.

Method

Participants

Data corresponding to 111 children from 9 to 12 years of age ($M_{\text{age}} = 9.63$, $SD = 0.73$; 75.7% girls) with elevated anxiety were examined in this study. Elevated anxiety was

determined via the established cut score of 42 or higher ($M = 55.47$, $SD = 12.02$) on the *Spence Children's Anxiety Scale* (Spence, 1997, 1998), after screening 702 youth attending public schools (Holly, Little, Pina, & Caterino, 2015). Approximately 56% were Hispanic/Latino ($n = 62$), 33% were Caucasian ($n = 37$), 7% were Native American ($n = 8$), 2% were African American ($n = 2$), 1% self-identified as 'Other' ($n = 1$), and 1% did not report ethnicity ($n = 1$). The average family income for the past 12 months was approximately \$40,000 per year with 41% of parents reporting income of between \$0 and \$25,000, 14% reporting between \$25,001 and \$40,000, 43% reporting between \$40,001 and over \$100,000, and 1% not reporting income ($n = 1$).

Measures

Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) measures a wide spectrum of common paediatric anxiety symptoms, including social anxiety via nine items to which children respond using a 4-point scale (0 = never true, 3 = often true). Baldwin and Dadds (2007) found the MASC social anxiety scale to correlate significantly with the Spence Children's Anxiety Scale ($r = .76$). The internal consistency estimate was .77 for the MASC social anxiety scale in this study.

Children's Negative Cognitive Error Questionnaire (CNCEQ; Leitenberg et al., 1986) measures children's cognitive distortions made in response to ambiguous situations. For this study, the 16 items corresponding to the social and academic domains were administered and children rated how similar the thought presented in a vignette was to their own thought via a 4-point scale. Items are scored as 0 (not like I would think), 1 (only a little like I would think), 2 (a lot like I would think), and 3 (almost exactly like I would think). In Leitenberg et al. (1986) and Watts and Weems (2006), cognitive distortions measured via the CNCEQ differentiated anxious from non-anxious. The internal consistency estimate in this study was .65 and .65 for cognitive distortions in the social and academic scales, respectively.

Emotion Expression Scale for Children (EESC; Penza-Clyve & Zeman, 2002) assesses emotional awareness (eight items) and reluctance to express emotion (eight items) to which children report the extent to which each statement is true via a 5-point scale. Items are scored as 1 (not at all true), 2 (a little true), 3 (somewhat true), 4 (very true), and 5 (extremely true). We used the reluctance to express emotion scale in this study. In Penza-Clyve and Zeman (2002), the reluctance to express emotion scale was significantly correlated with emotion inhibition, dysregulated emotion expression, and emotion control. The internal consistency estimate was .65 for the reluctance to express emotion scale in this study.

Social Skills Improvement Rating System (SSIS-RS; Gresham & Elliott, 2008) assesses social skill competences via 46 items to which children report the extent a statement is true on a 4-point scale. Items are scored as 0 (not true), 1 (a little true), 2 (a lot true), and 3 (very true). In Gresham, Elliot, Cook, Vance, and Keller (2010), child self-reports on the SSIS-RS are highly consistent with other sources (parents, teachers). The internal consistency estimate was .91 for total social skill competence scale in this study.

Early Adolescent Temperament Questionnaire – Revised (EATQ-R; Ellis & Rothbart, 2001) assesses attention control via six items based on parent report and via a 5-point scale. Items are scored as 1 (almost always untrue of your child), 2 (usually untrue of your child), 3 (sometimes true, sometimes untrue of your child), and 4 (usually true of your child), and 5 (almost always true of your child). Muris and Meester (2009) found a

significant correlation between attention control and anxiety ($r = -.42$). The internal consistency estimate was .71 for attention control scale in this study.

Procedure

All study procedures were approved by the university's Institutional Review Board. Children were recruited from nine public elementary schools after primary caregiver or legal guardian provided consent. With parent consent (assent from child), all participants completed a battery of questionnaires by trained research staff who read the items while children provided responses to each measure.

Data analytic plan

We conducted preliminary analyses to identify influential cases and associations that might have masked basic trends and relations in the data set. Missing data were tested for bias by dummy coding each case for missingness, which was then correlated with child sociodemographic characteristics (age, gender, ethnicity, and family income), social anxiety symptoms, and the study's focal variables (cognitive distortions, reluctance to express emotion, attention control, and social skill competence). We calculated bivariate correlations to examine the associations between cognitive distortions (overall cognitive distortions, as well as more specific social- and academic-related cognitive distortions), reluctance to express emotion, attention control, and social skill competence. We conducted a series of regression analyses to examine whether cognitive distortions predict reluctance to express emotion and social competence. Social anxiety symptoms (served as a covariate) and either social or academic cognitive distortions were entered into the model with either reluctance to express emotion or social skill competence serving as the criterion variable.

We next evaluated a moderated mediation model (see Figure 1) in order to examine whether cognitive distortions predict social competence via reluctance to express emotion and high attention control. We tested the conditional indirect effects of cognitive distortions on social skill competence via reluctance to express emotion and at varying levels of attention control ($-1SD$, mean, and $+1SD$) using a bootstrapping method (see Hayes, 2009 and MacKinnon, Lockwood, & Williams, 2004 for in-depth review) implemented in the Process macro for SPSS 22.0 (Hayes, 2013). We tested the model using cognitive distortions specifically related to peer interactions within a social and academic context. Consistent with Preacher, Rucker, and Hayes (2007), our moderated indirect path models were special cases in which a variable (attention control) moderates the 'b' path (reluctance to express emotion predicting social skill competence) but not the 'a' path (cognitive distortion predicting reluctance to express emotion). We followed the recommendation of Preacher *et al.* (2007) and used a modified product of coefficients [$a(b_1 + b_3W)$] to test each conditional indirect effect at one standard deviation above and below the mean of attention control (i.e., W is the value of attentional control at $-1SD$, mean, or $+1SD$). Bias-corrected bootstrapped 95% confidence intervals were used to test the significance of the indirect effects, such that if zero does not fall within the bias-corrected confidence interval, then one can conclude that with 95% confidence that the indirect effect is not zero and conceptually is equivalent to the indirect effect being significantly different from zero (Hayes, 2009; MacKinnon *et al.*, 2004; Preacher *et al.*, 2007). In addition, we calculated and tested for the significance of simple

slopes for each conditional ‘ b_1 ’ path (i.e., $b_1 + b_3W$). We re-tested the models with social anxiety symptoms (as measured by the MASC) serving as a theoretically relevant covariate to ascertain the robustness of the findings.

Results

Preliminary analyses

Inspection of variable distributions and bivariate scatterplots showed one case was three standard deviations below the mean on the SSIS-RS and this case showed a significant impact on estimation of the residuals for most of the regression models (Studentized Deleted Residuals; SDR; Neter, Wasserman, & Kutner, 1989; $SDR > 3.0$). As a result, the case was excluded from further analyses. Two additional cases were missing the EAQT-R, and a fourth case was missing the SSIS-RS. Nonsignificant correlations between missingness and the study’s focal variables were found suggesting data could be treated as missing at random (Allison, 2002). Bivariate correlations between child sociodemographic characteristics (age, gender, ethnicity, and family income) and the study’s focal variables revealed no significant relations to cognitive distortions, reluctance to express emotion, attention control, and social skill competence. As such, child sociodemographic characteristics were not included in subsequent analyses.

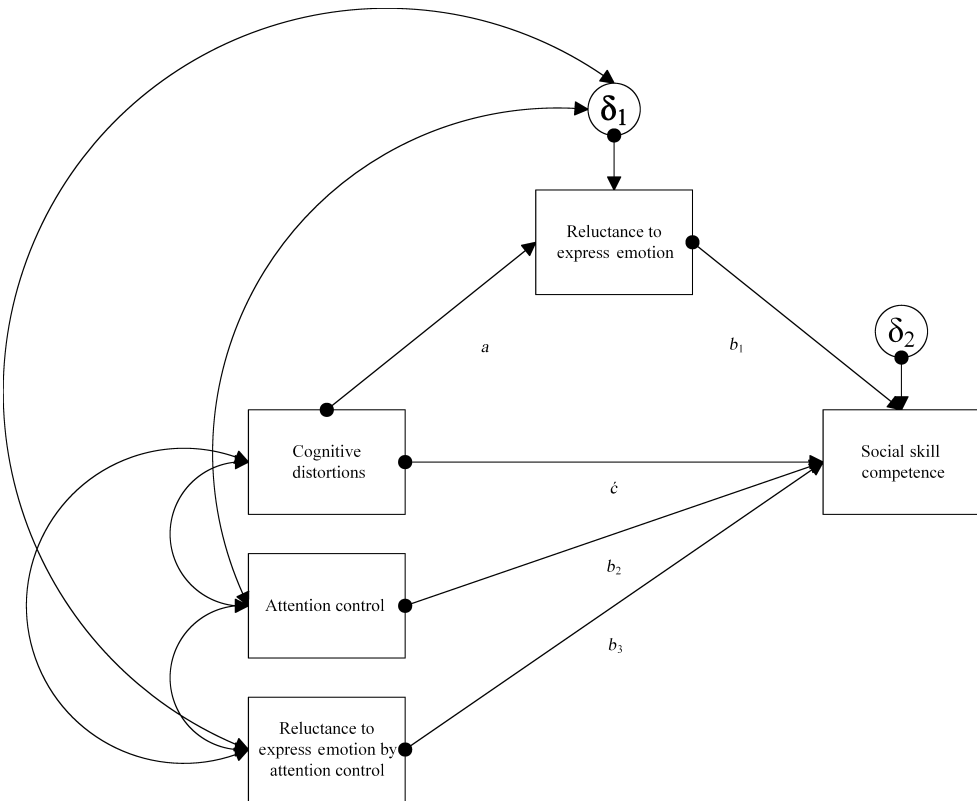


Figure 1. Moderated indirect model of cognitive distortions predicting social skill competence via reluctance to express emotion as function of varying levels of attention control.

Table 1 shows correlations, means, and standard deviations for the study's focal variables (social anxiety symptom levels were included in the Table). As shown in Table 1, reluctance to express emotion was positively correlated with cognitive distortions and anxiety (r 's = .21 to .36), and marginally negatively correlated with social skill competence ($r = -.18$). Academic and social cognitive distortions were both negatively correlated with social skill competence (r 's = $-.29$ and $-.39$, respectively), and attention control showed no significant correlations with any focal variable.

Are cognitive distortions related to reluctance to express emotion and social competence?

Results from the regression analyses are shown in Table 2. Overall, cognitive distortions in the social domain and academic domain accounted for a significant proportion of variance in reluctance to express emotion (Model 1: $F [2, 106] = 9.35, p < .001$; Model 2: $F [2, 106] = 13.04, p < .001$, respectively) and social competence (Model 3: $F [2, 106] = 9.72, p < .001$; Model 4: $F [2, 106] = 5.07, p = .008$, respectively). Reluctance to express emotion was significantly positively related to distortions in the social domain ($\beta = .20$) and distortions in the academic domain ($\beta = .30$). Social skill competence was significantly negatively related to distortions in the social domain ($\beta = -.38$) and distortions in the academic domain ($\beta = -.29$). MASC social anxiety symptoms were related to reluctance to express emotion but not significantly related to social skill competence.

Are cognitive distortions related to social competence via reluctance to express emotion and high attention control?

Table 3 shows that social and academic cognitive distortions were positively related to reluctance to express emotion ($B = .28$ [95% CIs: 0.02, 0.54]; $B = .46$ [95% CIs: 0.23, 0.71]) and negatively related to social skill competence ($B = -1.44$ [95% CIs: $-2.16, -0.72$]; $B = -.89$ [95% CIs: $-1.64, -0.14$]). Reluctance to express emotion was not significantly related to social skill competence in either model, including social or academic cognitive distortions ($B = -.24$ [95% CIs: $-0.77, 0.29$]; $B = -.25$ [95% CIs: $-0.82, 0.33$]). The interaction (see results for b_3 in Table 3) between reluctance to express emotion and attention control was related to social competence. This interaction was observed for cognitive distortions in the academic domain ($B = -.71, 95\% \text{ CIs: } -1.42, -0.01$), but not in the social domain ($B = -.63$ [95% CIs: $-1.30, 0.04$]). As shown in Table 4, tests of conditional indirect effect estimates (ab) for the significant interaction at high levels (+1 SD) of attention control revealed that reluctance to express emotion was negatively related to social skill competence ($b = -.35$ [95% CIs: $-0.82, -0.04$]). For children with greater attentional control, higher cognitive distortions in the academic domain were related to greater reluctance to express emotion, which in turn was significantly related to lower social skill competence. This was not true for children at mean levels or one standard deviation below the mean in attention control ($B = -.11$ [95% CIs: $-0.40, 0.14$] or $B = .12$ [95% CIs: $-0.19, 0.53$]). Controlling for social anxiety symptoms in the models did not change the pattern of results in any model.

Discussion

This research sought to shed some light on the relations among cognitive distortions, reluctance to express emotion, and social competence by asking two interrelated, but

Table 1. Zero-order correlations, means, and standard deviations among children’s cognitions, temperament, and social skills

	1	2	3	4	5	Mean	SD
1. Social cognitive distortions (CNEQC)						18.06	4.22
2. Academic cognitive distortions (CNEQC)	.54**					18.56	4.36
3. Reluctance to express emotion (EESC)	.21*	.36**				23.32	5.83
4. Attention control (EATQ-R)	.05	-.09	-.16			3.20	.72
5. Social skill competence (SSIS-R)	-.39**	-.29**	-.18 [†]	.14		103.24	16.75
6. Social anxiety (MASC)	.06	.24*	.34**	-.07	-.10	16.47	5.49

Note. CNCEQ = Children’s Negative Cognitive Error Questionnaire for Children; EESC = Emotion Expression Scale for Children; EATQ-R = Early Adolescent Temperament Questionnaire – Revised; SSIS-RS = Social Skill Improvement Rating System; MASC = Multidimensional Anxiety Scale for Children. ***p* < .01; **p* < .05; [†]*p* = .058.

Table 2. Summary findings from multiple regression analyses predicting reluctance to express emotion and social skill competence from cognitive distortions

Predictors	Reluctance to express emotion						Social skill competence					
	R ²	B	SE	β	t	<i>p</i>	R ²	B	SE	β	t	<i>p</i>
	Model 1						Model 3					
Social anxiety symptoms	.15	.34	.10	.32	3.59	<.001	.16	-.23	.27	-.08	.84	.40
Social cognitive distortions		.28	.13	.20	2.20	.03		-1.48	.36	-.38	4.39	<.001
	Model 2						Model 4					
Social anxiety symptoms	.20	.28	.10	.26	2.91	.004	.09	-.09	.29	-.03	.30	.76
Academic cognitive distortions		.40	.12	.30	3.34	.001		-1.10	.37	-.29	2.99	.004

Note. Social cognitive distortions and academic distortions were entered as a predictor (along with social anxiety symptoms) in separate models. Entering age, grade level, and ethnicity as covariates in the model did not change the pattern of results.

distinct questions. First, we wanted to know whether cognitive distortions were related to reluctance to express emotion and social competence among anxious youth, even after accounting for social anxiety symptoms? As hypothesized, the results of our study showed that cognitive distortions in both the academic and social domains were significantly related to reluctance to express emotion and social competence, regardless of their social anxiety symptoms. Second, we wanted to know whether cognitive distortions were related to social competences via reluctance to express emotion and high attention

Table 3. Unconditional direct effects of cognitive distortions predicting reluctance to express emotion (a), reluctance to express emotion predicting social skill competence (b_1), and cognitive distortions (c'), attention control (b_2), and reluctance to express emotion by attention control interaction (b_3) predicting social skill competence

Cognitive distortion model	a [95% CI]	b_1 [95% CI]	b_2 [95% CI]	b_3 [95% CI]	c' [95% CI]
Social distortions	0.28 [0.02, 0.54] ^a	-0.24 [-0.77, 0.29]	4.07 [-0.10, 8.24]	-0.63 [-1.30, 0.04]	-1.44 [-2.16, 0.72] ^a
Academic distortions	0.46 [0.23, 0.71] ^a	-0.25 [-0.82, 0.33]	3.28 [-1.08, 7.64]	-0.71 [-1.41, -0.01] ^a	-0.89 [-0.164, -0.14] ^a

Note. ^aConfidence interval does not include zero and is considered significant. Unstandardized parameter estimates are reported. The pattern of results remained significant after controlling for social anxiety symptoms.

Table 4. Conditional indirect effects of cognitive distortions predicting social skill competence via reluctance to express emotion (*ab*) as a function of attention control

	+1 SD attention control	Mean attention control	-1 SD attention control
Cognitive distortion model	<i>ab</i> [95% CI]	<i>ab</i> [95% CI]	<i>ab</i> [95% CI]
Social distortions	-0.19 [-0.61, 0.00]	-0.06 [-0.36, 0.05]	0.06 [-0.11, 0.38]
Academic distortions	-0.35 [-0.82, -0.04] ^a	-0.11 [-0.40, 0.14]	0.12 [-0.19, 0.53]

Note. ^aConfidence interval does not include zero and is considered significant. Each 'ab' value is a conditional indirect effect of cognitive distortions (total, social, or academic) on social skill competence via reluctance to express emotion and was calculated using the following formula $M_i = a_i b_{1i} + b_{3i} V$ (V represents the value of attention control [centred] at +1SD [-0.72], mean [0], and -1SD [0.72]). The pattern of results remained significant after controlling for social anxiety symptoms.

control? Again and as hypothesized, our results demonstrated that reluctance to express emotion explained the relation between cognitive distortions in the academic domain (not the social domain) and social skill competences, but only for youth more capable of suppressing emotional expression as indexed by higher attention control. As such, our findings offered partial support for the second hypothesis, as reluctance to express emotion did not explain the relation between cognitive distortions in the social domain and social skill competences.

The central role of cognitive biases in child anxiety has been widely recognized (Barlow, 2002; Beck & Emery, 1985; Chorpita & Barlow, 1998; Gallagher, Bentley, & Barlow, 2014; Weems, Costa, Watts, Taylor, & Cannon, 2007; Weems & Silverman, 2006). On the other hand, systematic research on the suppression of emotional expression and childhood anxiety has received little attention; besides by a small investigative team (Jacob *et al.*, 2014; Penza-Clyve & Zeman, 2002; Suveg & Zeman, 2004; Zeman *et al.*, 2001). Also, in the emotion regulation literature, some have noted that the adaptive nature of attention control may depend on the goals of the child (Eisenberg *et al.*, 2007; Rothbart & Sheese, 2007), but again systematic research in this area is scant and no study has considered the relation between children's attention control and emotion suppression. This study is therefore significant in advancing these research areas. Conceptually, anxious children might be inclined to suppress emotional expressions in an effort to overregulate arousal from feared situations, as the arousal might be more unacceptable by others than a socially inappropriate attention control strategy, for example, looking away while reading in front of the class to downregulate anxious arousal expressions – voice cracking – from the fear of making a mistake. This is, in part, what some have described as maladaptive responses that implicate attentional and memory biases typical in child internalizing problem aetiology (Epkins, 1996; Leitenberg *et al.*, 1986; Weems *et al.*, 2001).

Although this study augments knowledge relevant to social information processing and affective social competence models (e.g., Daleiden & Vasey, 1997; Halberstadt *et al.*, 2001; Lemerise & Arsenio, 2000) by suggesting that distorted negative cognitions and efforts to suppress emotional expression may lead to emotional and social difficulties in anxious children, two important caveats need to be recognized. First, the most important findings emerged from the moderated indirect model with multiple variables, a small sample size, and multiple tests that increased Type I error. Second, the inclusion criterion constrains generalizability of the findings so that they cannot be generalized to youth who

are not highly anxious. For these reasons, it is important that findings from this study be replicated. In addition, while secondary analyses of these data allowed for an opportunity to gain some sense about the relations among the focal variables, lack of longitudinal data precludes testing the directionality of the relations between cognitive biases, emotional suppression, and social skill competences among anxious youth. Also, the measurement approach limits the findings as it focused exclusively on self-reports, albeit sensible for the exploratory nature of this research. Therefore, utilizing tasks in subsequent studies that may elicit momentary cognitive biases and emotional suppression among anxious youth, as well as using behavioural observations to assess peer social interactions (e.g., Hessler & Fainsilber Katz, 2007; Muris *et al.*, 2009; Roy *et al.*, 2008), could strengthen the internal and ecological validity of our findings. That is, anxious children may overestimate their ability to hide their feelings from others, while cognitive biases are activated, or underestimate their general level of social skills functioning (pp. 45–53; Beck & Emery, 1985). Finally, while the relatively small sample size is justifiable given our focus on highly anxious youth, it is possible that null findings reflect a lack of statistical power and also limits our ability to test possible moderating factors influencing relations within the model (e.g., gender, ethnicity/race; Anderson & Mayes, 2010; Brody, 2000). Future studies will need to test our hypotheses using a larger sample size and separately for gender and ethnicity. For example, highly anxious children of Hispanic/Latino and Caucasian decent may culturally respond differently to cognitive distortions, such that the former may be more apt (or better able) to internalize or suppress emotional expression as evidenced in collective cultures, while the latter may tend to openly express their negative emotions (or be less capable of controlling emotional expression) to others as seen in individualistic cultures (De Leersnyder, Boiger, & Mesquita, 2013) thus differentially influencing the development of social skill competence.

Taken altogether, a next critical objective beyond the present study is to identify the nature of the interrelations among cognitive distortions in the academic domain, reluctance to express emotion, and attention control. There are a couple of ways researchers could achieve this task. First, longitudinal designs that measure our variables of interest from late childhood into early adolescence may help to establish a pattern of temporal precedence and the potential role of moderating factors across development. That is, we would expect based on our current findings and studies with adults (e.g., Szasz, Szentagotai, & Hofmann, 2012) that cognitive distortions that arise in late childhood would precede motivations to suppress emotional expression across this transition period. In turn, emotional suppression may result in deficits in social functioning in adolescence, but only for those anxious youth capable of quelling emotional expressions (i.e., youth with higher attention control; Eisenberg *et al.*, 2007; Jacob *et al.*, 2014; Lemerise & Arsenio, 2000). Second, experimental designs may help to disentangle the dynamic, momentary activation of emotion suppression in response to academic cognitive biases and ensuing interpersonal consequences among anxious children with higher (vs. lower) attention control. For example, one could randomly assign anxious youth (with higher or lower attention control) to be presented with either positive or ambiguous stimuli intended to activate different cognitive processes. For example, they could watch and listen to a vignette about other children laughing in the classroom as they pretend to give a speech to the class, which may elicit catastrophizing thoughts (e.g., Baily & Ostrov, 2008; Epkins, 1996; Leitenberg *et al.*, 1986). They could then participate in an academic group activity prone to elicit emotional expressions (e.g., answer difficult mathematical problems and explain their answers to the group) that will be observed for overt emotional expressions (or suppression) and general social skills functioning.

In summary, this study makes several incremental contributions to the anxiety literature, both theoretically and practically. First, our findings suggest that social and academic cognitive distortions often experienced by highly anxious children may have a more direct impact on their socio-emotional functioning beyond the influence of anxiety alone. That is, we found that even after controlling for the effects of social anxiety symptoms, cognitive distortions were related a greater motivation to suppress emotional expression and poorer social skill competence. Second, the findings provide initial support for explaining ‘how’ academic cognitive distortions may impact the socio-affective functioning among anxious children, as previously proposed by socio-affective information processing models (Crick & Dodge, 1994; Daleiden & Vasey, 1997; Halberstadt *et al.*, 2001; Kendall & Ronan, 1990; Lemerise & Arsenio, 2000). More specifically, academic cognitive distortions seem to motivate children to suppress their emotions, which in turn may lead to deficit in social skill competence, although our findings should be replicated using a larger sample, multimethod approach, and longitudinal methods. Third, our findings may have implications for clinical practice, such that therapists using cognitive-based treatments (e.g., CBT) should explore how anxious youth emotionally respond to cognitive distortions (i.e., do they want to suppress their emotions), specifically among those anxious children who tend to be more capable of attention control.

Acknowledgements

This work was supported in part by grant numbers K01MH086687 and L60MD001839 from the National Institute of Mental Health and the National Center on Minority Health and Health Disparities awarded to A. Pina, as well as a prevention science fellowship awarded to B.G. Scott, T32 MH018387 27 from the National Institute of Mental Health. The content is solely the responsibility of the authors and does not represent the official views of the funding agency

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Received 7 May 2017; revised version received 26 September 2017