

Early and Repeated Exposure to Examples Improves Creative Work

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TODAY'S WOOT

Which Way to Bacon Town?

by Adam Koford

\$12.00 + free shipping

I want one

bit.ly/MVjgVC



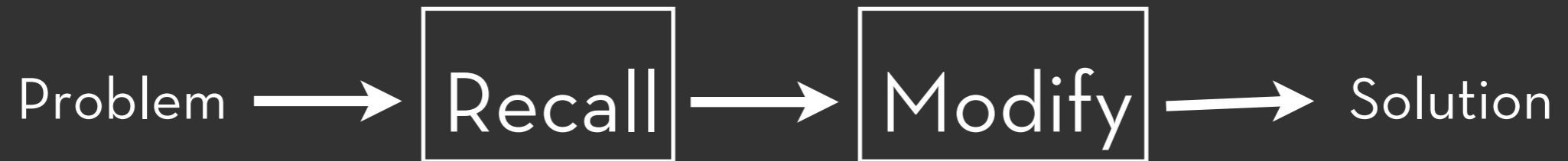
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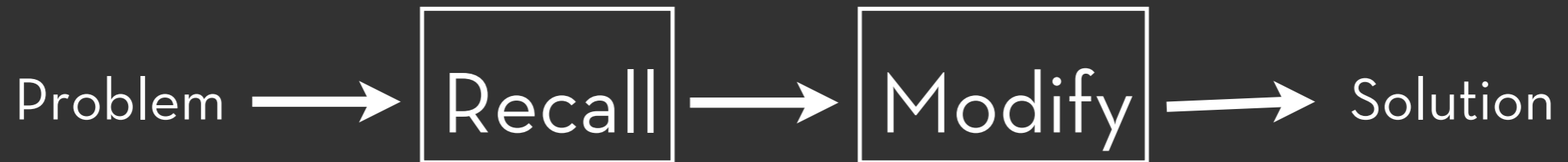
The Web enables more people to design

Examples structure creativity



Structured Imagination (Ward 1994)

Examples structure creativity



Structured Imagination (Ward 1994)

- Will fitting old solutions to new problems inhibit creativity?
 - Constraining effects of examples in a creative generation task (Smith *et al.* 1993)
 - How examples may (and may not) constrain creativity (Marsh *et al.*, 1996)

In practice

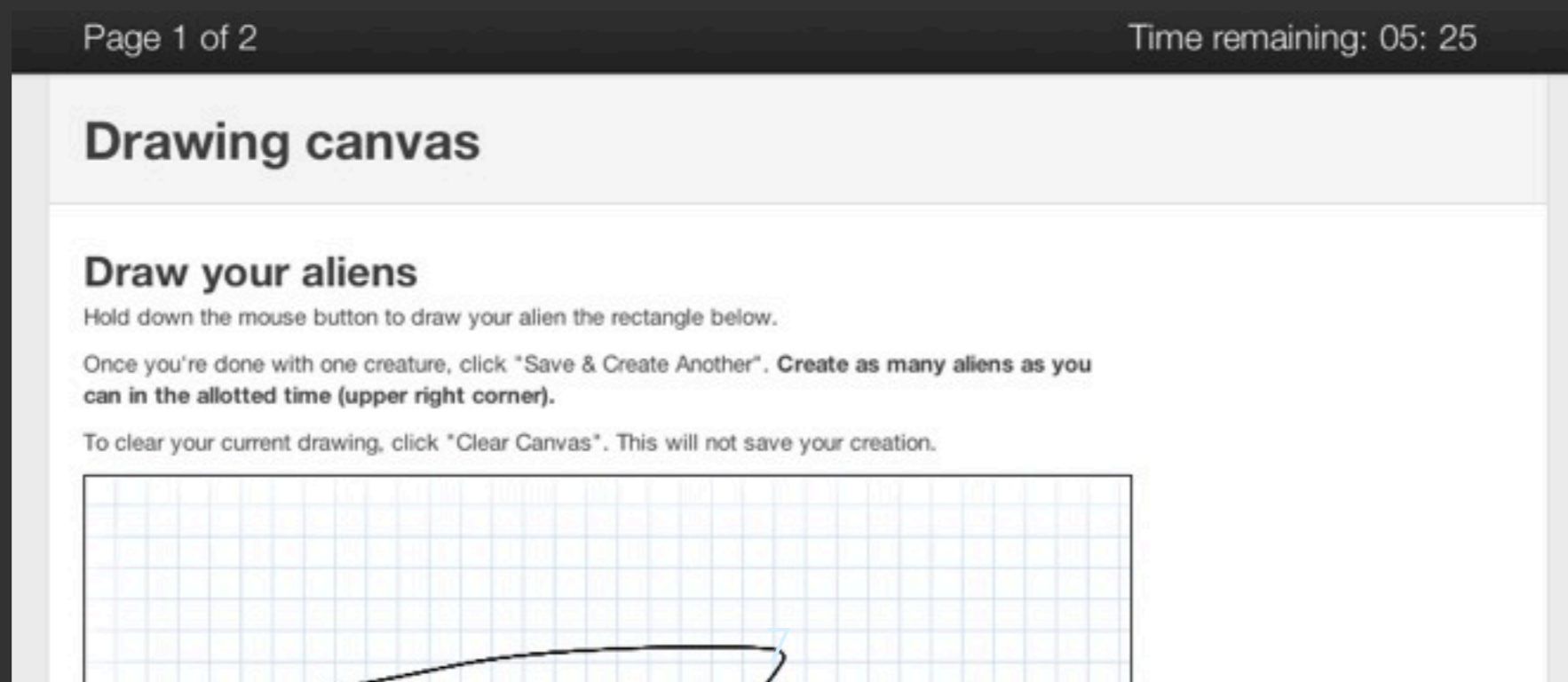
- Some look at examples **early**, to get an idea of the space
- Some look **late** in the process to help them think “out of box”
 - **But**, no consensus on strategy
- Nearly all worried about “**example bombardment**” (echoed in Herring et al., 2009)

When are examples most useful?

- Hypothesis 1: Exposure to examples later in the creative process would have the same creative benefits, but lower conformity than exposure at the start.
- Hypothesis 2: Examples will lead to increased conformity (features directly from examples) regardless of timing

Experiment

- 81 participants (27 male, 54 female; median age 34), on Mechanical Turk
- Living in the US, paid \$1.00
- High school or higher
- Participants drew alien figures as creative task



Why a drawing task?

- “Sketching as archetypal design activity” (Fallman D, 2003; Margolin and Buchanan, 1995)

Page 1 of 2 Time remaining: 05: 25

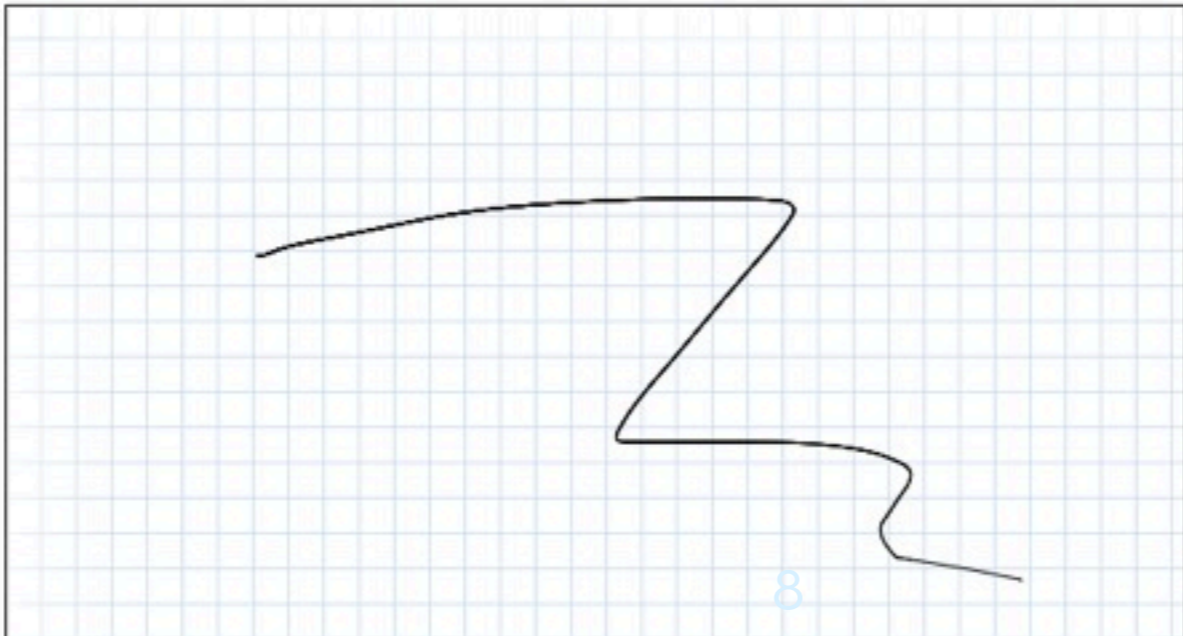
Drawing canvas

Draw your aliens

Hold down the mouse button to draw your alien the rectangle below.

Once you're done with one creature, click "Save & Create Another". **Create as many aliens as you can in the allotted time (upper right corner).**

To clear your current drawing, click "Clear Canvas". This will not save your creation.



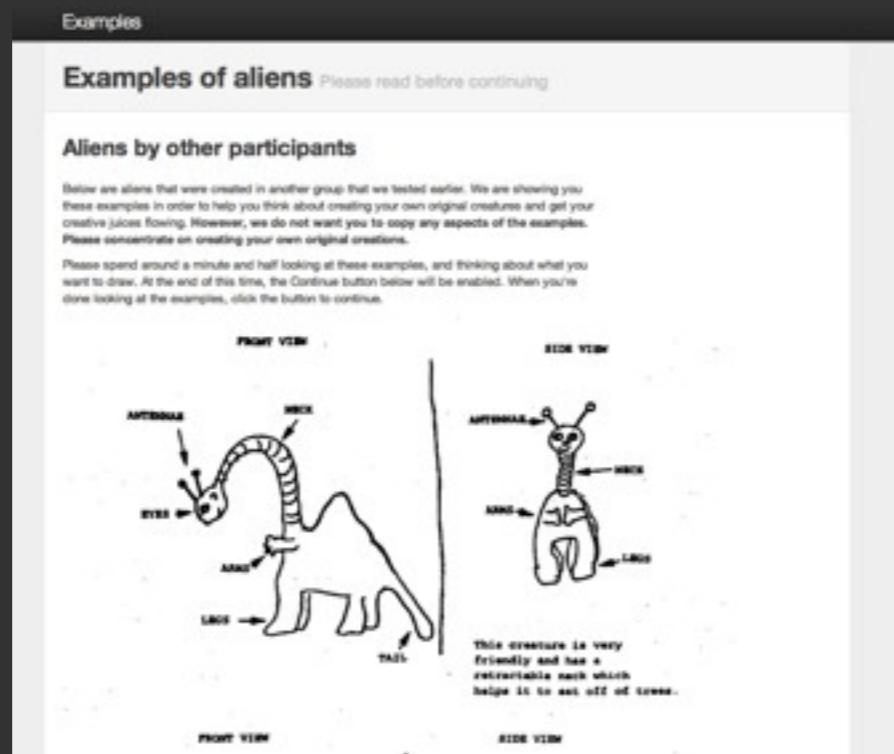
Procedure

- Draw alien figures (inspired by Marsh et al)
- Participants worked in two drawing sessions, 7 min each
- Think or see examples

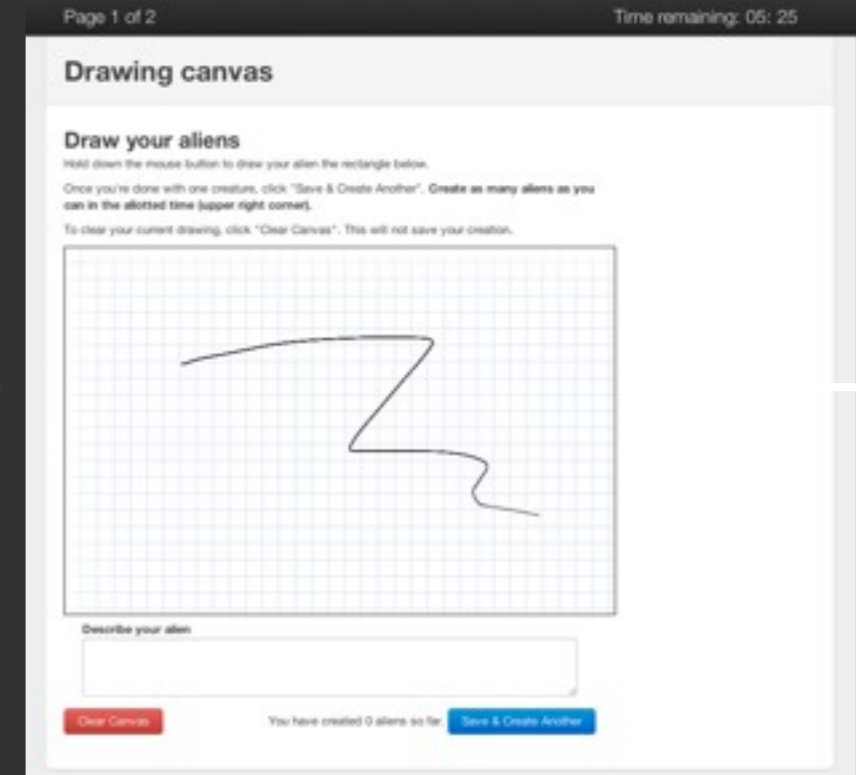
Condition	Pre session 1		Pre session 2	
None	Think	D r a w	Think	D r a w
Early	Examples		Think	
Late	Think		Examples	
Repeated = early + late	Examples		Examples	

Early example condition

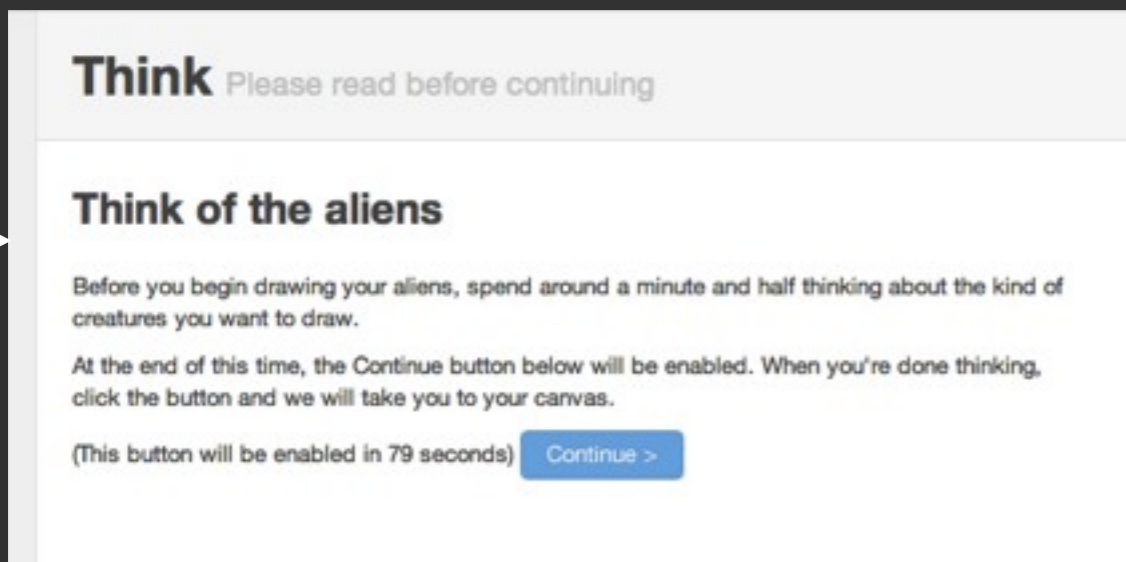
Consent →



Examples

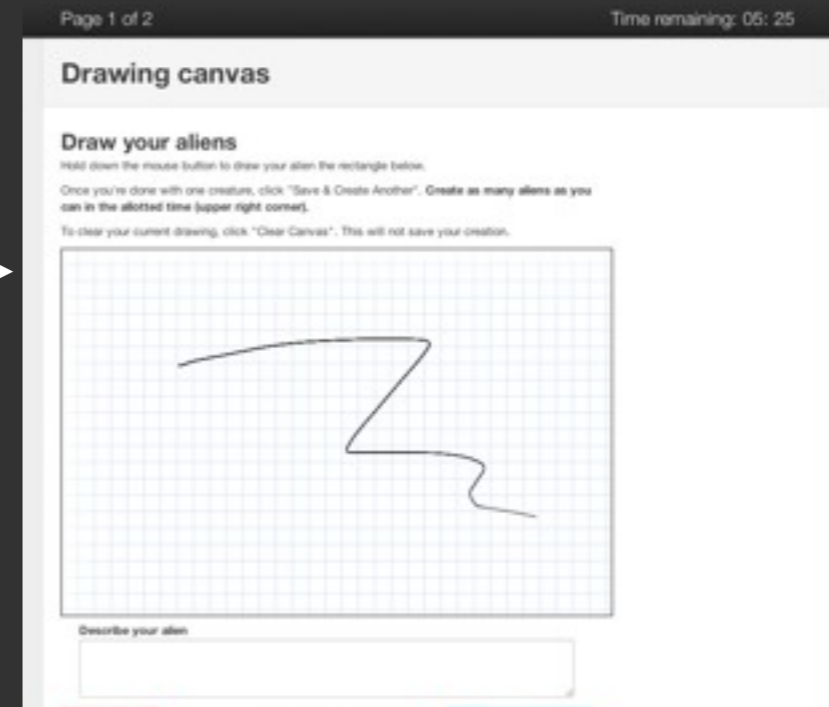


Draw



Think

10



Exit

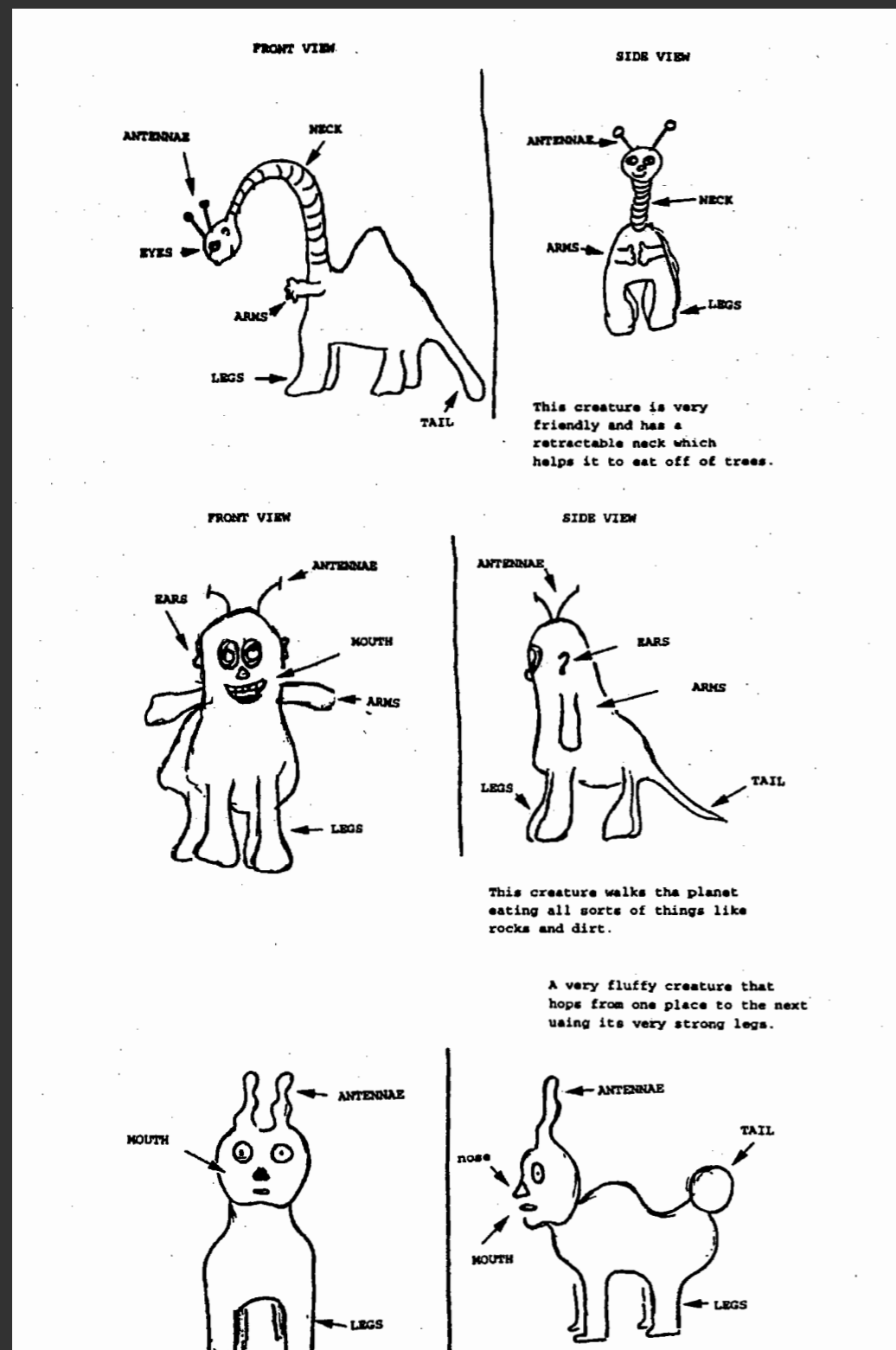


Participants saw 3 examples

From Marsh et al., 1996

Critical features

- Tail
- Antennae
- Four legs

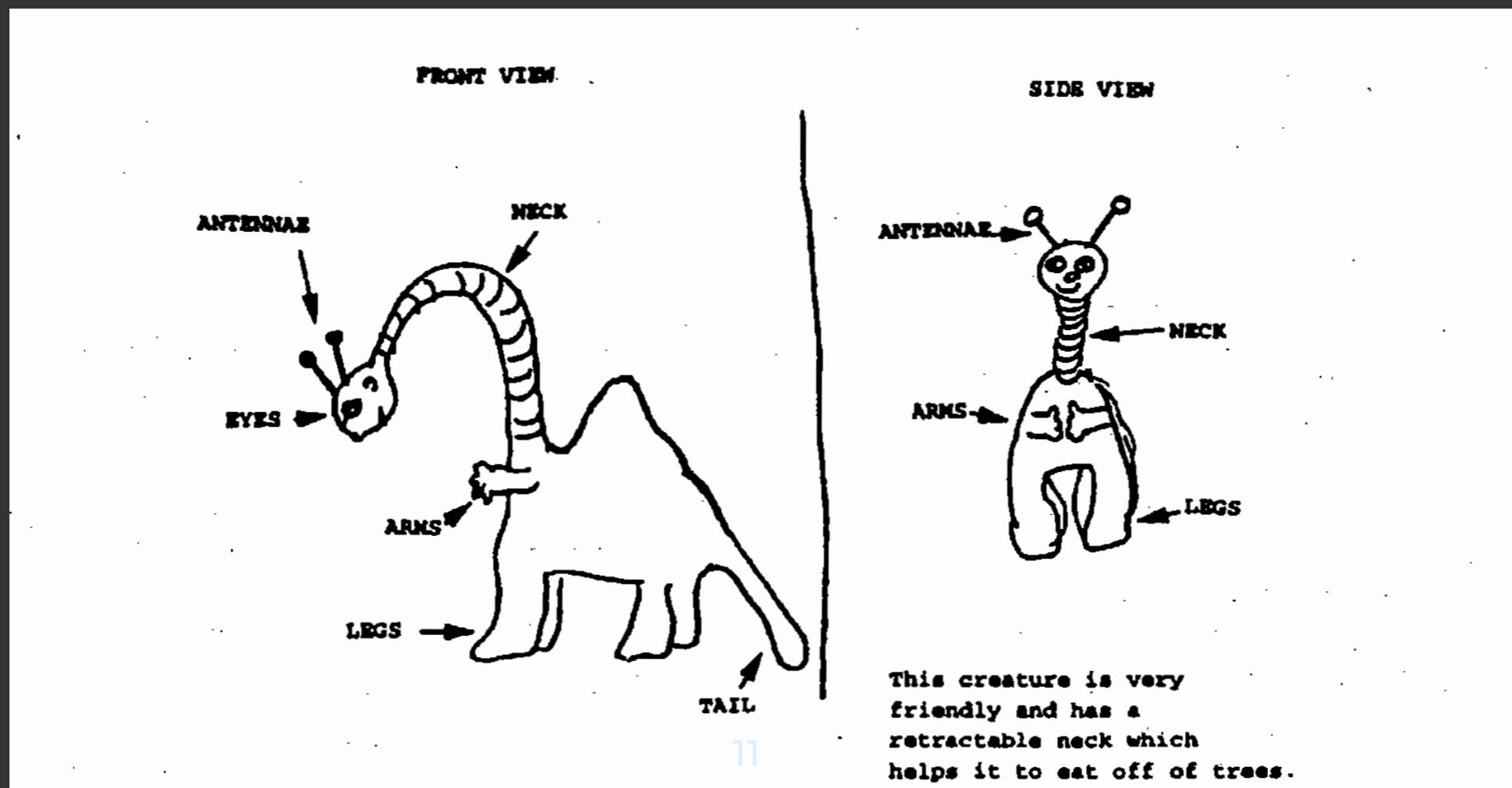


Participants saw 3 examples

From Marsh et al., 1996

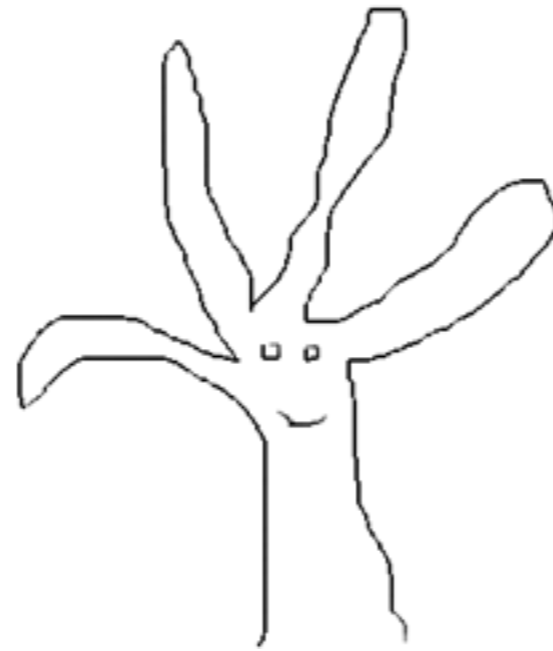
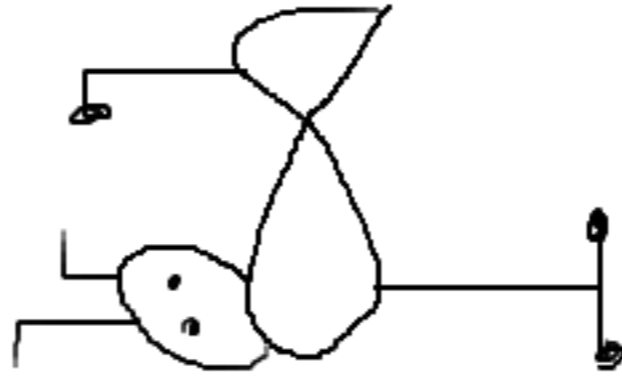
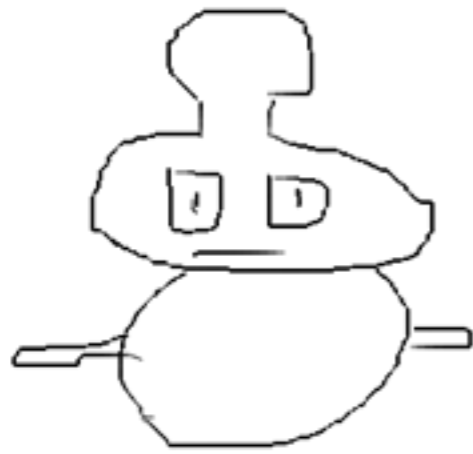
Critical features

- Tail

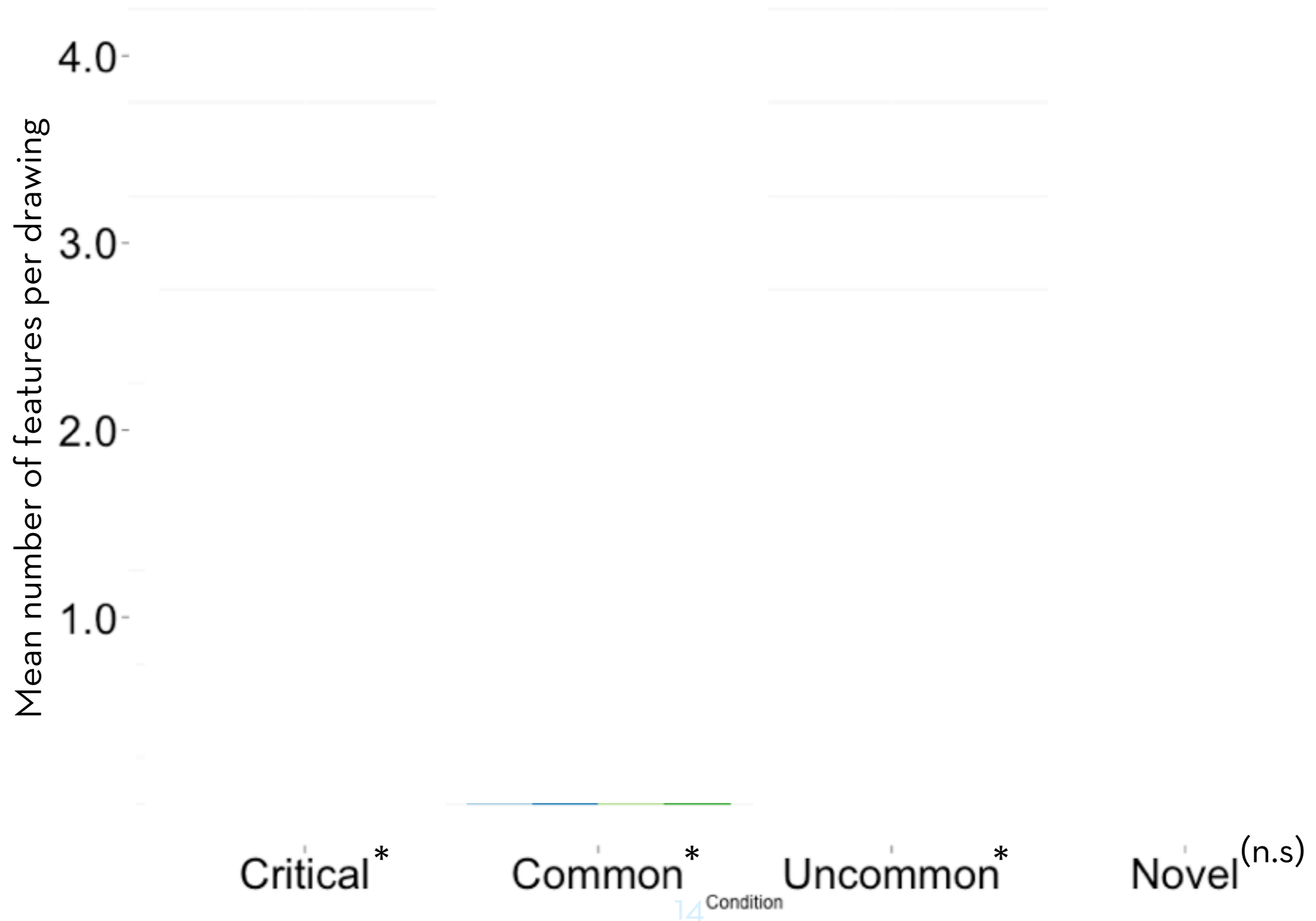


Measures of creativity

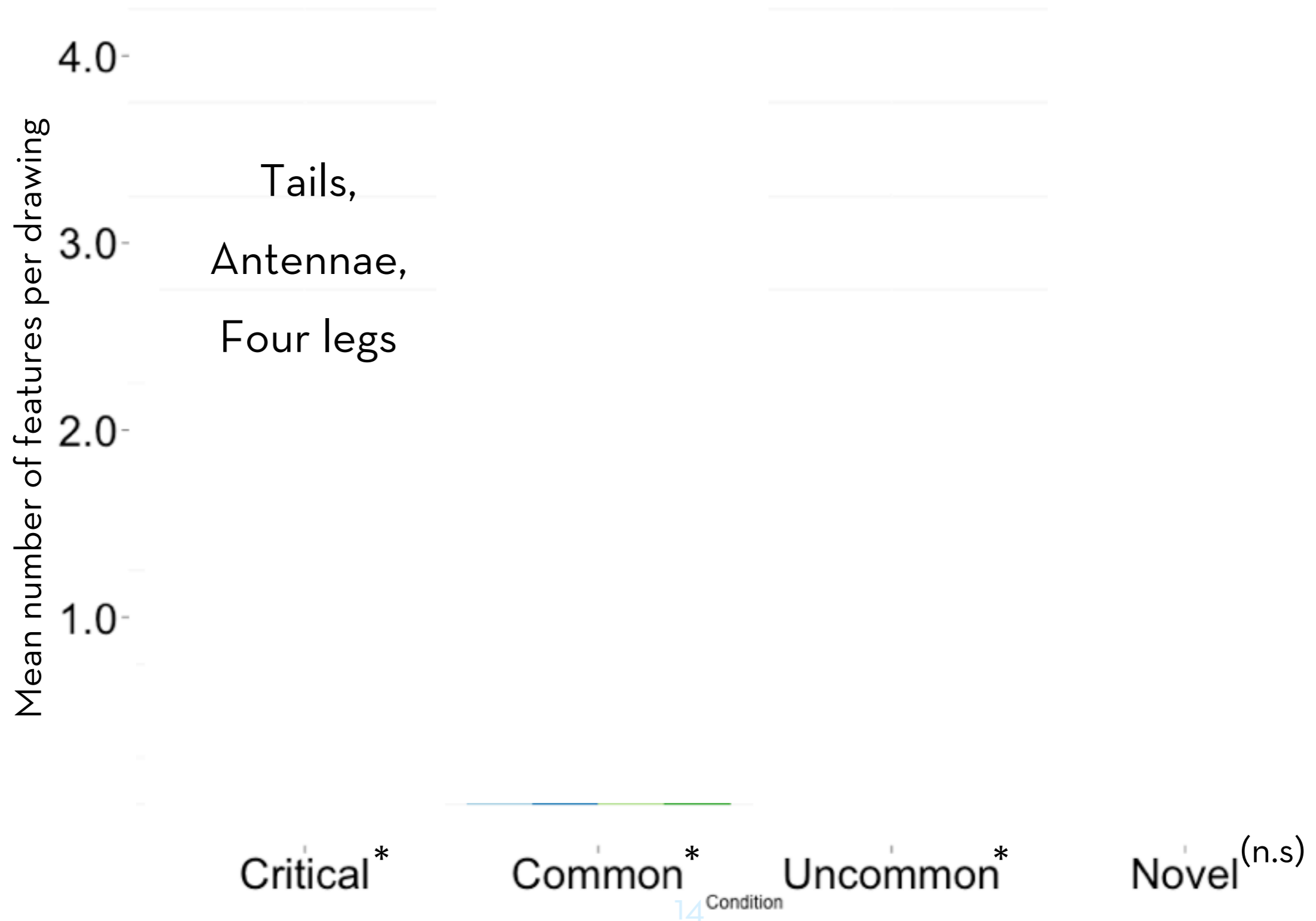
- **Critical features** measure conformity
- **Non-critical features:** not in examples
 - **novel:** speakers, propellers *etc.*
 - **uncommon:** pouch or tentacles *etc.*
 - **common:** arms, eyes or two legs *etc.*
- Creative drawings have more uncommon/novel features
- With examples, prior work found
 - ↓ common features
 - ↑ critical features
 - ↑ uncommon/novel features



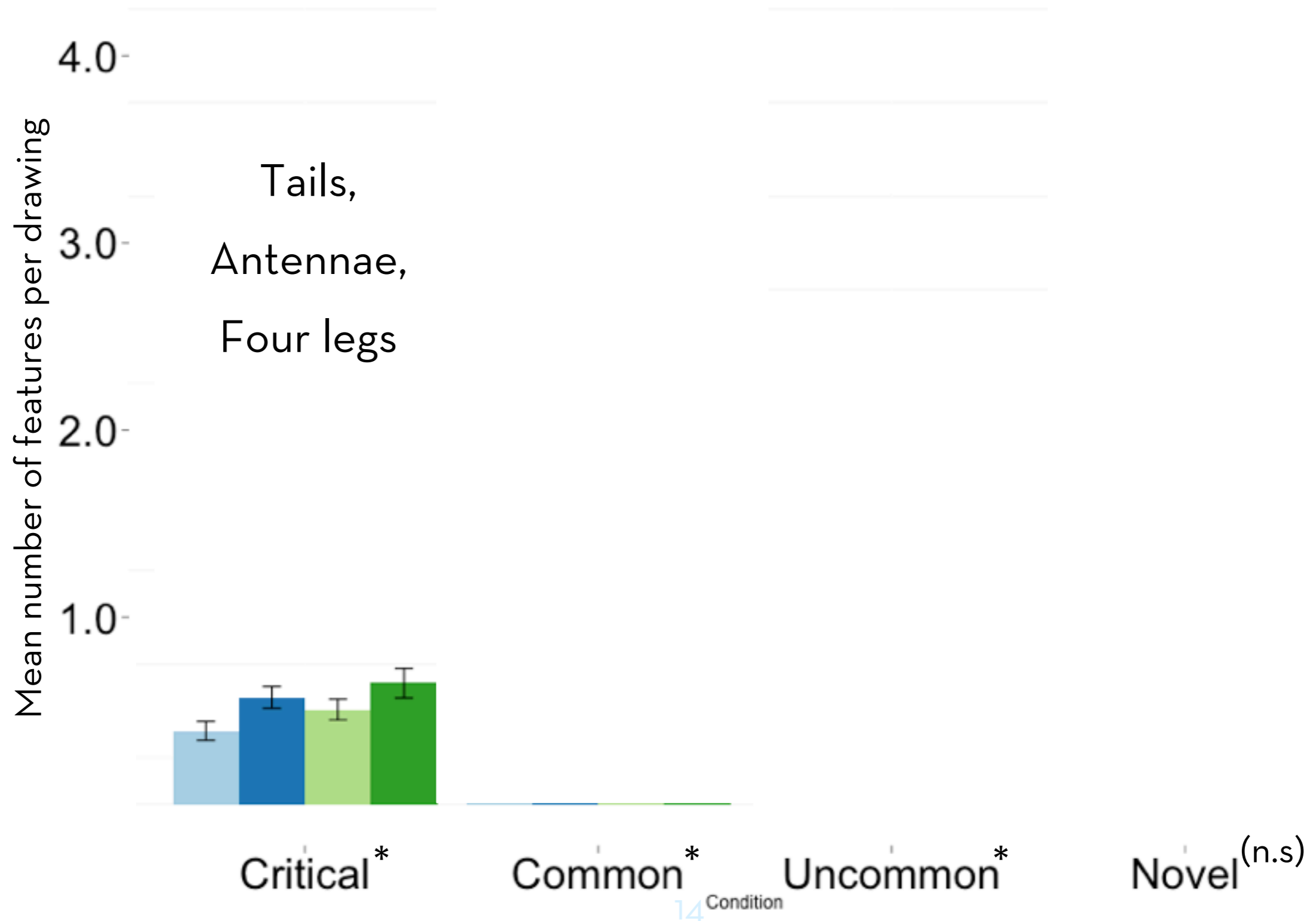
Features of drawings



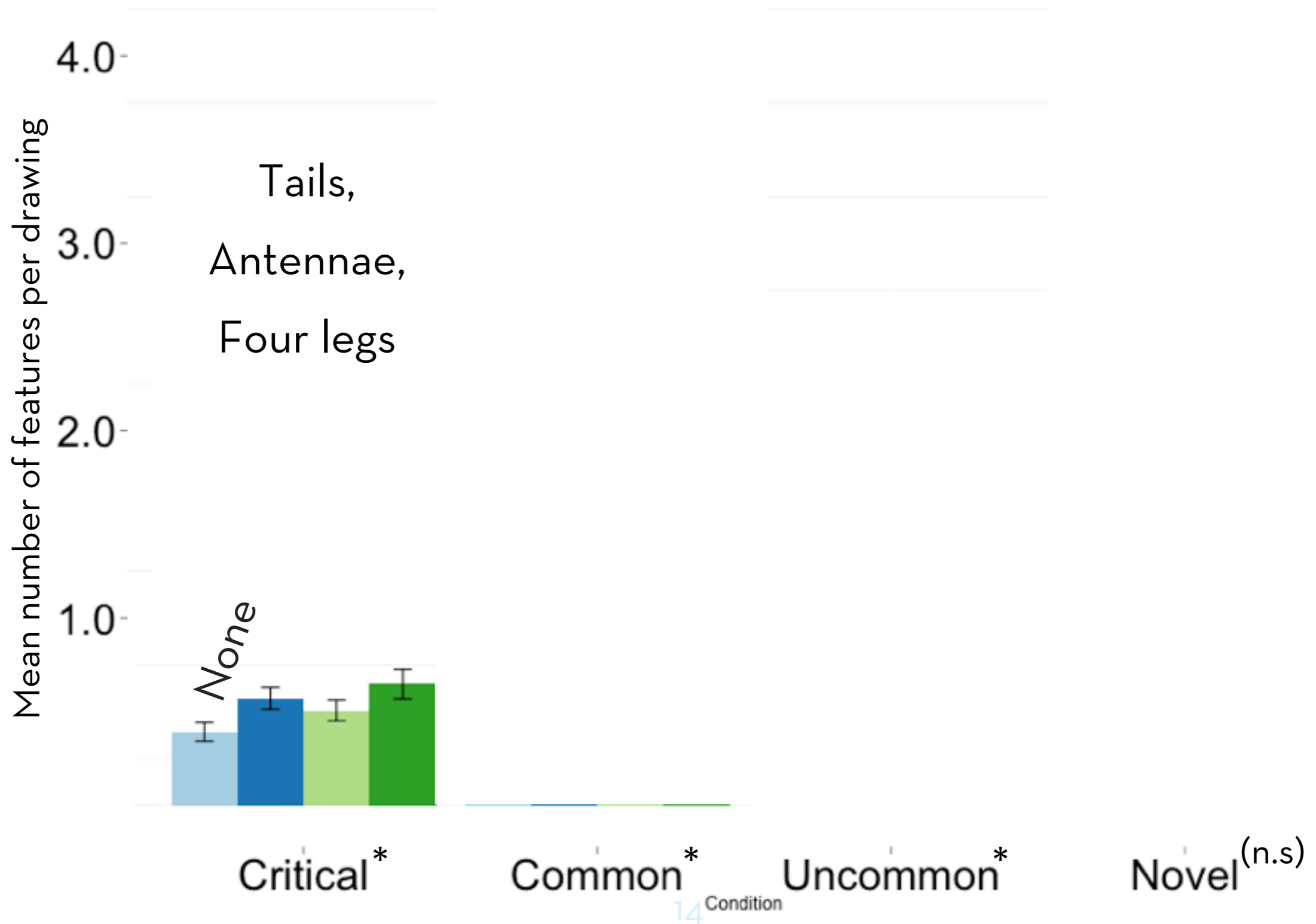
Features of drawings



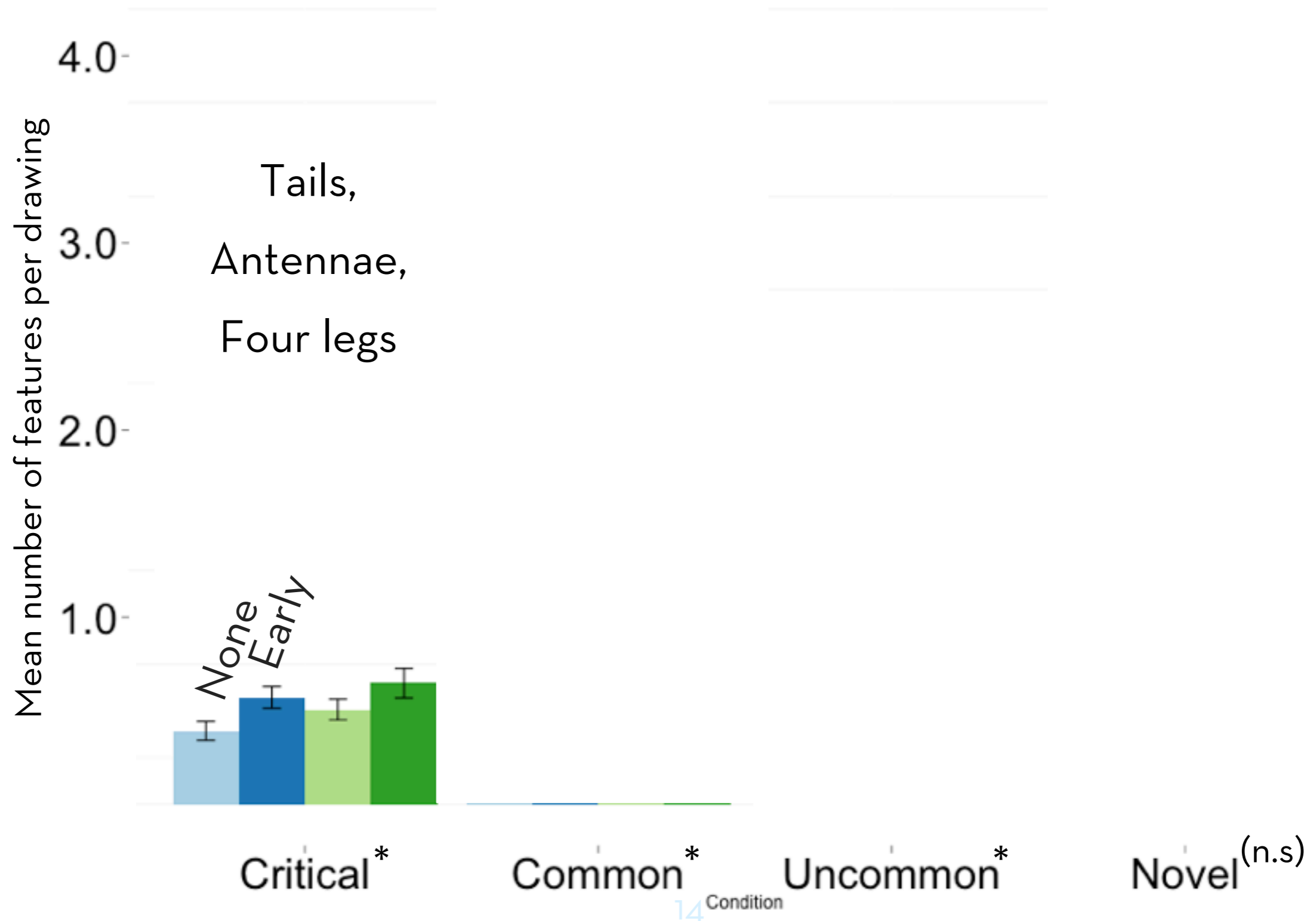
Features of drawings



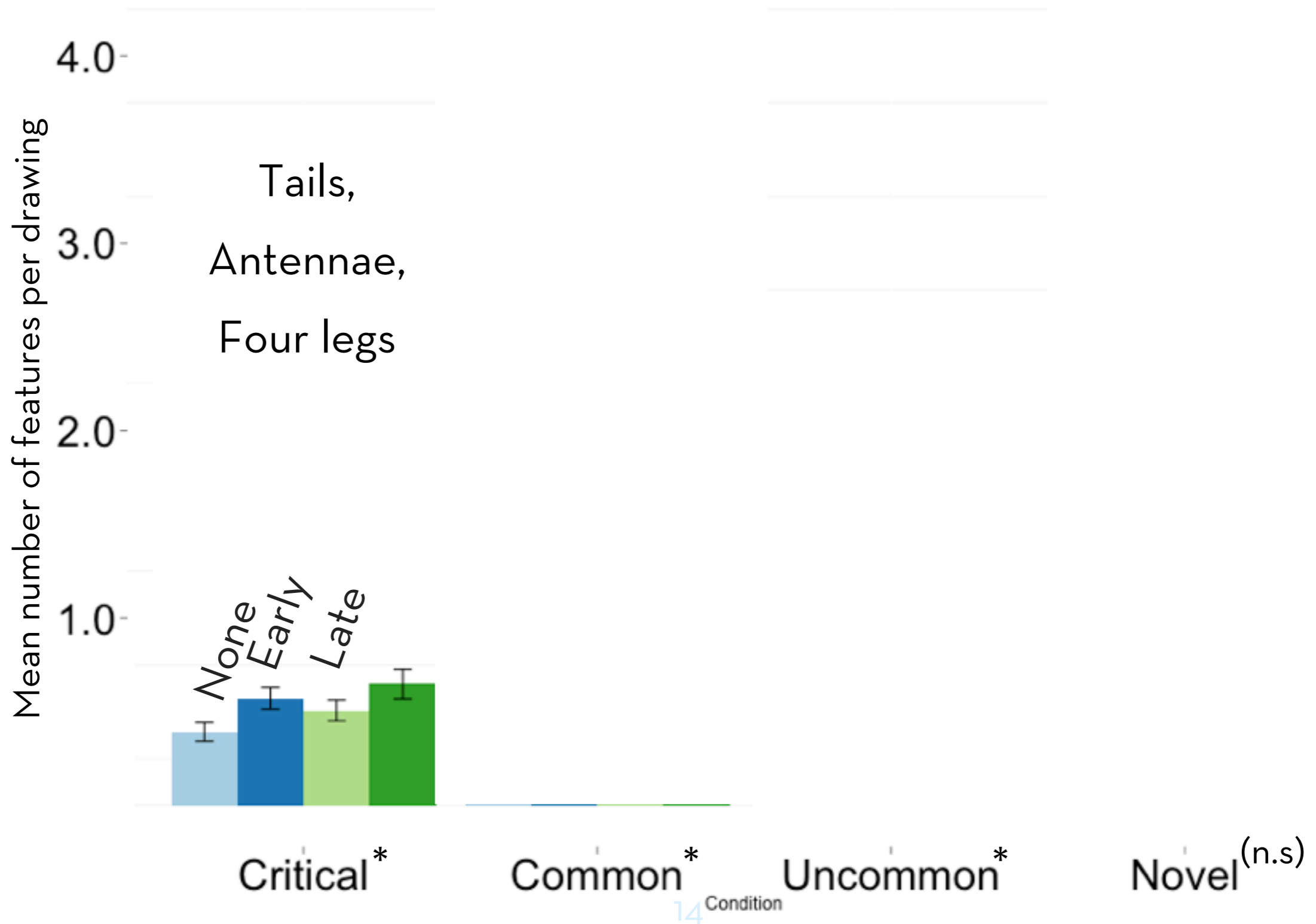
Features of drawings



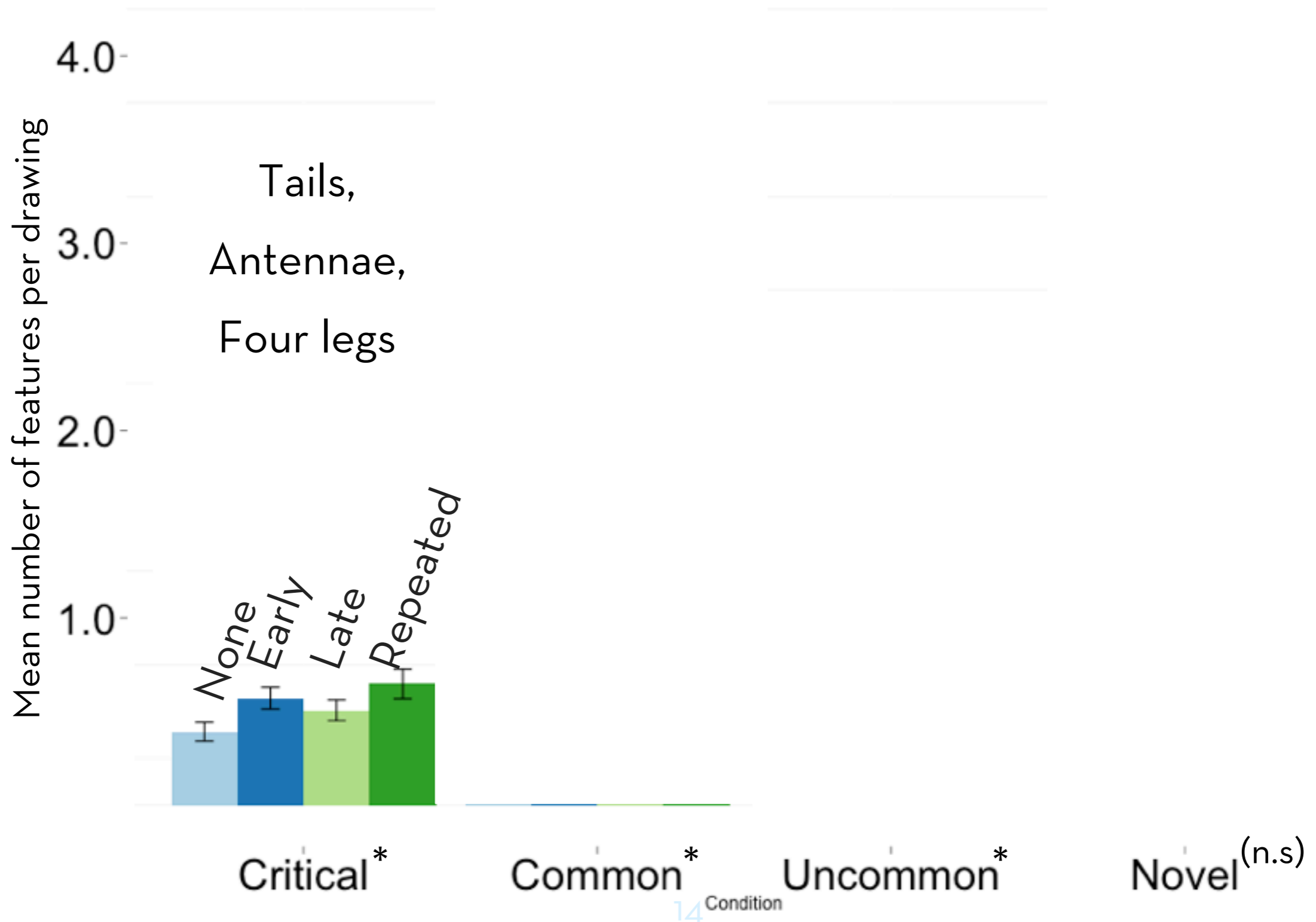
Features of drawings



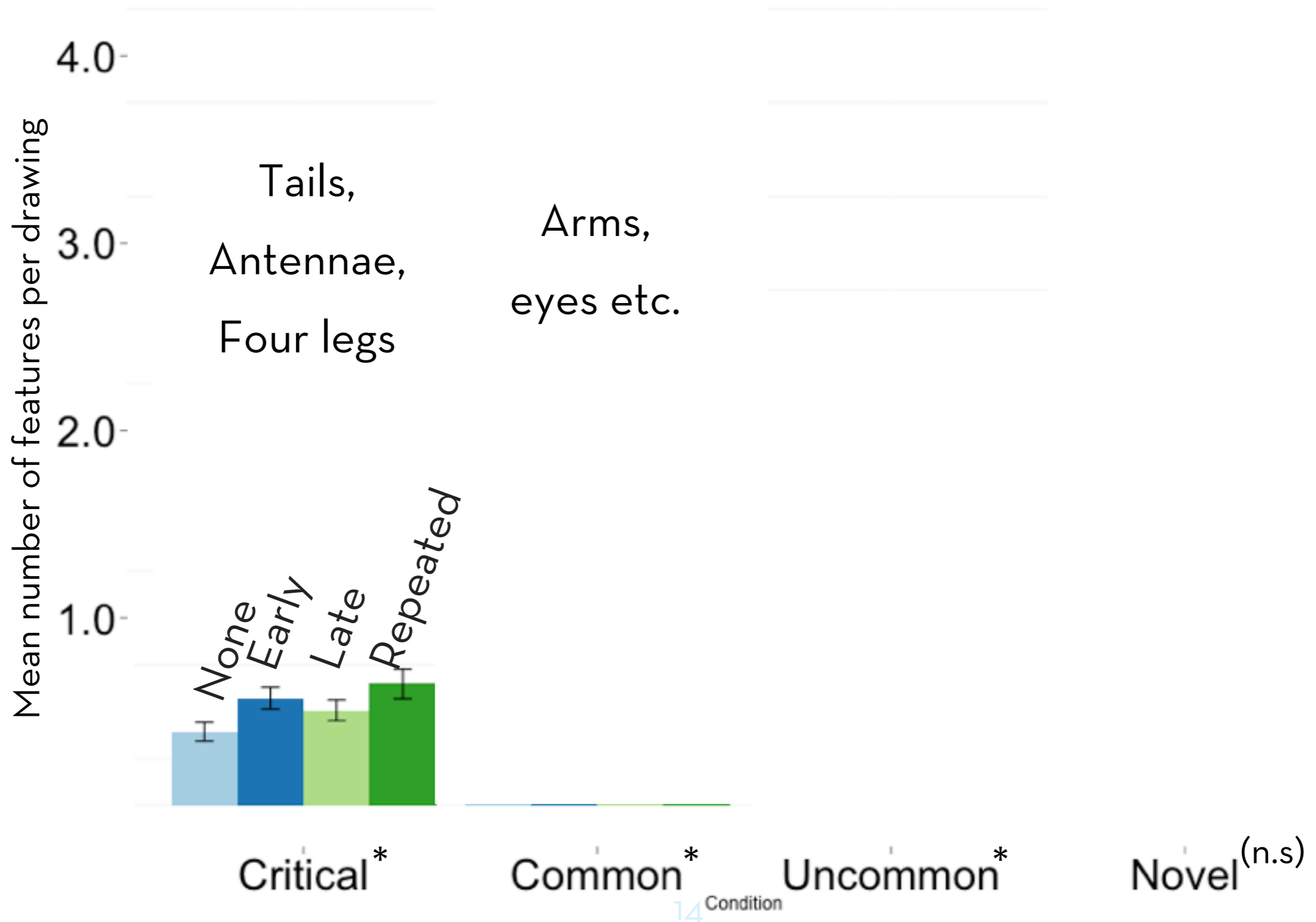
Features of drawings



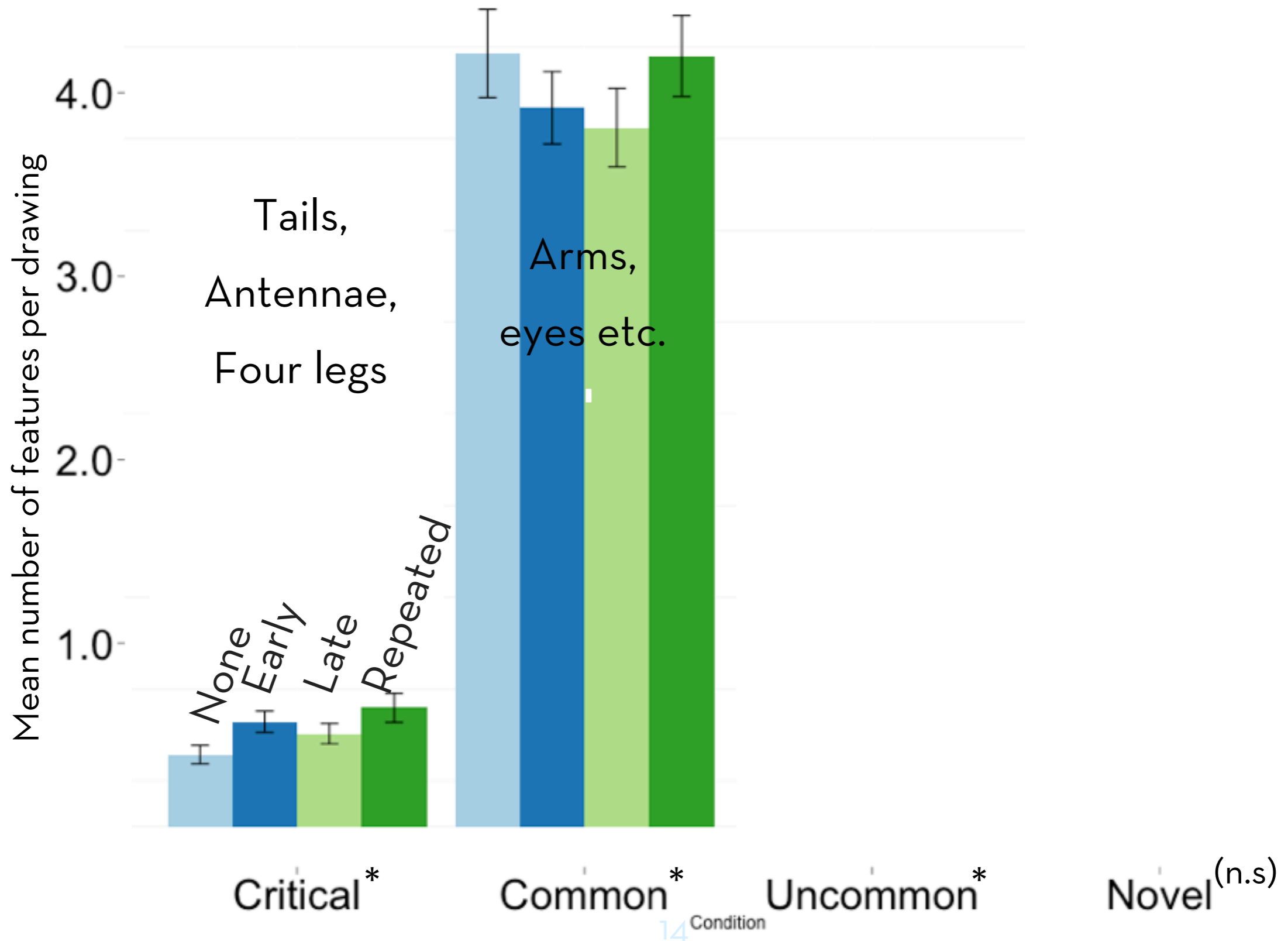
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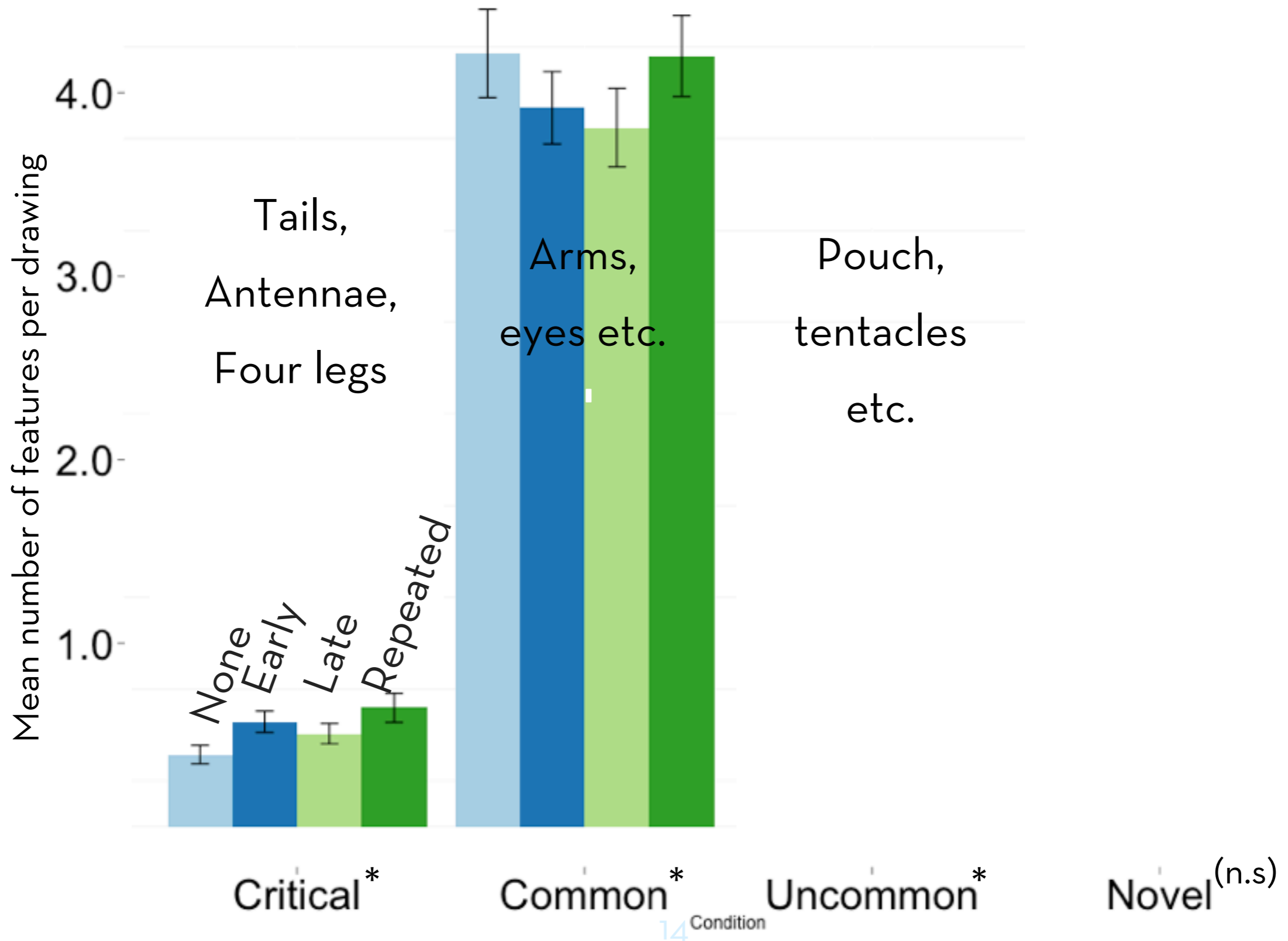
Features of drawings



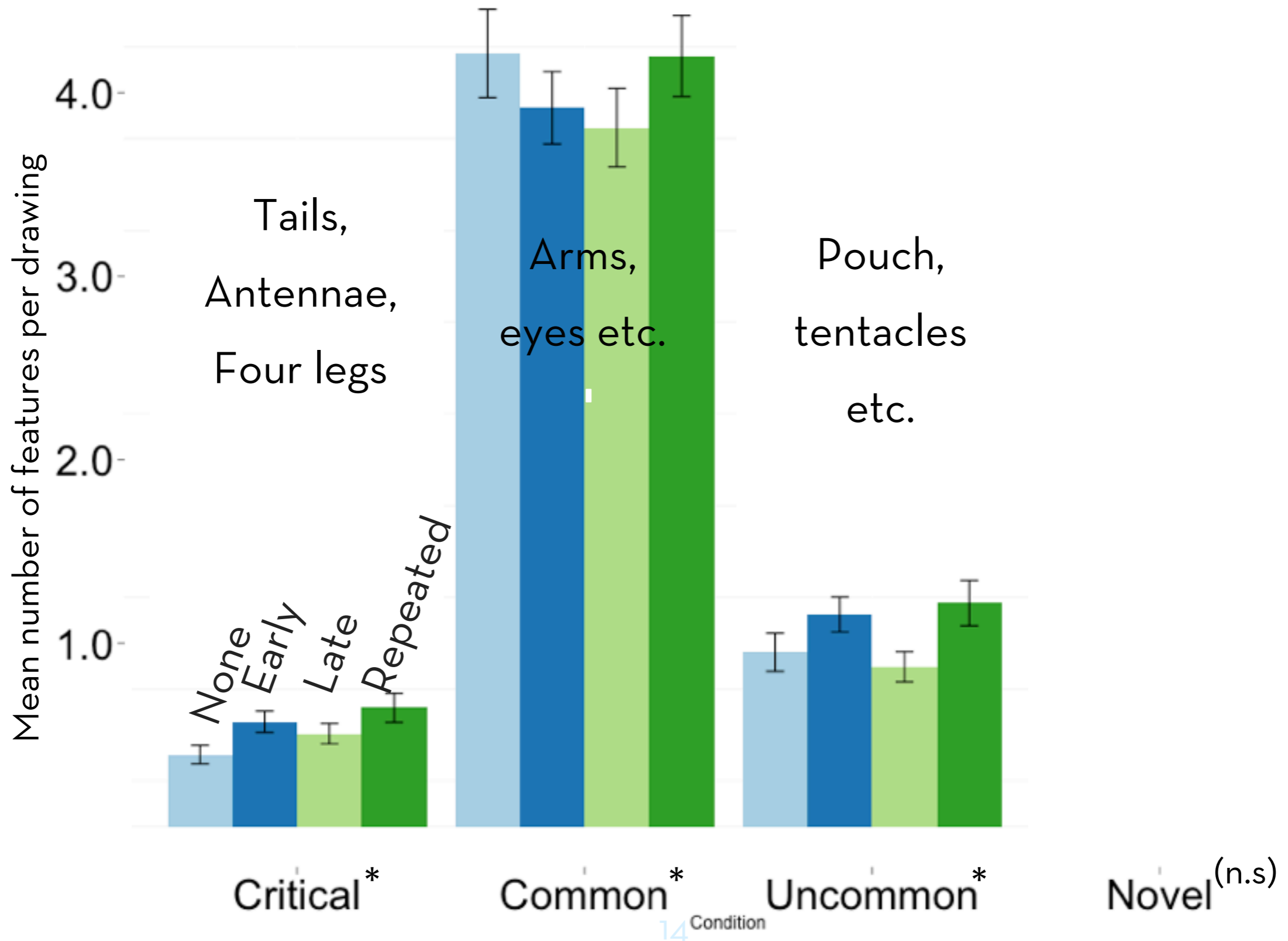
Features of drawings



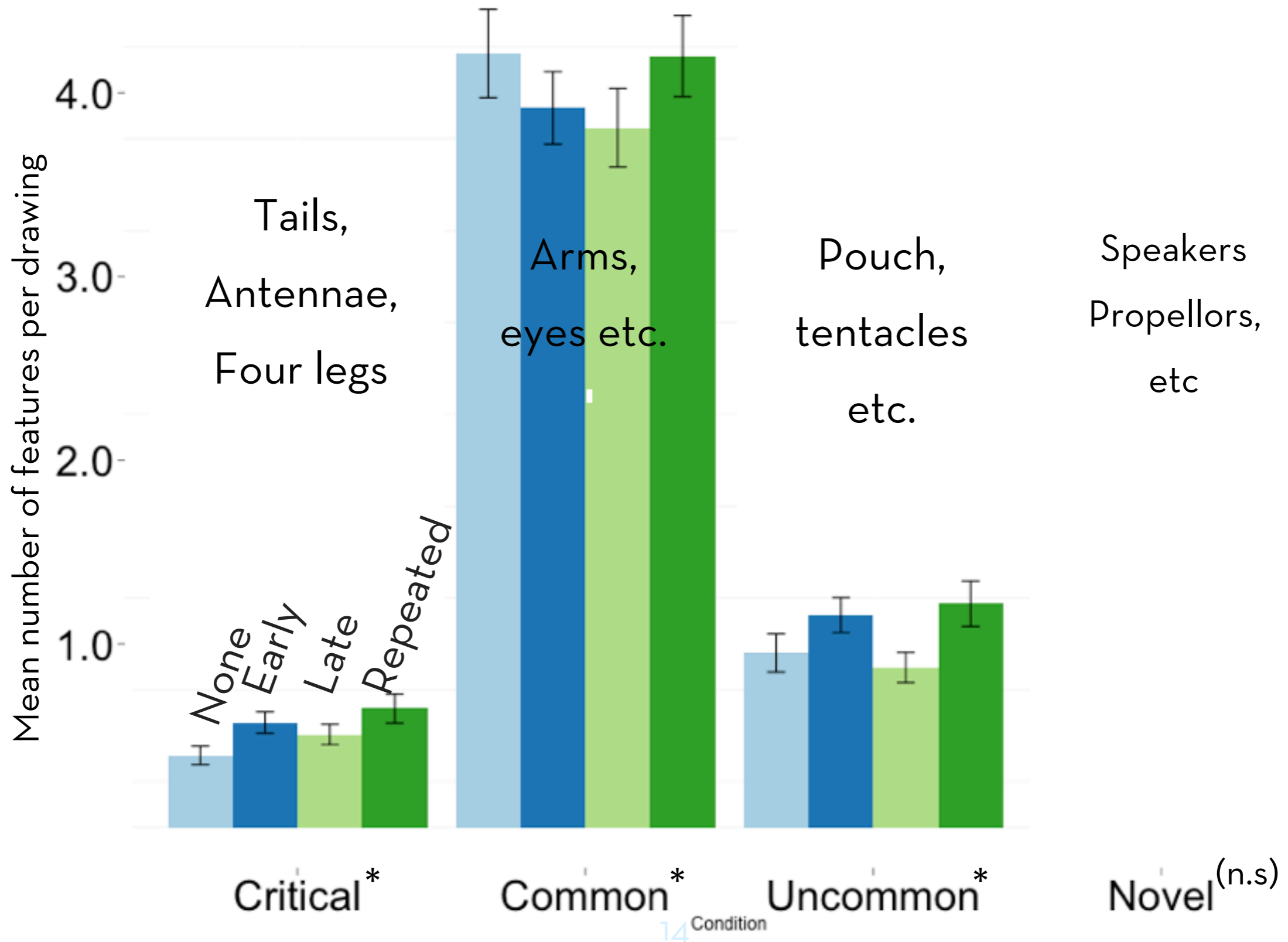
Features of drawings



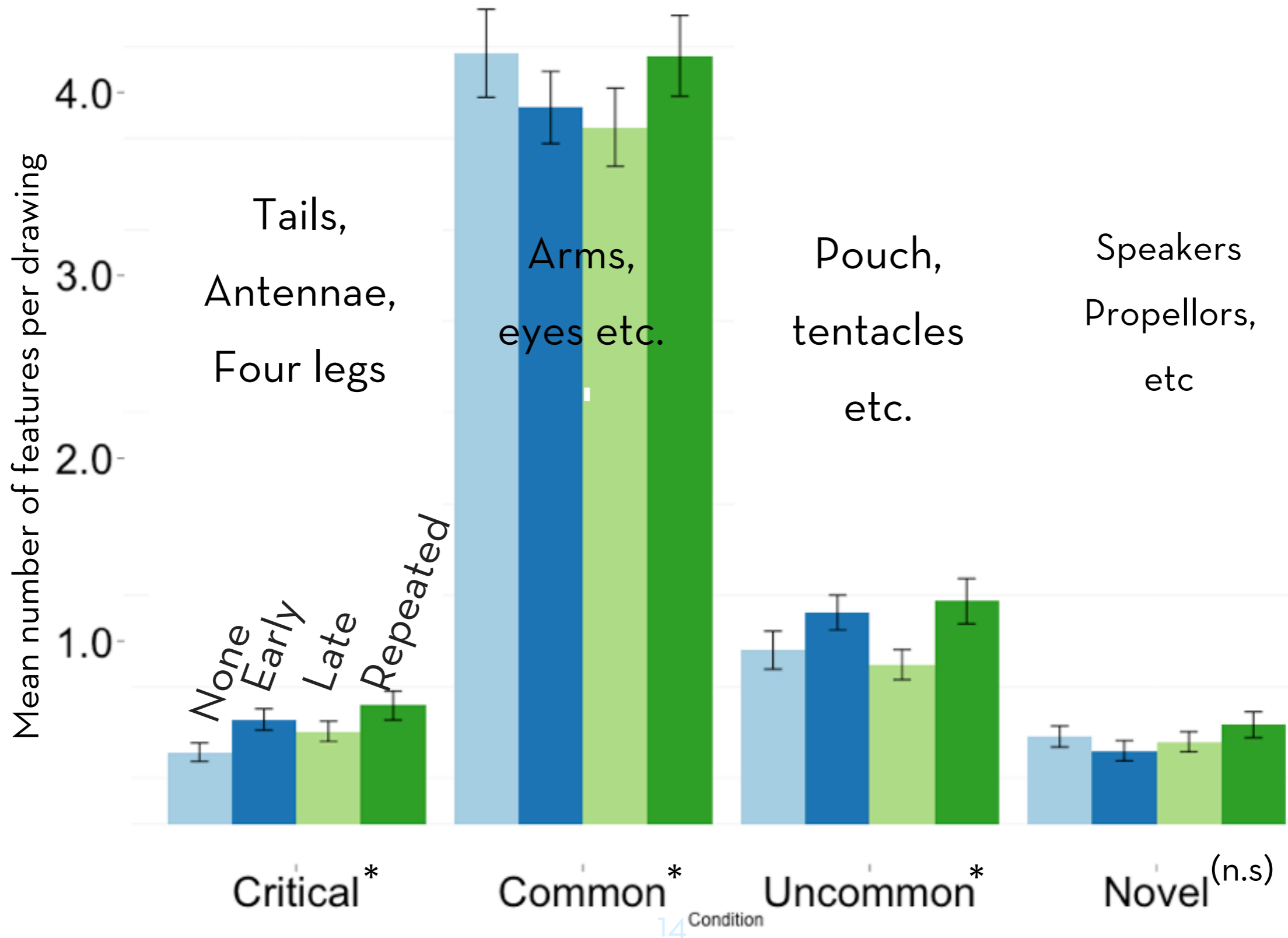
Features of drawings



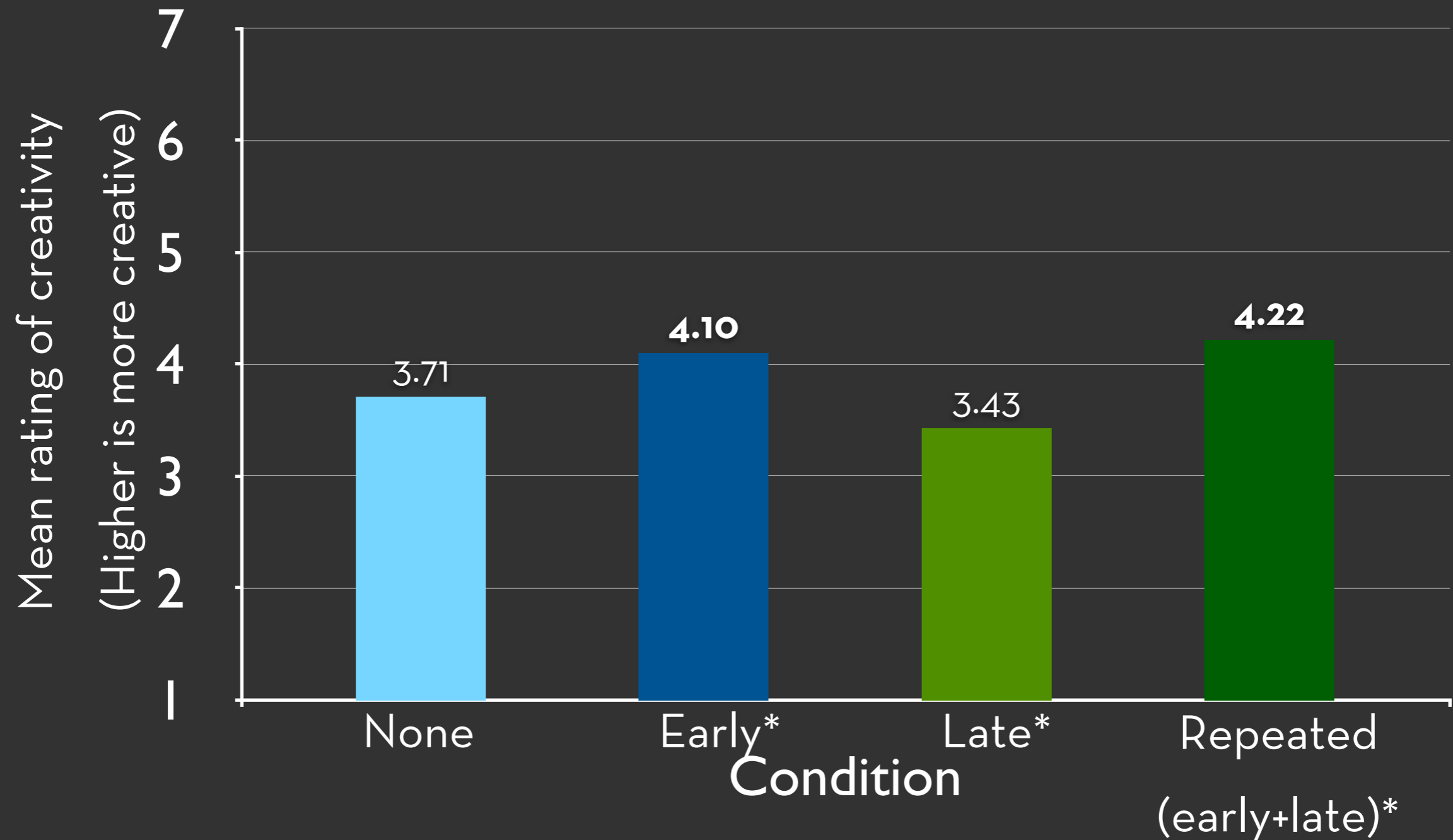
Features of drawings



Features of drawings



Early and repeated condition drawings rated more creative



Early and repeated example exposure leads to...

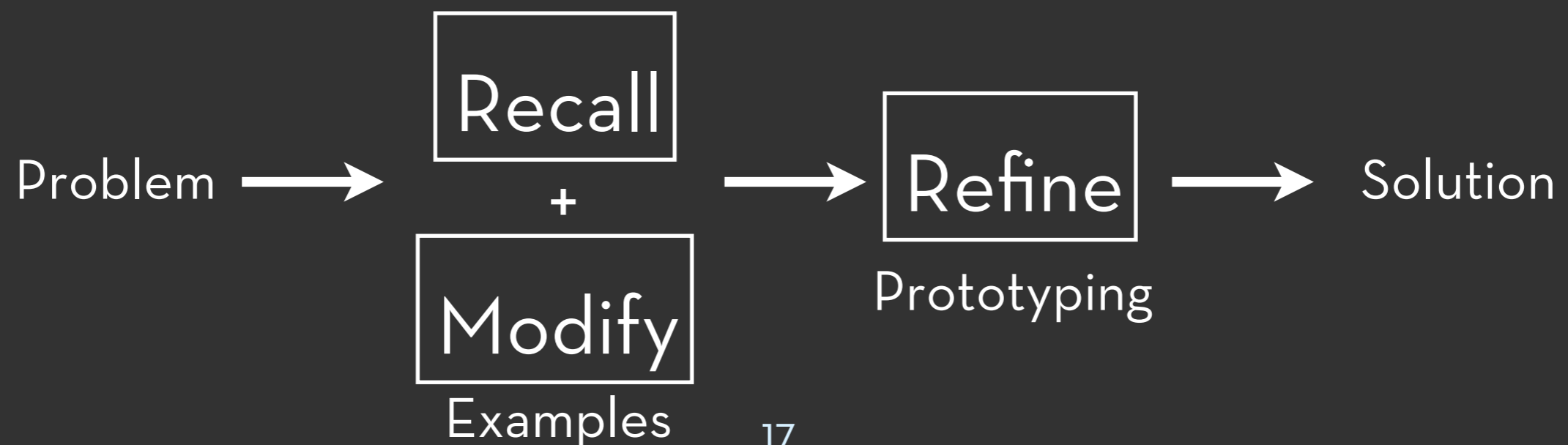
- More uncommon features
- Higher Likert ratings of creativity

- So, early/repeated examples lead to more creative work

Why?

Prototyping helps refine representations

- Examples helps form an initial representation of the creative concept (Heit, 1992)
- Prototyping -> abstraction and refinement of representation (Lim, Stolterman, & Tenenber, 2008)
- Late examples = diverging concepts, lower transference (Gentner et al, 2010)





Braun Radio (1960s)



Apple iPod (2001)

Bill Buxton: Buxton Collection

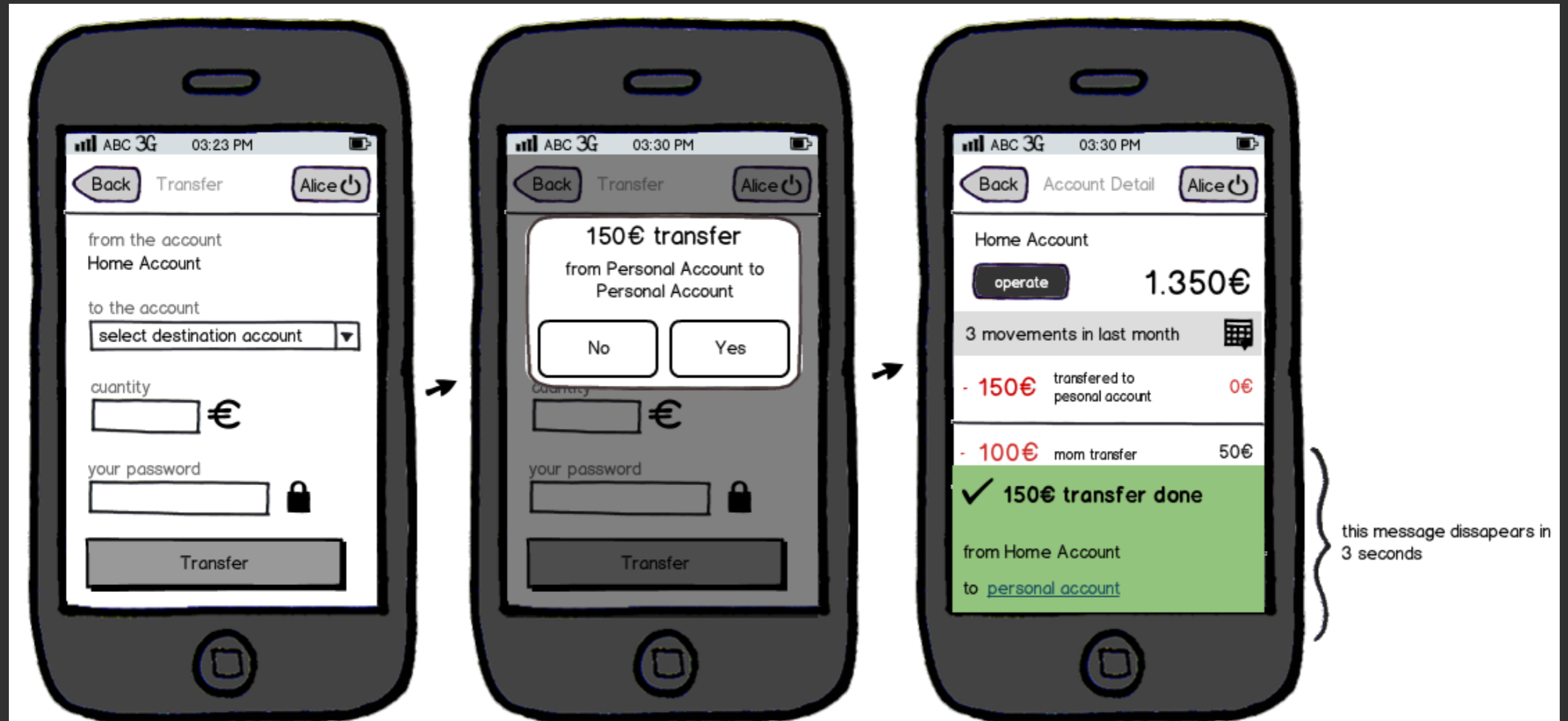
<http://research.microsoft.com/en-us/um/people/bibuxton/buxtoncollection/>

Future: Can examples improve tools?

The image shows a web design search tool interface. At the top, there's a search bar with the text "Web Design Search" and a "Launch Tutorial" button. Below the search bar, there are tabs for "Search Results" and "Bookmarks", and a "Zoom:" control with minus and plus buttons. The main area displays several website examples in a grid. On the right, there's a "Current Query" section showing a preview of a website. At the bottom right, there's a "Highlighted Page Style" section with a grid of style options: minimal, complex, dark, light, cool, warm, pale, colorful, text-light, and text-heavy. The highlighted style is "text-light".

hci.st/dtour

Future: Can examples improve pedagogy?

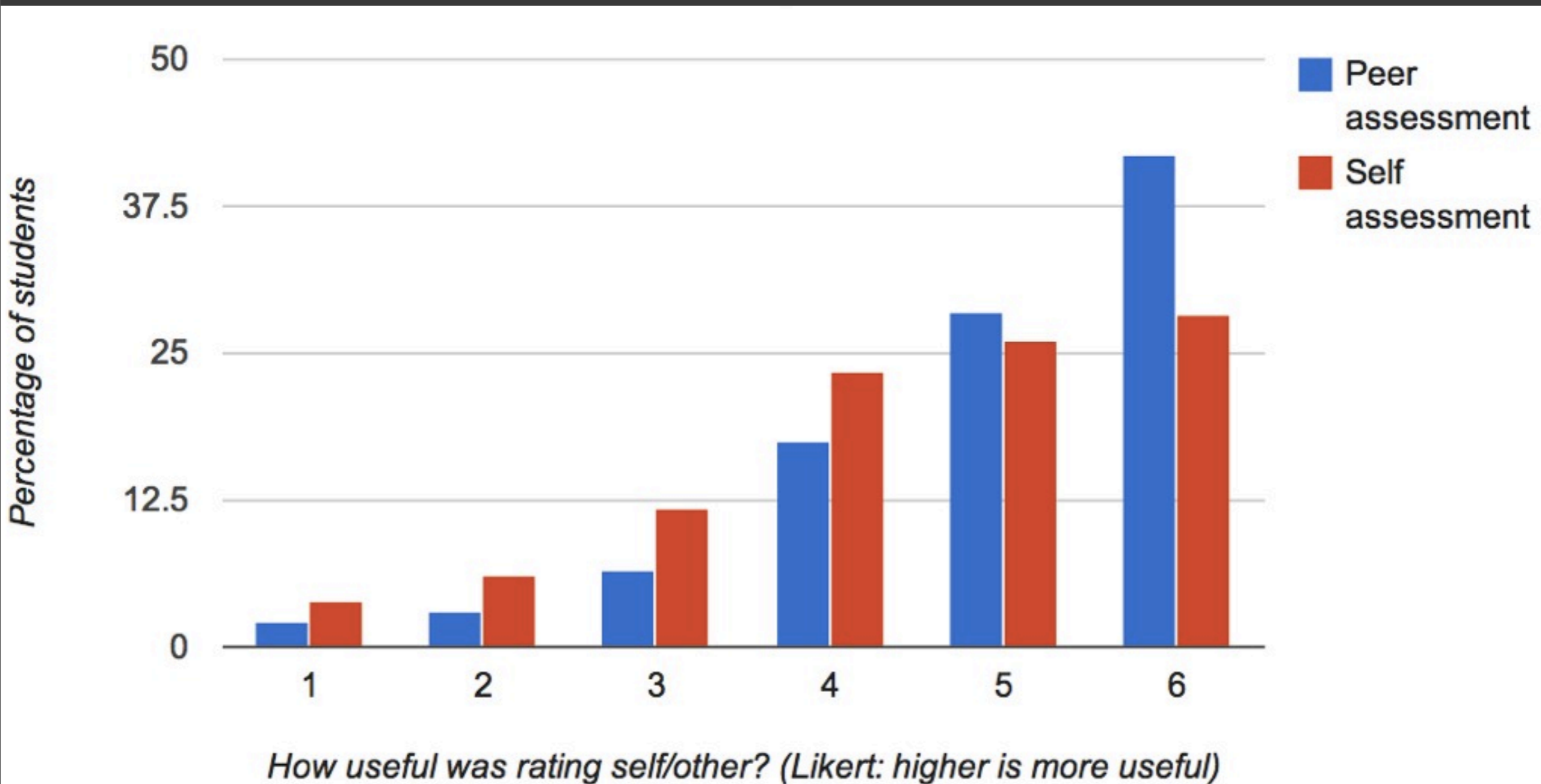


Prototype of mobile banking app from student submission

www.hci-class.org

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- How much did you feel like you learned from assessing **others'** work?
- How much did you feel like you learned from assessing your **own** work?



<http://hci.st/examples>

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Results: #Drawings

