The Ontogeny of Cultural Learning

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Imitation is a tool for cultural learning
Instrumental learning

- Children use imitation to learn instrumental skills
  - Focus on physical causality
  - Overimitation
  - Comparative psychology

Carpenter, Call, & Tomasello (2005)
Heyes (2012)
Horner, & Whiten (2005)
Lyons, Young, & Keil (2007)
Nielsen & Tomaselli (2010)
Precocious causal reasoning

- Dunbar & Klahr (1988)
- Frazier, Gelman, & Wellman (2009)
- Fay & Klahr (1996)
- Gopnik (2000)
- Gopnik & Sobel (2000)
- Gopnik, Sobel, Schulz, & Glymour (2001)
- Gweon & Schulz (2008)
- Hickling & Wellman (2001)
- Hutt & Bhavnani (1972)
- Karmiloff-Smith & Inhelder (1978)
- Kuhn (1989; 2009)
- Kushnir & Gopnik (2005)
- Legare (2012) Child Dev
- Legare, Gelman, & Wellman (2010) Child Dev
- Legare, Wellman, & Gelman (2009) Cog Psych
- Schulz & Bonawitz (2007)
- Schulz, Hooppeell, & Jenkins (2008)
- Schulz, Standing, & Bonawitz (2008)
- Shultz (1982)
- Siegler (1995)
- Sobel & Sommerville (2010)
- Switzky, Haywood, & Isett (1974)
- Vosniadou & Brewer (1992; 1994)
- Wellman (2012)
- Wellman, Hickling & Schult (1997)

- Amsterlaw & Wellman (2006)
- Baillargeon (2002)
- Baldwin, Markman, & Melartin (1993)
- Bindra, Clarke & Shultz (1980)
- Bonawitz, Chang, Clark, & Lombozzo (2011)
- Bonawitz, Lim, & Schulz (2009)
- Callanan & Oakes (1992)
- Chen & Klahr (1999)
- Chi, Bassok, Lewis, Reimann, & Glaser (1989)
- Chi, DeLeeuw, Chiu, & LaVancher (1994)
- Chinn & Brewer (1993)
- Crowley & Siegler (1999)
Comparative evidence
Causal opacity is pervasive
Homo ritualis
Cultural transmission

c. 1900-1930

2012
Ritual learning

- Children use imitation to learn rituals
  - Rituals are causally opaque, conventional practices
  - Affiliation with social groups motivates imitative fidelity
  - “Not the author of your own acts”

Over & Carpenter (2011)
Kenward (2012)
Legare & Souza (2012; 2014)
Legare, Evans, Rosengren, & Harris (2012)
## Predictions

<table>
<thead>
<tr>
<th></th>
<th>Instrumental Learning</th>
<th>Ritual Learning</th>
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<tbody>
<tr>
<td><strong>Focus</strong></td>
<td>Product</td>
<td>Process</td>
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<tr>
<td><strong>Imitative fidelity</strong></td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>Higher</td>
<td>Lower</td>
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Aim 1
Examine the kind of information children use to adjudicate between instrumental and conventional learning
Examining social cues
## Candidate cues

<table>
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<tr>
<th>Cue</th>
<th>Instrumental Learning</th>
<th>Ritual Learning</th>
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<td>Verbal cues</td>
<td>Instrumental</td>
<td>Conventional</td>
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<td>Consensus</td>
<td>Single actors</td>
<td>Multiple actors</td>
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<tr>
<td>Synchrony</td>
<td>Behavioral variation</td>
<td>Behavioral coordination</td>
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Research questions

- Can the instrumental and ritual stances be primed experimentally?
  - **Study 1** – Verbal cues
  - **Study 2** – Consensus and synchrony
Study 1: Verbal cues

- Do verbal cues adjudicate between instrumental and ritual learning?
  - **Instrumental language** → **Instrumental goal**
  - **Conventional language** → **Ritual goal**

- Developmental trajectory

Legare, Wen, Herrmann, & Whitehouse (resubmitted).
Methods

Video presentation

Instrumental condition:
Instrumental language
“She puts it in the box”

Ritual condition:
Conventional language
“She always does it that way”

Imitation task

N = 108 3-6-year-olds
Predictions

**Instrumental Condition**
- Instrumental language
- Lower imitative fidelity

**Ritual Condition**
- Conventional language
- Higher imitative fidelity
Results

Imitation Summary Score

Age (Years)

* p < .05
Summary

- Converging evidence differences in imitative fidelity based on verbal cues to instrumental vs ritual learning
  - Higher imitative fidelity in ritual condition
  - Increase in distinct behavioral profiles with age
What are the effects of multiple actors on imitative fidelity?

- Consensus
- Behavioral synchrony
- Developmental trajectory

Methods

Video presentation

Single Actor

Two Actors

Synchronous

Synch Single Actor

Imitation task

$N = 259$ 3-6-year-olds
Predictions

Instrumental, single actor

Instrumental language

Lowest imitative fidelity

Ritual, synchrony

Conventional language

Highest imitative fidelity
Results

Instrumental & Ritual Score

- 1 Actor
- 2 Actor
- Synchronous
- Synchronous Single Actor

*p < .05
Summary

- Witnessing multiple actors and synchronous action increase imitative fidelity

- Increase in imitative fidelity with age
Aim 2

Examine cross-cultural differences in learning instrumental skills and cultural conventions across social contexts
Cross-cultural perspectives: Tanna, Vanuatu
Cross-cultural perspectives: Tanna, Vanuatu
Are there cross-cultural differences in expectations for conformity?

Cross-cultural comparisons of imitative fidelity

- Austin, Texas, USA
  - N = 85 6-8 year-olds
- Tanna, Vanuatu
  - N = 57 6-8 year-olds
Methods

Live model presentation

Instrumental condition:
Instrumental language
“I’m going to make a necklace”

Ritual condition:
Conventional language
“Everyone always does it this way”

Imitation task
Methods
Predictions

**Instrumental Condition**
- Instrumental language
- Lower imitative fidelity

**Ritual Condition**
- Conventional language
- Higher imitative fidelity
Cross-cultural questions

- Is imitative fidelity higher in the ritual condition?
- Is there cultural variation in overall imitative fidelity?
Results – Imitative fidelity

Imitative fidelity score by country and condition

Vanuatu: $N = 57$, 6-8 year-olds
US: $N = 85$, 6-8 year-olds

$* p < .05$
$*** p < .0001$
Conclusions

- Overall imitative fidelity comparable in both the U.S. and Vanuatu
- Children in both the U.S. and Vanuatu imitated with high levels of fidelity in the ritual condition
Study 4: Parent-child dyads

- How do parents scaffold children’s imitation?

- Are parents sensitive to the same cues?

Clegg & Legare (in prep)
Methods

- Live model, familiar activity (necklace-making task)
- Parent-child dyads
Ritual condition
Instrumental condition
Results

Imitative fidelity score by condition

\[ N = 73 \text{ 3-6-year-olds (+ parent)} \quad *** p < .001 \]
Results

Proportion of parents demonstrating or encouraging action by condition

Condition

Proportion of parents

Instrumental

Ritual

$N = 73$ 3-6-year-olds (+ parent)

** $p < .01$
Summary

- Parallel and distinct behavioral profiles for instrumental versus ritual learning
- Cross-cultural similarities and differences
- Parents and children are sensitive to cues to imitative fidelity
Conclusions
Conclusions

- Efficient social learning requires using imitation and innovation flexibly

- Cues to adjudicate between instrumental and ritual learning
  - Verbal and non-verbal cues

- Cross-cultural continuity and variation

- Parent scaffolding of instrumental and conventional learning
Child (social) scientists
Funders and investigative team

- CCD Lab website: www.cristinelegare.com
- Information: legare@austin.utexas.edu
- Funding
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  - John Templeton and McDonnell Foundations
- Collaborators
  - Harvey Whitehouse, Paul Harris, and Susan Gelman
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- Graduate students
  - Jennifer Clegg, Justin Busch, Nicole Wen
- Lab staff
  - Katherine Cullum