Internalizing Symptoms Predict Children’s Vagal Tone while Observing their Parents’ Anger


Introduction

- Throughout early childhood, children learn to identify and regulate their own emotions through witnessing their parents’ emotion expression and regulation (Cole et al., 1994; Kopp, 1989).
- Family conflict, marital discord, and parental depression have been linked to internalizing problems in children, suggesting witnessing parents’ negative emotions may be maladaptive (El-Sheik, 2006).
- Few studies have focused on child characteristics that contribute to individual differences in children’s experiences of parents’ negative emotions.
- One potential characteristic is cardiac vagal tone, an index of one’s ability to regulate emotion (Leon-Hernandez, 2009). High vagal tone is adaptive and promotes healthy interactions with others (Porges, 2007).
- The purpose of this study is to examine whether individual differences in children’s change in vagal tone while witnessing their parents express anger and sadness is moderated by their levels of internalizing problems.

Hypotheses

Hypothesis 1: In children with low internalizing problems, vagal tone will increase (from baseline) while witnessing their parents’ anger, indicating good emotion regulation. In children with high internalizing problems, vagal tone will not change (from baseline) when witnessing their parents’ anger, indicating poor emotion regulation.

Hypothesis 2: Similarly, in children with low internalizing problems, vagal tone will increase (from baseline) while witnessing their parents’ sadness, indicating good emotion regulation. In children with high internalizing problems, vagal tone will not change (from baseline) when witnessing their parents’ sadness, indicating poor emotion regulation.

Methods

Sample

- A sample of children prone to internalizing problems was recruited over two procedures:
  1. Researchers contacted parents of 4-6 year old children from the Georgia State Infant and Child Subject Pool.
  2. Interested parents responded to online web postings.

Table 1: Sample Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>54.3% Male</th>
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<tbody>
<tr>
<td>Age</td>
<td>M=6.65 yrs</td>
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<tr>
<td>Ethnicity</td>
<td>Asian: 3%</td>
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<tr>
<td></td>
<td>Black: 21.2%</td>
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<tr>
<td></td>
<td>Hispanic: 31%</td>
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<tr>
<td></td>
<td>White: 63.6%</td>
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<tr>
<td></td>
<td>Other: 3%</td>
</tr>
<tr>
<td></td>
<td>Multiracial: 6.1%</td>
</tr>
</tbody>
</table>

Procedure:

Simulated Emotional Phone Call:

- The parent and child engage in a five-minute role-played emotional scenario in which the parent receives an emotional phone call (based on the Simulated Phone Argument Task by Davies et al., 2004).
- As the parent and child sit alone in a room, the parent receives a phone call from the experimenter, which the child receives as a phone call from the mother’s friend. The child colors a picture as the parent repeats statements from an audio recording played over the phone.
- The phone call has eight conditions each lasting 40 seconds including:
  - Four emotion conditions (happy, sad, angry, happy) during which the parent identifies the emotion or says other emotionally-consistent phrases (e.g., “that makes me so sad”) in the appropriate emotional tone.
  - Four baseline conditions (one for each “emotion” phase) during which the parent pretends to be “on hold”.

Measures:

Emotion Regulation:
- Electrocardiograms (ECG) were recorded using three 1-3/8” electrodes placed on the child’s chest (See Figure 1).
- Raw ECG signals were recorded using Biopac MP150 data acquisition system and cleaned and scored using AcqKnowledge software according to established guidelines (Task Force of the European Society of Cardiology, 1996).

Results

Data Analysis Plan: Repeated-measures (2x2) ANOVAs were used to test the hypotheses.

Hypothesis 1: Tests of Within-Subjects Effects in Anger Condition

- The interaction between internalizing problems and condition predicting vagal tone was significant, F(1,31)=4.63, p=.039, η²=.13.
- Children with low risk of internalizing problems had a significant change in vagal tone from the baseline condition to the anger condition, F(1,9)=18.9, p=.019, η²=.48.
- Children with high risk of internalizing problems did not have a significant change in vagal tone from the baseline condition to the anger condition, F(1,22)=.062, p=.806, η²=.03.

Hypothesis 2: Tests of Within-Subjects Effects in Sad Condition

- The interaction between internalizing problems and condition predicting vagal tone was not significant, F(1,30)=.026, p=.872, η²=.001.
- Children with low risk of internalizing problems did not have a significant change in vagal tone from the baseline condition to the sad condition, F(1,9)=.461, p=.514, η²=.049.
- Children with high risk of internalizing problems did not have a significant change in vagal tone from the baseline condition to the sad condition, F(1,21)=.147, p=.705, η²=.007.

Discussion

- Our results suggest that a child’s risk for internalizing problems is associated with their ability to regulate emotions while witnessing others’ negative emotions, particularly anger.

1. Internalizing Risk predicts Regulation to Parents’ Anger

- Children’s emotion regulation during others’ angry displays may be particularly important when considering children’s risk for internalizing problems.
- Previous studies indicate that children become distressed when observing anger expressed by family members (Cummings, Iannotti, & Zahn-Waxler, 1985).
- Research suggests that correctly processing anger is difficult for preschool aged children and may be particularly difficult for children from negative home environments.
- Children’s abilities to accurately identify others’ angry displays develops around age 10, whereas abilities to correctly identify sad or happy displays develops around age 5 (Durand, Gallay & Segeuric, 2007).
- Children of highly negative mothers are less accurate than children of less negative mothers at identifying anger (Raver & Spagnolo, 2008).
- Preschool aged children overattribute themselves as the cause of their mother’s anger (Covell & Abramovitch, 1987).
- Children’s interpretations of self-blame for their parent’s anger may cause guilt and shame emotions, which are associated with internal distress (Luby, 2006).

2. Internalizing Risk does not predict Regulation to Parents’ Sadness

- Children have less direct experience with adult’s sadness than with their anger (Dennh & Guit, 1992).
- Results suggest that witnessing others’ sadness may require less emotion regulation capacities from children than witnessing others’ anger. This may be specific parents’ anger, as it may have particular relevance to the child (e.g., children may have more experience being the focus of parents’ anger than their sadness).
- Alternatively, it is possible that parents had more difficulty fending sadness than anger during the phone conversation, which could explain findings.

3. Future Directions

- Little is known about why some children from negative family environments develop psychopathology, while others do not.
- Future studies should investigate poor emotion regulation problems as a mechanism of risk for internalizing problems in these children.
- Our study was conducted in a controlled lab setting. Future research may investigate monitoring children’s vagal tone in more realistic settings.

References

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