
Social–Emotional Attention in School-Age Children: A Call for School-Based Intervention during COVID-19 and Distance Learning

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Early research indicates that the COVID-19 pandemic and subsequent regulations put children at increased risk of negative mood, anxiety, attention difficulties, and social challenges. Concordantly, these difficulties also are associated with deficits in social–emotional attention in children. On a daily basis, students are required to process and respond to a large amount of complex social–emotional information, including attending to teachers and interacting with peers. These attentional demands and associated stressors have increased as students are required to stare at computer screens during online learning as a result of COVID-19 restrictions. However, there is a dearth of research that investigates the role of social and emotional information on attention in children. The present study assessed the effects of social relevance and emotional valence on attentional demands in children and how functioning is related to individual differences in symptoms and deficits that may be exacerbated by the COVID-19 pandemic. Results show that social and emotional information affect attention in children. Task performance also was associated with negative mood, social stress, and attention focus. This study highlights the need for school-based distance learning interventions to help ameliorate negative social–emotional risks of the COVID-19 pandemic in children. Potential effective avenues include mindfulness–based interventions and attention bias modification training.

KEY WORDS: *COVID-19; school-based intervention; social–emotional attention*

Most school experiences are inherently social and require consistent processing of social–emotional information. Currently, many educational institutions are increasing the use of distance learning methods during the COVID-19 pandemic. The pandemic and associated restrictions may have a host of impacts on psychological functioning in children; for example, significant increases in anxiety and depression following the COVID-19 outbreak have been reported (Duan et al., 2020). In addition, COVID-19 quarantine restrictions may alter children’s social–emotional development and lead to increased “clinginess,” inattention, irritability, and anxiety (Jiao et al., 2020). Results from preliminary research indicate that distance learning, in combination with the COVID-19 pandemic, presents an unprecedented set of additional social, emotional, and academic challenges for students who are typically targeted by school social work intervention (Brooks et al., 2020).

Research highlights the important and complex role attention plays in social and emotional behavior in children. Attention regulation, or the appropriate control of attention to best meet the demands of a given situation, has been linked to effective social competence and emotion regulation in children (Eisenberg, Champion, & Ma, 2004). Poor attention regulation is associated with many childhood challenges that also are linked to difficulties in social–emotional development including anxiety, depression, aggression, autism spectrum disorder, and attention-deficit/hyperactivity disorder (Sokhadze et al., 2012). Furthermore, attention mediates the relationship between emotional comprehension and academic competence (Rhoades, Warren, Domitrovich, & Greenberg, 2011), and two processes closely related to attention regulation, executive attention and self-regulation, predict school achievement and academic skills (Checa & Rueda, 2011).

Social workers favor behavioral or psychological interventions to target sexual health, aggression, self-esteem, school attendance, identity, and depression (Allen-Meares, Montgomery, & Kim, 2013), and attention-based interventions are often overlooked. Just as teachers must revise teaching methods and approaches to better meet the needs of children in a virtual learning environment (Dhawan, 2020), school social workers must make intervention adjustments to be effective on a virtual platform. Moreover, the implementation of distance learning and increased use of technology present a unique opportunity for school counselors and social workers to harness the potential therapeutic power of attention interventions. However, before implementation of such interventions, research is needed to better establish the relationship between attention and the potential risks to child social-emotional functioning caused by COVID-19. This research will help develop and guide effective social work interventions during this unique time.

Social and emotional information appear to be particularly salient and affect attention regulation (Lemerise & Arsenio, 2000). Therefore, investigating social-emotional processing in children is particularly relevant in the context of COVID-19 and distance learning where the attentional demands placed on children are higher and the social and emotional cues may be more complex and less overt than in traditional learning environments. During distance learning, students may be at increased risk of negative effects associated with difficulties in attentional regulation, including mood disorders and decreased social-emotional skills. It is imperative to explore the relationship between social-emotional functioning and attention regulation to inform school social work interventions to combat some of the potential negative effects of the COVID-19 pandemic on children.

PRESENT STUDY

The present study applied cognitive science methods to illuminate the unique and interactive effects of emotional and social information on attention regulation in children and investigated clinically relevant individual differences associated with attention regulation that may be particularly affected by distance learning and societal responses to COVID-19 including mood and emotion, social functioning, and attention variables. Based on previous liter-

ature, we hypothesized that participants with elevated difficulties in those areas would have more difficulty regulating their attention in the presence of social and emotional information. This study will help clarify the relationship between social-emotional attention regulation and clinically relevant outcomes. Results have the potential to directly inform the development of optimal interventions for students. Thus, a broader goal of this study is to promote interdisciplinary collaboration between cognitive science and social work with the hope of developing effective and practical evidence-based school interventions for children.

METHOD

Participants

Participants were recruited and all data were collected before the COVID-19 shutdown, between June 2019 and February 2020. Recruitment materials were distributed to private psychotherapy practices, schools, pediatric hospitals, online neighborhood and parenting groups, parks, and businesses. Twenty-eight children were included in the analyses ($M_{\text{age}} = 13.1 \pm 2.4$). Exclusion criteria included diagnosis of autism spectrum disorder, history of psychosis, use of extended-release stimulant medication, extreme difficulty with verbal communication, primary language other than English, inability to read at or above fourth-grade level, diagnosis of red-green color blindness, or IQ score ≤ 70 . See Table 1 for further details on the participant demographics.

Color Flanker Task

Understanding social-emotional information consists of attending to and compiling many pieces of information including body language, tone, context, and environment, and often includes processing and decoding information with conflicting emotional information. Therefore, the use of a conflict processing task that requires decision making in the face of potentially conflicting information (Kanske & Kotz, 2012) provides an effective, naturalistic measure with which to probe social-emotional attention. Flanker tasks are a common category of conflict processing task that require selective regulation of attention to a target while ignoring conflicting, surrounding stimuli that “flank” the target. We developed a color flanker task (Kanske & Kotz, 2012) to examine selective attentional control in the presence of social-emo-

Table 1: Sample Demographics

Factor	<i>M</i> ± <i>SD</i>	%
Biological sex		
Male		64
Female		36
Age (years)	13.14 ± 2.42	
IQ score	110 ± 12	
Race		
White/Caucasian		61
Black/African American		25
Biracial/multiracial		17
Asian/Pacific Islander		3
Hispanic		3
Prefer not to answer		3
Latino		17
Household annual income (\$)		
<24,999		3
25,000–49,000		6
50,000–74,000		8
75,000–100,000		25
>100,000		56
DSM-5 diagnoses		
Attention-deficit/hyperactivity disorder		14
Learning or other disability		11
Mood disorder (anxiety or depression)		6
No diagnoses		72
Participants engaged in therapy		22
Participants who take daily psychotropic medication		8

Notes: DSM-5 = *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition. Parents were able to select multiple racial groups, DSM-5 diagnoses, and psychotropic medications. Other learning or other disability included slow processing speed, sensory processing disorder, receptive language delay, non-red/green color blindness, dysgraphia. Therapy included group and individual therapy. Psychotropic medication included Concerta, sertraline, and Prozac.

tional information. In each trial, a series of three of the same word were presented in a column—the center word was the “target,” and the other two words were “flankers.” Participants were instructed to indicate the ink color of the target word via button press (counterbalanced across participants). Trials were congruent (all words the same color; that is, all red or all green) and incongruent (that is, the ink color of the target was opposite from the color of the flankers; for example, target in green, flankers in red). Incongruent trials (that is, high-conflict trials) are more difficult and require more attention regulation when compared with congruent trials (that is, low-conflict trials). Words used as stimuli varied in terms of how positive or

negative the word is, that is, valence (pleasant/positive, unpleasant/negative, or neutral) and social relevance (social or nonsocial). One hundred eighty words were used: 30 positive, socially relevant; 30 negative, socially relevant; 30 positive, nonsocial; 30 negative, nonsocial; and 60 neutral, nonsocial. Each word was used in one congruent and one incongruent trial, for a total of 360 trials divided into three blocks (see Figure 1). Performance on the flanker task is measured by trial accuracy and reaction time (RT). Faster RTs indicate improved performance due to less interference from or better attention regulation in the face of distracting information. Slower RTs may reflect more distraction or worse attention regulation on this task.

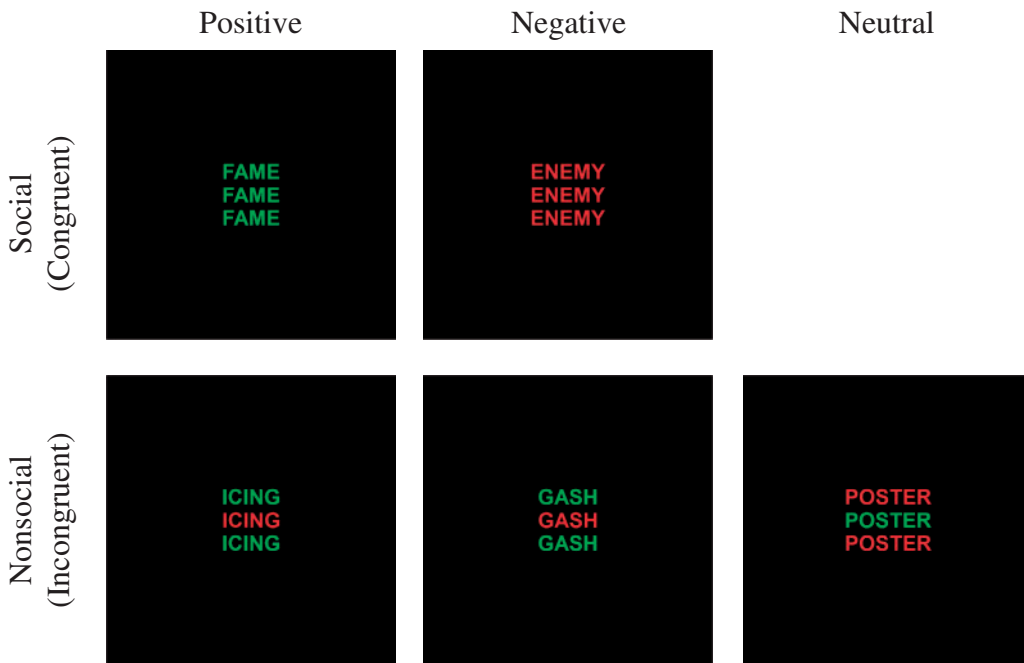
Measures

To assess mood and social variables, parents and participants completed the Behavior Assessment System for Children, third edition (BASC-3) (Reynolds & Kamphaus, 2015) and the Positive and Negative Affect Schedule for Children (PANAS-C) (Laurent et al., 1999). Participants also completed the How I Feel scale (HIF) (Walden, Harris, & Catron, 2003) and parents also completed the Social Responsiveness Scale, second edition (Constantino et al., 2003). To assess attention, participants completed the Attention Control Scale for Children (ACS-C) (Muris, de Jong, & Engelen, 2004). The vocabulary and block design subtests of the Wechsler Abbreviated Scale of Intelligence, second edition (WASI-II) (Wechsler, 2011) were administered to calculate a Full-Scale Intelligence Quotient score.

Procedures

All procedures were reviewed and approved by the university institutional review board. Participants and legal guardians provided assent and consent, respectively. While guardians completed report measures, participants received instructions on the color flanker task and performed a practice task until they reached ≥70 percent accuracy or completed three sets of practice trials. Immediately before the study task, participants completed PANAS-C. Participants completed three blocks of the color flanker task while inside a functional magnetic resonance imaging scanner. Then participants were administered WASI-II subtests and completed BASC-3, HIF, and ACS.

Figure 1: Example of the Color Flanker Task



Notes: These are examples of stimuli organized by valence and social relevance. There were no neutral social trials.

RESULTS

Only significant results including report measures are included in the following sections. Results that did not reach a significance level of $p < .05$ and significant results that did not include the report measure as a factor are not included.

Behavioral

To assess potential effects of socially relevant information and interactions with stimulus difficulty and emotional pleasantness, a congruency (congruent, incongruent) \times valence (positive, negative) \times social (social, nonsocial) repeated measures analysis of variance on RT was conducted.

The expected main effect of congruency was observed. There also was a congruency by social interaction. Although RTs were faster for congruent than incongruent trials across both social and nonsocial trials, the difference between congruent and incongruent RTs was larger for social than nonsocial trials (see Figure 2). Finally, there was a valence by social interaction. For social trials, RTs were faster for negative than positive stimuli. The opposite pattern was observed for nonsocial trials:

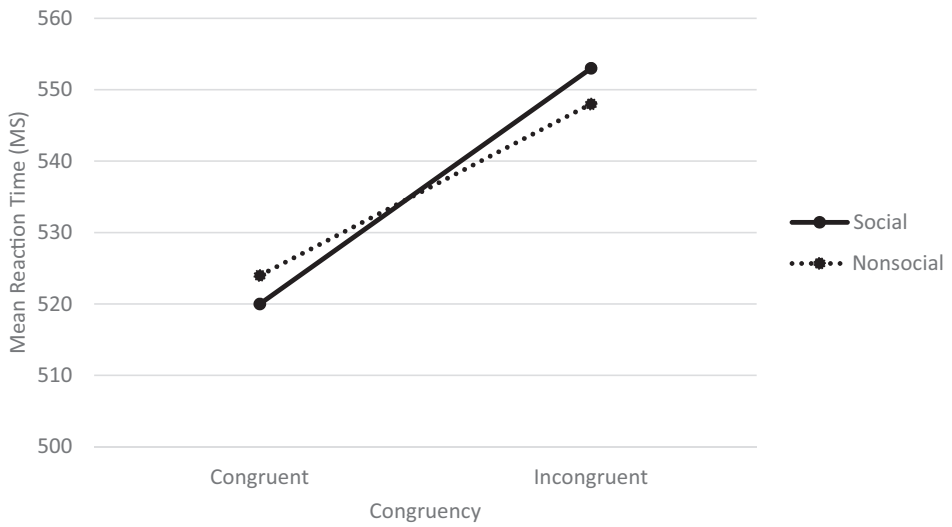
RTs were faster for positive than negative stimuli (see Figure 3). Thus, children were more attentive to negative social than positive social stimuli, but more attentive to positive nonsocial than negative nonsocial stimuli.

Clinically Relevant

To determine the influence of clinically meaningful individual differences, we conducted a separate congruency \times valence \times social \times report measure score multivariate analysis of variance for each report measure score of interest. Significant main effects of or interactions with a report measure were further investigated. Follow-up correlational or median split (separating participants who scored high versus low on the clinical measure) analyses were conducted.

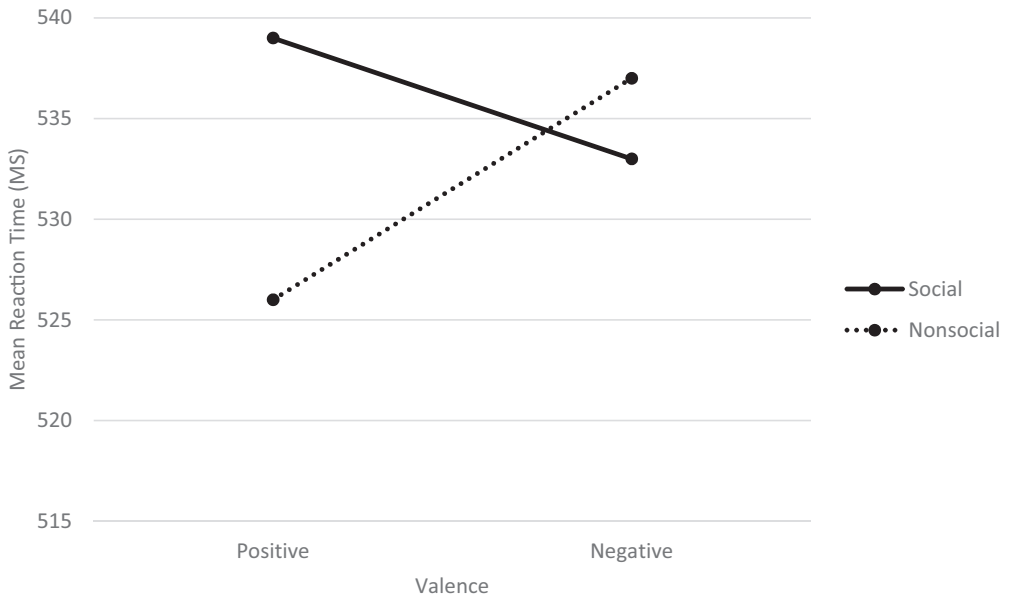
Emotion and Mood. There was a congruency by negative emotionality (as measured on the HIF) interaction. Follow-up analyses revealed a negative correlation between negative emotionality scores and RT on congruent trials, but not on incongruent trials. Thus, the higher participants' reported

Figure 2: Congruency × Social Interaction on Reaction Time



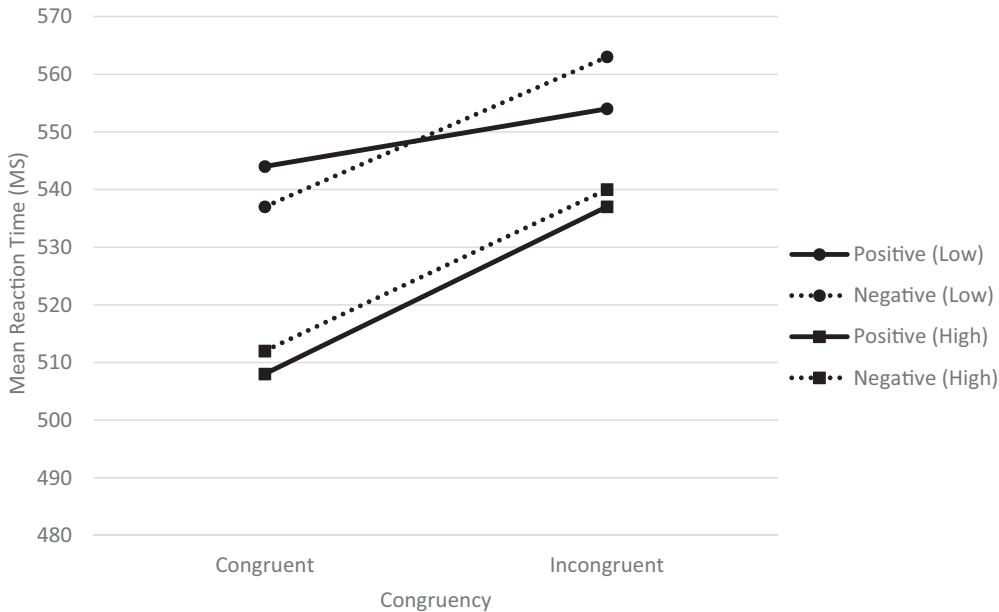
Note: MS = milliseconds.

Figure 3: Valence × Social Interaction on Reaction Time



Note: MS = milliseconds.

Figure 4: Congruence × Valence Interactions on Reaction Time for High and Low Social Stress Groups



Note: MS = milliseconds.

negative mood, the faster their RT was on low-conflict trials.

Social. There was a congruency × valence × social stress (as measured on BASC-3 self-report) interaction. Follow-up median split analyses revealed a trend congruency × valence interaction for low-stress participants not observed for high-stress participants (see Figure 4). Low-stress participants had faster RTs for negative than positive congruent trials, but displayed the opposite pattern for incongruent trials: faster RTs for positive than negative trials. There also was a trend valence × social × social stress interaction. Follow-up median split analyses revealed a valence × social interaction for high-stress participants not observed for low-stress participants (see Figure 5). High-stress participants had faster RTs for nonsocial trials than social positive trials, but RTs were similar for social and nonsocial negative trials.

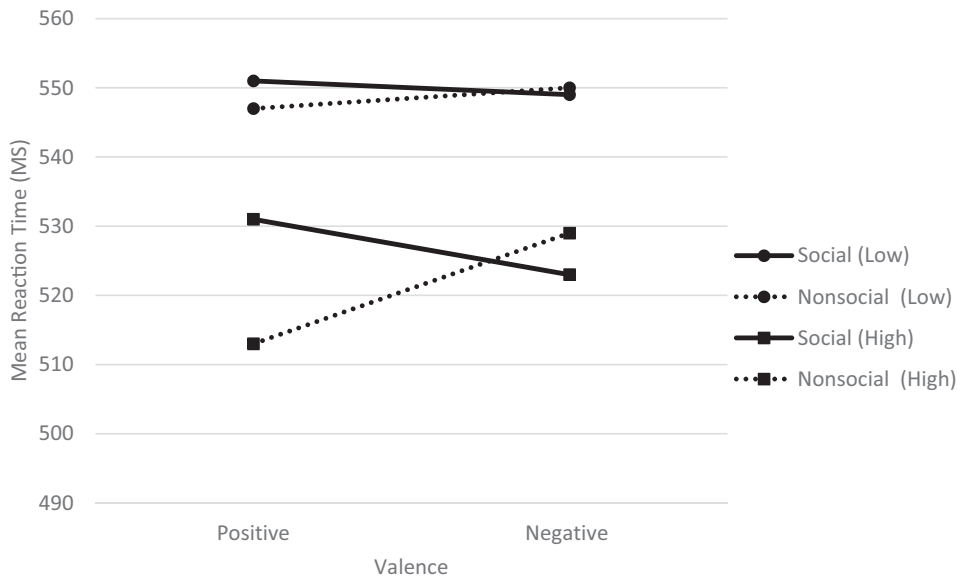
Attention. There was a congruency × valence × focus (as measured by the ACS) interaction. Follow-up median split analyses did not reveal

significant interactions for low- or high-focus participants.

DISCUSSION

The goal of the current study was to investigate how social, emotional, and attentional deficits are related and to inform how these difficulties may be exacerbated by the COVID-19 pandemic. Study results indicate that social and emotional information, independently and in conjunction, may influence attention performance. In addition, negative mood, social stress, and attention focus are related to attention performance. Together, these findings demonstrate the critical relationship between a child's social-emotional functioning and their ability to attend to information that is socially and emotionally salient. This speaks to why so many youths, faced with increased social and emotional stressors during the COVID-19 pandemic, are struggling with the increased attentional demands associated with online learning. Furthermore, the results of this study support the need for

Figure 5: Valence × Social Interactions on Reaction Time for High and Low Social Stress Groups



Note: MS = milliseconds.

social–emotional attention interventions for children and adolescents during distance learning and the COVID-19 pandemic.

The instructions for the flanker task developed for this study were to identify the ink color of the target word; therefore, the meaning and other aspects of the words were irrelevant to performance. The present study is the first to demonstrate that stimulus emotional valence, even when not relevant to the task, influences attention performance in children. This may be of particular importance in the context of the virtual classroom and counseling space; for example, a social worker portraying a positive valence (for example, excitement or happiness) may facilitate engagement in intervention and learning.

There is substantial evidence that performance on social–emotional attention tasks is influenced by mood factors. For example, children with anxiety disorders display an increased threat bias (Roy et al., 2008) and those with dysphoria or depression demonstrate increased attention bias to negative stimuli (see, for example, Gotlib, Krasnoperova, Yue, & Joormann, 2004). Here, we observed that higher negative mood was associated with faster responses

on lower-conflict (that is, congruent) trials. These results were somewhat surprising given (a) previous reports of an association between high levels of depressive symptoms and low attention regulation (Khosravi, Parker, Shuback, & Adleman, 2020) and (b) that children with clinical diagnoses commonly associated with negative mood (for example, depression) often have difficulties with attention (Kessler, Avenevoli, & Ries Merikangas, 2001). However, research suggests that negative mood may narrow attentional focus to negative stimuli (Gotlib et al., 2004). It is possible that participants with more negative mood had a narrowed attention focus, resulting in less interference and thus faster RTs. Of note, although this relationship was significant for congruent trials, we observed only a trend toward a similar relationship between negative mood and RT on higher-conflict, incongruent trials. This may indicate that effects of mood on attention were small and thus did not reach significance on higher-conflict, more difficult incongruent trials.

As rates of depression, anxiety, and other psychopathologies are on the rise in children during the COVID-19 pandemic, it is of particular importance to understand the relationship between social

stress and behavioral attention regulation in the presence of social and emotional information. Our results highlight that attention is influenced by both stimulus valence (that is, whether the stimulus is positive or negative) and social relevance. This research expands on previous research that did not consider the effects of stimulus social relevance. Moreover, the differential effects of stimulus valence and social relevance on attention were independently influenced by participant-reported social stress. These results provide preliminary evidence that children who have high amounts of social stress show different patterns of attention to social-emotional stimuli when compared with children with low social stress. Further research is needed to discern the nature of this relationship, and future research investigating individual differences in attention regulation should account for the effects of stimulus valence as well as social relevance.

Individuals with mood and attention disorders attend more to negative social information and feedback (for example, peer rejection) than those without such diagnoses (Paulson, Buermeyer, & Nelson-Gray, 2005), which may further reinforce the characteristics and symptoms associated with the disorders (that is, withdrawal, low self-esteem) (Wittenborn, Rahmandad, Rick, & Hosseinichimeh, 2016). As the COVID-19 pandemic may exacerbate difficulties with attention and mood regulation in children (Jiao et al., 2020), some children with underlying attentional and mood vulnerabilities may be at heightened risk for negative attention bias. Therefore, there is increased need for specific interventions to address potential social-emotional attentional biases during the pandemic. Some attention-based interventions, in particular those that modulate attention biases, have been effective in treating mood disorders such as anxiety (Eldar et al., 2012) and major depressive disorder (Yang, Zhang, Ding, & Xiao, 2016) in children. Thus, there is reason to believe attention-based interventions may help improve mood symptoms in children during the pandemic.

Most research on the effect of social stress on attention focuses on acute social stress, and results are mixed. Some research indicates that social stress increases sympathetic activation, which then improves attention processing efficiency (Giuliano et al., 2018). However, other studies show that chronic social stress leads to behavioral freezing and delayed RTs (Roelofs,

Bakvis, Hermans, van Pelt, & van Honk, 2007). The present study builds on the social stress and attention literature and is of particular relevance to children experiencing the COVID-19 pandemic because it examines the relationship between *chronic* social stress and task performance. Our findings indicate that social stress interacts with stimulus valence and task difficulty to affect performance. That is, participants who reported lower social stress responded more quickly to low-conflict than high-conflict trials in the presence of negative information, but this pattern was not seen in the presence of positive information. In addition, the relationship between stimulus valence and social stress on task performance was influenced by the social relevance of stimuli. Participants who reported higher levels of social stress responded more quickly to positive nonsocial than negative nonsocial trials, but revealed the opposite pattern (faster for negative than positive) on social trials. These results indicate that future studies on the effects of social stress on attention and conflict processing should consider *both* stimulus emotional valence and social relevance.

Of note, our data were collected before the COVID-19 shutdown. Given that adolescents have reported a significant increase in stress during the COVID-19 pandemic, citing loneliness and peer relationship difficulties as the major stressors (Ellis, Dumas, & Forbes, 2020), our results may underestimate the levels of stress that students have experienced during the pandemic. Escalations in social stress associated with the pandemic may put children at increased risk for attention regulation difficulties, particularly during distance learning. Our results suggest that attention may be influenced by task-irrelevant social and emotional information, even among children with lower levels of social stress. Thus, all children may benefit from social-emotional attention intervention and positive social engagement.

Intervention Recommendations

The present study establishes the relationship between social-emotional attention regulation and negative mood, social stress, and attention, highlighting the need for attention-based intervention for children during COVID-19. Two types of interventions have been shown to improve psychological functioning in children through changes in attention regulation: mindfulness-based inter-

vention (MBI) and attention bias modification (ABM). Some such interventions have also been modified for an online format, making them particularly useful for school social workers during COVID-19 and distance learning.

MBIs are effective in reducing stress and anxiety in nonclinical samples of children in school settings (Kallapiran, Koo, Kirubakaran, & Hancock, 2015). Changes in school routines associated with COVID-19 are associated with increased student stress (Lee, 2020), and the findings of the present study indicate that social stress and attention regulation are related. Through principles such as sustained attention to the present moment (Malinowski, 2008), school-administered MBIs improve both attention and mood outcomes in children (for example, Crescentini, Capurso, Furlan, & Fabbro, 2016). Therefore, MBIs may be useful in mitigating stress during the pandemic and improving attention regulation. Although virtual MBIs for children need further validation, there is evidence that MBIs can be effectively adapted to a virtual format for college students and adults (for example, Ahmad et al., 2020). Several school mindfulness interventions, for example, mindfulness-based stress reduction, mindfulness-based cognitive therapy, and acceptance-based meditation may be readily adapted to distance learning. As one example, an eight-week group MBI that involves guided mindfulness meditations (for example, mindful breathing, body scans), psychoeducation on stress and self-care, group sharing of experiences, and 15-minute homework assignments (Raes, Griffith, Van der Gucht, & Williams, 2014) may be effectively administered through distance learning.

Children with mood difficulties, especially anxiety, have a tendency to attend more to negative stimuli. Results from the present study indicate that even children without clinical anxiety may exhibit individual differences in attention related to the emotional valence and social relevance of stimuli. ABMs, originally developed for children with clinically diagnosed anxiety, train children to regulate their attention away from negative stimuli and toward positive stimuli and have been shown to improve anxiety symptoms (see, for example, Waters et al., 2016). Given our findings and the increased attentional demands placed on children during virtual learning, ABMs may be another therapeutic consideration. Moreover, there have been reported increases in child anxiety due to the pan-

demic (Jiao et al., 2020), and ABMs have been shown to decrease anxiety in children. Many ABMs were developed for computer administration and have been shown to be effective when administered at home, making them particularly useful during COVID-19 restrictions and distance learning. These computer-based interventions use cognitive science methods to train children to spend less time attending to negative emotional faces (Bar-Haim, Morag, & Glickman, 2011) or to seek out and attend to positive picture stimuli (for example, happy children, cute animals) (Waters et al., 2016).

LIMITATIONS

The findings of the present study should be considered in the context of its limitations. First, because participant recruitment was interrupted due to the COVID-19 shutdown, analyses were conducted on a relatively small sample. Nevertheless, we observed significant and clinically meaningful results with overall medium to large effect sizes. In addition, we used several report measures to best characterize the clinically meaningful variables of interest; however, because of the small sample size, we did not correct for multiple comparisons. Given these unprecedented times and the potential sizable, rapid impact that COVID-19 may have on child and adolescent psychological development, it is important to report any potential findings that could inform interventions as quickly as possible.

CONCLUSION

This study provides evidence that the influence of emotional and social information on attention performance may be affected by negative mood, social stress, and deficits in attention focus, all of which are at risk of being exacerbated during the COVID-19 pandemic. This study is relevant to school social workers as it elucidates the effects of task-irrelevant social and emotional information on attention. Presence of task-irrelevant social and emotional information is common in school and may affect student performance. Furthermore, processing social and emotional information may be particularly difficult and require increased attention during the online demands of distance learning. Because students may be increasingly vulnerable to negative outcomes associated with COVID-19 regulations and distance learning (for example, social stress, increases in mood difficulties, issues with attention), our results highlight the need for interven-

tions that target social–emotional attention. School social work interventions are important because they provide opportunities to underserved students (for example, minority groups, immigrants, and those in high–poverty areas) who may not otherwise have the means or resources to receive mental health services via private practices and are at increased risk of mental health difficulties during the pandemic (Fitzpatrick, Harris, & Drawve, 2020).

The current research underscores the need for social workers to implement interventions that target social–emotional attention to combat some of the most pressing mental health concerns for students during the COVID-19 pandemic. We recognize the strain on schools, teachers, counselors, and social workers to modify lesson plans and convert to distance learning. Therefore, it is imperative that schools and staff receive proper funding and support to implement interventions in addition to academic lessons. During these unprecedented times, student mental health must be a priority, and proactive steps are required. **CS**

REFERENCES

- Ahmad, F., El Morr, C., Ritvo, P., Othman, N., Moineddin, R., & MVC Team. (2020). An eight-week, web-based mindfulness virtual community intervention for students' mental health: Randomized controlled trial. *JMIR Mental Health*, *7*(2), e15520.
- Allen-Meares, P., Montgomery, K. L., & Kim, J. S. (2013). School-based social work interventions: A cross-national systematic review. *Social Work*, *58*, 253–262.
- Bar-Haim, Y., Morag, I., & Glickman, S. (2011). Training anxious children to disengage attention from threat: A randomized controlled trial. *Journal of Child Psychology and Psychiatry*, *52*, 861–869.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *Lancet*, *395*(10227), 912–920.
- Checa, P., & Rueda, M. R. (2011). Behavioral and brain measures of executive attention and school competence in late childhood. *Developmental Neuropsychology*, *36*, 1018–1032.
- Constantino, J. N., Davis, S. A., Todd, R. D., Schindler, M. K., Gross, M. M., Brophy, S. L., et al. (2003). Validation of a brief quantitative measure of autistic traits: Comparison of the Social Responsiveness Scale with the Autism Diagnostic Interview-Revised. *Journal of Autism & Developmental Disorders*, *33*, 427–433.
- Crescentini, C., Capurso, V., Furlan, S., & Fabbro, F. (2016). Mindfulness-oriented meditation for primary school children: Effects on attention and psychological well-being. *Frontiers in Psychology*, *7*, Article 805.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22.
- Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders*, *275*, 112–118.
- Eisenberg, N., Champion, C., & Ma, Y. (2004). Emotion-related regulation: An emerging construct. *Merrill-Palmer Quarterly*, *50*(3), 236–259.
- Eldar, S., Apter, A., Lotan, D., Edgar, K. P., Naim, R., Fox, N. A., et al. (2012). Attention bias modification treatment for pediatric anxiety disorders: A randomized controlled trial. *American Journal of Psychiatry*, *169*, 213–230.
- Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science*, *52*(3), 177–187.
- Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020). Fear of COVID-19 and the mental health consequences in America. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(Suppl. 1), S17–S21.
- Giuliano, R. J., Karns, C. M., Bell, T. A., Petersen, S., Skowron, E. A., Neville, H. J., & Pakulak, E. (2018). Parasympathetic and sympathetic activity are associated with individual differences in neural indices of selective attention in adults. *Psychophysiology*, *55*(8), e13079.
- Gotlib, I. H., Krasnoperova, E., Yue, D. N., & Joormann, J. (2004). Attentional biases for negative interpersonal stimuli in clinical depression. *Journal of Abnormal Psychology*, *113*(1), 127–135.
- Jiao, W. Y., Wang, L. N., Liu, J., Fang, S. F., Jiao, F. Y., Pettoello-Mantovani, M., & Somekh, E. (2020). Behavioral and emotional disorders in children during the COVID-19 epidemic. *Journal of Pediatrics*, *221*, 264–266.
- Kallapiran, K., Koo, S., Kirubakaran, R., & Hancock, K. (2015). Review: Effectiveness of mindfulness in improving mental health symptoms of children and adolescents: A meta-analysis. *Child and Adolescent Mental Health*, *20*(4), 182–194.
- Kanske, P., & Kotz, S. A. (2012). Effortful control, depression, and anxiety correlate with the influence of emotion on executive attentional control. *Biological Psychology*, *91*(1), 88–95.
- Kessler, R. C., Avenevoli, S., & Ries Merikangas, K. (2001). Mood disorders in children and adolescents: An epidemiologic perspective. *Biological Psychiatry*, *49*, 1002–1014.
- Khosravi, P., Parker, A. J., Shuback, A. T., & Adleman, N. E. (2020). Attention control ability, mood state, and emotional regulation ability partially affect executive control of attention on task-irrelevant emotional stimuli. *Acta Psychologica*, *210*, Article 103169.
- Laurent, J., Catanzaro, S. J., Joiner, T. E., Rudolph, K. D., Potter, K. I., Lambert, S., et al. (1999). A measure of positive and negative affect for children: Scale development and preliminary validation. *Psychological Assessment*, *11*, 326–338.
- Lee, J. (2020). Mental health effects of school closures during COVID-19. *Lancet Child & Adolescent Health*, *4*(6), Article 421.
- Lemerise, E. A., & Arsenio, W. F. (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development*, *71*(1), 107–118.
- Malinowski, P. (2008). Mindfulness as psychological dimension: Concepts and applications. *Irish Journal of Psychology*, *29*(1–2), 155–166.
- Muris, P., de Jong, P. J., & Engelen, S. (2004). Relationships between neuroticism, attentional control, and anxiety disorders symptoms in non-clinical children. *Personality and Individual Differences*, *37*, 789–797.

- Paulson, J. F., Buermeyer, C., & Nelson-Gray, R. O. (2005). Social rejection and ADHD in young adults: An analogue experiment. *Journal of Attention Disorders*, 8(3), 127–135.
- Raes, F., Griffith, J. W., Van der Gucht, K., & Williams, J.M.G. (2014). School-based prevention and reduction of depression in adolescents: A cluster-randomized controlled trial of a mindfulness group program. *Mindfulness*, 5, 477–486.
- Reynolds, C. R., & Kamphaus, R. W. (2015). *Behavior Assessment System for Children* (3rd ed.). Minneapolis: Pearson Assessments.
- Rhoades, B. L., Warren, H. K., Domitrovich, C. E., & Greenberg, M. T. (2011). Examining the link between preschool social-emotional competence and first grade academic achievement: The role of attention skills. *Early Childhood Research Quarterly*, 26(2), 182–191.
- Roelofs, K., Bakvis, P., Hermans, E. J., van Pelt, J., & van Honk, J. (2007). The effects of social stress and cortisol responses on the preconscious selective attention to social threat. *Biological Psychology*, 75(1), 1–7.
- Roy, A. K., Vasa, R. A., Bruck, M., Mogg, K., Bradley, B. P., Sweeney, M., et al. (2008). Attention bias toward threat in pediatric anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 47, 1189–1196.
- Sokhadze, E. M., Baruth, J. M., Sears, L., Sokhadze, G. E., El-Baz, A. S., Williams, E. L., et al. (2012). Event-related potential study of attention regulation during illusory figure categorization task in ADHD, autism spectrum disorder, and typical children. *Journal of Neurotherapy*, 16(1), 12–31.
- Walden, T. A., Harris, V. S., & Catron, T. F. (2003). How I Feel: A self-report measure of emotional arousal and regulation for children. *Psychological Assessment*, 15, 399–412. doi:10.1037/1040-3590.15.3.399
- Waters, A. M., Zimmer-Gembeck, M. J., Craske, M. G., Pine, D. S., Bradley, B. P., & Mogg, K. (2016). A preliminary evaluation of a home-based, computer-delivered attention training treatment for anxious children living in regional communities. *Journal of Experimental Psychopathology*, 7, 511–527.
- Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence* (2nd ed.). San Antonio, TX: Pearson Clinical.
- Wittenborn, A. K., Rahmandad, H., Rick, J., & Hosseini-chimeh, N. (2016). Depression as a systemic syndrome: Mapping the feedback loops of major depressive disorder. *Psychological Medicine*, 46, 551–562.
- Yang, W., Zhang, J. X., Ding, Z., & Xiao, L. (2016). Attention bias modification treatment for adolescents with major depression: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 55, 208–218.

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