INHIBITION DEFICITS, EMOTION DYSREGULATION, AND AGGRESSION IN CHILDREN WITH ADHD

BY: ERIKA FAGER
BACKGROUND

What is ADHD?

• developmental disorder
• Characterized by being excessively active, impulsive, and disorganized with off task behaviors (that is not age-appropriate) (Mitchell et al., 2017; American Psychiatric Association, 2013)
• clinically classified as
  • primarily inattentive
  • primarily hyperactive/impulsive or
  • a combination of both (Nigg & Casey, 2005).

Often have emotion regulation deficits and executive function deficits (Bunford et al., 2014; Nigg & Casey, 2005).
**BACKGROUND**

**Emotion Regulation**

• Process of influencing what emotions are felt and when, and how you experience and express them (Gross, 1998).

• How?
  • Modulating responses, discriminating emotions
  • Cognitive regulation
    • Ex. selection of situation, deployment of attention, reappraisal, (Martin and Ochsner, 2016; Gross, 1998)
BACKGROUND

Executive Function

• top down control overriding thoughts actions and emotions in favor for goal (Hare and Casey, 2005)
  • Inhibition
    • Ex. Does the child have trouble putting brakes on his/her actions?
BACKGROUND

Aggression

• Looking specifically at
  • Reactive Aggression- frustration and provocation, poor executive function and impulsivity
    • Those with reactive aggression often have greater difficulty with Emotion regulation (Ahmed et al., 2015)
    • Higher prevalence in ADHD (Shaw et. al., 2007)
OUR HYPOTHESES

• emotion dysregulation is associated with both inhibition and aggression, and this association is higher in those with ADHD.

• emotion dysregulation has an effect on aggression, but this effect is a result of inhibition deficits
METHODS

Participants

• 61 one participants
  • typically developing (TD) children (n=28, 12 female)
  • ADHD children (n=33, 15 female).
  • Between 8-12 years old (mean=10.2 for TD, 9.2 for ADHD)
METHODS

Measures

• Emotion dysregulation - Emotion Regulation Checklist
  • Emotion regulation and negative lability
  • Ex. if the child displays appropriate negative emotions (anger, fear, frustration, distress) in response to “hostile, aggressive or intrusive acts by peers.” (Shields & Cicchetti, 1997; Molina et al., 2014)

• Inhibitory Deficits- Behavior Rating Inventory of Executive Function
  • Ex. “Does the child get out of control more than friends or interrupts others..” (Gioia et al. 2000).

• Aggression- Child Behavior Checklist
  • Ex. Does child “child gets into fights” or “argues a lot” (Achenbach & Rescorla, 2001)
Do inhibitory control deficits mediate (or account for) the relationship between emotion dysregulation and aggression.

**Emotion Dysregulation**
- ERC - emotion regulation and negative lability

**Inhibition Deficits**
- Brief - inhibition raw score

**Aggression**
- CBCL - aggressive behavior subscale

**MEDIATION ANALYSIS**
Emotion Dysregulation
- ERC - emotion regulation and negative lability

Inhibition Deficits
- Brief - inhibition raw score

Coefficient .71***

Aggression
- CBCL - aggressive behavior subscale

Coefficient .74***

Coefficient 0.73***
when mediating for Inhibition Deficits

Significance Key: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

COMBINED ADHD AND TD GROUP
Emotion Dysregulation
- ERC - emotion regulation and negative lability

Inhibition Deficits
- Brief - inhibition raw score

Aggression
- CBCL - aggressive behavior subscale

Coefficient 0.52**
Coefficient 0.63** when mediating for Inhibition Deficits

Significance Key: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘’ 1
ADHD GROUP

Inhibition Deficits
• Brief- inhibition raw score
  Coefficient .39.*
  Coefficient -.495

Emotion Dysregulation
• ERC- emotion regulation and negative lability
  Coefficient .58***

Aggression
• CBCL- aggressive behavior subscale
  Coefficient .60***
  when mediating for Inhibition Deficits

Significance Key: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
EMOTION DYSREGULATION AND INHIBITION DEFICITS

- Emotion Dysregulation found to have a significant effect on Inhibition Deficits
  - Same brain areas associated with inhibition and emotional appraisal (Ochsner, 2015)
- Greater in ADHD Group
  - Greater inhibitory deficits and struggle with emotional control (Bunford, 2014)
EMOTION DYSREGULATION AND AGGRESSION

- Emotion Dysregulation found to have a significant effect on Aggression
  - Reactive aggression, increased amygdala activity, and difficulty regulating emotions (Shaw, 2014)

- Greater in ADHD Group
  - ADHD and aggression (Murray et al.; Shaw et al, 2014)
  - ADHD and emotion dysregulation (Bunford, 2014)
Emotion Dysregulation and Aggression (When Accounting for Inhibition Deficits)

- Emotion Dysregulation still had a significant effect on aggression even when accounting for Inhibition Deficits, indicating that inhibition is not a significant mediator of this relationship.
OUR HYPOTHESES

• emotion dysregulation is associated with both inhibition and aggression, and this association is higher in those with ADHD.
  • Supported

• emotion dysregulation has an effect on aggression, but this effect is a result of inhibition deficits
  • Not supported.. Why?
    • Measures of emotion regulation involved inhibition (bring question example of this)
      • Ex. Can child “modulate excitement.
    • Cool EF vs. Hot EF
      • Hot EF- situations that are emotionally or motivationally significant
      • Cool EF- neutral contexts (Zelazo and Carlson, 2012)
CONCLUSIONS

• future research regarding aggression
• testing possible treatment approaches
  • Future work is needed to clarify efficacy of aggression treatments in children with and without ADHD.
  • Hot EF approach

FUTURE DIRECTIONS

• Look at Brain activity during emotion regulation and inhibition tasks
• Look at emotion experience rather than emotion regulation
• Same tests with more than just inhibition subscales
**MODERATION**

**Emotion Dysregulation**
- ERC - emotion regulation and negative lability

**Inhibition Deficits**
- Brief - inhibition raw score

**Aggression**
- CBCL - aggressive behavior subscale
RESULTS

Moderation

• Both- not significant
• TD- not significant
• ADHD- not significant

• Inhibition was not found to significantly increase or decrease the relationship between ED and Aggression

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<th>ADHD and TD</th>
<th>ADHD</th>
<th>TD</th>
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<tbody>
<tr>
<td>ED</td>
<td>.40(.73)</td>
<td>1.00(.58) standardized*</td>
<td>.64(.59)*</td>
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<td>Inhibition</td>
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<td>1.32(-.07)</td>
<td>1.30(-.10)</td>
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<td>EDxInhibition</td>
<td>-.003(-.03)</td>
<td>-0.03055(-.20)</td>
<td>-.04296(-.33).</td>
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