Palooza Feels Binty about Something!
Studying How Children Acquire Emotion Adjectives

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Acknowledgments

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Outline

- Background: How are emotion concepts acquired?
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- Preliminary conclusions and further directions
What are emotions?
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Where do emotion concepts come from? Two approaches...

- **“basic emotions” approach:**
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- **constructionist approach:**
  emotion concepts are constructed based on our experiences
“Basic Emotions” Approach


- Humans are born with five “basic” emotions:
  - happiness
  - sadness
  - anger
  - fear
  - disgust
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- the same emotional expressions will be produced by the same neuromuscular movements
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- they will be (essentially) the same for all people, across cultures and languages (Ekman et al. 1987)
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- Measurements of facial expressions via facial electromyography do not reliably predict emotional states (e.g. anger vs. sadness)
- People do not always produce facial expressions corresponding to reported internal states
SURPRISED
EXCITED
Instead, people’s facial expressions correspond more broadly to even more basic, underlying features: valence (pleasant vs. unpleasant) and arousal (active vs. calm).
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How do we acquire concepts of more fine-grained, discrete emotions if the visual cues for emotion perception are aligned only with these more basic features (pleasure/displeasure, arousal)?
Constructionist approach

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Lindquist & Gendron (2013), p.66
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...language plays a role in emotion because it helps acquire, organize, and use the concept knowledge that is an essential element in emotion perceptions ... and perhaps even experiences.

Lindquist et al. 2015, p.100
Constructionist approach

Evidence for the “constructionist” view:

- Neurotypical adults
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  - Better performance in face sorting task when verbal labels are provided, than when no labels are provided

- Semantic dementia
  - Task: sort pictures of 6 emotion categories (happy, sad, afraid, etc.).
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  - 3- and 4-year-olds begin to acquire 'sad' and 'fearful' and separate those faces from 'angry' in sort tasks
  - 7-year-olds show adult-like categorization (except 'disgust')

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So where does the language come from?

A common assumption is that children hear words and (magically!) map them onto some salient thing in their environment → Word-to-world mapping. This might work for (some) concrete nouns, but not so much for verbs, and arguably not for abstract words.
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\begin{align*}
\text{[Subject [Verb]]} & \quad \text{sleep, *hit, *give, ?think} \\
\text{[Subject [Verb [Object]]]} & \quad *\text{sleep, hit, *give, *think} \\
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→ Sentence-to-world mapping

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...but what about adjectives? And, more generally, what about labels for internal states or abstract properties?
Prior research suggests that labels for internal/abstract states are more strongly cued by sentence frames than scene information.
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- Papafragou et al. (2005): adults and children are more likely to identify a “mystery verb” as a mental verb (e.g. think, believe) if their task involved translating a nonsense verb in Vamissa LODS that she ziptorks the silltap Matt GORPS that his grandmother is under the covers than after viewing a scene, even one that involved obvious false belief.
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- In Becker (2014) children could infer that novel adjectives had properties of control adjectives (denote desires, emotions) vs. tough-adjectives given short video scenes.
Our Study: Comparing Contextual Cues and Syntactic Cues to Emotion Words

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In both studies children had to choose the picture of an alien that illustrated the meaning of the novel word
Study 1: Sentence Context

Three sentence frames (between subjects):

1. be + Adjective: Palooza is binty
2. feel + Adjective: Palooza feels binty
3. feel + Adjective + about: Palooza feels binty about something

be Adj          happy, sad, tired, cold, tall, red
feel Adj        happy, sad, tired, cold, *tall, *red
feel Adj about  happy, sad, *tired, *cold, *tall, *red
Study 1: Sentence Context

Puppet A: I know an alien who is binty!
Puppet B: Really? You know an alien who is binty?
Puppet A: Yes! This alien is binty.
Puppet B: Wow! You know an alien who is binty!
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...is binty/feels binty/feels binty about something
Study 1: Sentence Context

Participants: 120 children ages 3–5 years

Procedure:

- 3 warm-ups (inclusion criterion: 2/3 correct)
- 4 target videos
- 3 fillers ("I know an alien who is serding!")
- After each video conversation, point to 1 of 3 alien pictures
Point to where Palooza feels binty.
Moderate effect of sentence frame: kids pick emotion images more in “feels about” than “feels”, but not sig. more than in “is” condition.

Sig. effect of age: older kids pick more emotion images than action images

No 3-way interaction (Age x Sentence x Choice)
Study 1: Results (by Age)

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Misha Becker
Acquisition of Emotion Adjectives
Study 1: Discussion

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*It was Palooza’s birthday. All her friends came to her birthday party and gave her presents. Palooza jumped up and down.*

*Now, Palooza is binty. What do you think binty means? Point to where Palooza is binty!*
Point to where Palooza feels binty.
Participants: 113 children ages 3–5 years

Procedure:

- 3 warm-ups (inclusion criterion: 2/3 correct)
- 7 stories highlighting a positive or negative emotion for a character
- After each story children hear the novel adjective used in one of 3 sentence frames
  - Now Palooza is binty! What do you think binty means? Point to where Palooza is binty!
  - Now Palooza feels binty! . . .
  - Now Palooza feels binty about something! . . .
- Children point to one of 3 alien images
Study 2: Results
Significant effect of age
- Older kids pick more emotion images (5 > 4 and 4 > 3)
- 3-year-olds pick more action images than 4 or 5
- 4-year-olds pick marginally more physical state images than 5-year-olds
Study 2: Results

- Significant effect of age
  - older kids pick more emotion images (5>4 and 4>3)
  - 3-year-olds pick more action images than 4 or 5
  - 4-year-olds pick marginally more physical state images than 5-year-olds
- 3-way interaction between Age x Sentence Frame x Image choice
  - 4-year-olds were significantly influenced by sentence frame, picking the emotion image sig. more in “feels/feels about” than “is”, but about the same in “feels” and “feels about” conditions.
  - 5-year-olds were marginally influenced by sentence frame, picking the emotion image more in “is” and “feels about” than in “feels” condition.
Study 2: Discussion

- Story context appears to boost children’s mapping of the novel adjective onto an emotion.
- Older children (age 4, 5) are more susceptible to this influence than younger children (3).
- Sentence frame is additionally helpful for 4-year-olds: given the sentence frame “feels Adj.” or “feels Adj. about” they were more likely to pick the emotion picture.
- Contrary to expectation this did not happen for 5-year-olds: they picked emotion pictures equally given “is Adj.” or “feels Adj. about”.
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Conclusion So Far

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- Story context alone (story + "is" condition) cues emotion meaning for 5-year-olds.
- Story context + sentence frame cues emotion meaning for 4-year-olds.
How are emotion adjectives used in speech to children?
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Shablack (2017) examined spontaneous use of emotion adjectives by children and by parents speaking to children.

CHILDES database: 12 children ages 2–3 years
## Positive Emotion Adjectives

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
</tr>
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<tbody>
<tr>
<td>happy, happiness</td>
<td>afraid</td>
</tr>
<tr>
<td>glad</td>
<td>mad</td>
</tr>
<tr>
<td>excited</td>
<td>fear, fearful</td>
</tr>
<tr>
<td>calm</td>
<td>nervous</td>
</tr>
<tr>
<td>joy</td>
<td>gross</td>
</tr>
<tr>
<td>cheer, cheerful</td>
<td>gloomy</td>
</tr>
<tr>
<td>interested</td>
<td>upset</td>
</tr>
<tr>
<td>content</td>
<td>frustrated</td>
</tr>
<tr>
<td></td>
<td>jealous</td>
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## Negative Emotion Adjectives

|                   | angry, anger              |
|                   | sad, sadness              |
|                   | scared                    |
|                   | worry, worried            |
|                   | disgust, disgusted, disgusting |
|                   | depressed                 |
|                   | annoyed                  |
|                   | furious                  |
|                   | unhappy                   |
Use of Emotion Words

ADULT USE (%)

- All others: 11%
- Afraid: 8%
- Angry: 6%
- Scared: 14%
- Excited: 3%
- Glad: 9%
- Happy: 22%
- Sad: 13%
- Mad: 14%

CHILD USE (%)

- All others: 5%
- Afraid: 9%
- Angry: 6%
- Scared: 17%
- Excited: 2%
- Mad: 15%
- Happy: 34%
- Sad: 12%
## Sentence Environments of Use

<table>
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<th>Following Environment</th>
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</tr>
<tr>
<td>look</td>
<td>at</td>
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<td>make</td>
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Sentence Environments of Use

**Preceding Sentence Environment**

- **be**: 71.58% Adults, 53.04% Children
- **null be**: 0% Adults, 0% Children
- **get**: 27.31% Adults, 6.60% Children
- **look**: 9.13% Adults, 4.13% Children
- **make**: 1.63% Adults, 1.07% Children
- **feel**: 0.26% Adults, 0% Children

**Following Sentence Environment**

- **of**: 32.97% Adults, 19.11% Children
- **that**: 13.78% Adults, 13.37% Children
- **at**: 17.58% Adults, 18.87% Children
- **to**: 11.56% Adults, 6.59% Children
- **about**: 10.22% Adults, 2.20% Children
- **because/since**: 8.89% Adults, 8.39% Children
- **when**: 5.67% Adults, 6.67% Children
Preliminary analysis suggests there may be limited information for bootstrapping from the sentential environments in which emotion adjectives are used: *be* is the most common preceding environment.
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However, there may be cues from:

- make/get Adj. (also compatible with physical states)
- Adj. that/to/about
General Conclusion

There is a role for both language and situational context in learning the meanings of emotion words.

Lots of open questions! For example...
- If we increase the range of sentence frames used (make/get/feel Adj about/to/that...) does this help in a novel word learning task?
- What are the kinds of sentence frames that emotion words select in other languages?
- For children who have difficulties recognizing emotion in faces (e.g. children with autism), is language instruction helpful? Or does the problem recognizing emotions hinder learning emotion words?
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THANK YOU!