Let's talk structure

the positive consequences of structural representations of social categories

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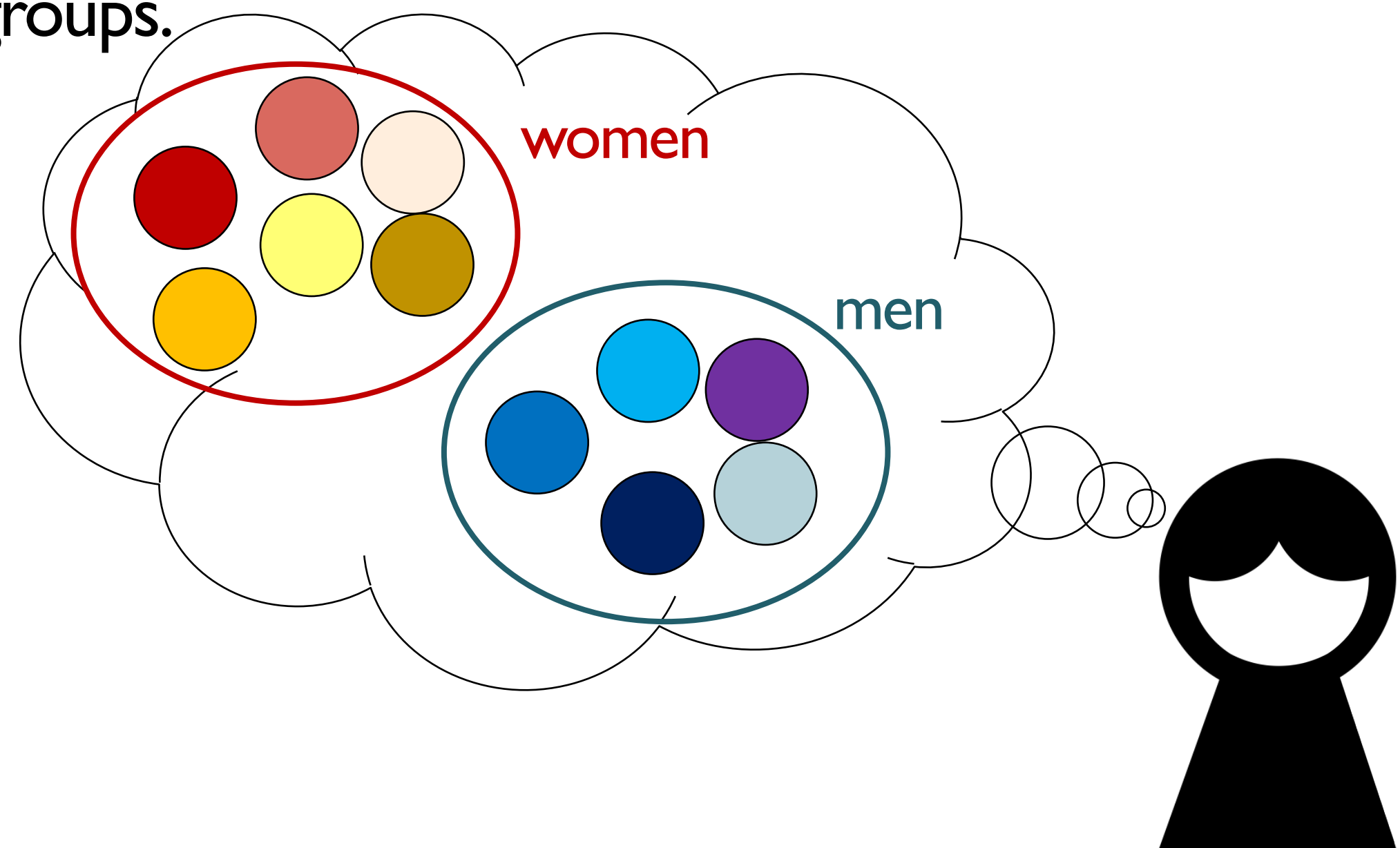
Stanford University

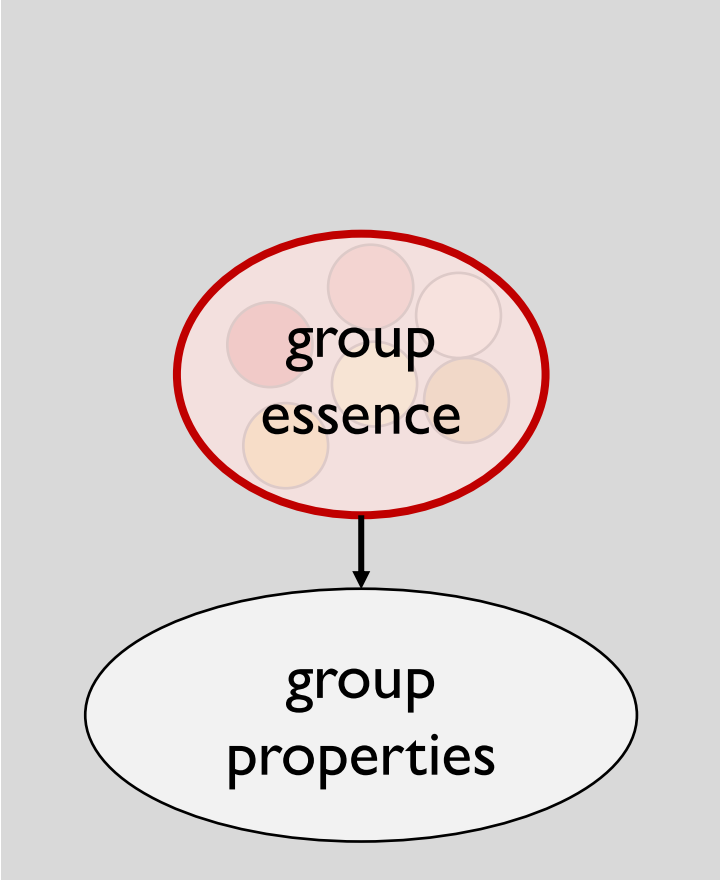
Leonard Learning Lab
10.12.2021

We structure the social world by categorizing people into groups.



how *do* we represent differences between groups?

essentialism

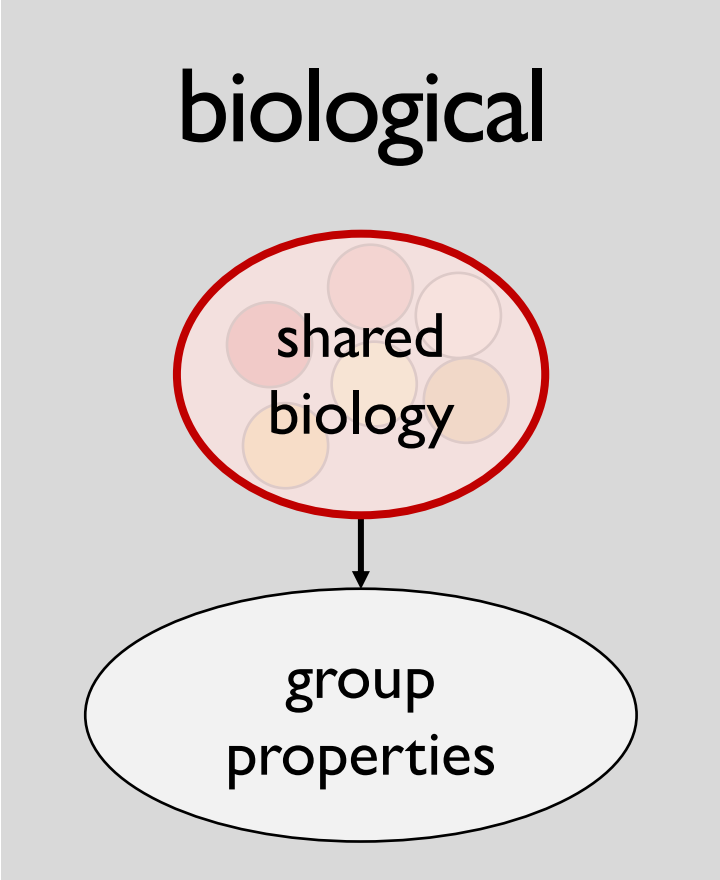


Category members share some internal **essence**

that causes typical category properties.

Gelman (2003)

essentialism



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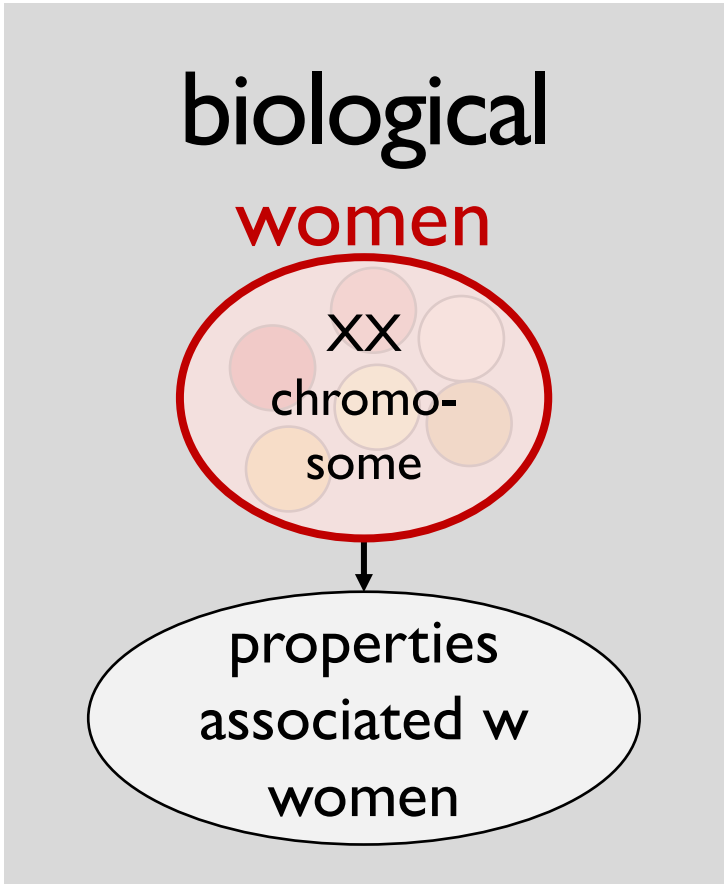
essentialism



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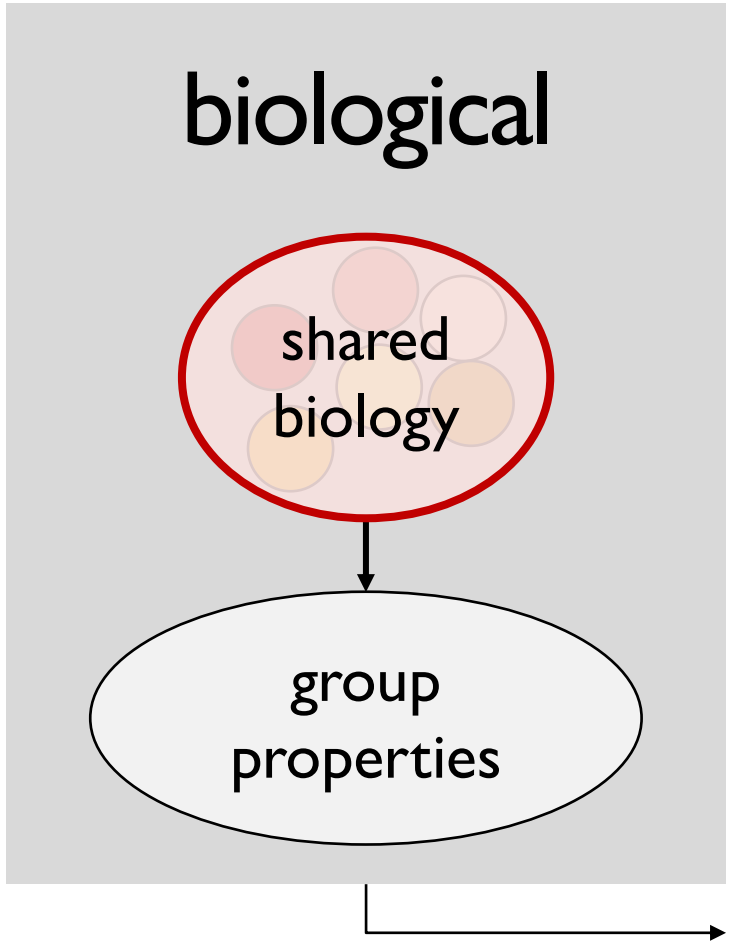
lack of ground truth for biological essentialism of gender: Fausto-Sterling, race: Lewontin (1972)

essentialism



Category members share some internal **essence**

(often cached out as shared biology)

that causes typical category properties.

problematic consequences:

1) what is the case

- group-based generalization (stereotyping)

2) what should be the case

- group properties seen as natural and just, counter-stereotypical examples seen as "wrong"

…

1) Taylor, Rhodes & Gelman (2009), 2) Levy et al. (1995)

a review: Rhodes & Moty (2020)

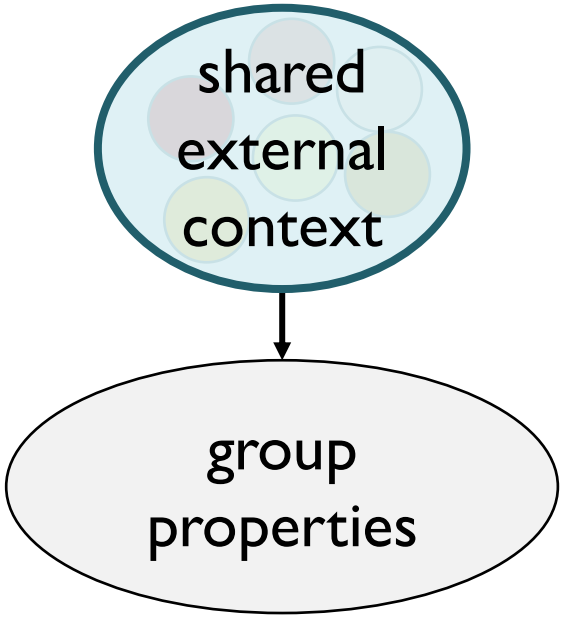
how *should* we represent differences between groups?

essentialism

biological

Category members share a **stable external context**.

structural

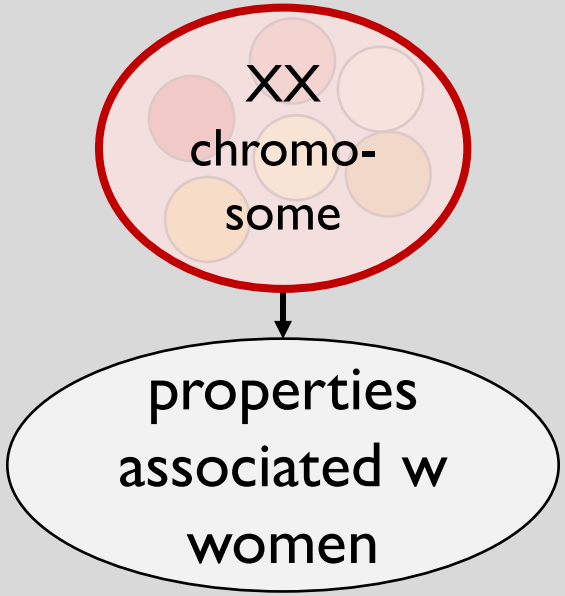


Haslanger (2000), Scott (1986)

essentialism

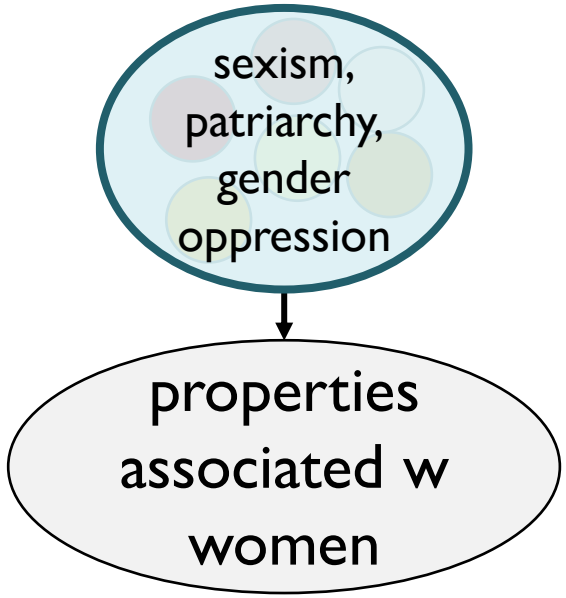
biological

women



structural

women



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essentialism

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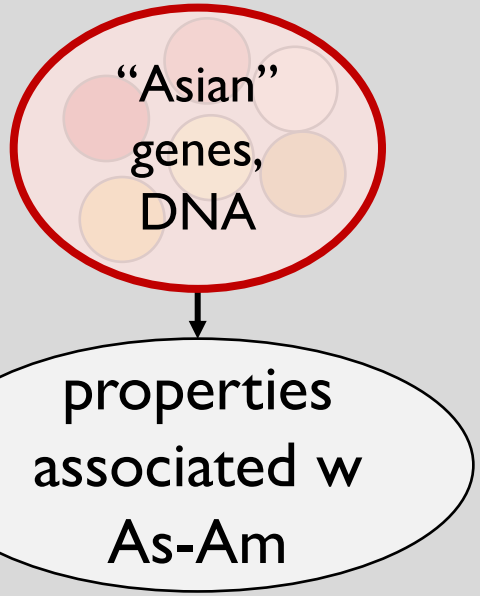
Asian-Americans



structural

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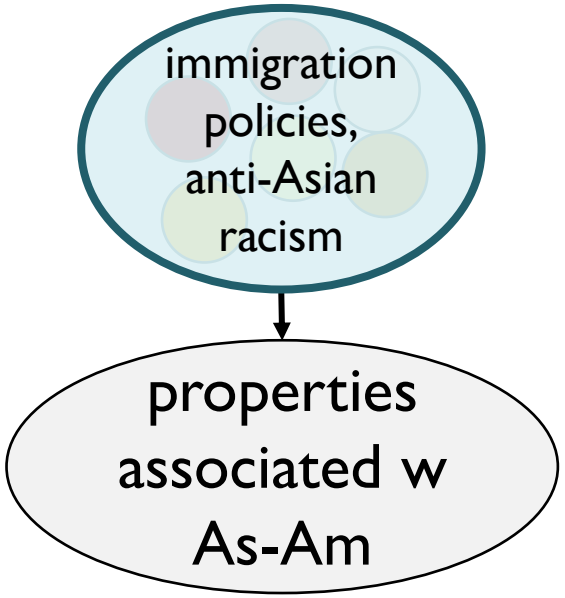
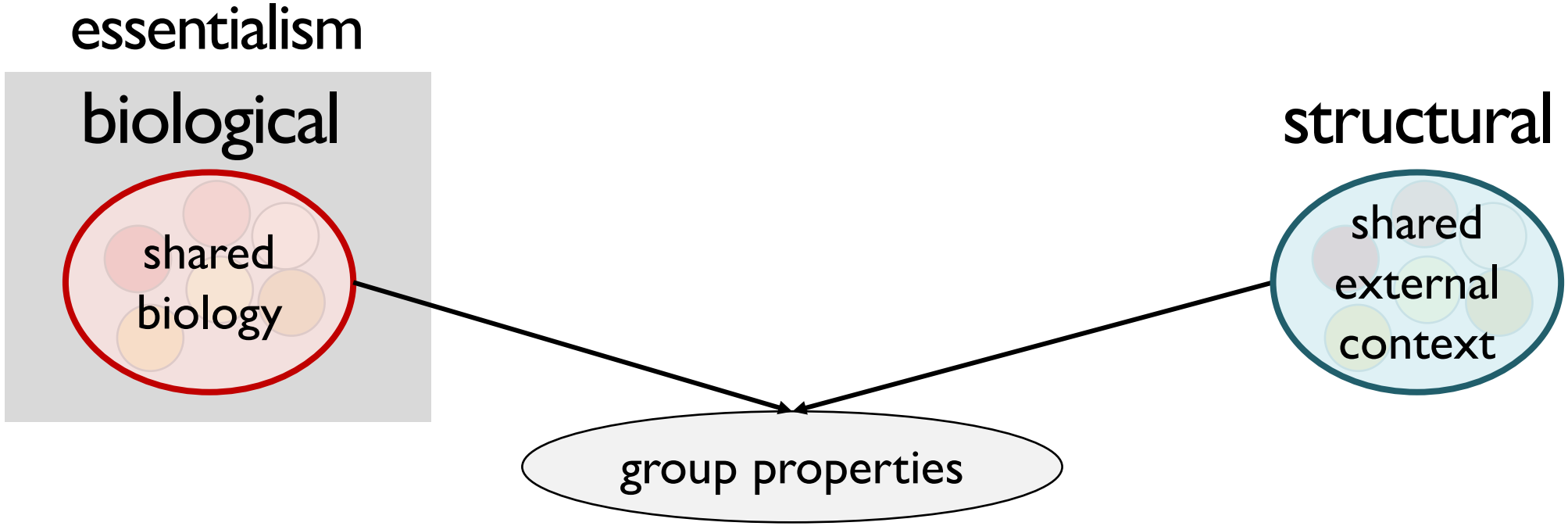


Yuji Ichioka, founding of the Asian American Political Alliance, UC Berkeley (1968)

1) Could structural representations be a **more positive** alternative to essentialism?



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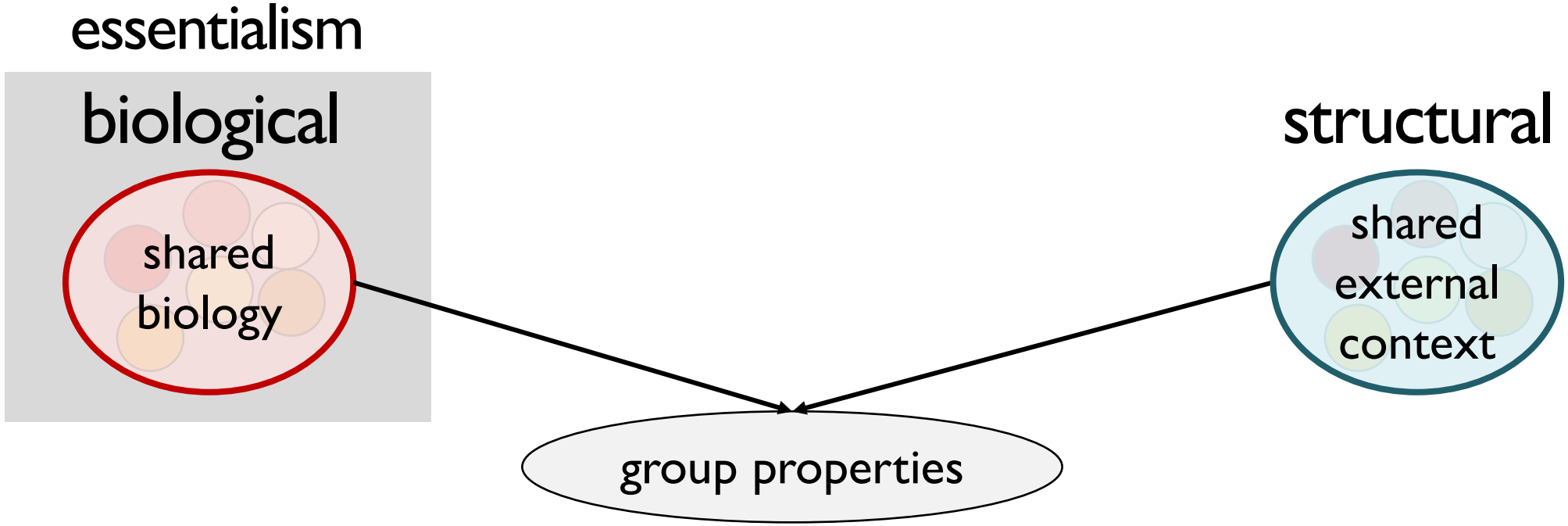


problematic consequences:

1) what is the case

- group-based generalizations (stereotyping)

2) what should be the case

- justifies properties as natural and normative

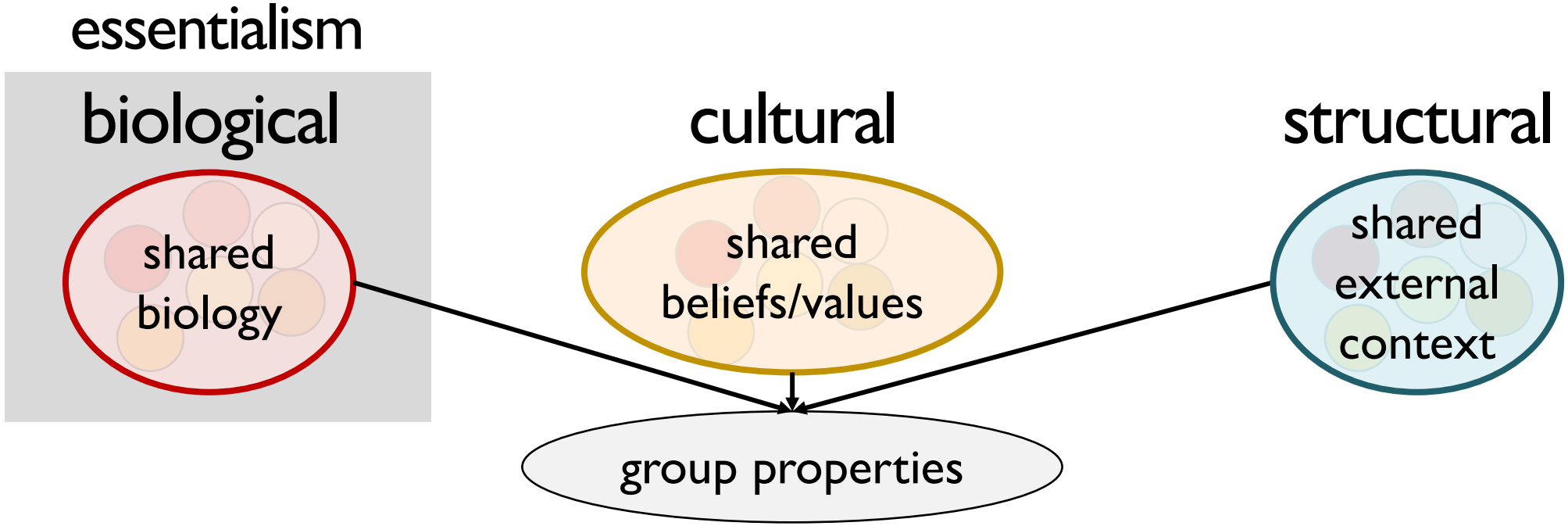
better consequences?

1) what is the case

- context-based generalizations

(Vasilyeva et al, 2019/2020)

2) Where does attributing properties to **group culture** fit in?



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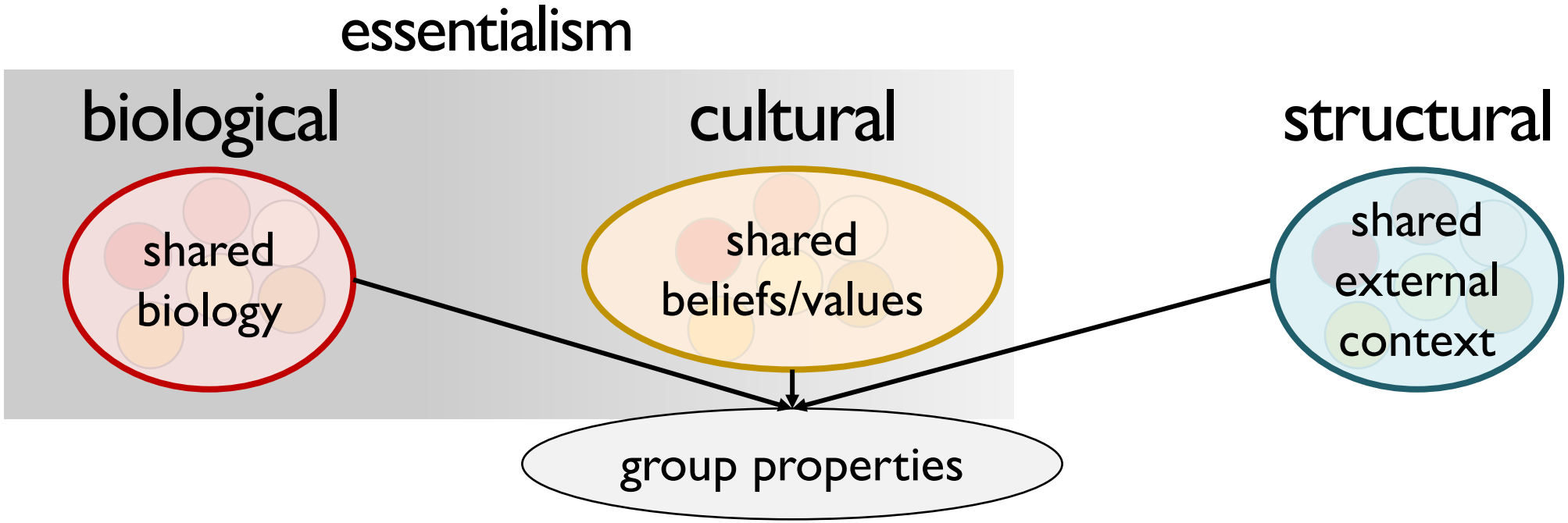

value-based essentialism: Bailey, Knobe & Newman (2021)

negative consequences of cultural explanations for groups' academic achievement: Sue & Okazaki (1990), Osajima (2005)

ground truth of structural over cultural explanations for gaps between groups' academic achievement: Kim (2002), wealth: Herring & Henderson (2016)

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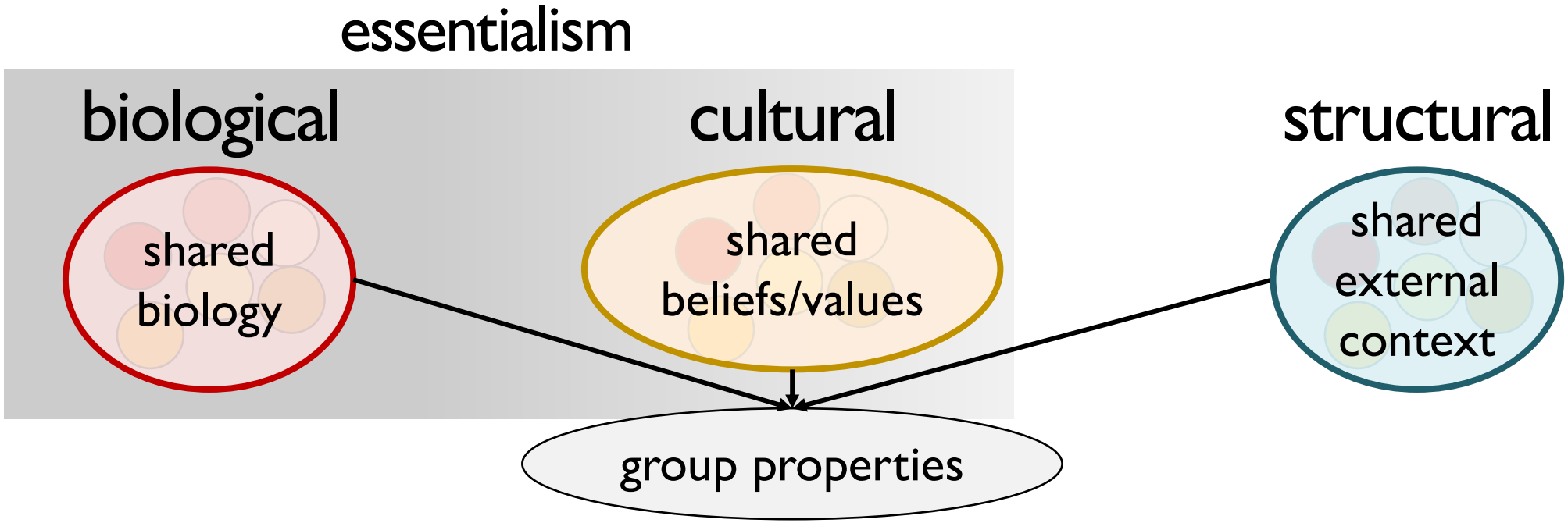
2) Where does attributing properties to **group culture** fit in?

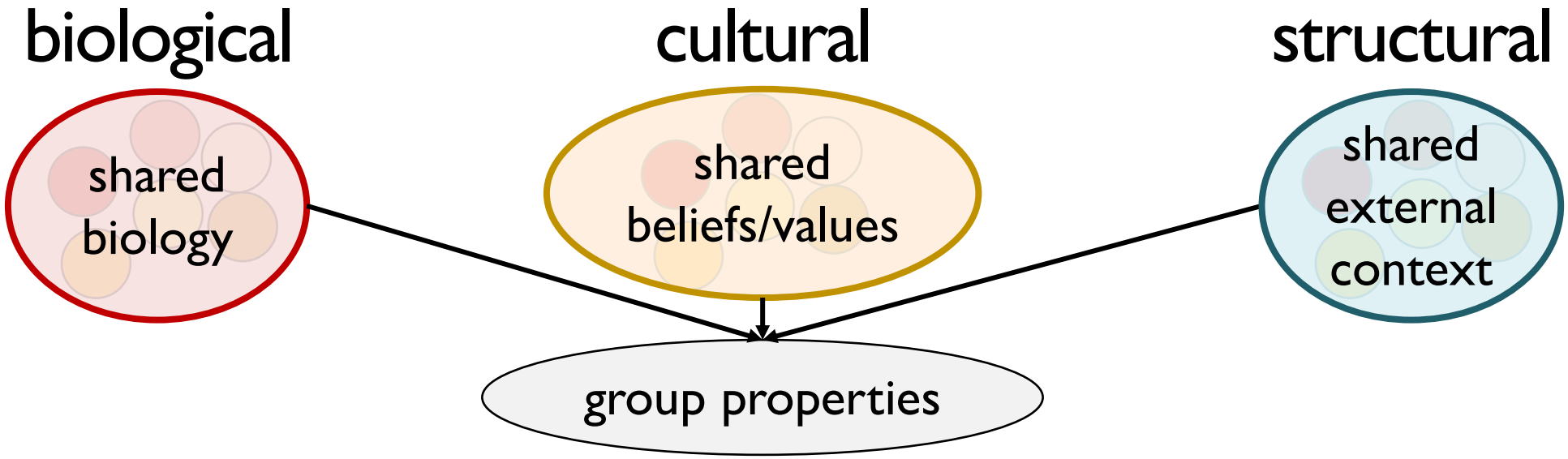


novel groups

Zarpies

Vawns

induce one of these representations…



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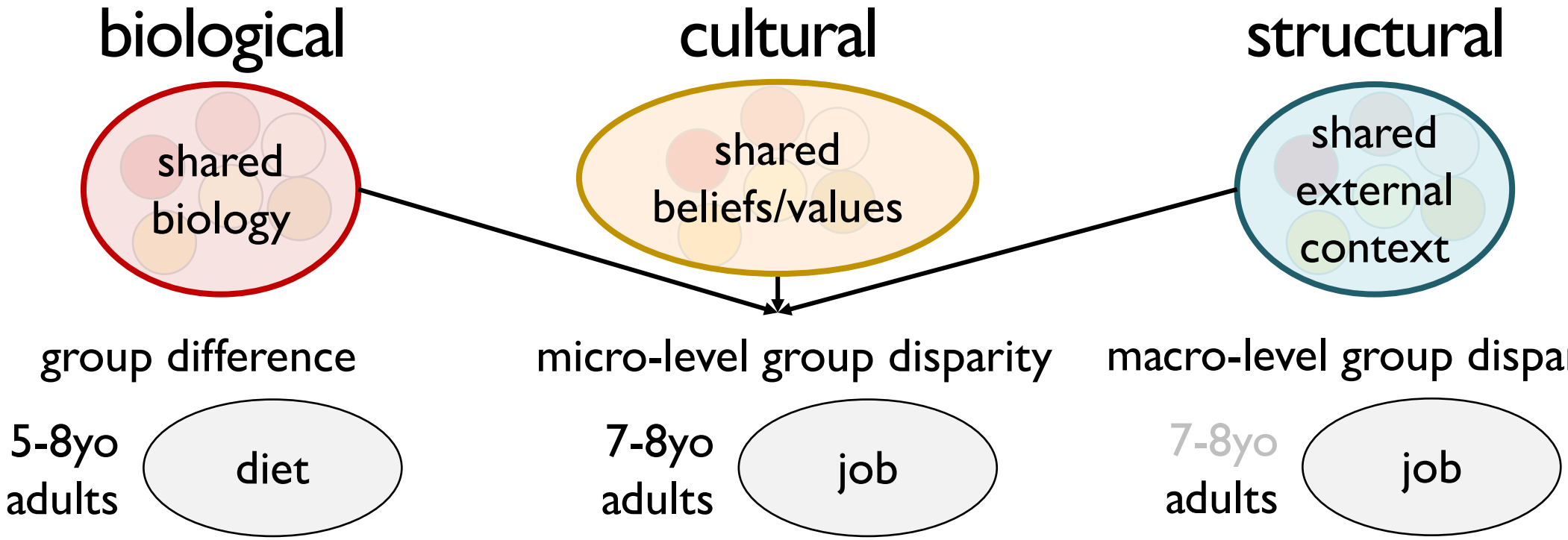
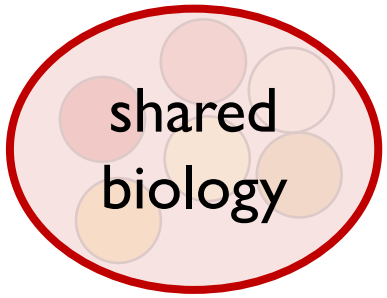
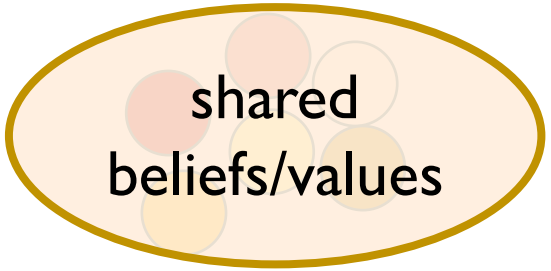


induce one of these representations…

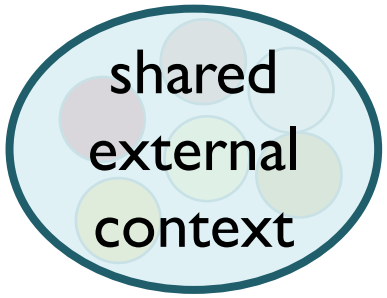
biological



cultural



structural



look at their different consequences…

1) what is the case

- generalize based on group vs context

2) what should be the case

- attitudes towards non-conformity
- attitudes towards present disparity

3) how to change what is the case

- intervene on group vs context

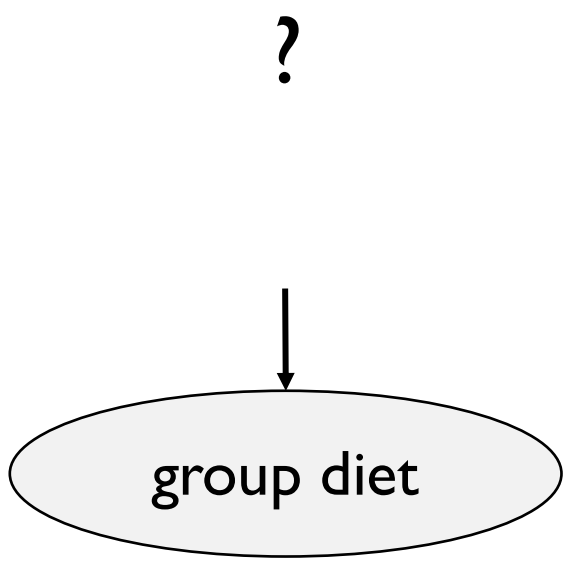
reasoning about group differences

adults

5-8yo

Why does a group tend to eat certain foods?

type in the chat!



Why does a group tend to eat certain foods?

type in the chat!

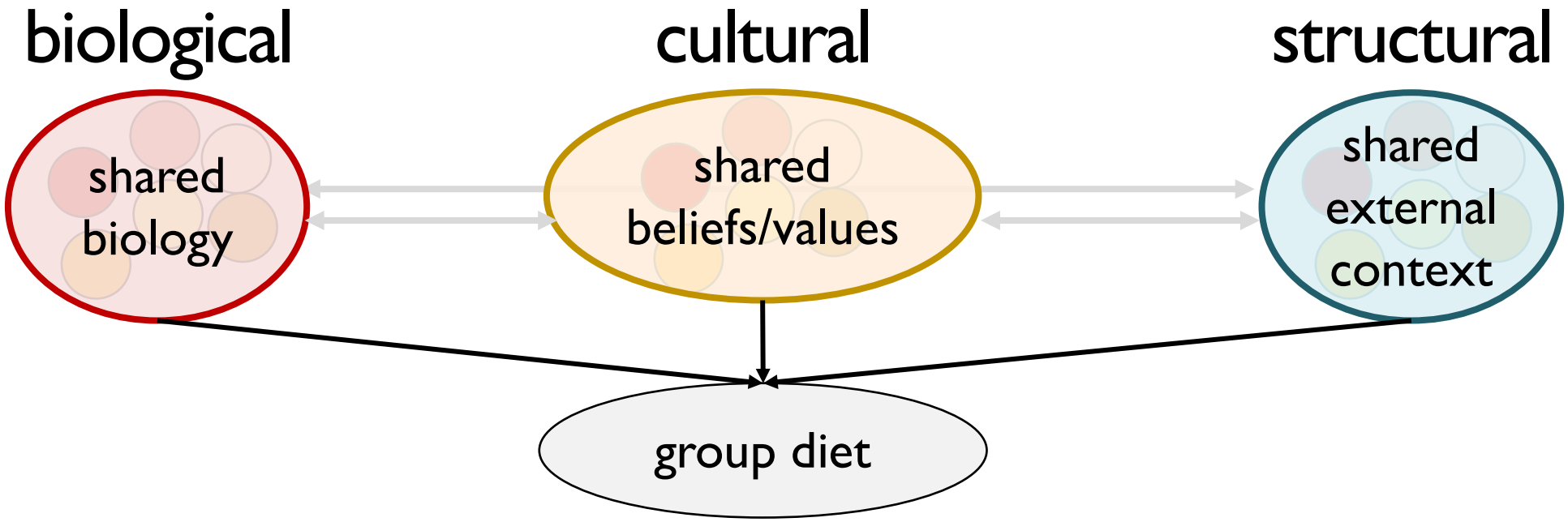
East Asian people & lactose intolerance (LCT gene for lactase)

"Our bodies best digest…" (folk biology)

religious beliefs (eg vegetarian, halal, kosher)

Northern Chinese & noodles

Southern Chinese & rice (climate for growing rice vs wheat)



Why does a group tend to eat certain foods?

group has characteristic **physiology** that make some foods **suitable or not suitable to eat**

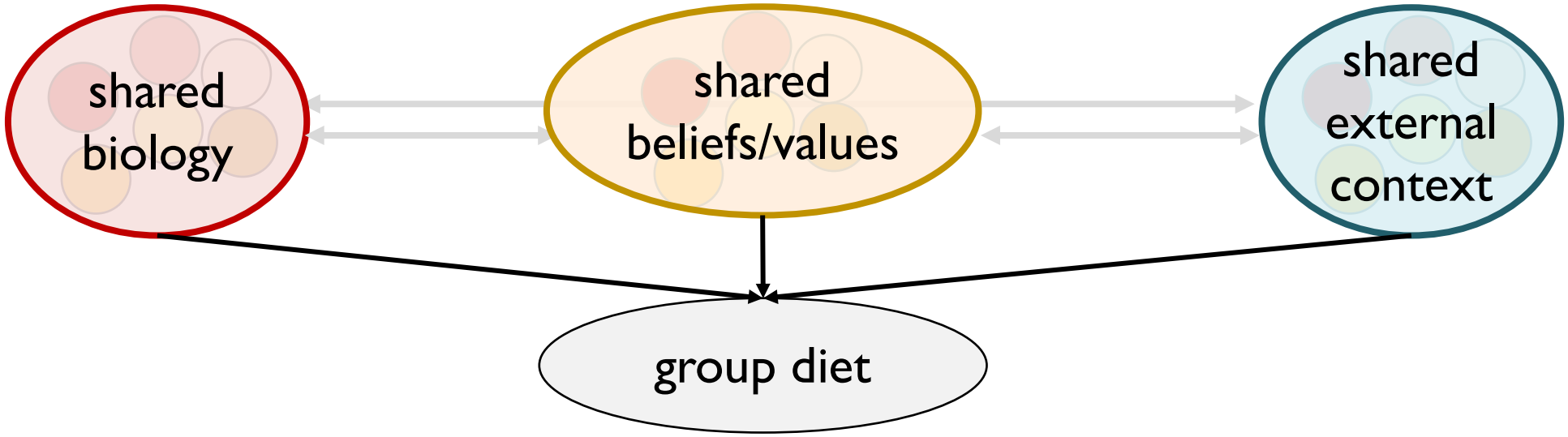
group has characteristic **shared beliefs, values** that make some foods **taboo**

group's **environment** makes some foods **available or not available**

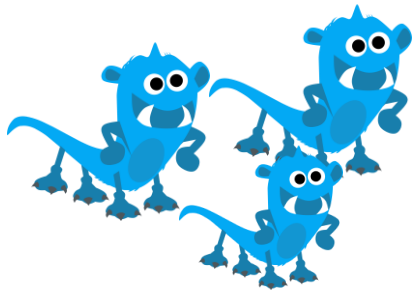
allergies / intolerance

taboo food restrictions

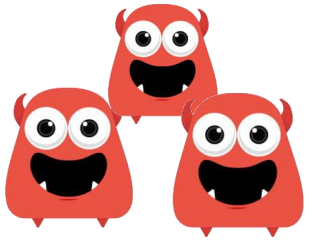
what grows where



*group labels, pictures, berries counterbalanced for 5-8yo



Zarpies



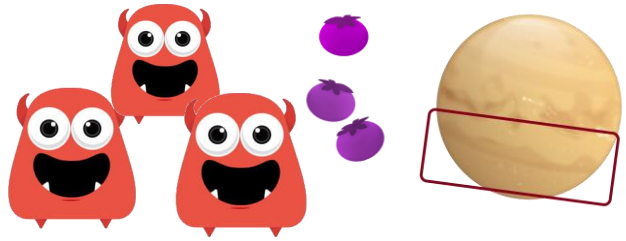
Vawns

MTurk: adults (n=167, ~55/condition)

Zoom: 5-8yo (n=67, ~22/condition)

*group labels, pictures, berries counterbalanced for 5-8yo

Zarpies live on this side of the planet.
Zarpies eat starberries.



Vawns live on the other side of the planet.
Vawns eat roundberries.

adults (n=167, ~55/condition)
5-8yo (n=67, ~22/condition)

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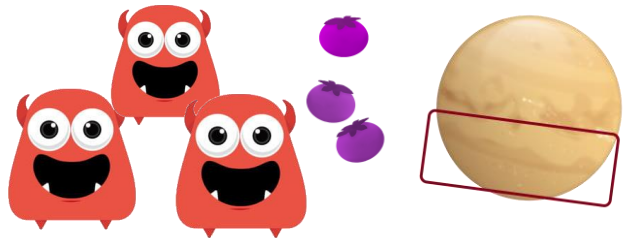


Vawns live on the other side of the planet.
Vawns eat roundberries.

Because of the way their bodies work, other berries make them sick, so …

allergies / intolerance

shared biology

Because they believe eating other berries is bad luck, …

taboo food restrictions

shared beliefs/values

Because starberries are the only berries that grow in the area where they live, …

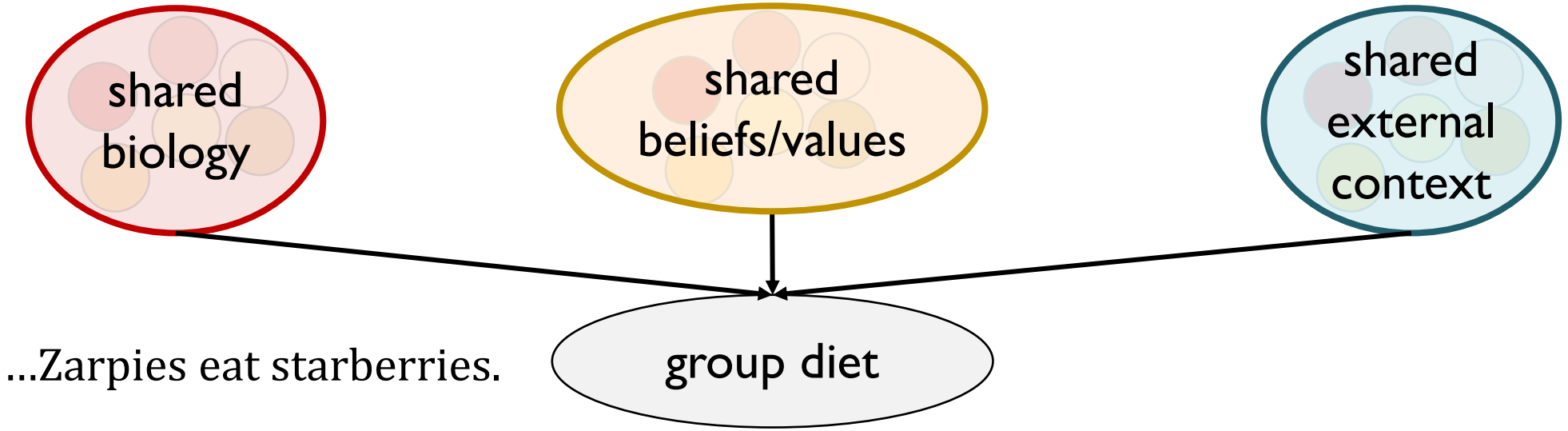
what grows where

shared external context

…Zarpies eat starberries.

group diet

adults (n=167, ~55/condition)
5-8yo (n=67, ~22/condition)



look at their different consequences…

*presented in fixed order: 2, 1, 3

1) what is the case

- generalize based on group vs context

2) what should be the case

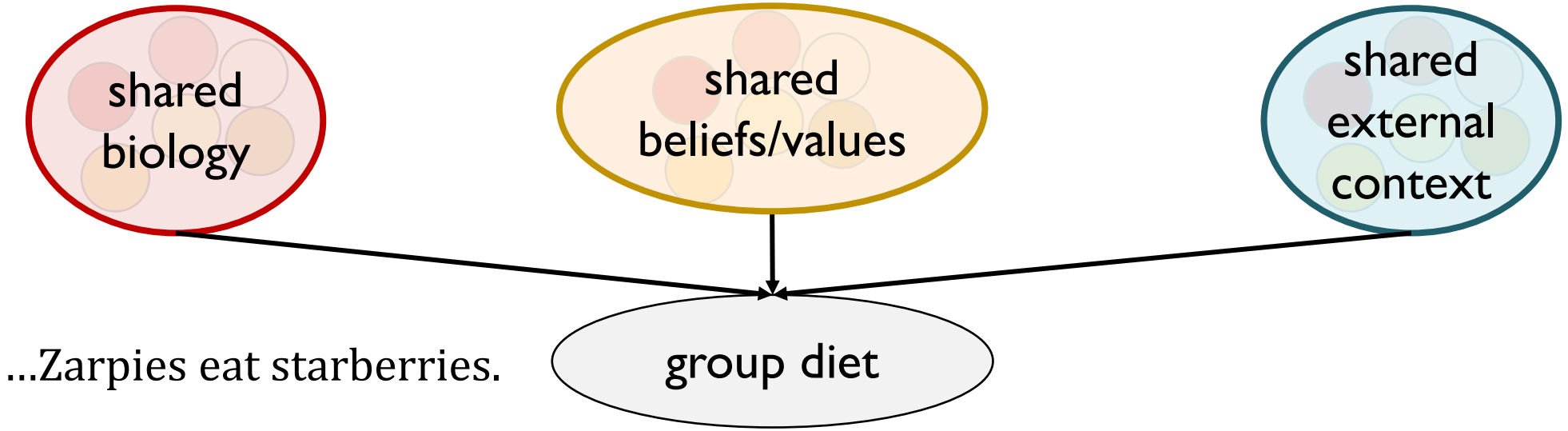
- attitudes towards non-conformity

3) how to change what is the case

- intervene on group vs context

adults (n=167, ~55/condition)

5-8yo (n=67, ~22/condition)



structural representations could lead to…

OSF

1) *what is the case*
generalize based on context vs group

2) *what should be the case*
less negative attitudes about non-conformity

3) *how to change what is the case*
intervene on context vs group

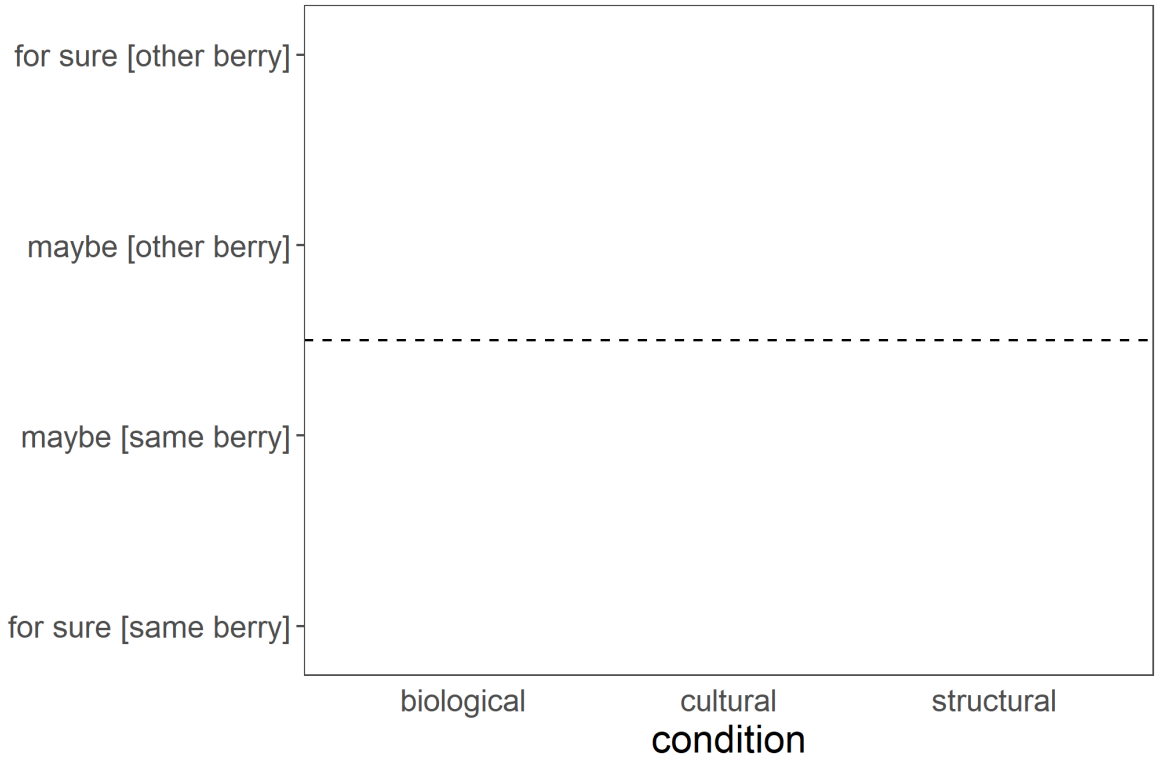
adults (n=167, ~55/condition)
5-8yo (n=67, ~22/condition)

what is the case: generalization

Look, here's another Zarpie… lives **on the other side of the planet.**
Which berries do you think this Zarpie eats?
(starberries/roundberries → for sure/maybe)

5-8yo

(n=67, ~22/condition)



adults

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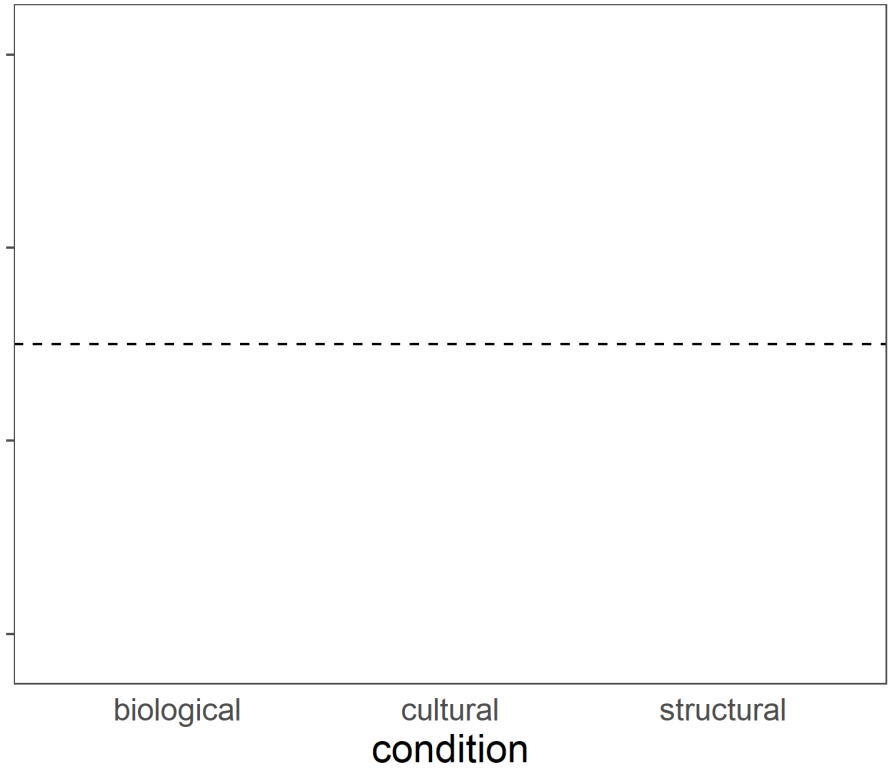

modeled on switched-at-birth tasks:
e.g. Gelman & Wellman (1991)

structural reps: context-sensitive generalization in adults

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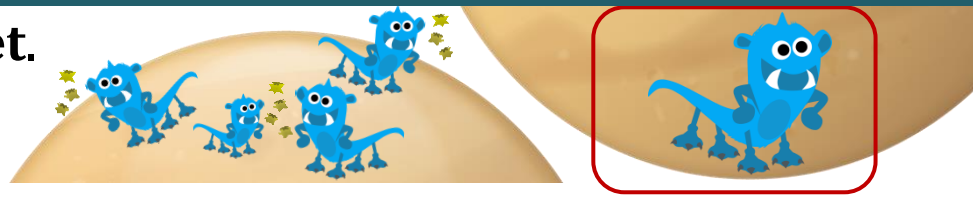

5-8yo

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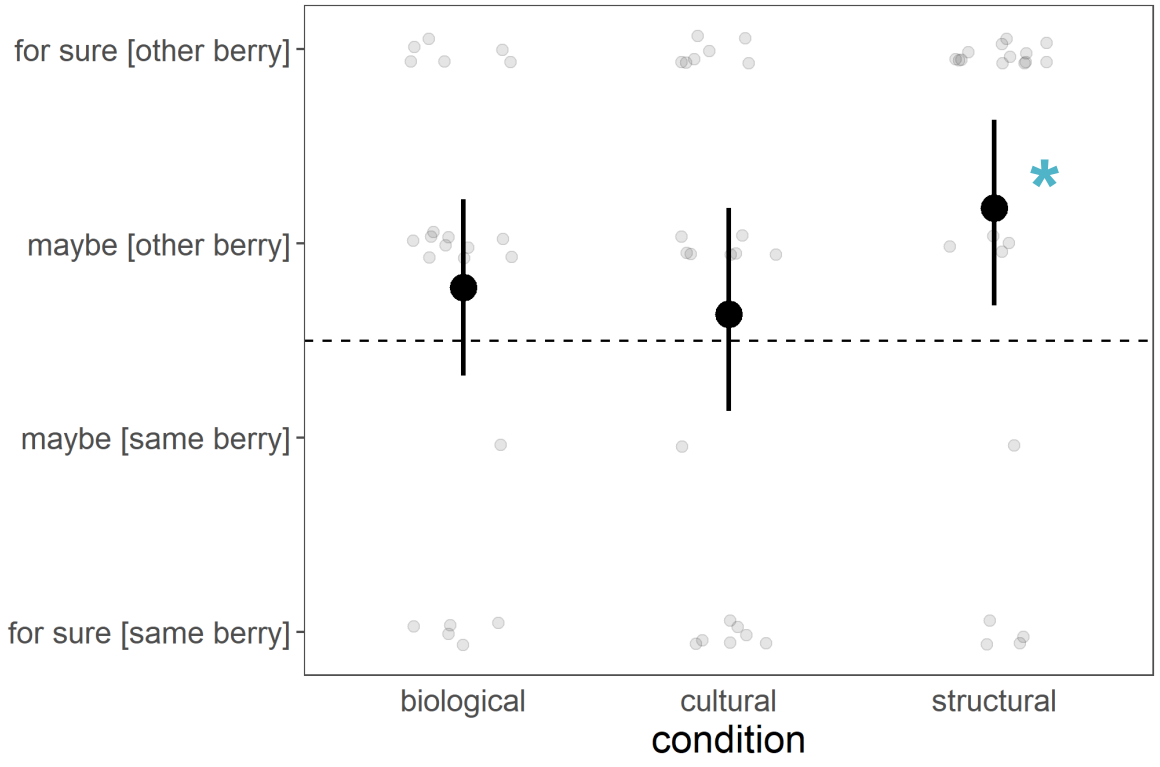

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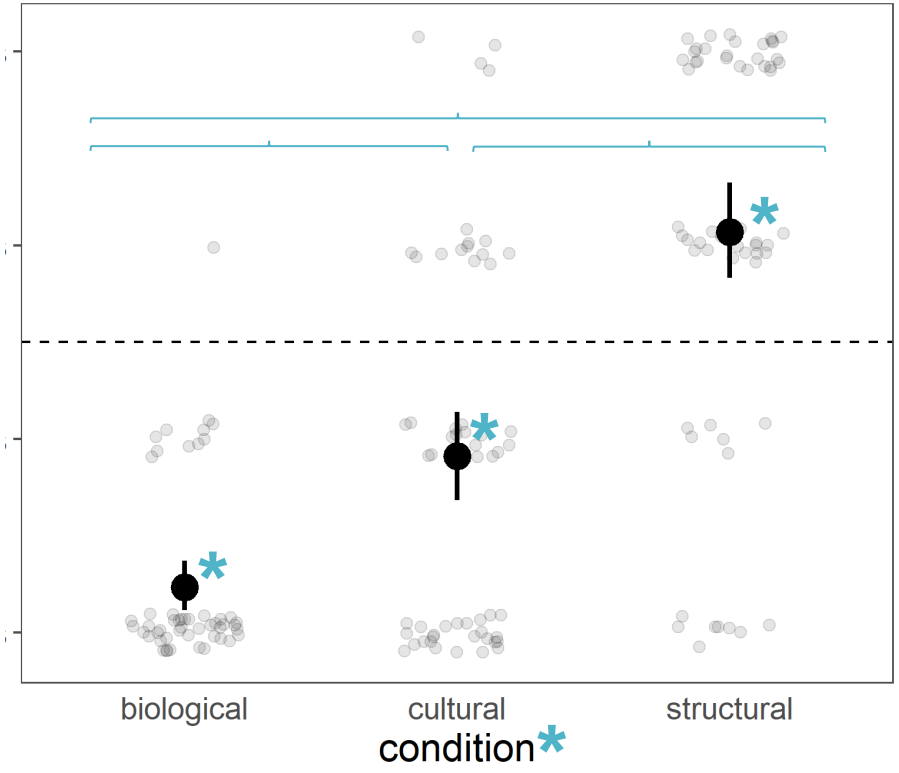


* main effect of condition (lm controlling for difficulty of intervention); vs midpoint (two-sided t-test)

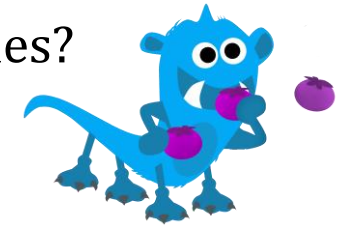
differences between conditions (same lm with FDR-corrected pairwise comparisons)

● = 95% bootstrap CIs

○ = individual participants

what should be the case: attitudes about non-conformity

Look, this Zarpie is eating **roundberries**!
Is it **okay or not okay** for this Zarpie to eat roundberries?
(okay/not okay → a little/pretty/very good or bad)



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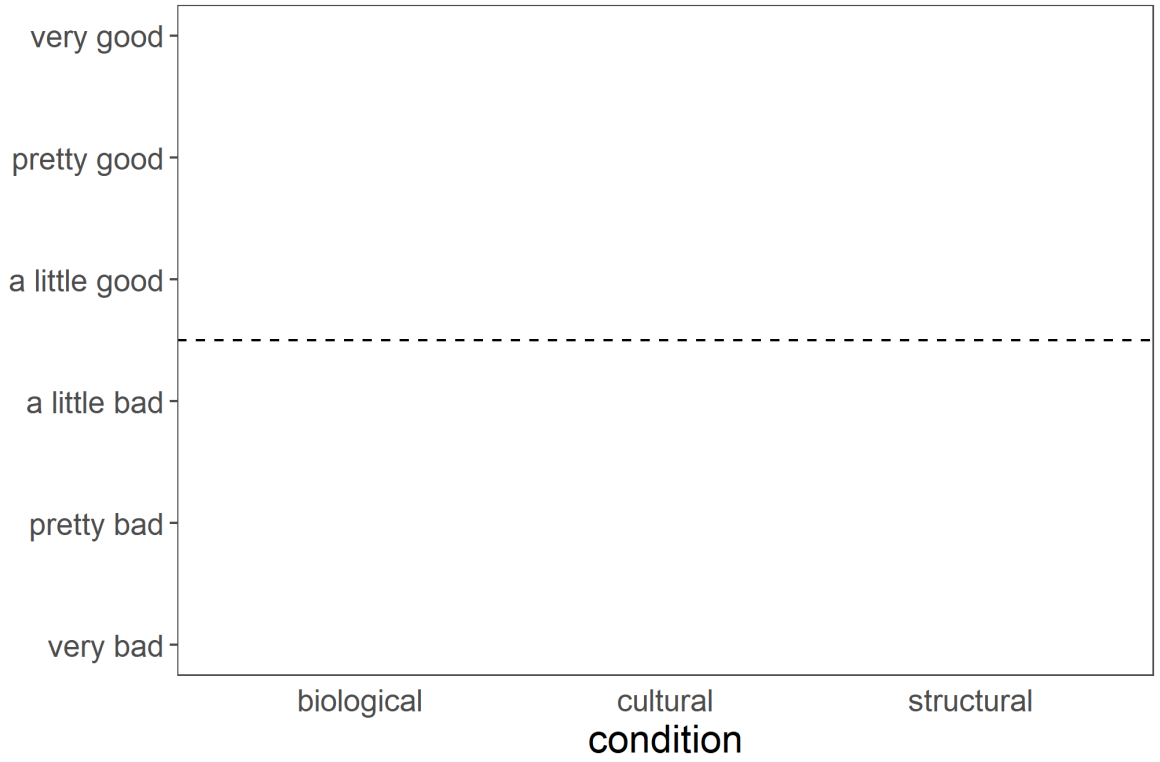

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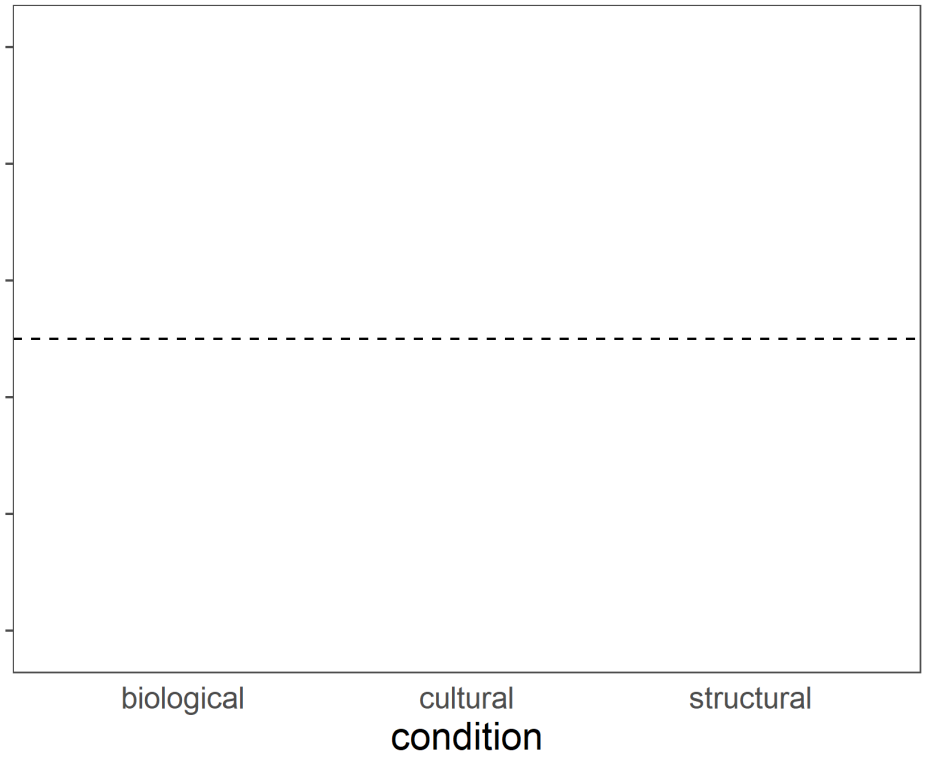

same measure from:
Roberts, Gelman & Ho (2016), Roberts, Ho & Gelman (2017)

structural reps: less negative attitudes about non-conformity

Look, this Zarpie is eating **roundberries**!

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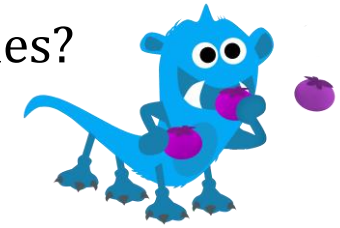
(okay/not okay → a little/pretty/very good or bad)



5-8yo

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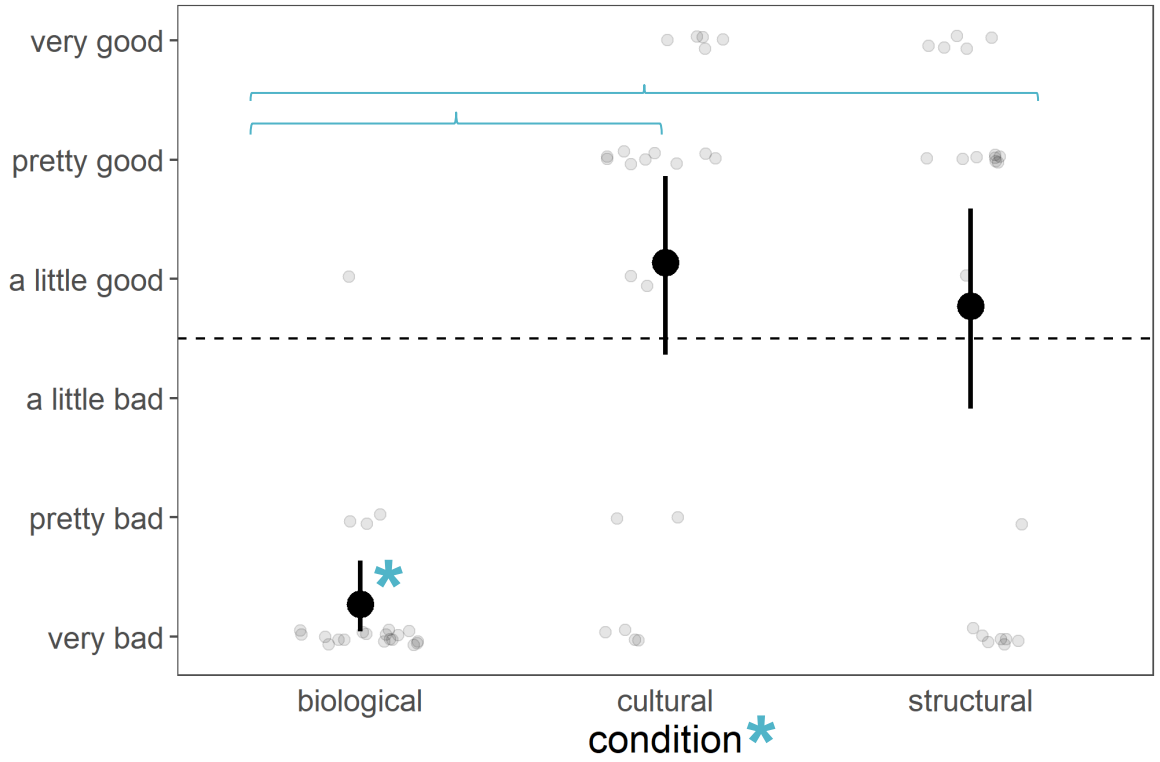

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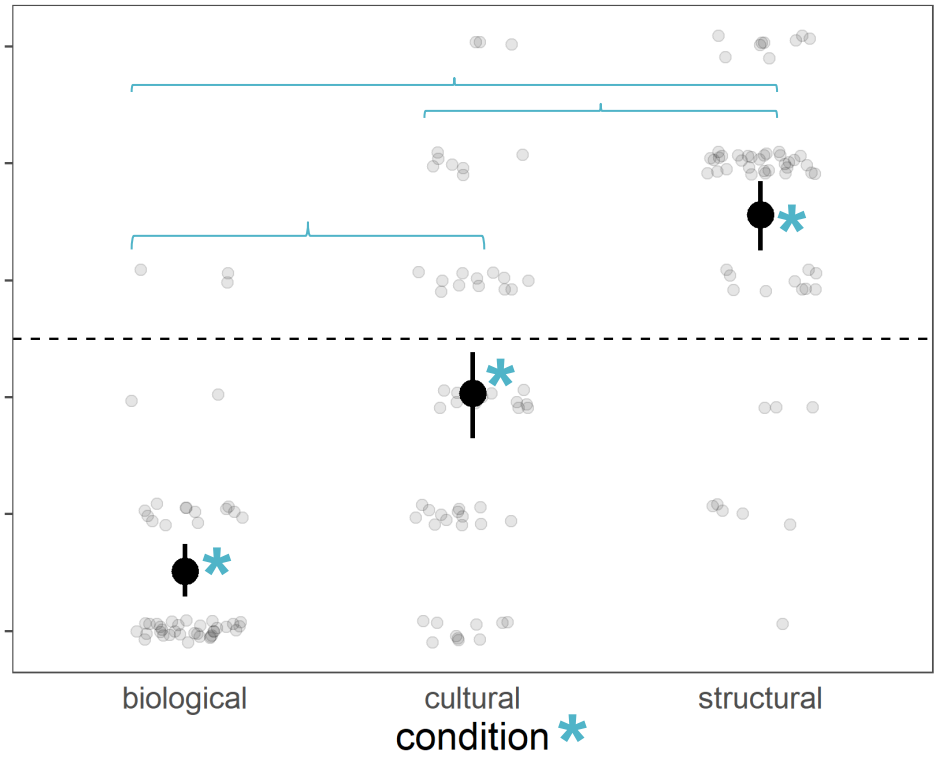


* main effect of condition (lm controlling for difficulty of intervention); vs midpoint (two-sided t-test)

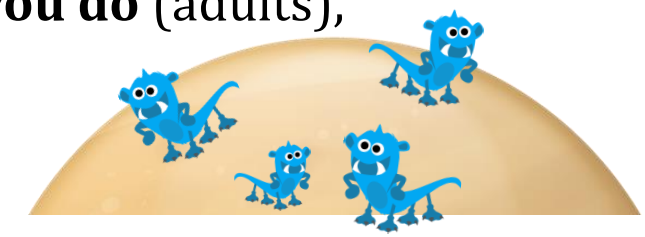
differences between conditions (same lm with FDR-corrected pairwise comparisons)

● = 95% bootstrap CIs

○ = individual participants

how to change what is the case: intervention

storm blew away starberries (5-8yo) / starberry harvest failed this year (adults)
We'll need to get the Zarpies to eat roundberries instead.
If you could make anything happen, **what could we do** (5-8yo) / **what would you do** (adults),
so that the Zarpies can eat roundberries? (open-ended)



how to change what is the case: intervention

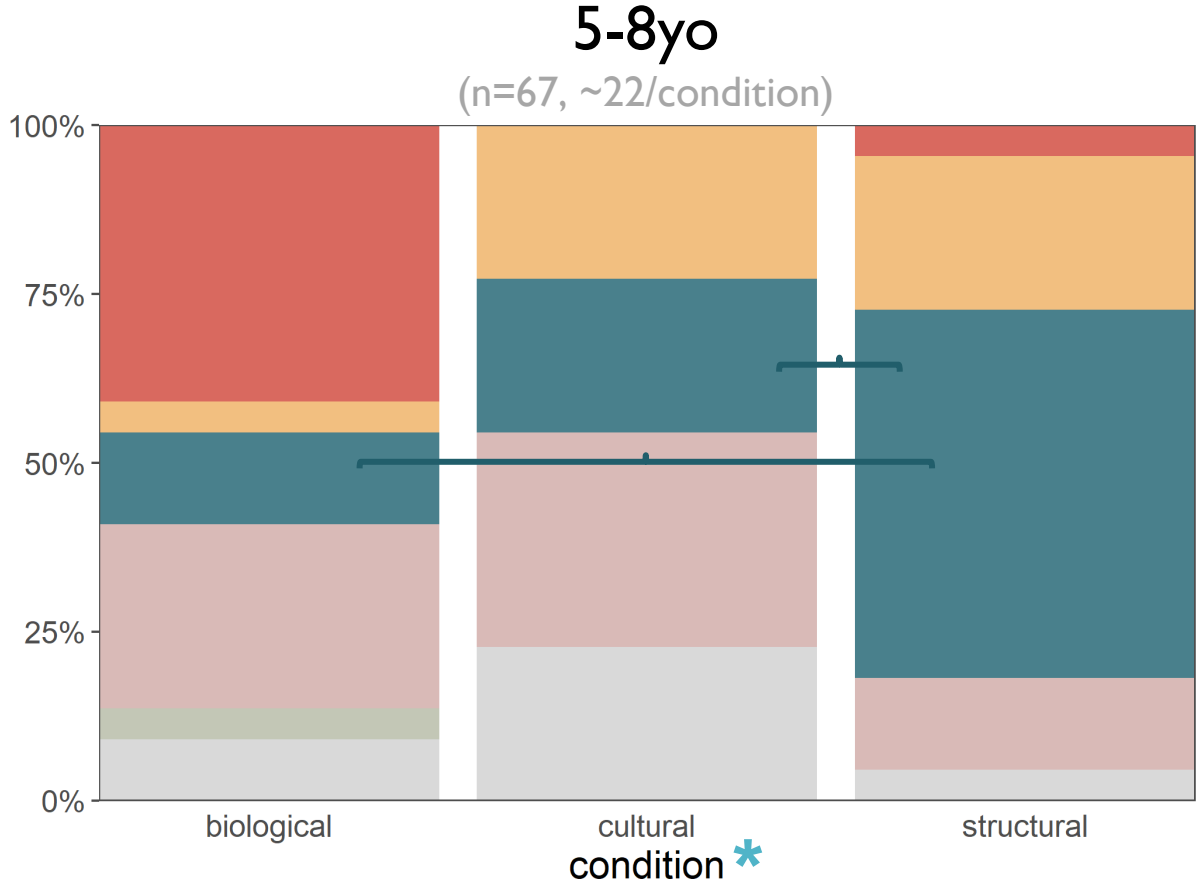
If you could make anything happen, **what could we do** (5-8yo) / **what would you do** (adults), **so that the Zarpies can eat roundberries?** (open-ended → 2 independent coders blind to condition)

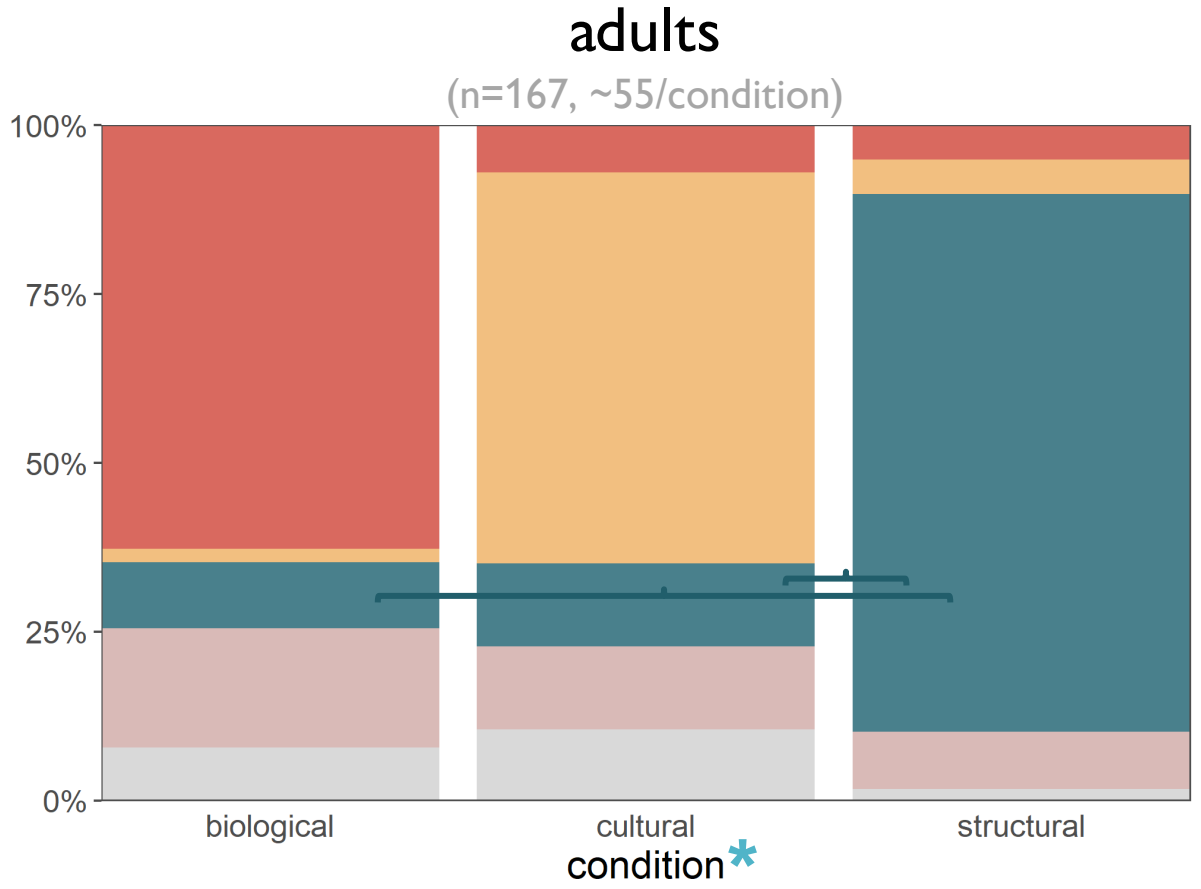
	5-8yo (85% agreement, κ = 0.81)	adults (94% agreement, κ = 0.92)
change group biology	give them a pill or medicine have them eat a little at a time	give them a pill or medicine have them build tolerance
change group beliefs/culture	tell them the berries are good luck	convince them it's not bad luck
change environment (increase food access)	get them roundberries from other side ask the Vawns to share roundberries	grow, plant, or import the other berry have them visit the other side of the planet
change the food	turn them into starberries take the stuff they can't eat out	prepare the berries so they are safe to eat
other	find more starberries do nothing	don't know

structural reps: interventions on **structural context**

If you could make anything happen,
what could we do (5-8yo) / **what would you do** (adults)
so that the Zarpies can eat roundberries?

change group biology *5-8yo *adults
change group beliefs/culture *adults
change environment (increase food access) *5-8yo *adults
change the food
other



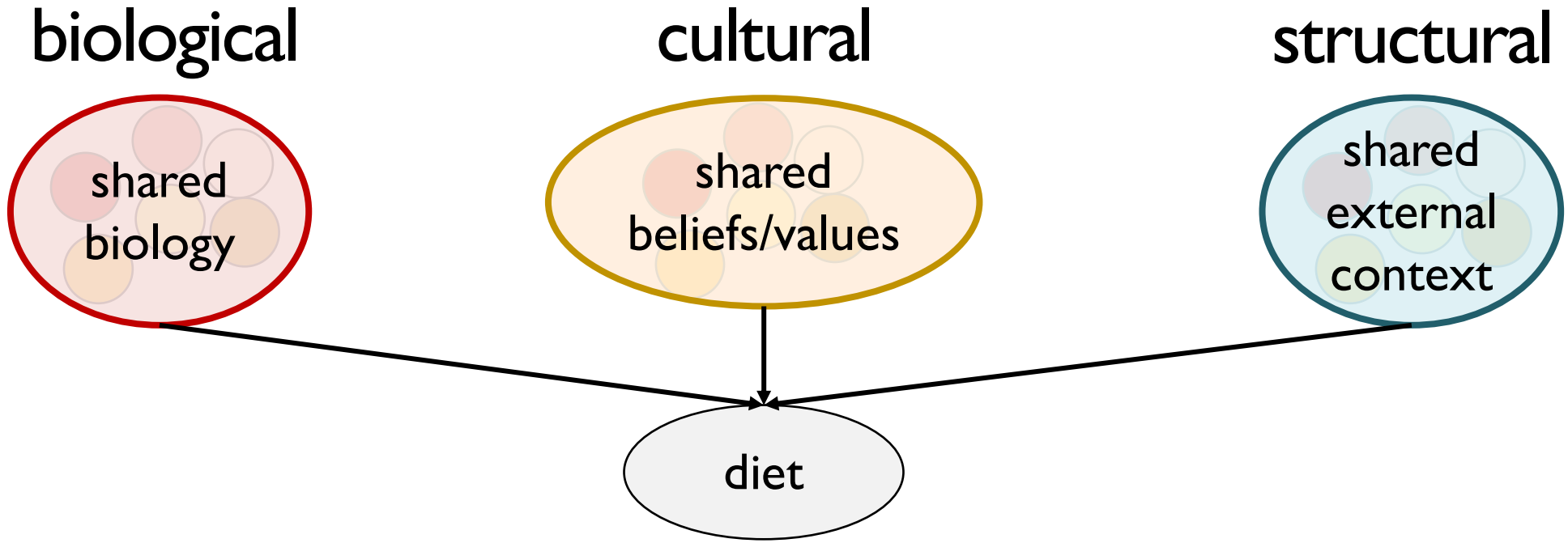


* interventions differ across conditions (Fisher's exact test), __ intervention differs across conditions (lm ctrlling for difficulty of intervention)
__ intervention differs across conditions (same lm with FDR-corrected pairwise comparisons)

difficulty of intervention was controlled for in other analyses

Would it be easy or hard to do that? (5-8yo) (easy/hard → very/a little)
How easy or difficult would it be to do the action you suggested above? (adults) (easy/difficult → very/somewhat)

cf. Peretz-Lange, Perry & Muentener (2021)



structural representations lead to:

what is the case

context-sensitive generalization (for adults)

what should be the case

less negative attitudes about non-conformity

how to change what is the case

interventions on structural context

Amy Miyahara

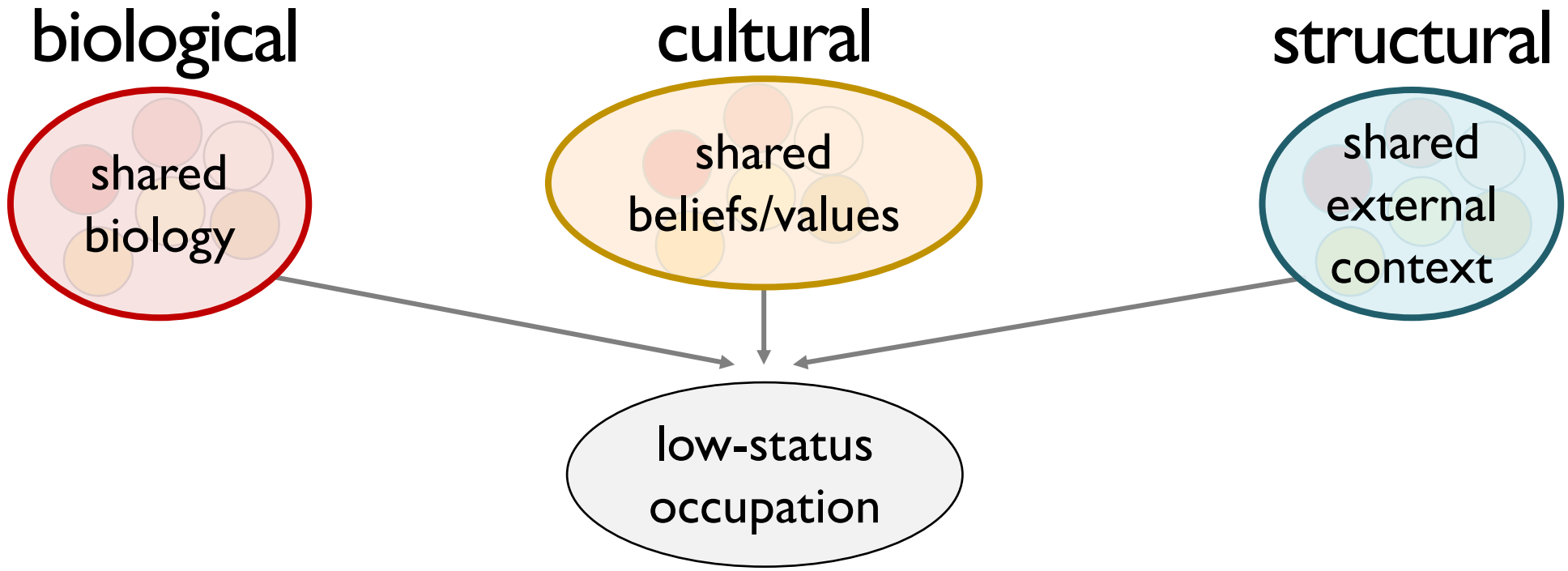
Stanford BA ‘23

reasoning about micro-level group disparities

adults

7-8yo

induce one of these construals…



look at their different consequences…

what is the case

generalize based on group vs context

how to change what is the case

intervene on group vs structural conditions

what should be the case

attitudes towards non-conformity

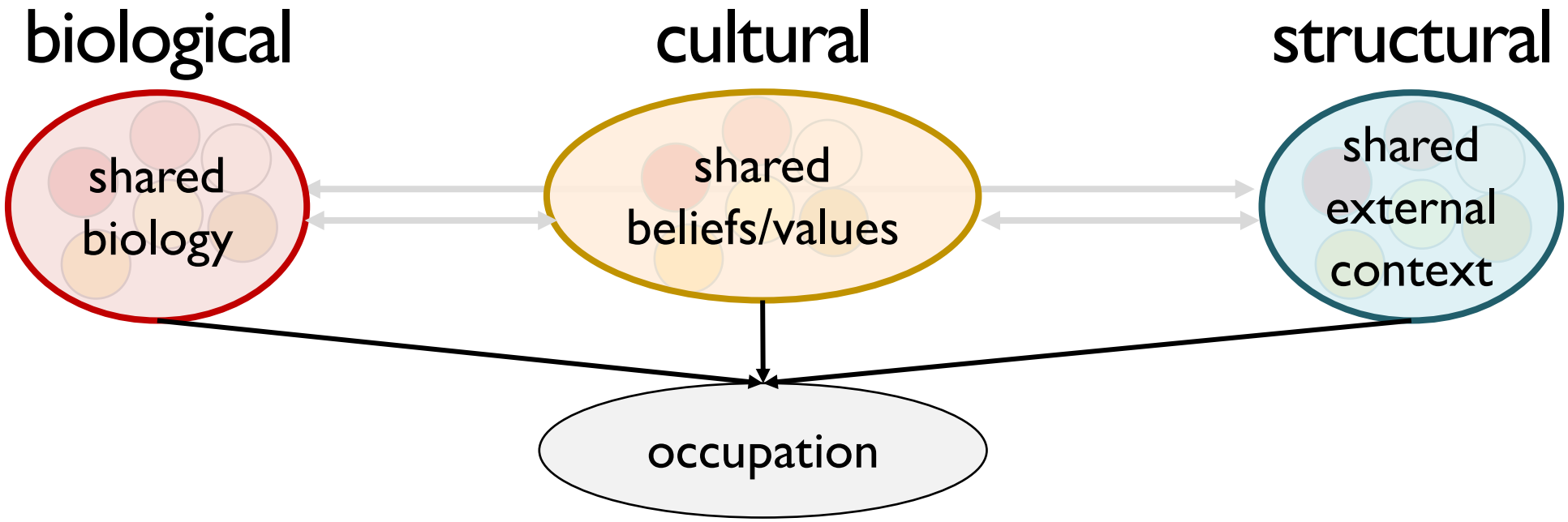
attitudes towards present disparities

Why does a group tend to work a certain job?

women & factory work
("nimble fingers",
also "detail-oriented", "docile")

Jews & banking
("stingy", "greedy",
"materialistic")

Chinese-Americans & restaurants (language barrier, limited resources, stereotyping, economic discrimination)

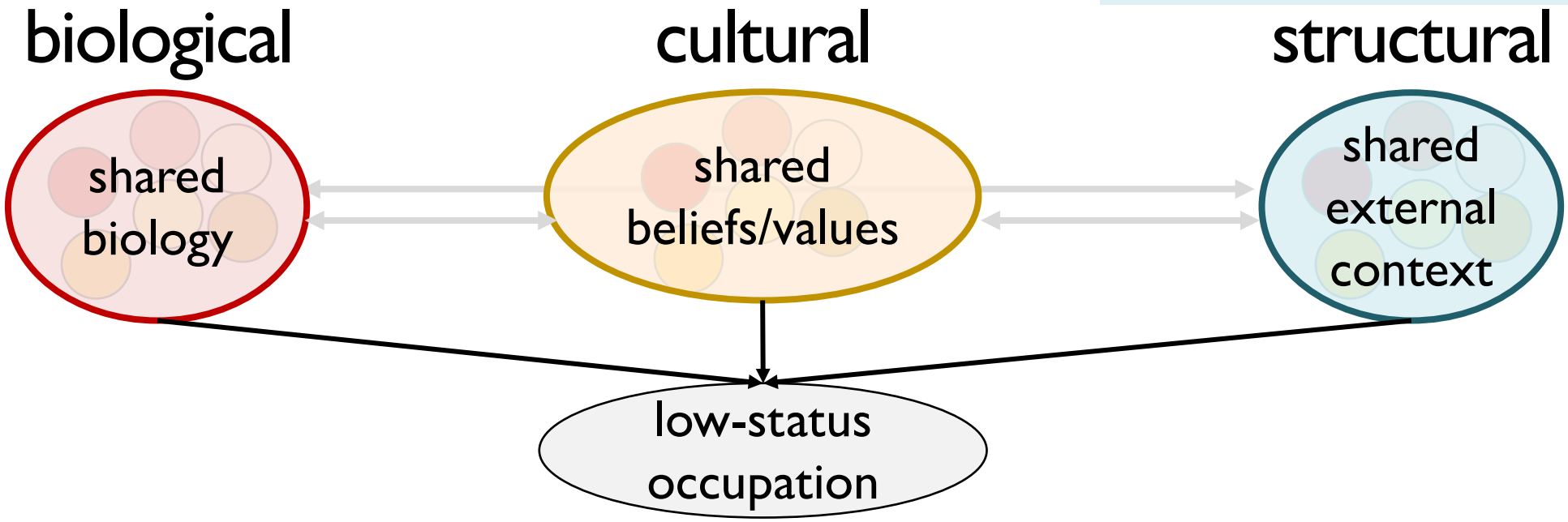


Why does a group have a certain occupation?

group has characteristic **physiology or biological traits** that make them suited to the job

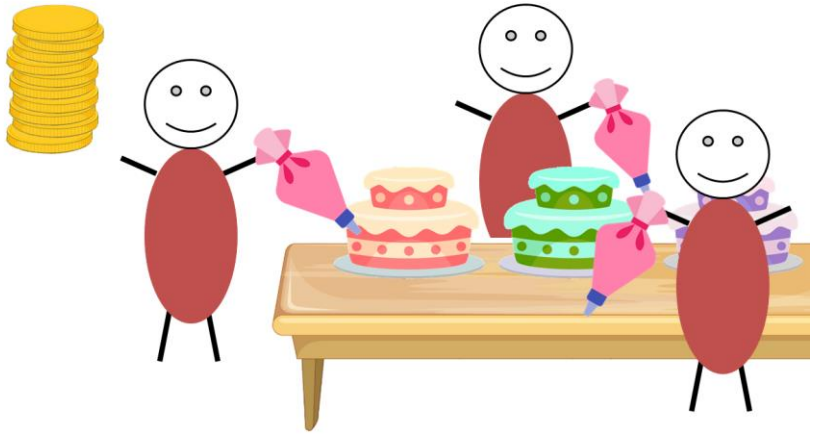
group has characteristic **shared beliefs, values, traditions** that match the job

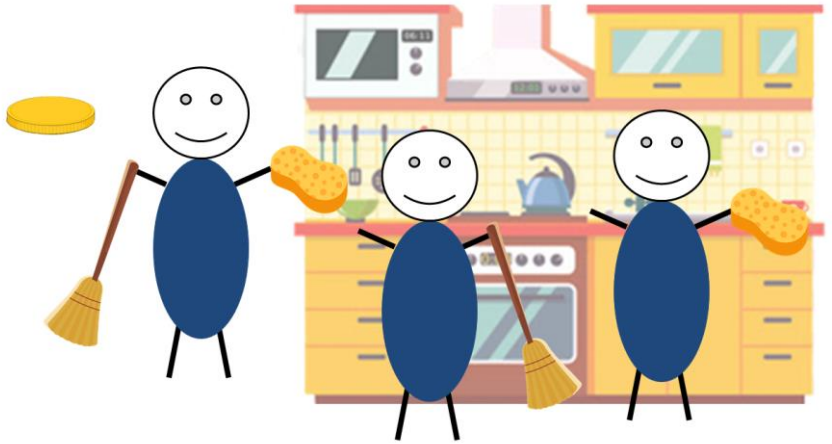
group faces **barriers, constraints, economic discrimination** that leaves them with few other options than the job



*group labels/pictures, jobs counterbalanced for 7-9yo

Smorgsville has a bakery that both Reds and Blues work at.
In this bakery, everyone works one of two jobs. You can either decorate cakes or clean the bakery.





Reds work as cake decorators.
At Smorgsville's bakery, all Reds decorate cakes. Decorating cakes is **creative and a lot of fun**, and people always tell the Reds how pretty their cakes are. Sometimes, the Reds get to **taste the cakes**!

Let's see how many coins Reds get for decorating cakes…. Reds get **10 coins** for decorating cakes.

Blues work as cleaners.
At Smorgsville's bakery, all Blues are cleaners. They have to sweep the floor, scrub the counters, and wash all of the dishes. It is **hard work, and not that fun**. Blues **do not get to taste the cakes**.

Let's see how many coins Blues get for cleaning the bakery…. Blues get **1 coin** for cleaning the bakery.

occupational disparity

MTurk: adults (n=98, ~33/condition)
Zoom: 7-9yo (n=66, ~22/condition)

low-status* occupation

*adults consider the more negative outcome to be in need of explanation (Wong & Weiner, 1981)

Blues clean the bakery because…

Blues are **born with strong arms and strong bodies.** Their **strong bodies make them very good at cleaning**, since it takes strength to wash the floor and scrub the pots.

shared biology

Blues and their parents and their parents' parents have been cleaning bakeries for a **long time**. They really **like things clean** and **think it is important for everything to be clean.** Blues **teach their children** how to clean when they're kids.

shared beliefs/values

Blues are **not allowed** to decorate cakes in bakeries. **Their city has a rule** that only Reds can decorate cakes. Blues **aren't allowed to go to the school that teaches** you how to decorate cakes. This situation leads Blues to clean bakeries instead.

shared external context

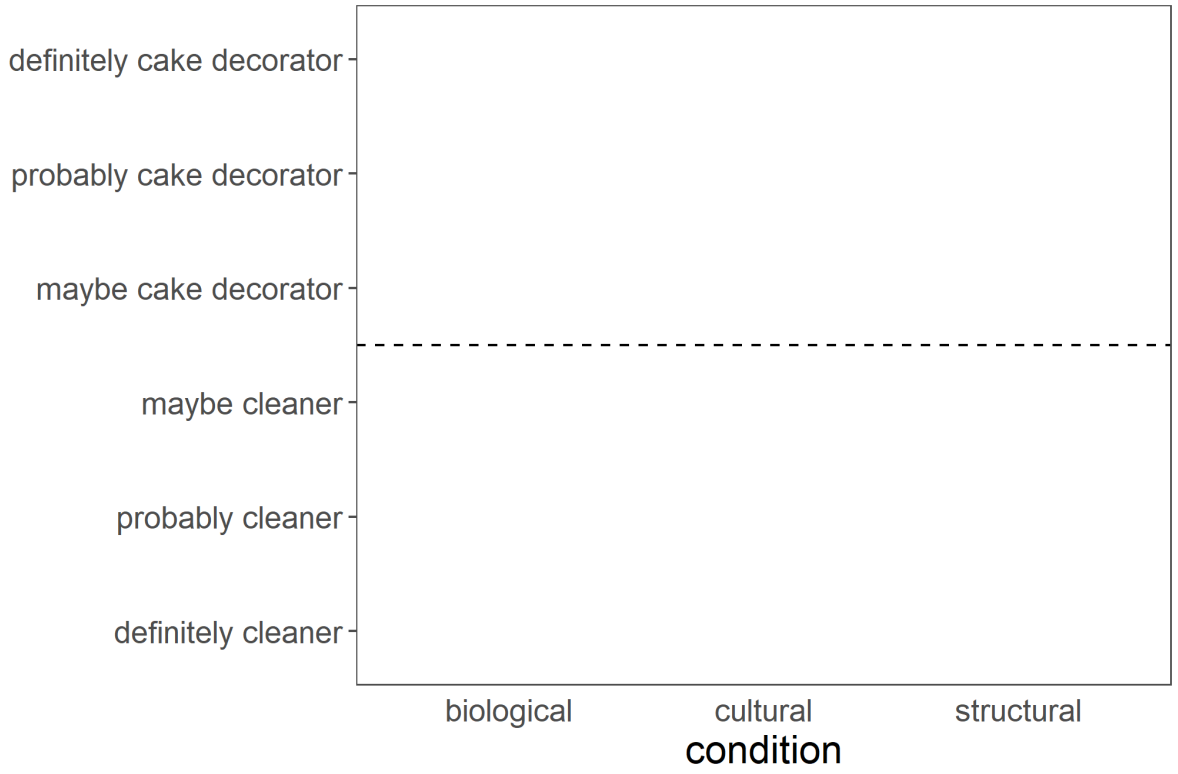
adults (n=98, ~33/condition)
7-9yo (n=66, ~22/condition)

what is the case: generalization

This Blue **doesn't live in Smorgsville.** This Blue was born and raised in Flooftown, with **different rules about who works in bakeries.** This Blue works at a bakery here in Flooftown. What job do you think this Blue works in Flooftown?

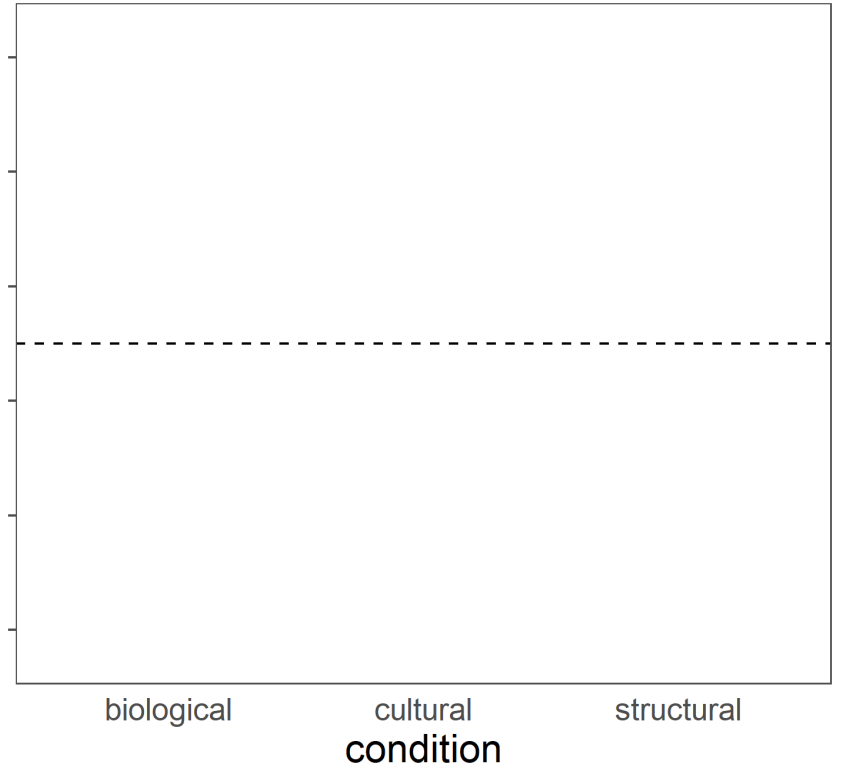
7-9yo

(n=66, ~22/condition)



adults

(n=98, ~33/condition)



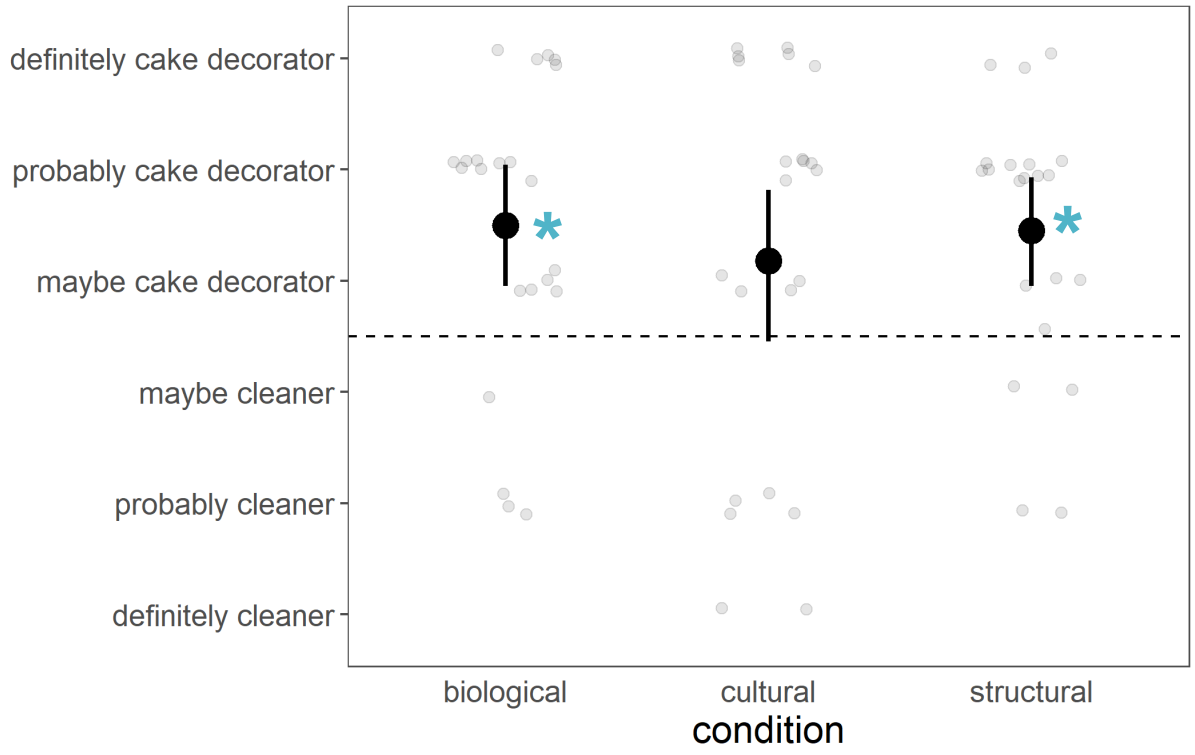
modeled on switched-at-birth tasks:
e.g. Gelman & Wellman (1991)

what is the case: generalization

This Blue **doesn't live in Smorgsville.** This Blue was born and raised in Flooftown, with **different rules about who works in bakeries.** This Blue works at a bakery here in Flooftown. What job do you think this Blue works in Flooftown?

7-9yo

(n=66, ~22/condition)



adults

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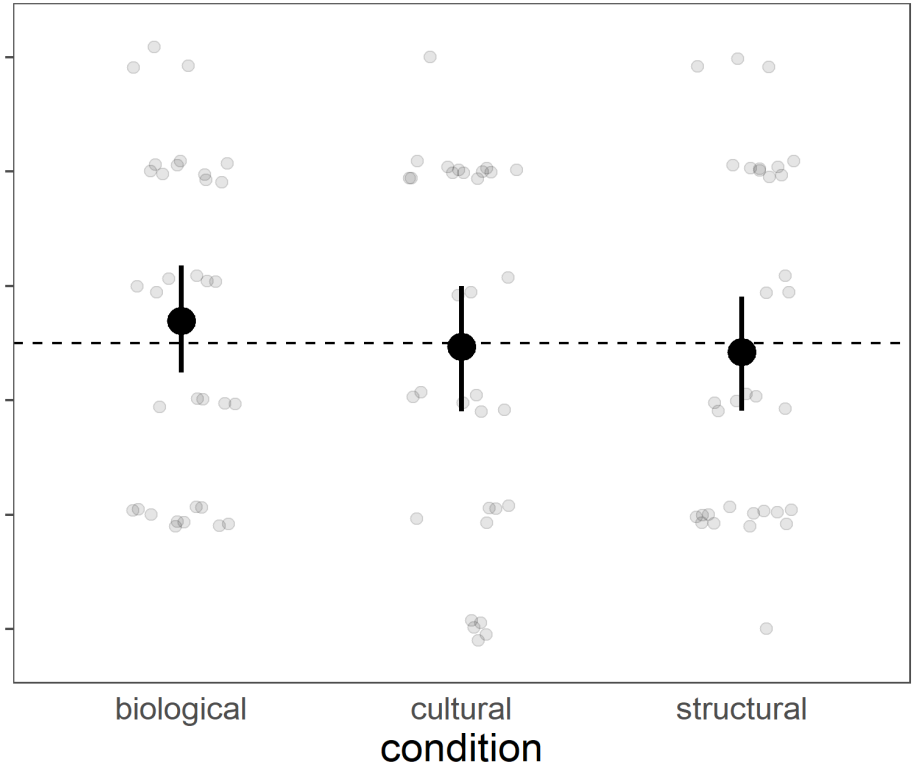


* main effect of condition (lm controlling for difficulty of intervention); vs midpoint (two-sided t-test)

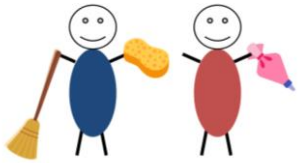
differences between conditions (same lm with FDR-corrected pairwise comparisons)

= 95% bootstrap CIs

= individual participants

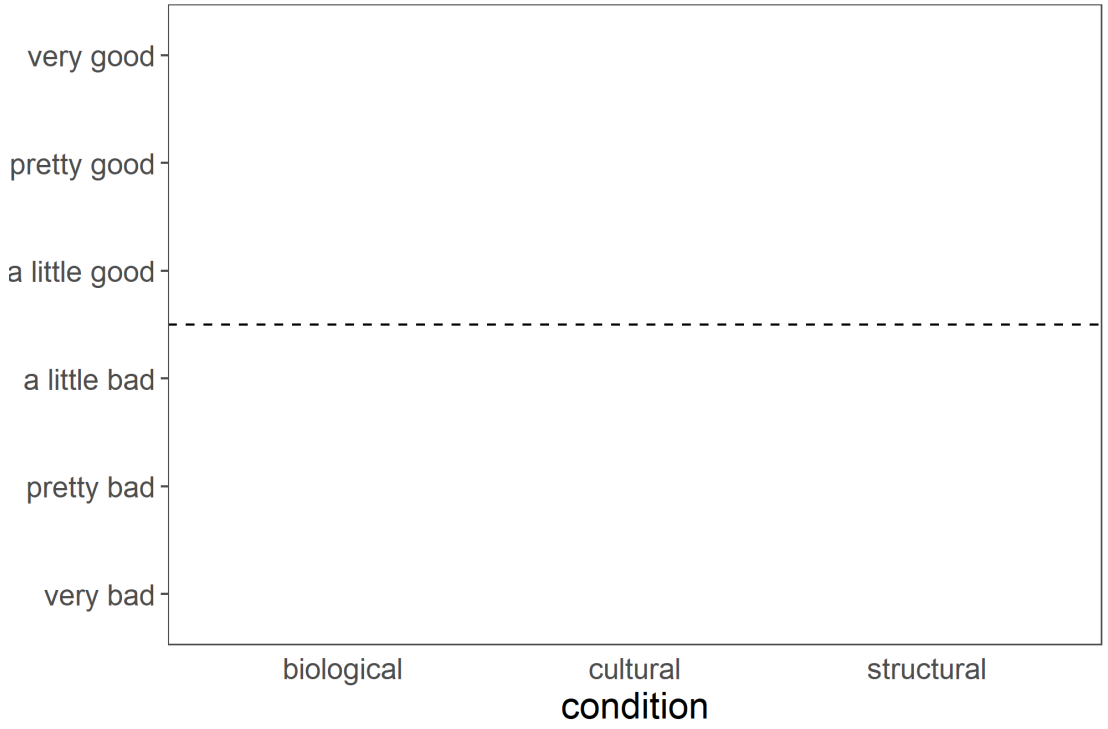
what should be the case: endorsement of present disparity

Is it **okay or not okay** that Blues clean bakeries and Reds decorate cakes?
(okay/not okay → {very, pretty, a little} good/bad)



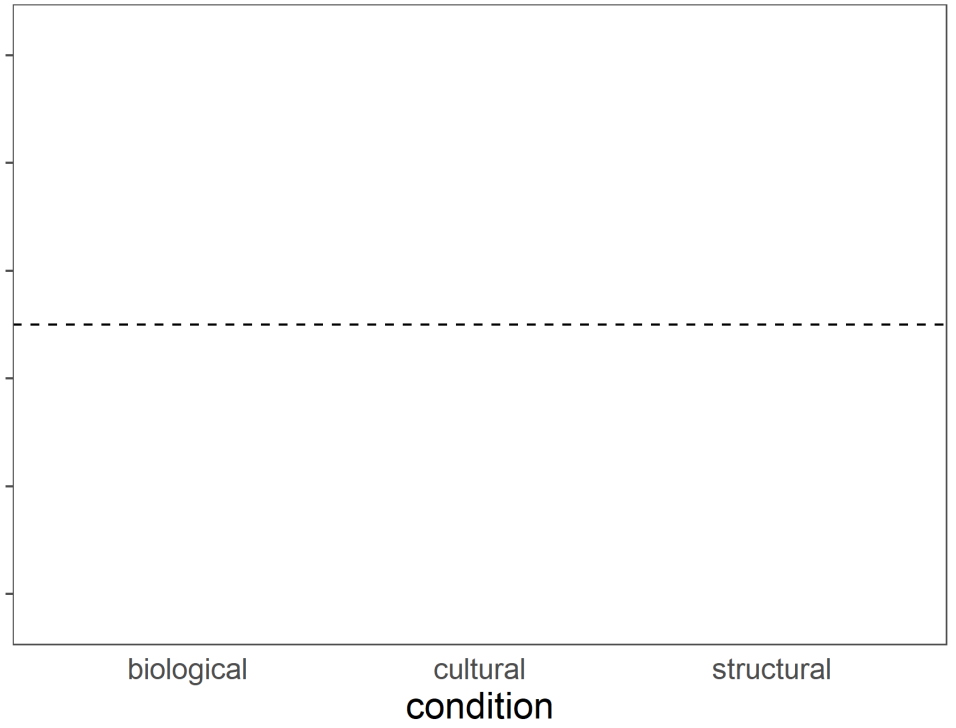
7-9yo

(n=66, ~22/condition)



adults

(n=98, ~33/condition)



structural representations decrease endorsement of disparities

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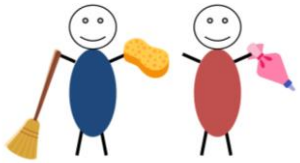
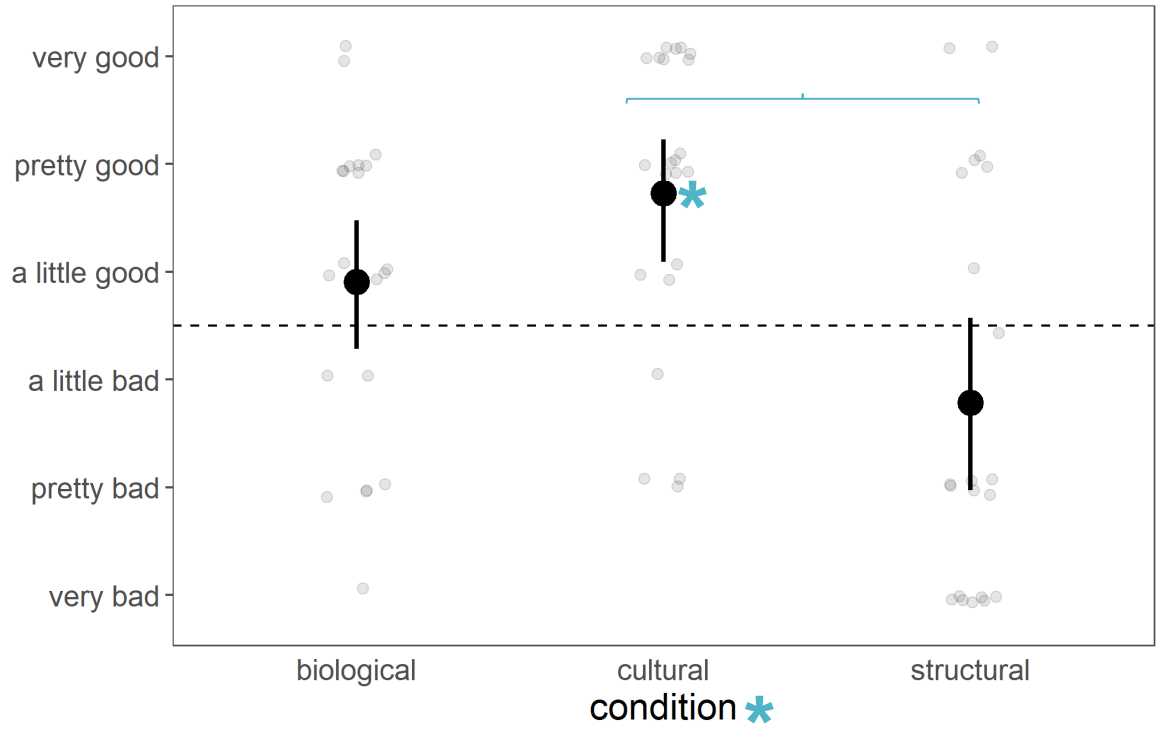
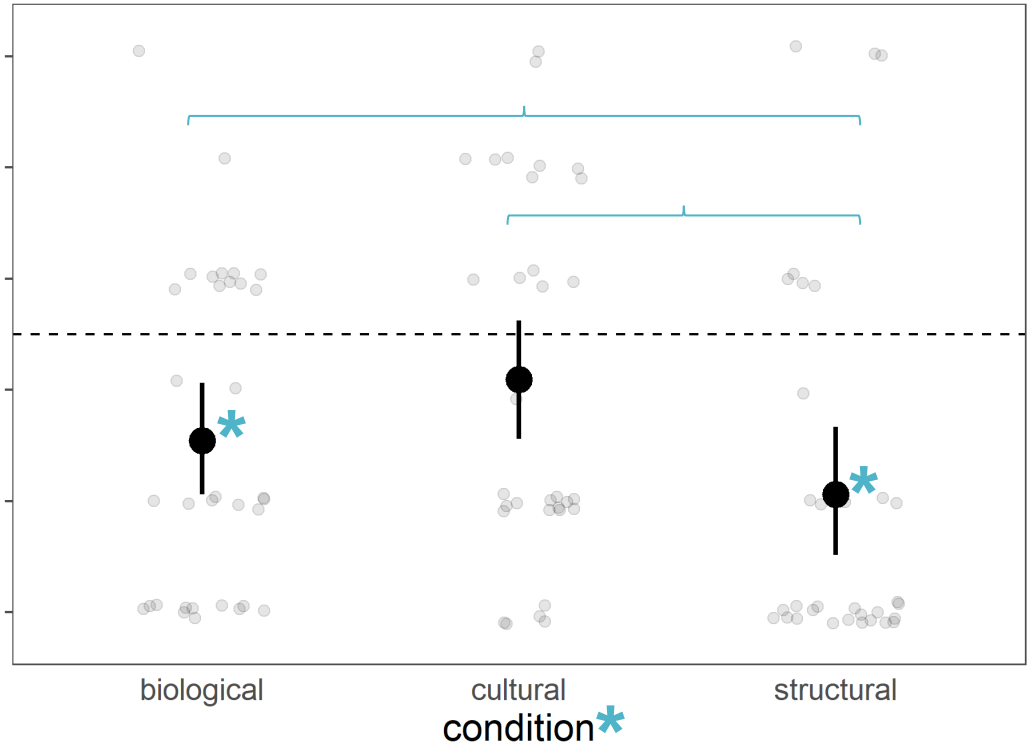


7-9yo
(n=66, ~22/condition)



adults
(n=98, ~33/condition)

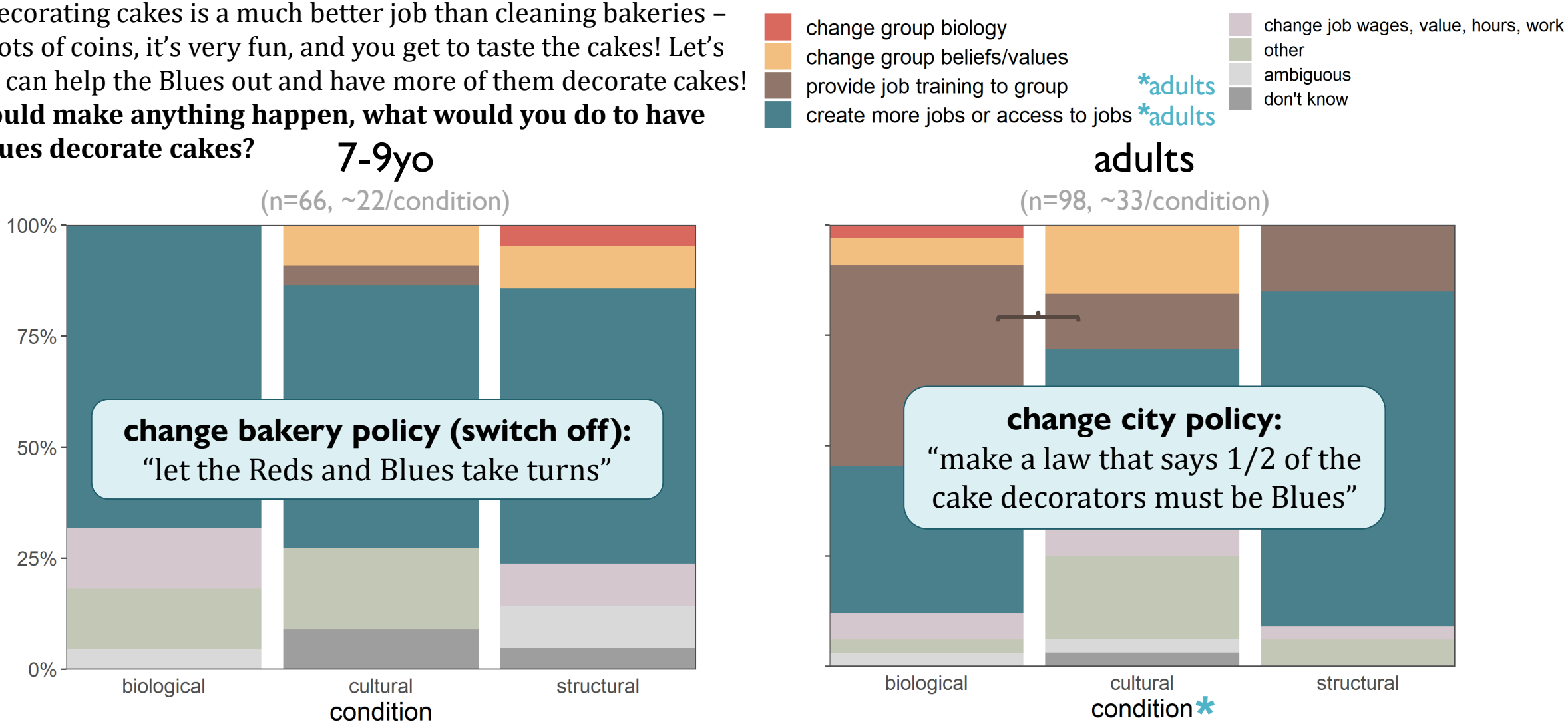


* main effect of condition (lm controlling for difficulty of intervention); vs midpoint (one-sample t-test)
differences between conditions (same lm with FDR-corrected pairwise comparisons)

● = 95% bootstrap CIs
○ = individual participants

structural reps help adults suggest structural interventions

I think decorating cakes is a much better job than cleaning bakeries – you get lots of coins, it's very fun, and you get to taste the cakes! Let's see if we can help the Blues out and have more of them decorate cakes!
If you could make anything happen, what would you do to have more Blues decorate cakes?



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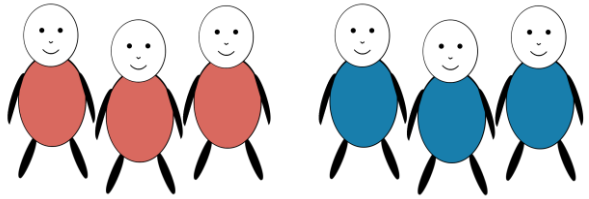
__ intervention differs across conditions (same lm with FDR-corrected pairwise comparisons)

reasoning about macro-level group disparities

adults

N = 90 adults on MTurk
30/condition



Vawns work as managers at a food distributing company.
Vawns sell and ship a variety of food grown on the island, including aquafruit and many other kinds of fruit and foods.

Vawns earn a **comfortable wage** working as distribution managers. Working as a distribution manager is a relatively **low risk** job.

occupational disparity

Zarpies work as aquafruit farmers.

Aquafruit are fruit that grow underwater off the coast of islands in this area.

Zarpies dive into the ocean near the island to harvest aquafruit. Zarpies are **paid very little** for harvesting aquafruit. Harvesting aquafruit can also be **dangerous**, because there are many sharks in the water.

low-status occupation

Zarpies work as aquafruit farmers, and don't often work other jobs.

This is because Zarpies see better in the water than on land, their bodies are streamlined and powerfully built, and they have big hands and feet that are good for swimming, from even early in childhood.

Zarpies' bodies are well-suited to farming aquafruit.

shared biology

This is because Zarpies grow aquafruit by tradition, have passed down knowledge of how to farm aquafruit to their children for generations, and feel a special attachment to the ocean.

Zarpies' traditions and values are well-suited to farming aquafruit.

shared beliefs/values

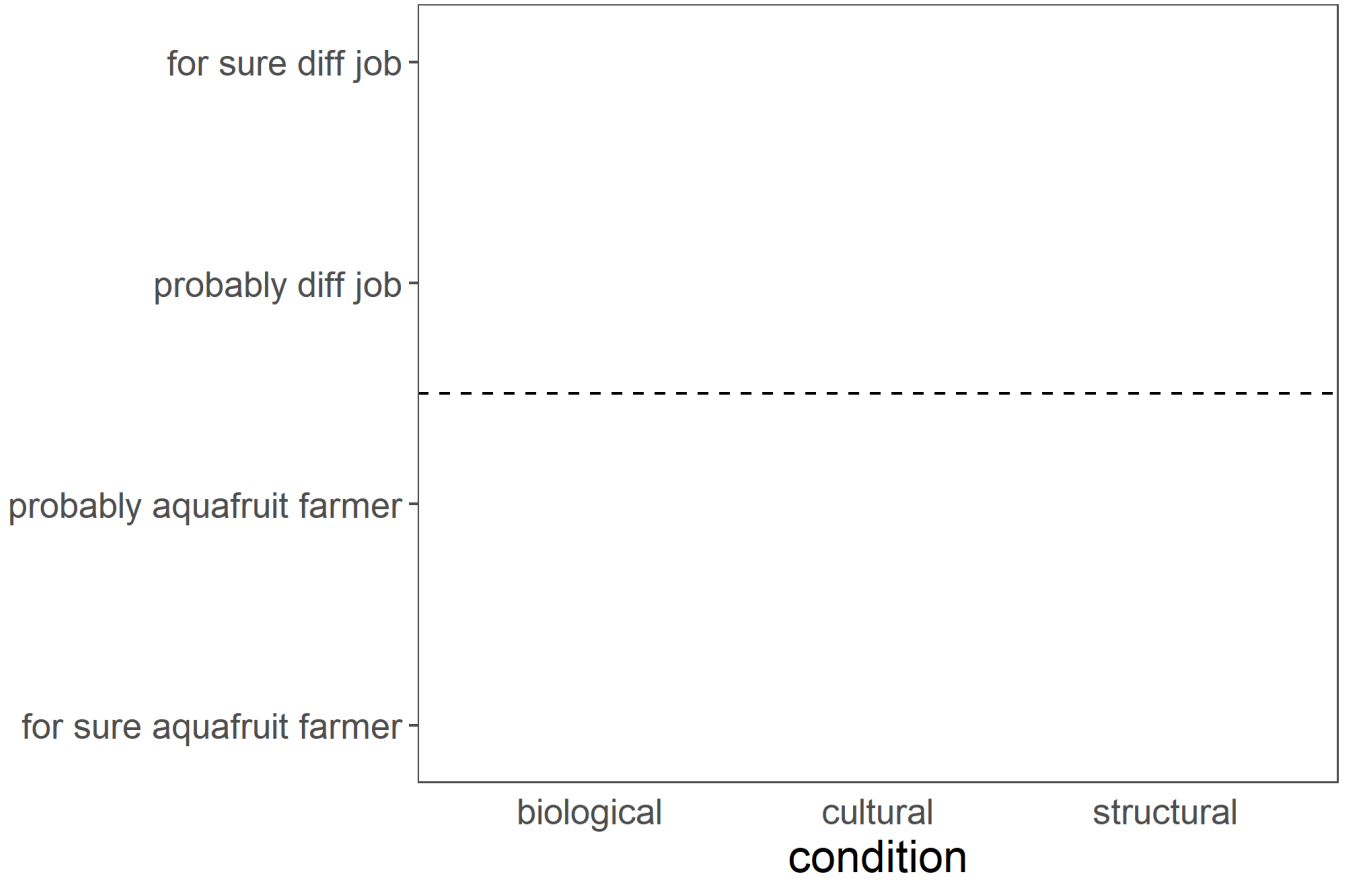
This is because Zarpies are required by this island's government to fill out complex and expensive paperwork to be hired in other jobs, which limits economic opportunities for Zarpies.
This situation leads Zarpies with little other choice than to farm aquafruit.

shared external context

what is the case: generalization

Look, here's another Zarpie! This Zarpie does not live on the island of Zarpies and Vawns. This Zarpie was born and raised in a different island country, with a different government, different employment policies, and different groups of people. They live and work in that different island country.

What job do you think this Zarpie works in their country?



structural reps lead to more context-sensitive generalization

Look, here's another Zarpie! This Zarpie does not live on the island of Zarpies and Vawns. This Zarpie was born and raised in a different island country, with a different government, different employment policies, and different groups of people. They live and work in that different island country.
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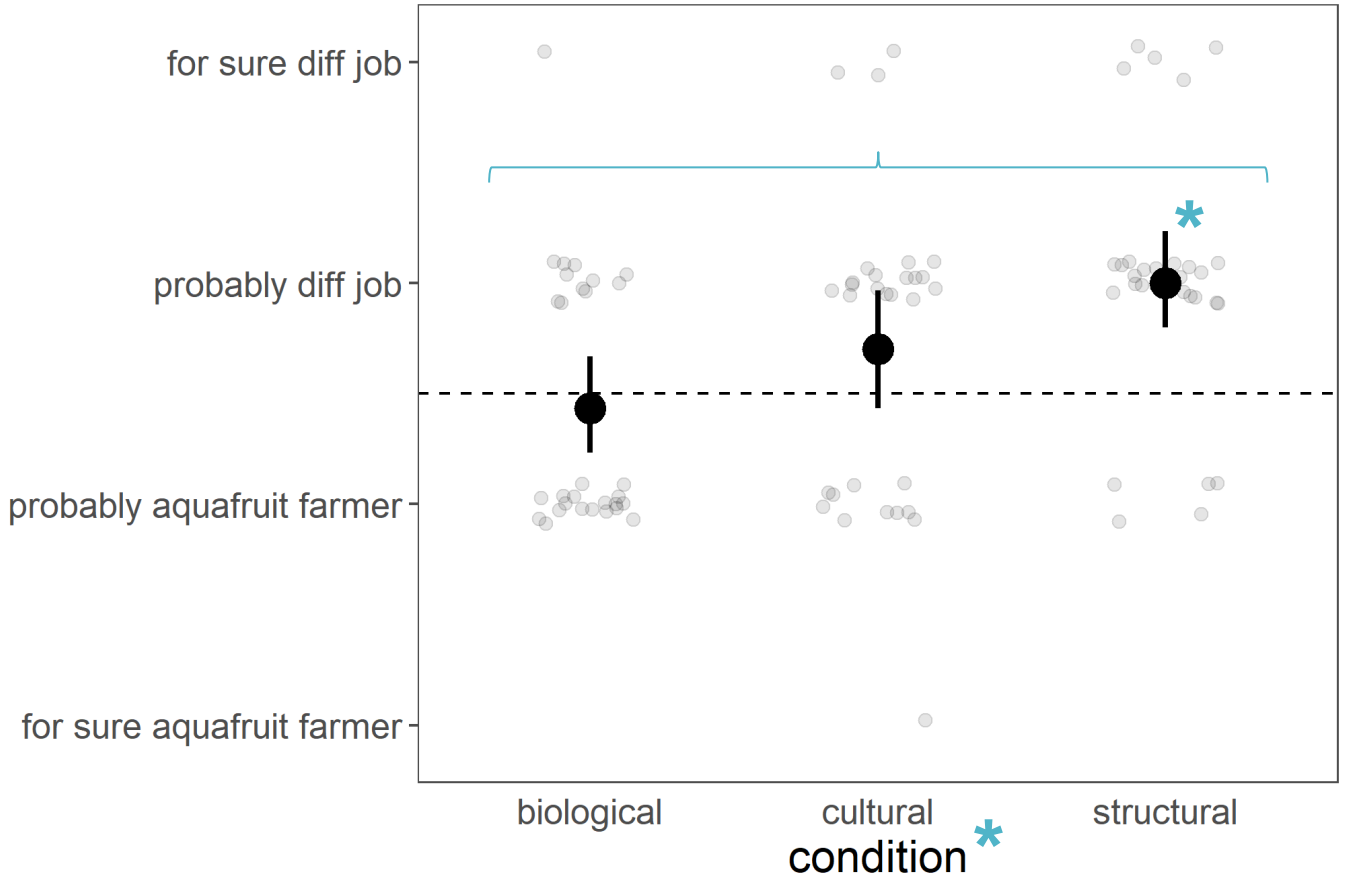

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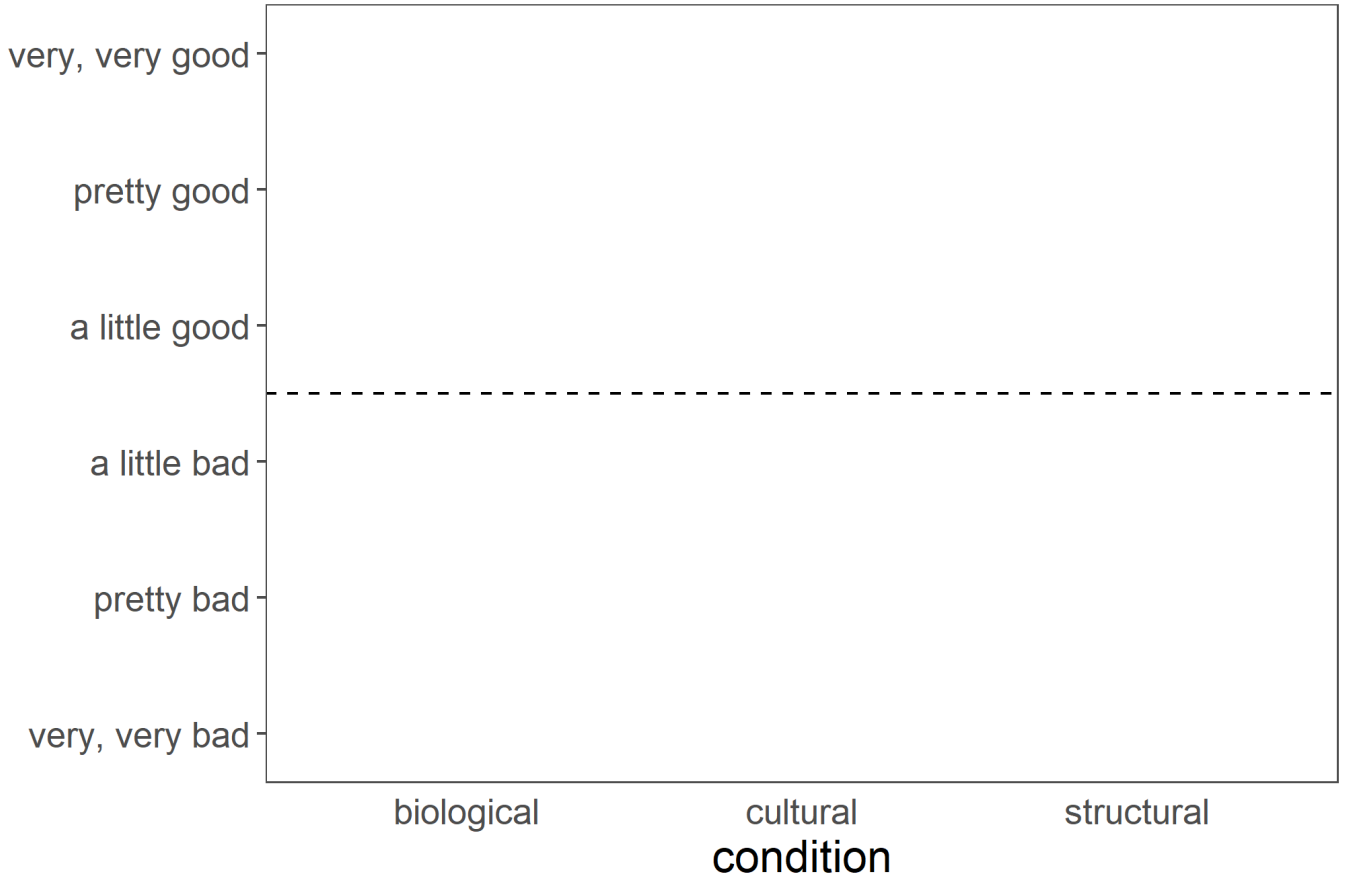
● = 95% bootstrap CIs

○ = individual participants (n=90 adults, ~30/condition)

what should be the case: attitudes about present disparities

Is it okay or not okay that Zarpies mostly work as aquafruit farmers and Vawns mostly work as distribution managers?

(okay/not okay → a little/pretty/very, very good or bad)



structural reps decrease endorsement of disparities

Is it okay or not okay that Zarpies mostly work as aquafruit farmers and Vawns mostly work as distribution managers?

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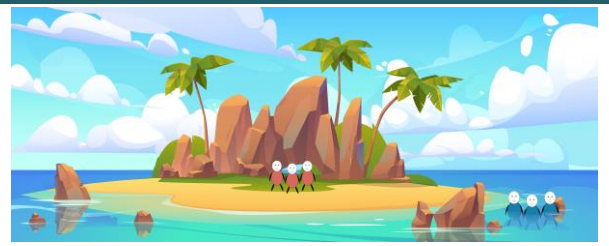

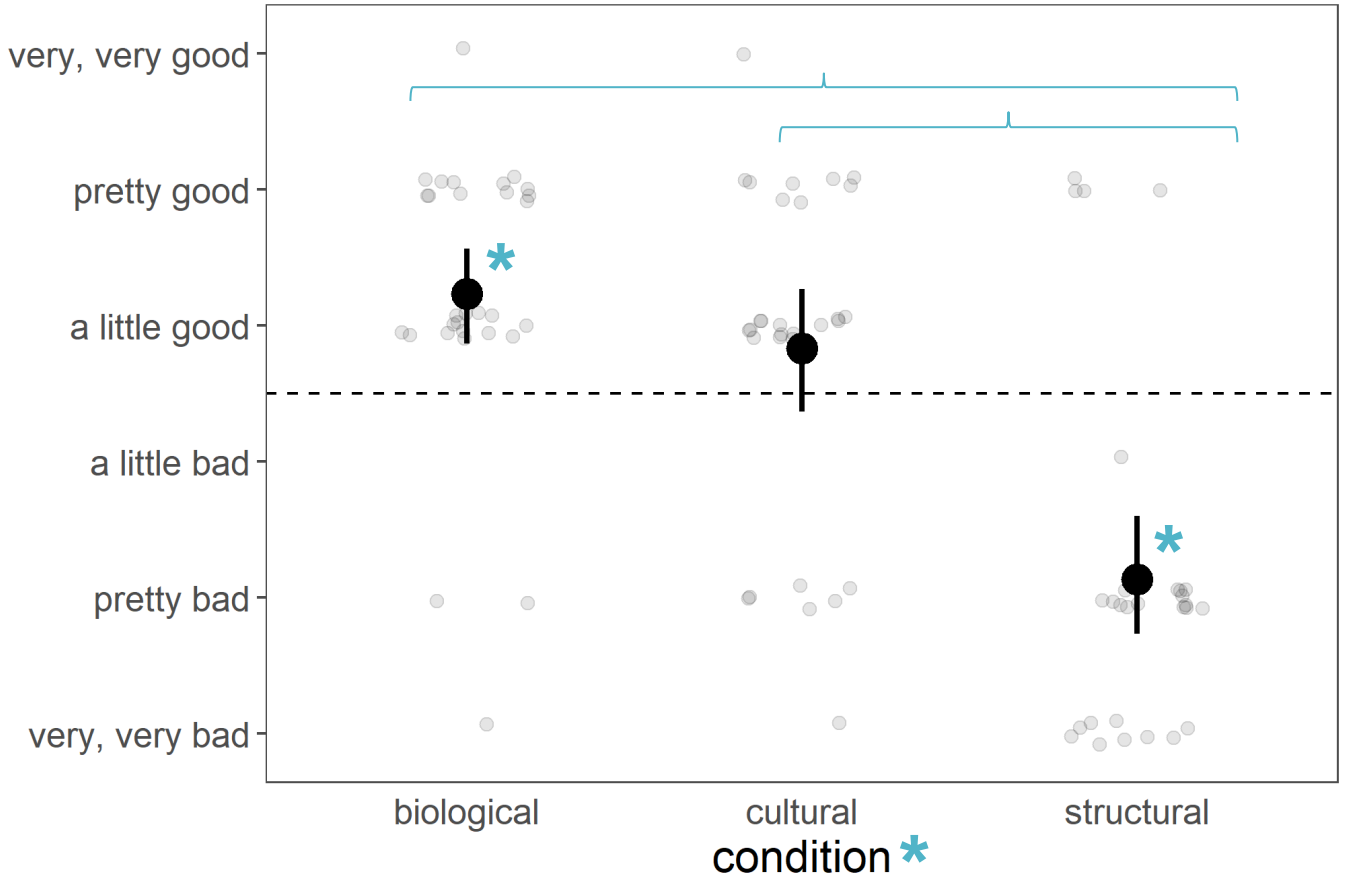

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(n=90 adults, ~30/condition)

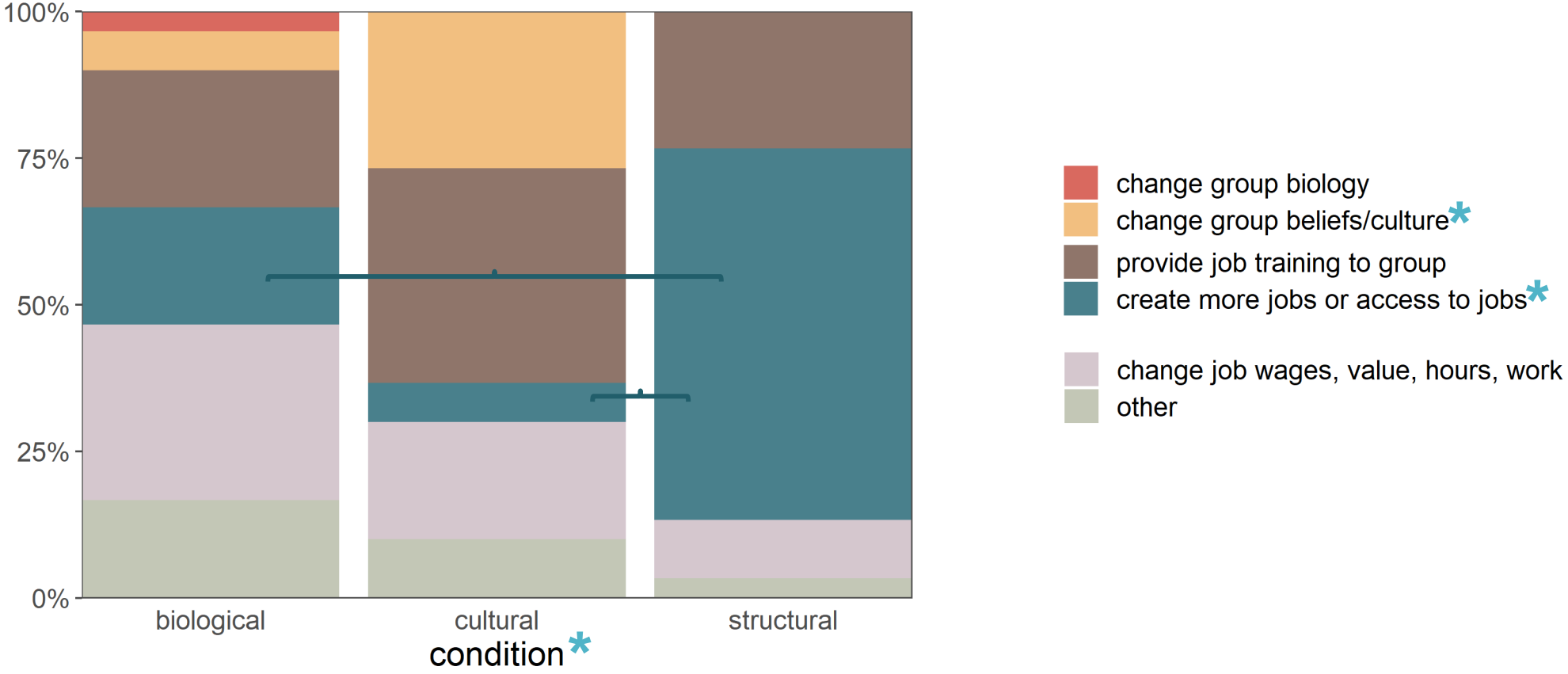
how to change what is the case: intervention

The island government would like to get more Zarpies to work as distribution managers, rather than aquafruit farmers. **If you could make anything happen, what would you do to get the Zarpies to work as distribution managers?** Please list 1 specific action you would do, and please be as specific as possible. The more specific you can be, the better. What would you do/change and how?

N = 90 adults on MTurk
30/condition

structural reps suggest structural interventions

The island government would like to get more Zarpies to work as distribution managers, rather than aquafruit farmers. **If you could make anything happen, what would you do to get the Zarpies to work as distribution managers?** Please list 1 specific action you would do, and please be as specific as possible. The more specific you can be, the better. What would you do/change and how?



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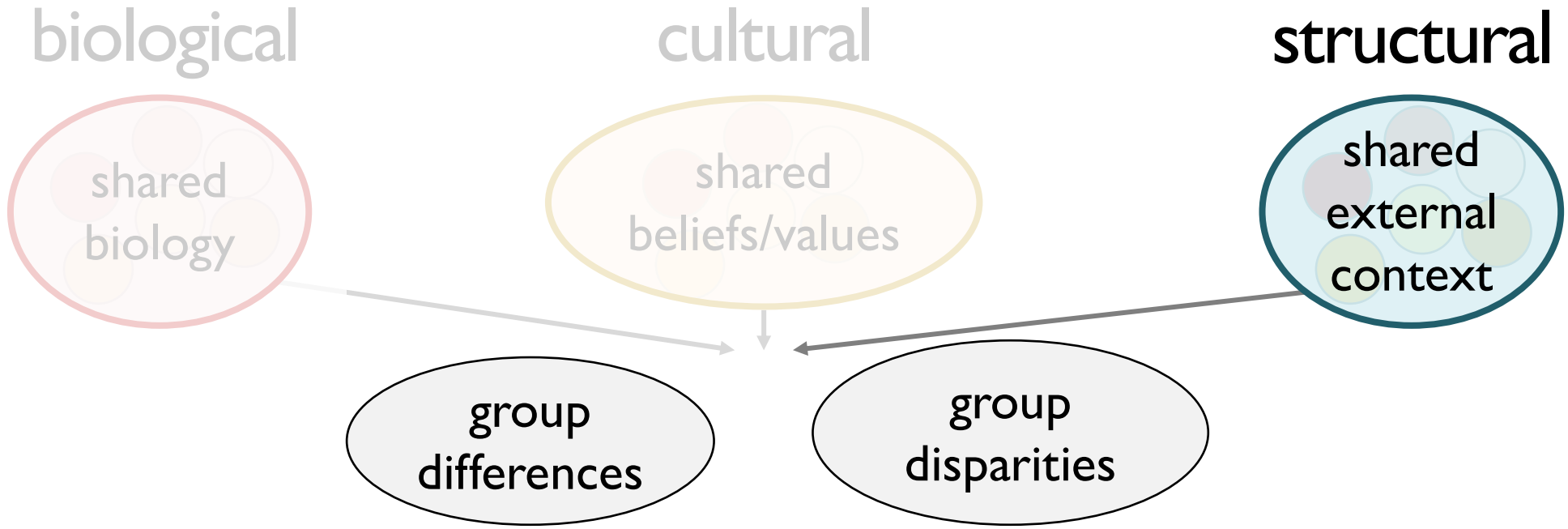


structural representations as a positive alternative to essentialism

what is the case

more context-sensitive generalization

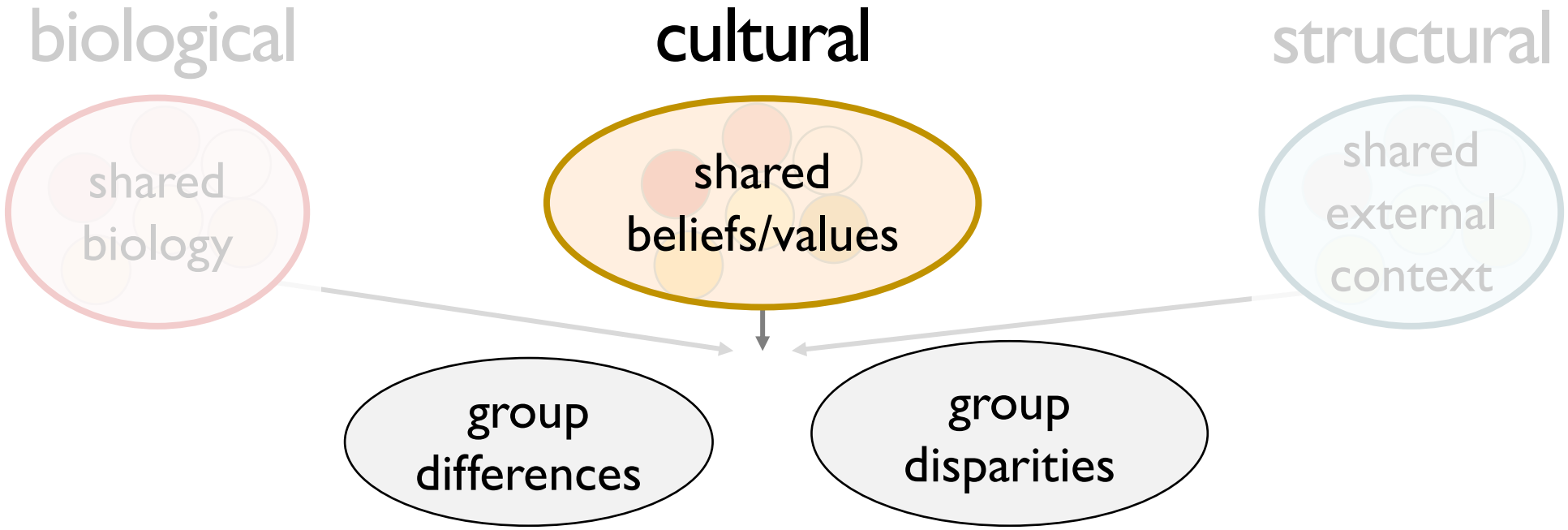
how to change what is the case

more structural interventions

what should be the case

more positive attitudes about non-conformity

less endorsement of present disparities



cultural representations as an intermediate or even extreme form of essentialism

what is the case

what should be the case

how to change what is the case

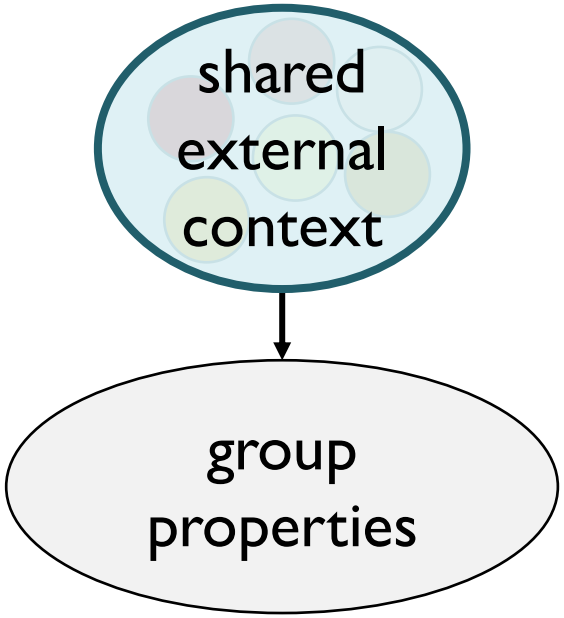
how *should* we represent group differences?

essentialism

biological

Category members share a **stable external context**.

structural



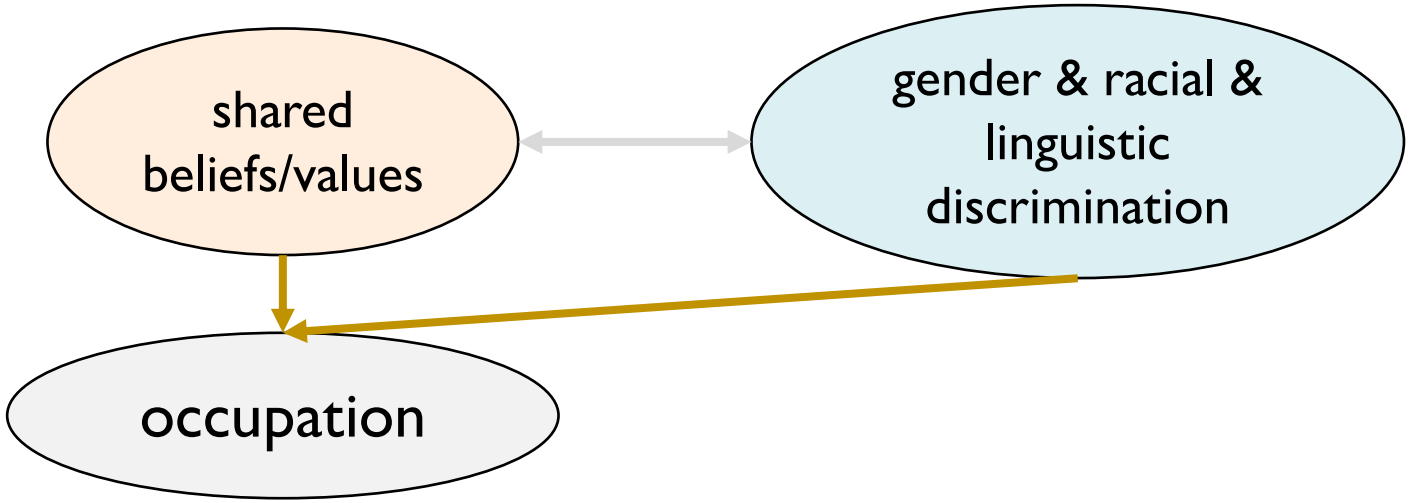
Haslanger (2000), Scott (1986)

ground truth of group differences/disparities often involves structural causes… but also complex interactions

…the most common occupations among Indian women are software developers and physicians—two typically high-wage occupations—while the top occupations among Vietnamese women are manicurists and hairdressers, which are typically low-wage occupations.

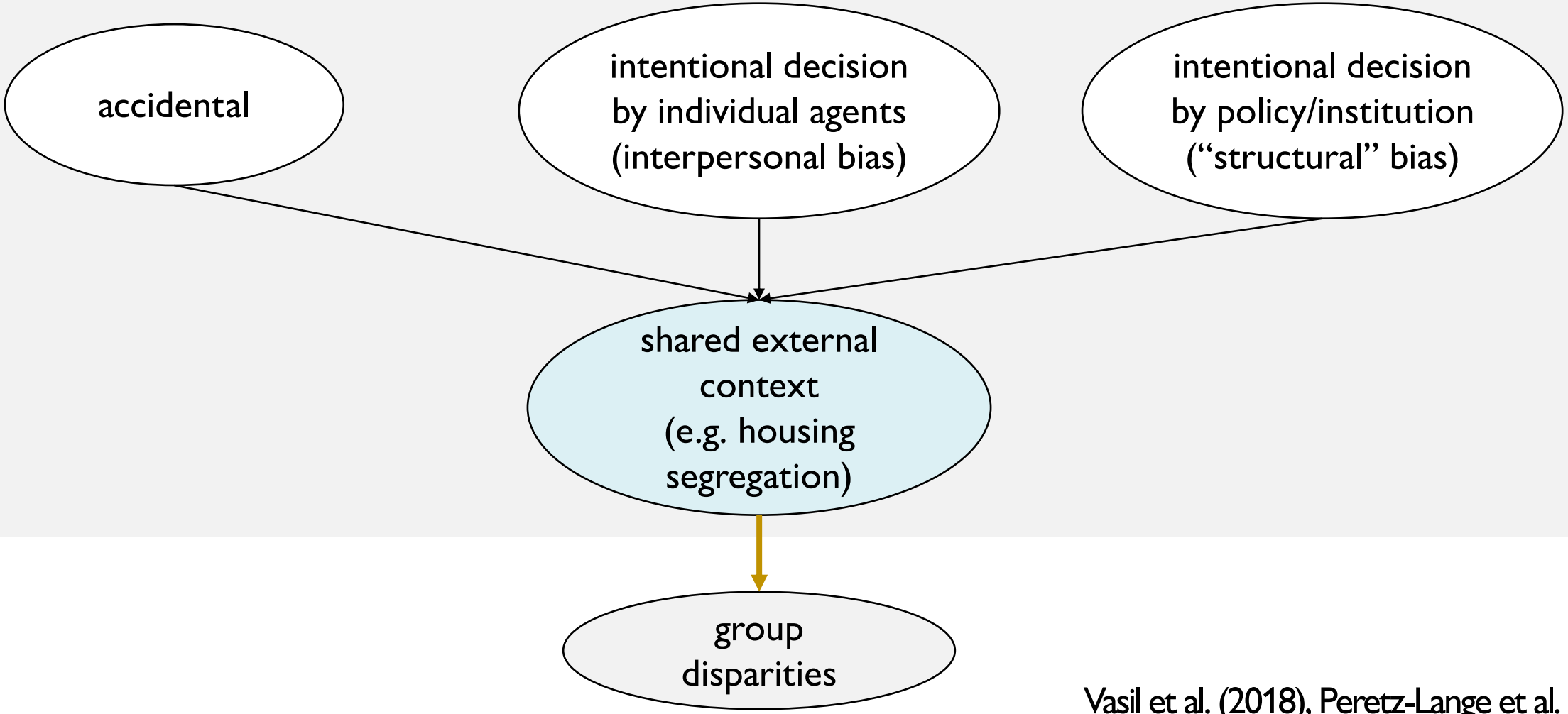
Some factors driving these differences among subpopulations may include cultural differences, differences in immigration patterns and generational wealth, and persistent biases around gender, race, ethnicity, nationality, and language.

Center for American Progress (2021). *The Economic Status of Asian American and Pacific Islander Women*.



the origins of structural context
(what do we mean by structural?)

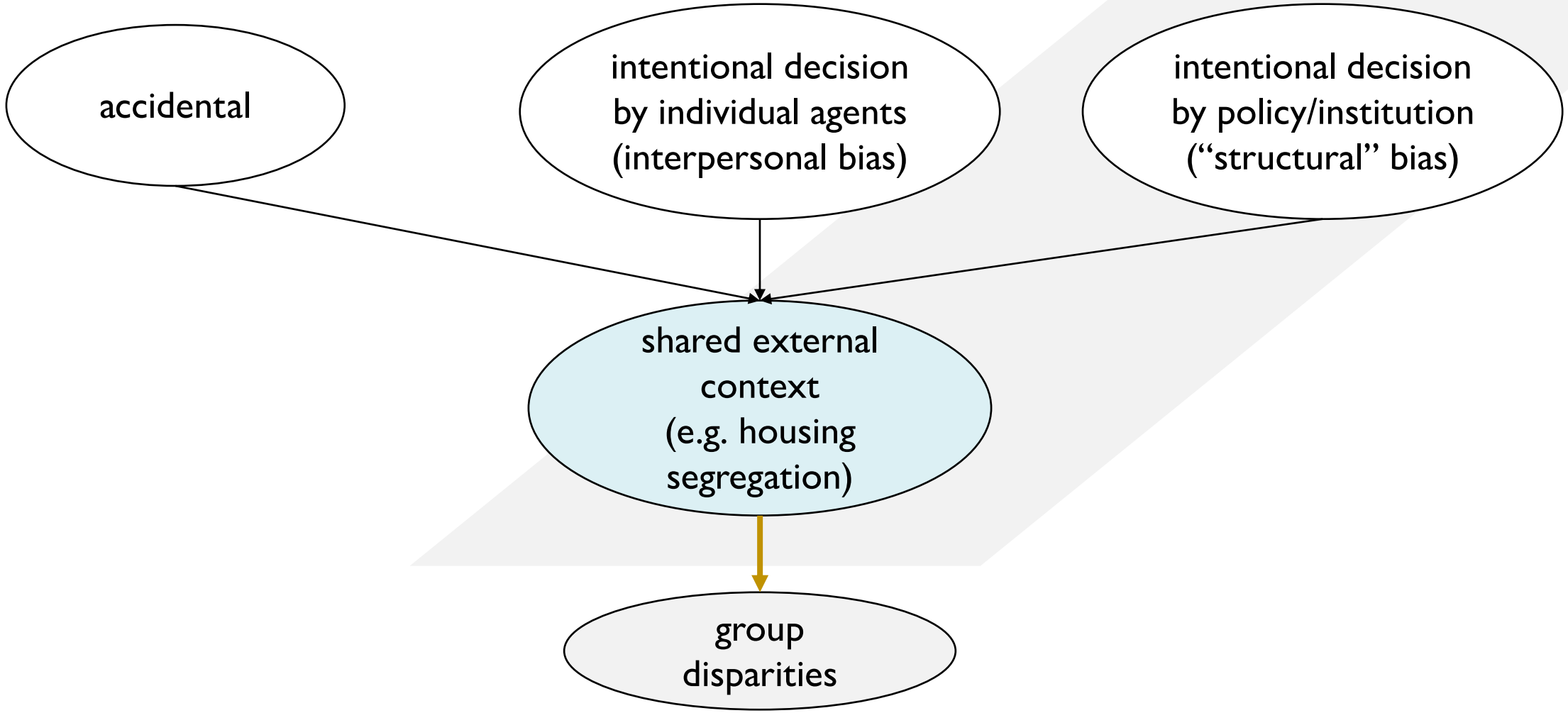
structural (a *stable* external context)



Vasil et al. (2018), Peretz-Lange et al. (2021)

the origins of structural context
(what do we mean by structural?)

structural (rooted in social structure: *laws, institutions, power*)



feedback & support (+& intervention coding)

Ellen Markman
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Aarthi Popat+
Cai Guo+

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Tobi Gerstenberg

Aaron Chuey
David Rose
Kayla Good
Melissa Santos
Mercedes Muñoz
Mika Asaba
Nicky Sullivan

prereg, materials, data osf.io/hz76n

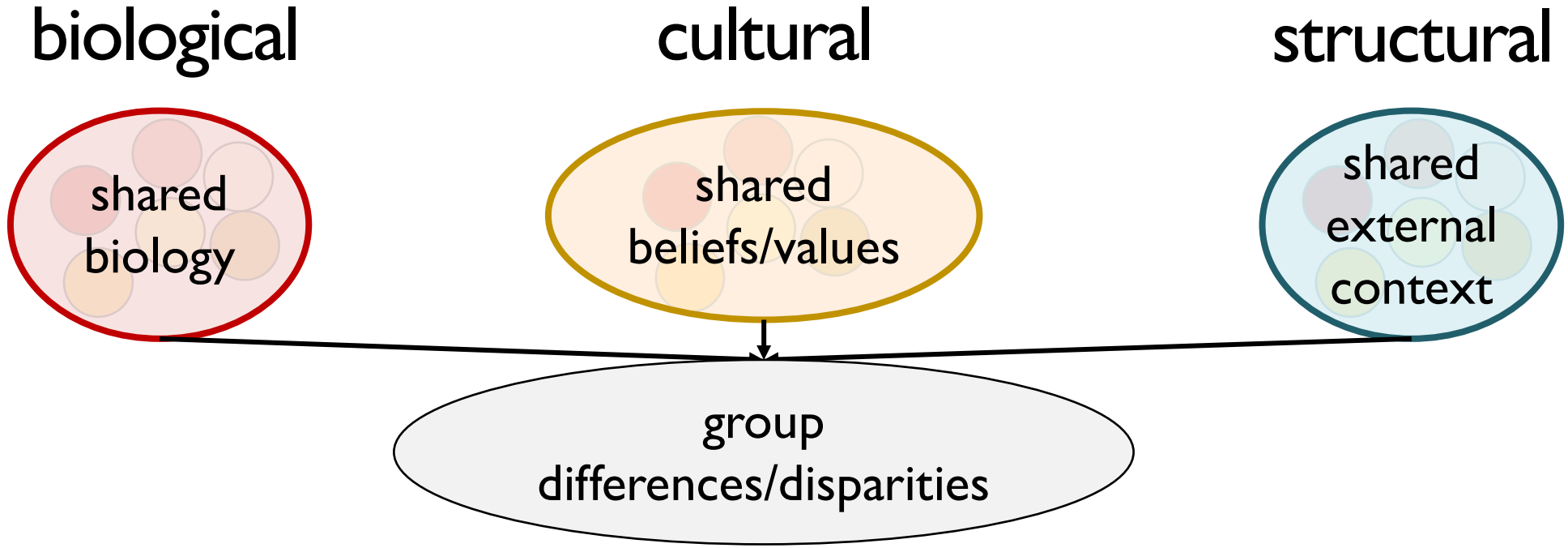
funding
Regina Casper Stanford Graduate Fellowship (SGF) in Science & Technology

MTurk
adult participants

Stanford Developmental Psychology

CHS ChildrenHelpingScience.com

online Zoom testing
Hyo Gweon
Teresa Garcia
Jessa Stegall
Brandon Carrillo
child participants & families



structural representations as a positive alternative to essentialism

feel free to email me too!

marianna.zhang@stanford.edu

prereg, materials, data

osf.io/hz76n

Questions?