Would you like to know?

The relationship between *aversion towards ambiguity* and *extreme worry* about finding out your own genetic predisposition for **mental health**

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50TH BEHAVIOR GENETICS ASSOCIATION MEETING - 26 JUNE 2020

QIMR Berghofer Medical Research Institute

The University Of Queensland AUSTRALIA

WHY FOCUS ON WORRY?

- Polygenic risk scores are moving from research discovery studies to clinical research studies.

- In order to make PRS relevant in a clinical setting (Lewis & Vassos, 2020):

"Step 5/5: [...] ensure that any application of polygenic risk scores avoids deterministic interpretations and is based on the understanding that PRS is an indicator, not a precise measure".

Lewis, C. M., & Vassos, E. (2020). Polygenic risk scores: from research tools to clinical instruments. *Genome Medicine*, *12*, 1-11.

WHY FOCUS ON WORRY?

- Messages that contain threatening health information can interfere with preventive health behavior (Etchegary & Perrier, 2007).
  - Individuals can react defensively increasing misunderstanding of information.

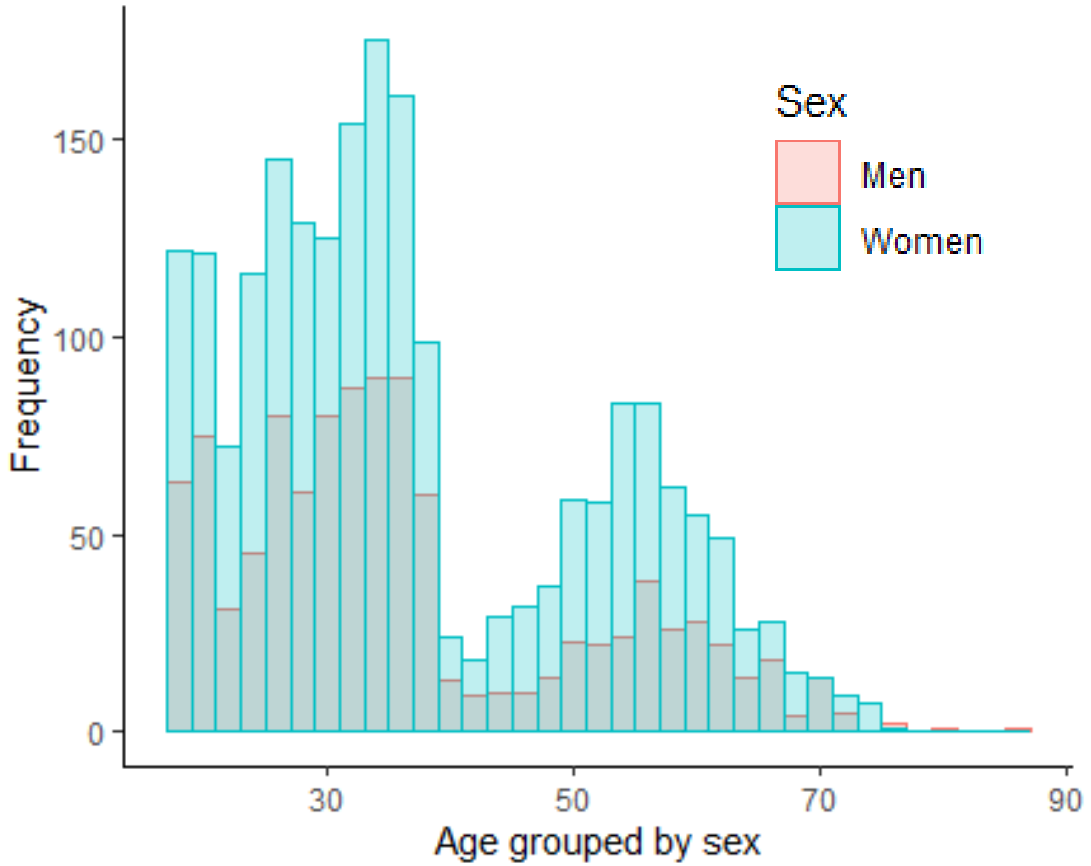
- We want to know what are people beliefs and worries before we start a conversation.

Etchegary, H., & Perrier, C. (2007). Information processing in the context of genetic risk. Journal of genetic counseling, 16(4), 419-432.

OUR STUDY

Australia (N=4020)

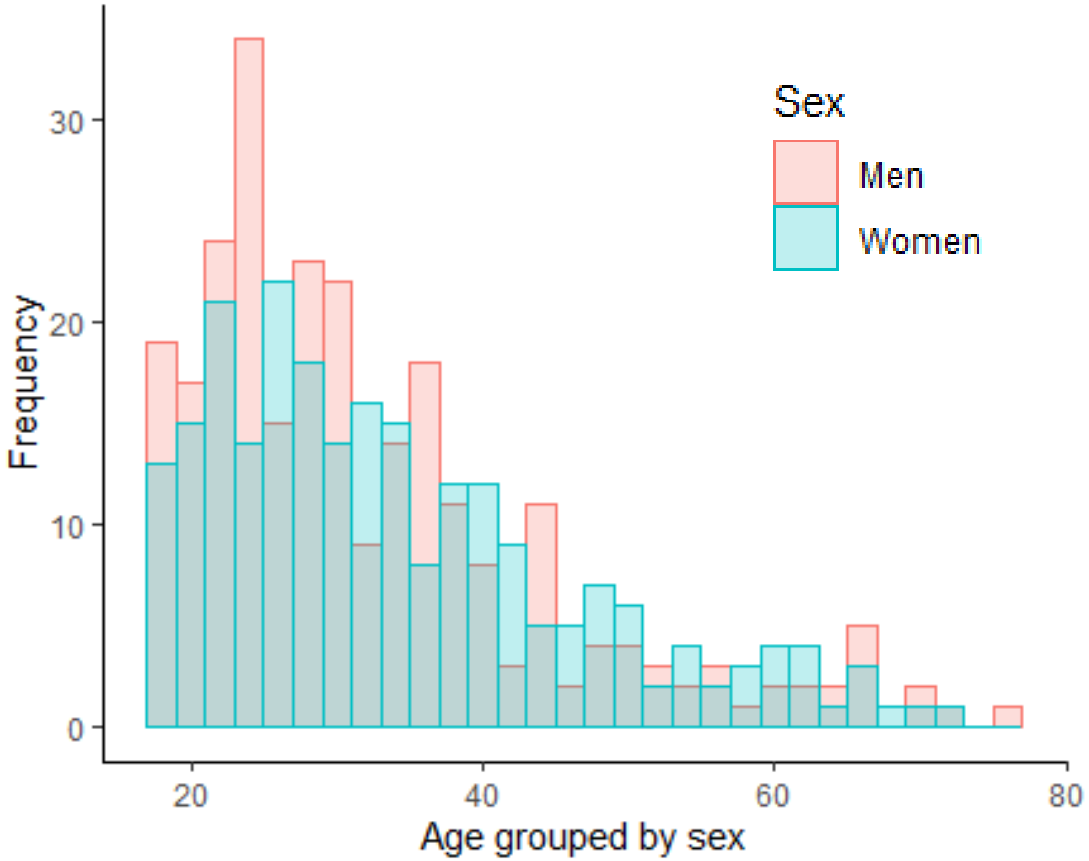
- Families participating in genetic studies at QIMR.
- 17 to 86 y.o. (M=37.5, SD=14.1).
- 66.5% women, and 57.5% with university degree.
- Genetic literacy: 6.8% very poor, 30.3% poor, 48.3% fair, 4.5% good.



OUR STUDY

United States (N=500)

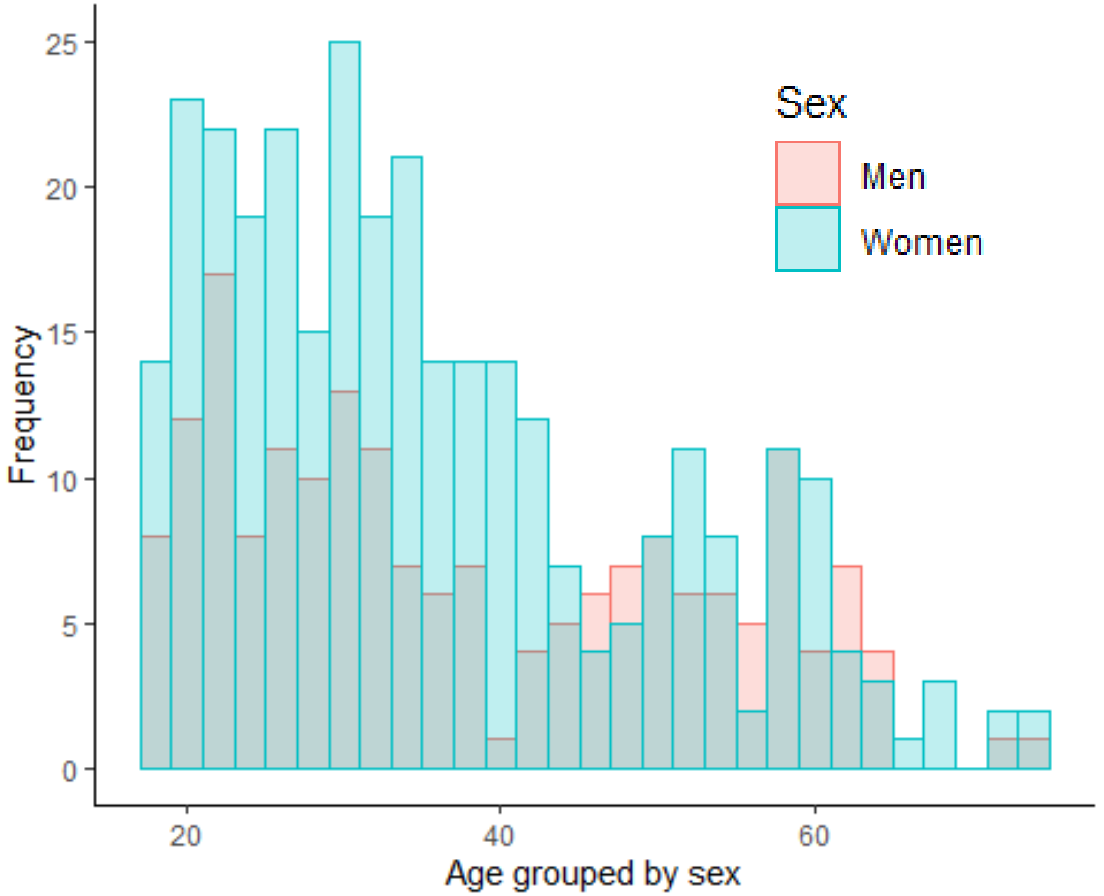
- General population recruited via Prolific online survey platform.
- 18 to 76 y.o. (M=33.6, SD=12.4).
- 47.6% women and 47.6% with university degree.
- Genetic literacy: 8.2% very poor, 33.4% poor, 51.6% fair, 6.8% good.



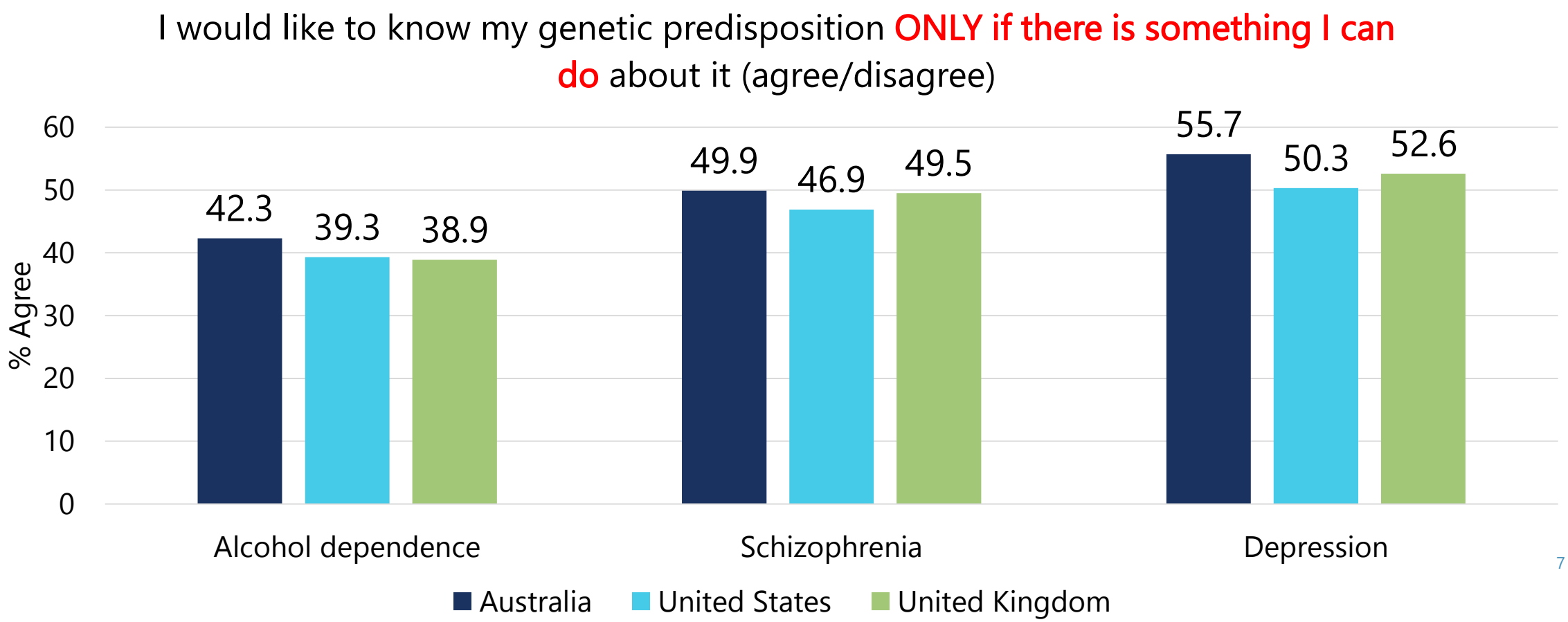
OUR STUDY

United Kingdom (N=501)

- General population recruited via Prolific online survey platform.
- 18 to 75 y.o. (M=37.1, SD=13.9).
- 62.9% women and 51.7% with university degree.
- Genetic literacy: 5.4% very poor, 33.1% poor, 47.7% fair, 13.8% good.



HOW MUCH DO PEOPLE WORRY ABOUT GENETICS?



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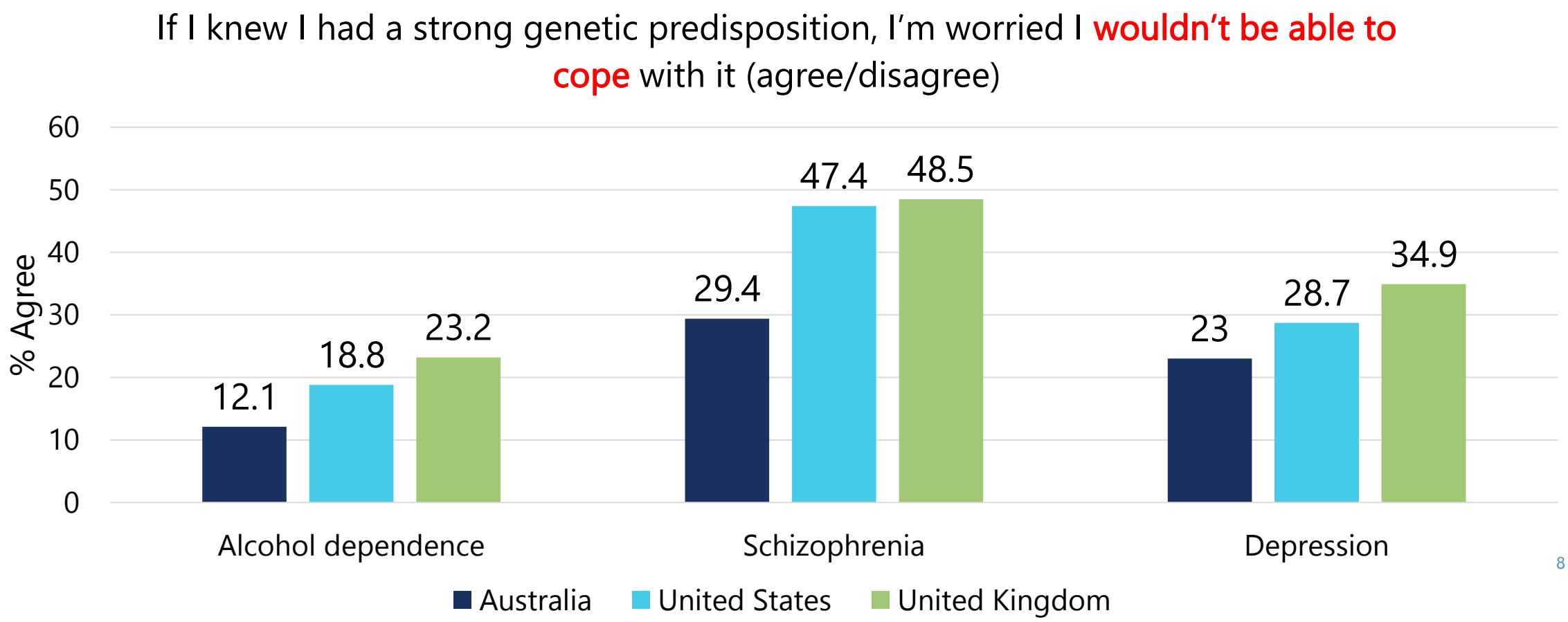

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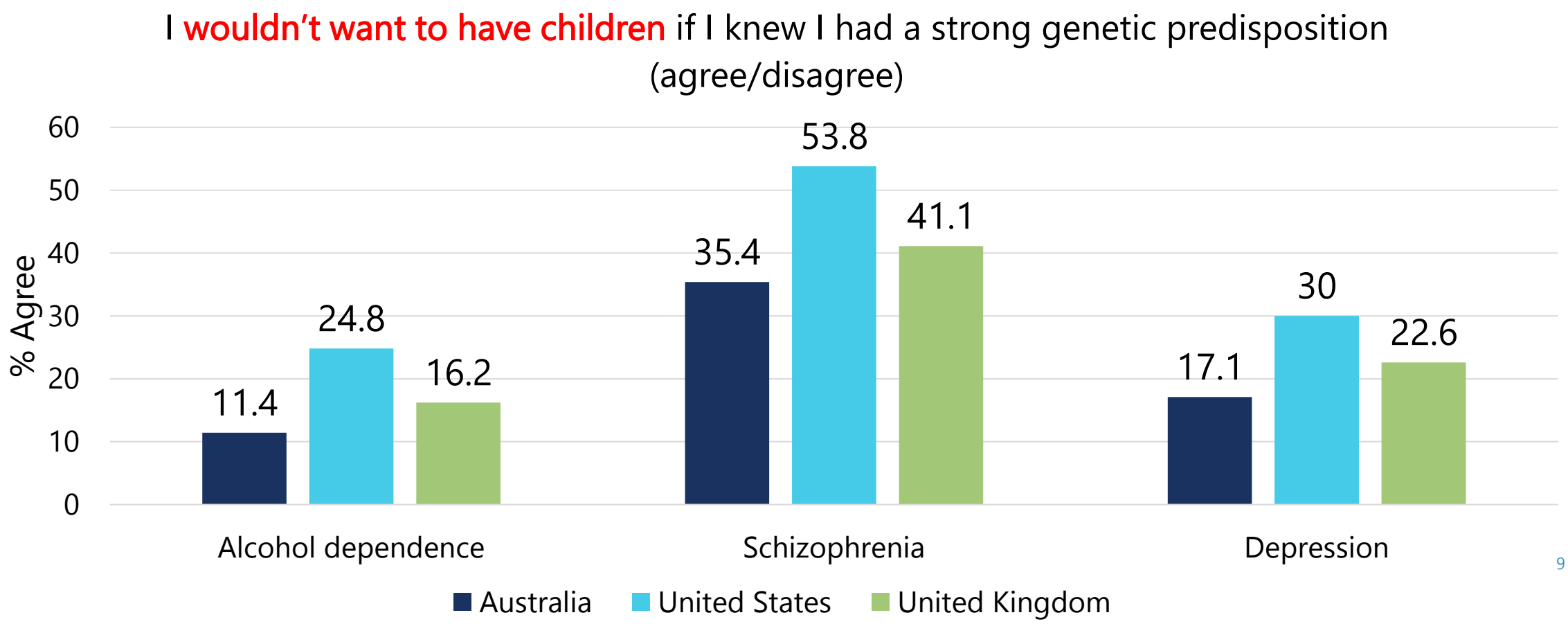

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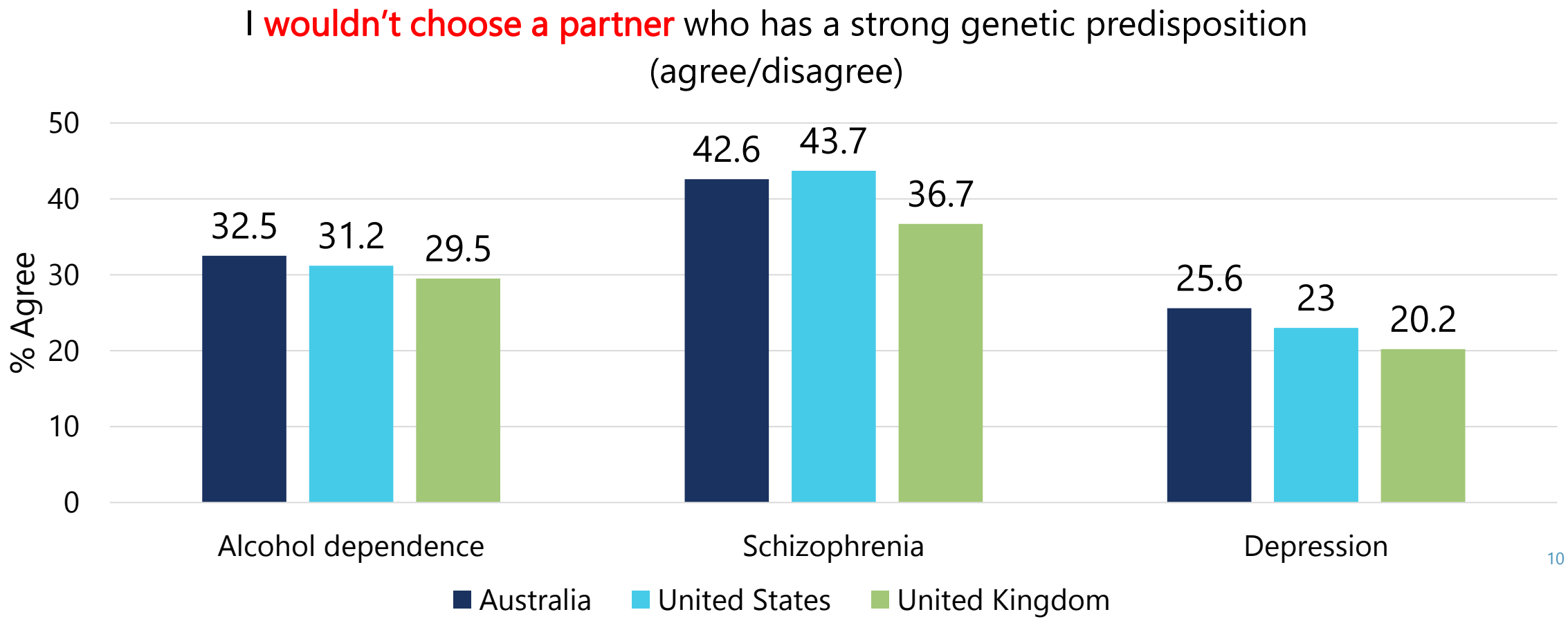
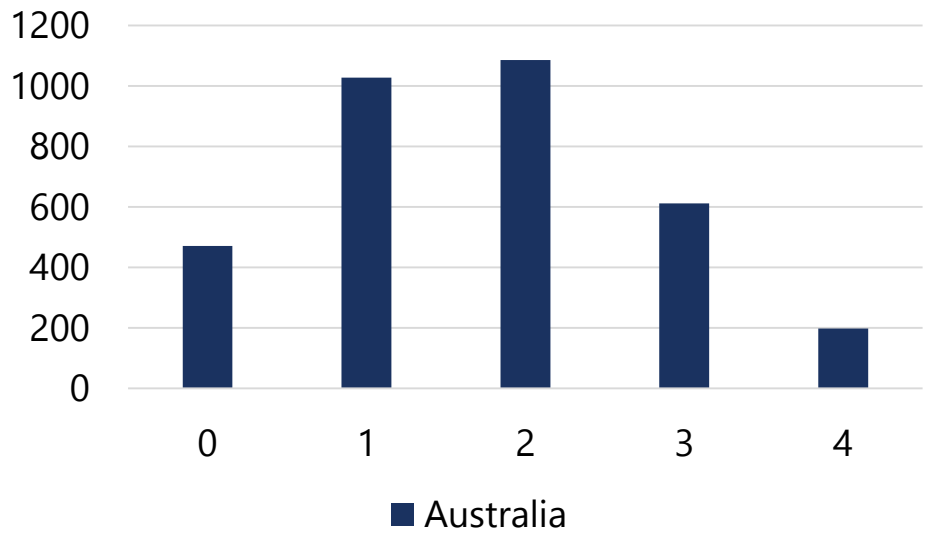


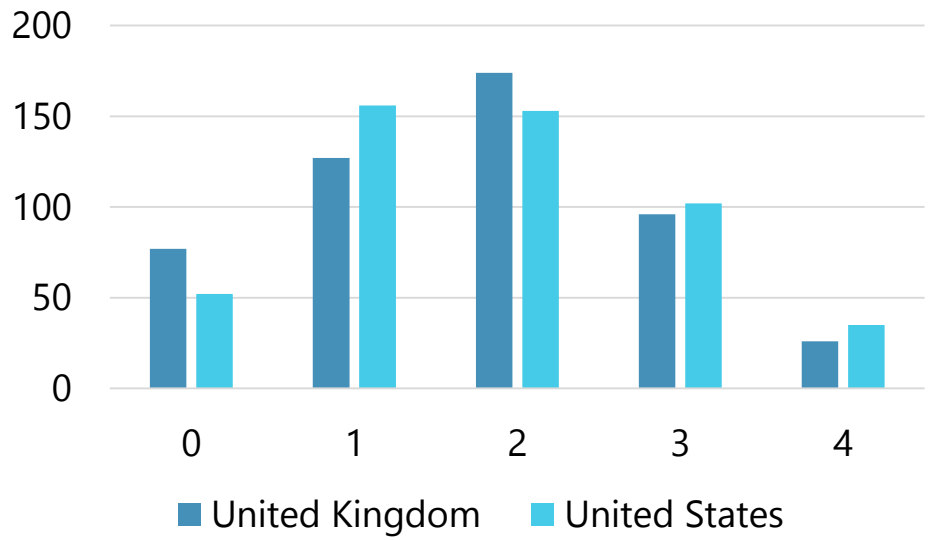
WHAT IS 'EXTREME WORRY'?

- **Sum score**: AGREEMENT with the previous statements.

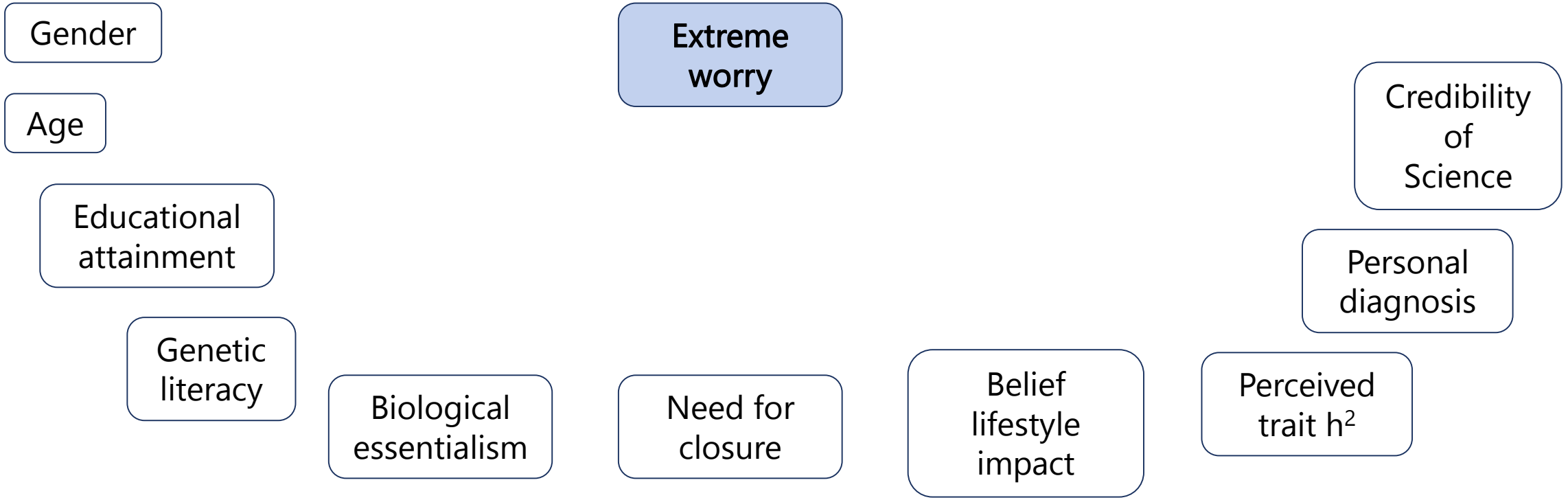
For each trait scores range from 0 (not worried) to 4 (extremely worried).

Example (below): sum score for worry related to depression.





STUDY 1 - WHY WOULD PEOPLE RESPOND THIS WAY?



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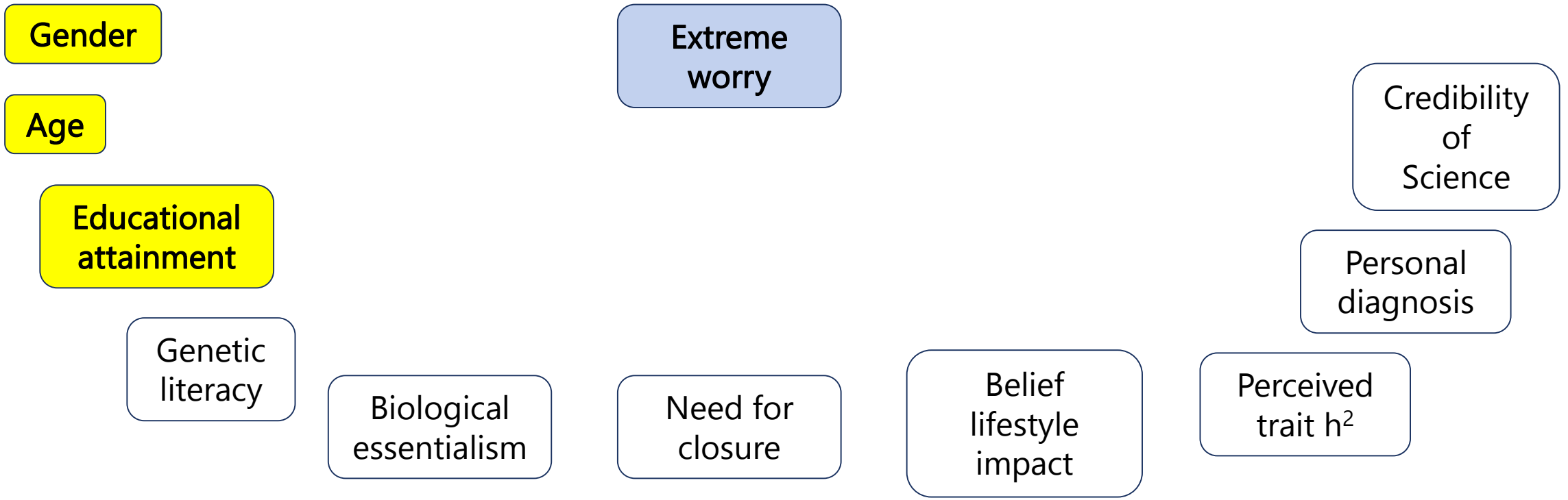

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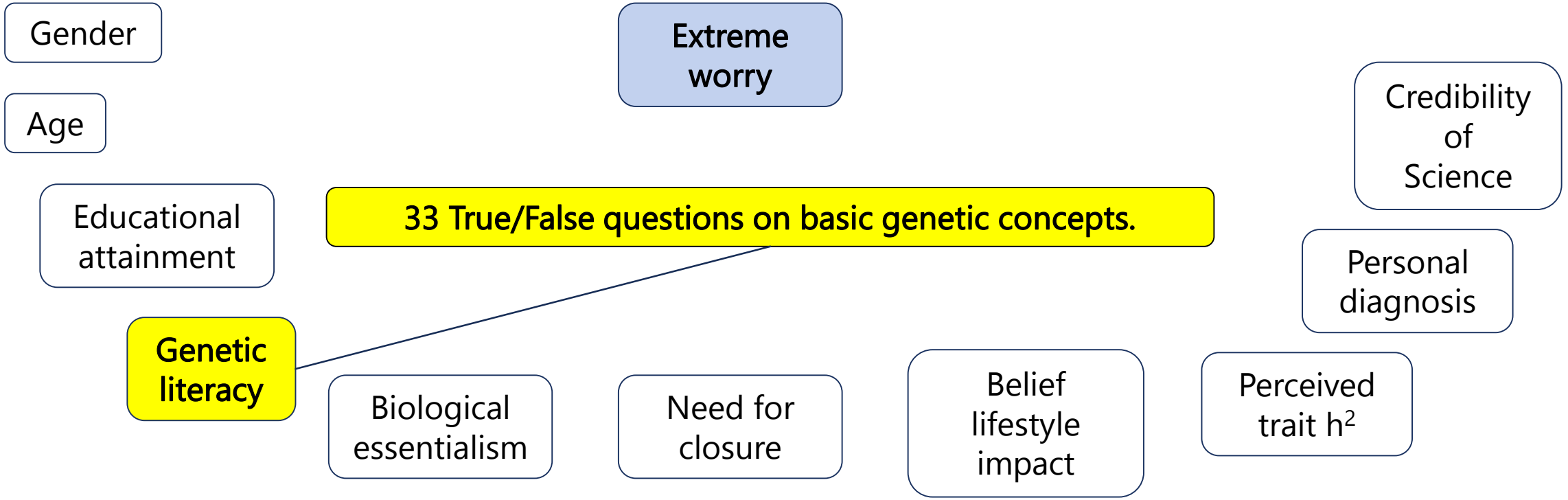

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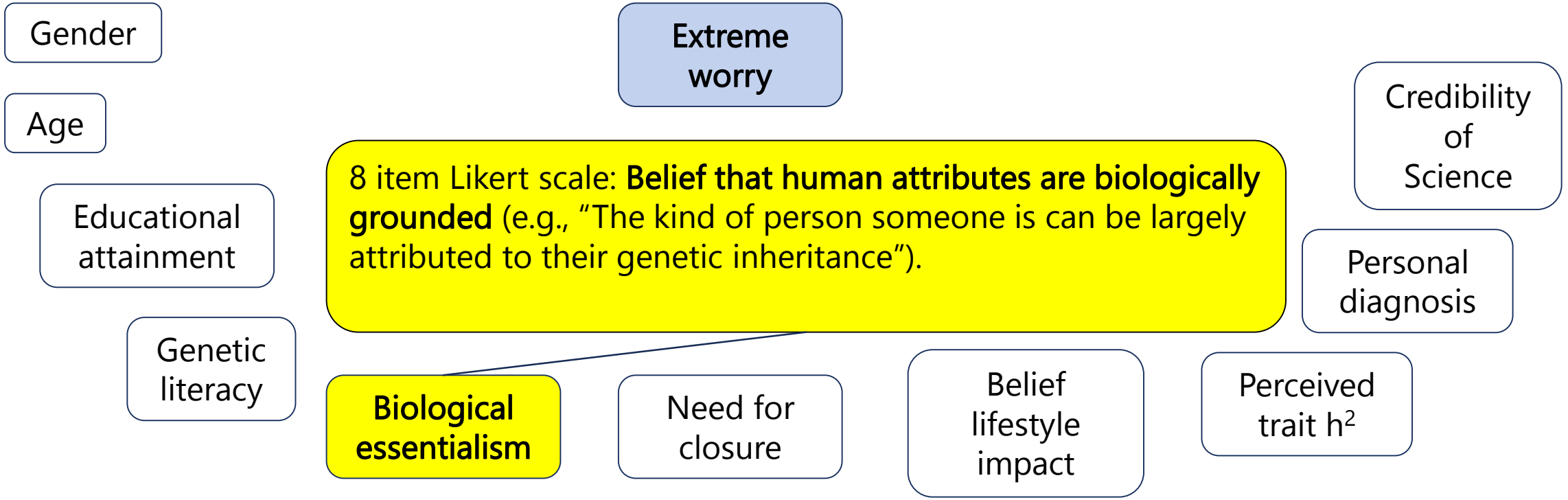

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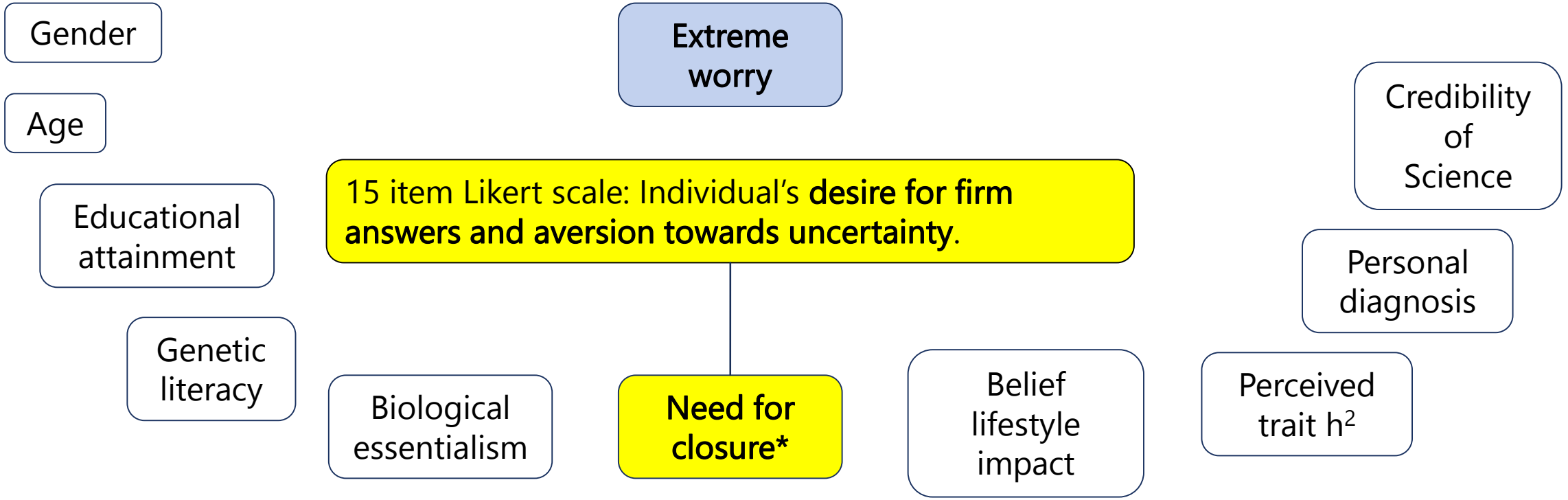

* We will be focusing on this variable later.

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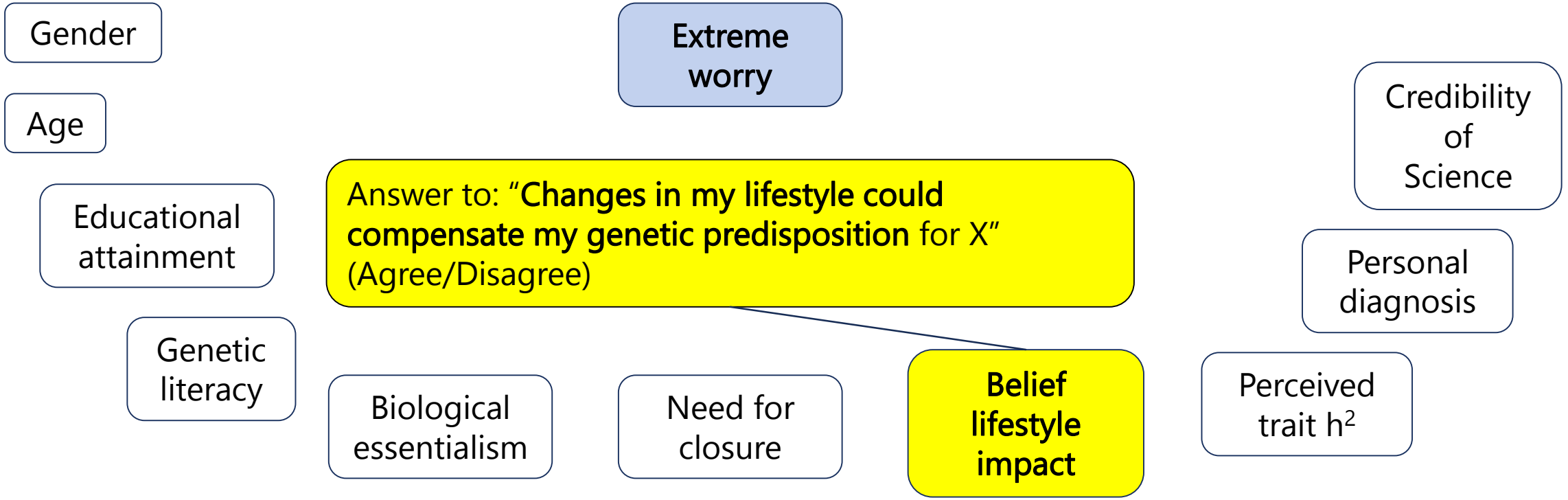

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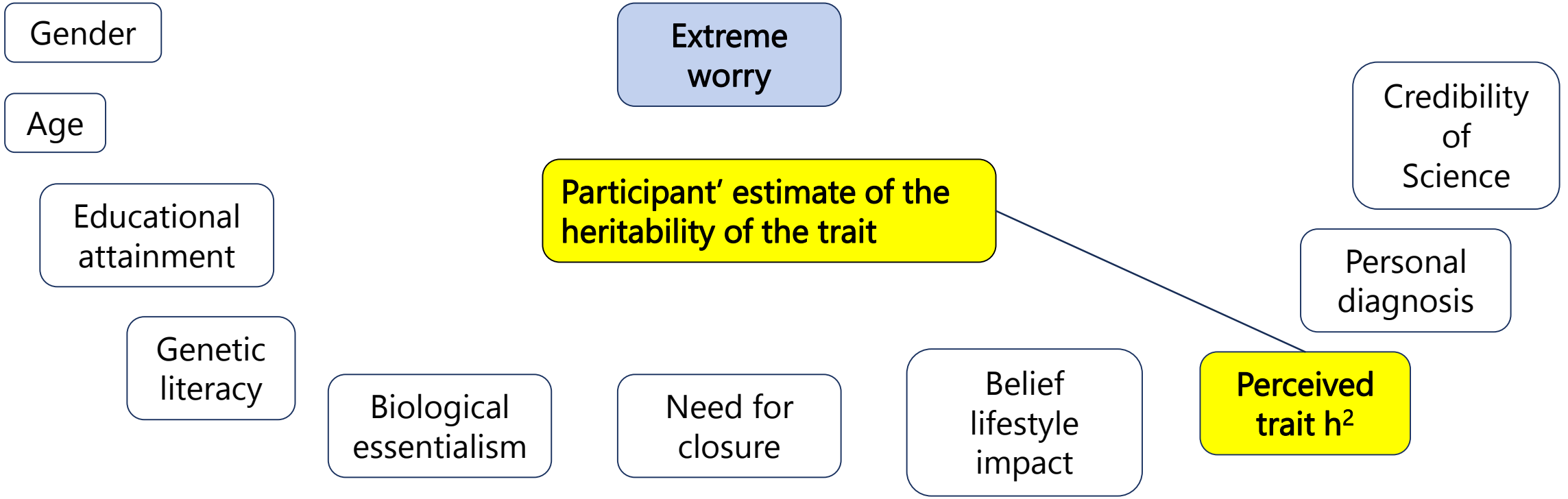

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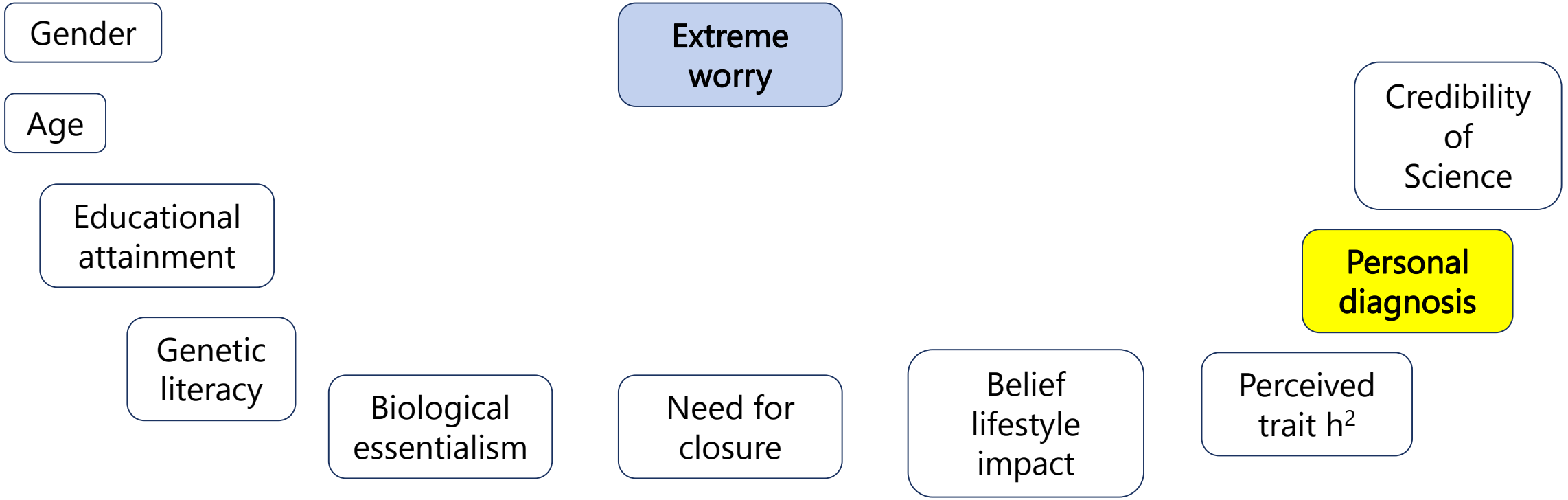

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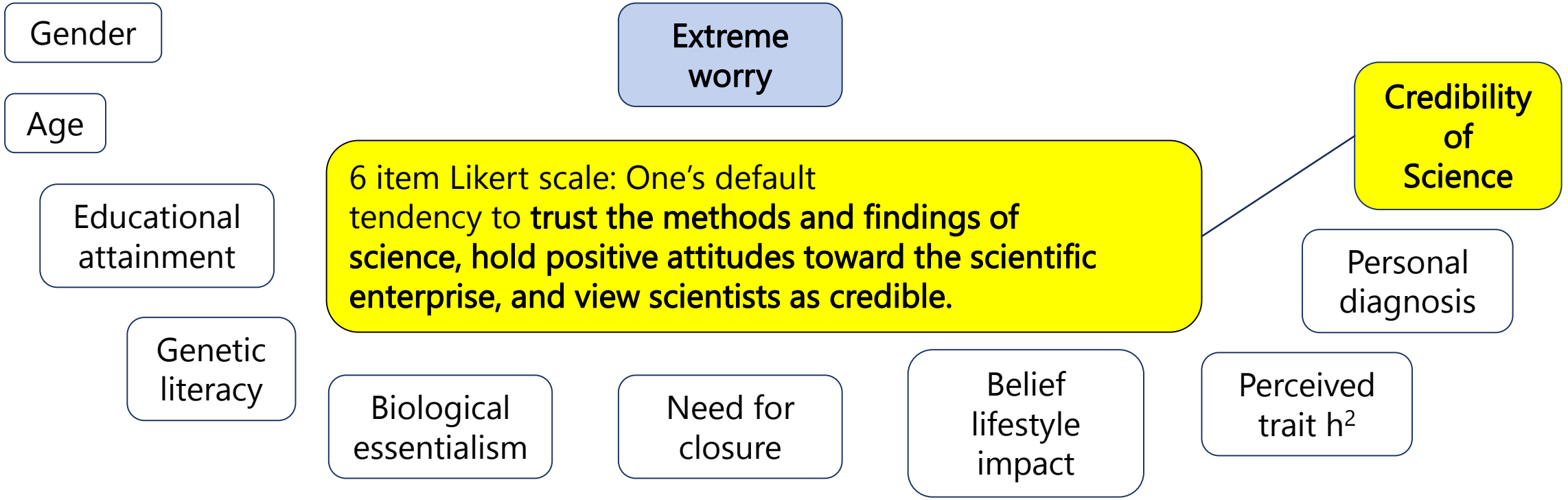

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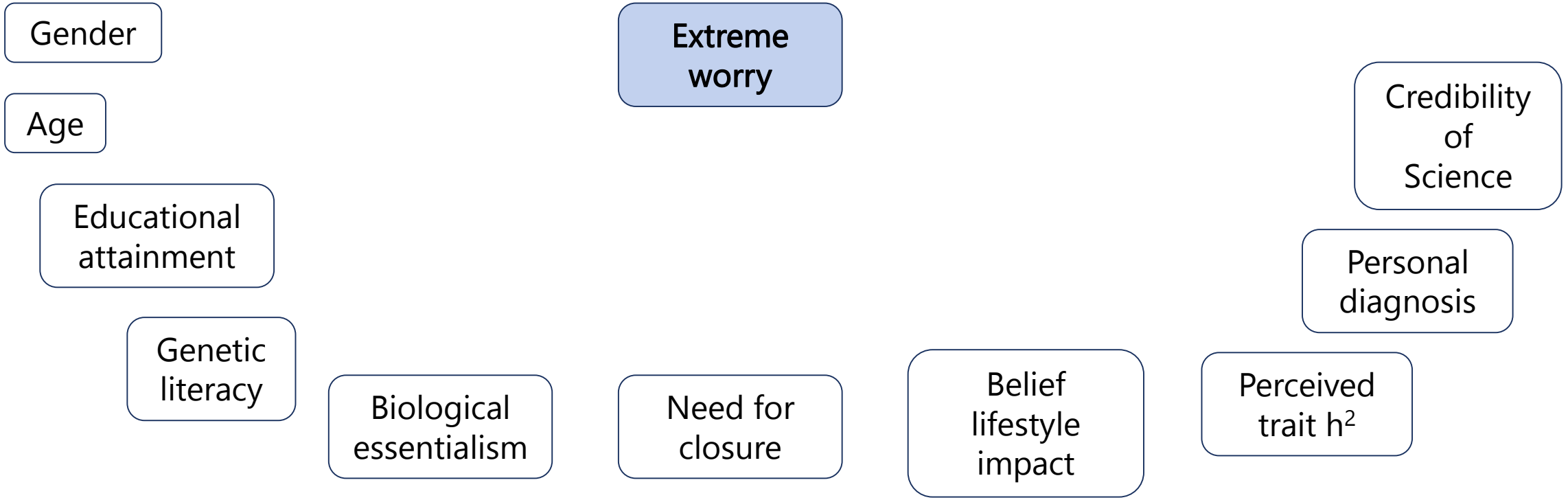
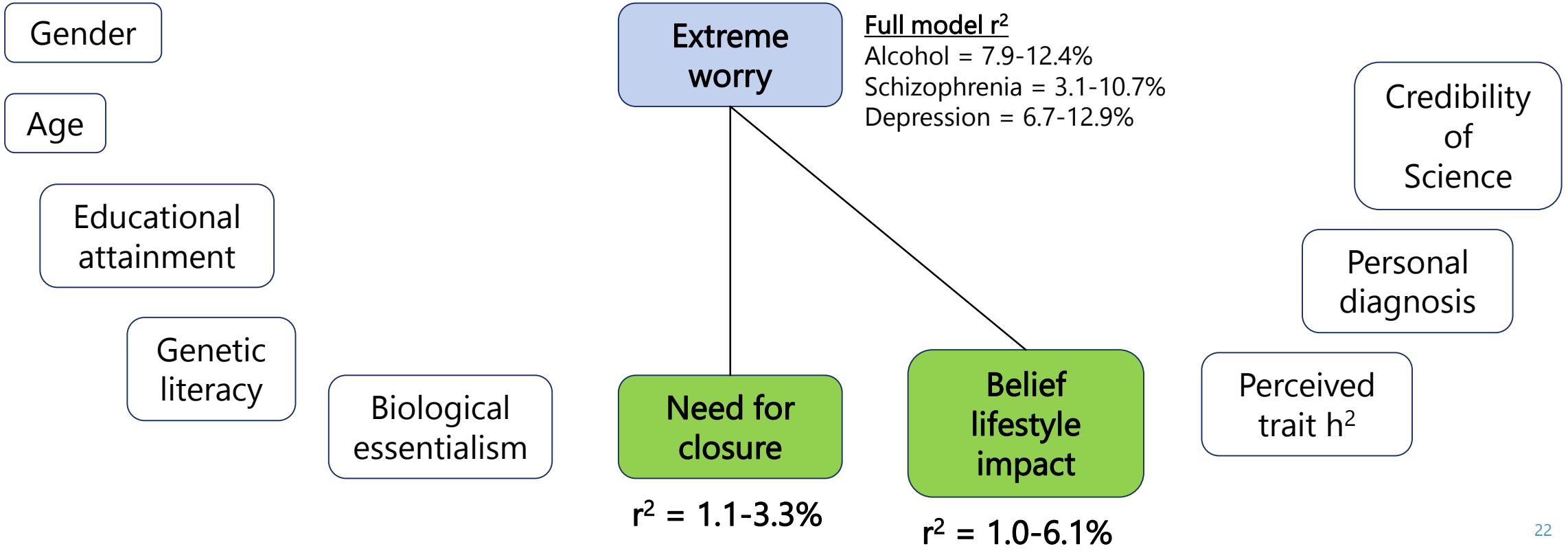


STUDY 1 - WHY WOULD PEOPLE RESPOND THIS WAY?

Across countries and traits, only two predictors are consistently significant:



Note: analysis were run separately for each country and trait.

INTERIM SUMMARY

Two consistent predictors of extreme worry:

1. Believing that changes in lifestyle can't compensate genetic predisposition.

2. High individual's desire for a firm answer to a question and an aversion toward ambiguity (i.e., need for closure).

INTERIM SUMMARY

Two consistent predictors of extreme worry:

1. Believing that changes in lifestyle can't compensate genetic predisposition.

2. **High the individual's desire for a firm answer to a question and an aversion toward ambiguity (i.e., need for closure).**

However, firm answers and genetics × environment are not exactly synonyms

WHAT IS NEED FOR CLOSURE?

Individuals high in dispositional NFC:

- Prefer order and structure in their lives and predictability.
- Desire for secure and stable knowledge that is reliable across circumstances and unchallenged by exceptions.
- Urgency to reach swift and firm decisions
- Discomfort with ambiguity, lack of closure is aversive.
- Closed-minded, unwillingness to have their knowledge challenged.

Examples: *- I don't like to go into a situation without knowing what I can expect from it.*

- I feel uncomfortable when I don't understand the reason why an event occurred in my life.

PROBLEMS WITH HIGH NEED FOR CLOSURE

- Individuals often **leap to conclusions** based on partial or inconclusive information gathering (Roets et al. 2015, 2017).
- Strongly **related to** various measures of **stereotyping and prejudice** ("prejudice-prone personality"; Roets et al. 2015, 2017), including **genetic determinism** (Keller 2005).
- **Reduced willingness to revise diagnoses** in light of new evidence (Roets et al. 2014).

Can need for closure a potential target for counselors?
What do we know about it?

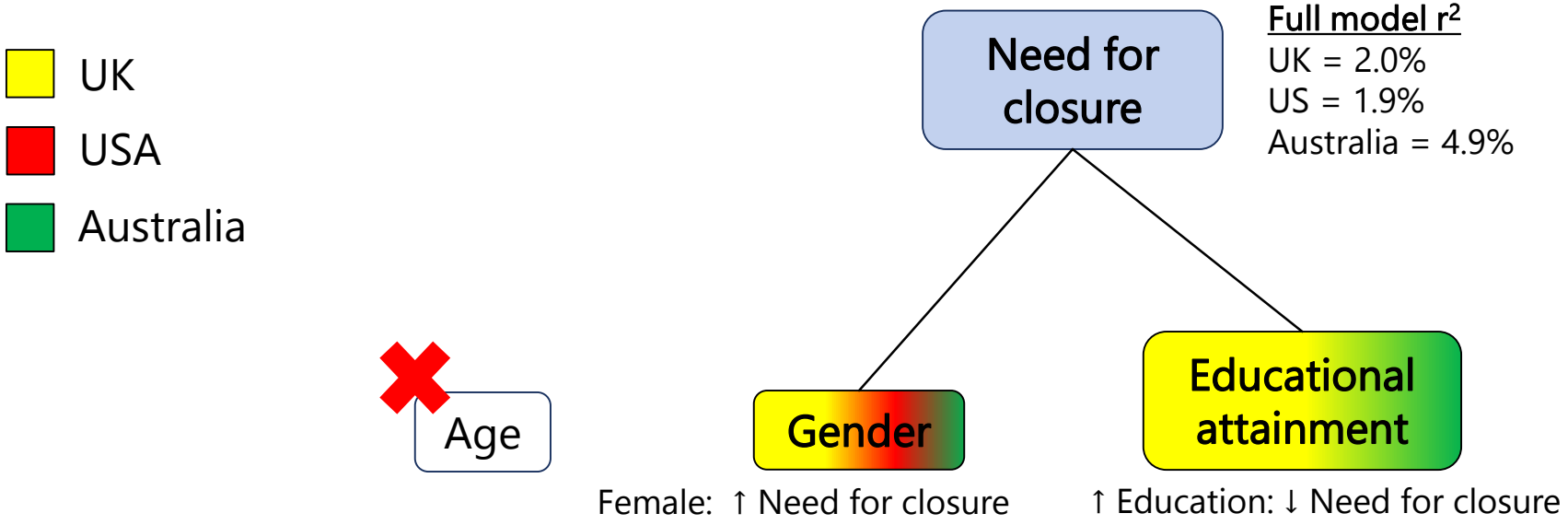
WHAT DO WE KNOW ABOUT NEED FOR CLOSURE

Need for closure

- Individual differences in the trait have been **associated with aging** (higher need for closure) **and cognitive abilities** (lower need for closure) (Roets et al. 2015).
- One previous twin h^2 estimate (N=884 adults, Minnesota Twin Study):

  VA = 36.6%; 95%CI: 23.2–48.1 (Ksiazkiewicz et al., 2016)
- No G×E studies. No GWAS approach: only candidate gene studies on emotional reactivity to uncertainty, and cognitive flexibility.

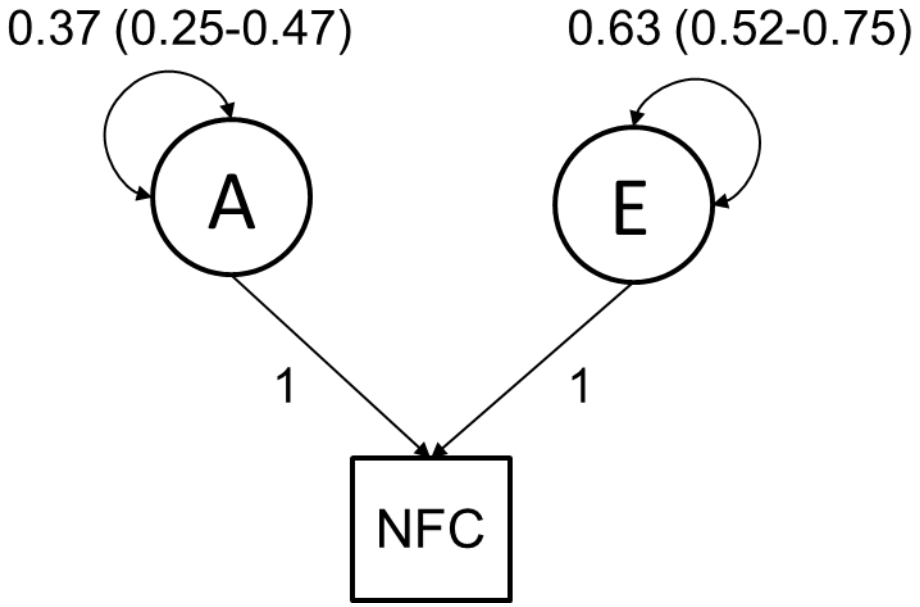
STUDY 2a – WHAT PREDICTS NEED FOR CLOSURE?



Note: only linear effect found significant

STUDY 2b - VARIANCE DECOMPOSITION & TWIN STUDY

- **Variance** components were **not moderated by age or educational attainment** (*university education vs not*).
  - Not in general population either (UK, UK).
  - More specific environmental factors could point us to potential interventions for need for closure.
- Almost identical estimates of VA to previous twin study.



N = 1113 MZ & 1515 DZ

CONCLUSIONS

- People will most likely have concerns and responses to genetic risk information.
- Both, their **beliefs** about the **impact of lifestyle** and their **ability to cope with uncertainty** are the **best predictors** of extreme worry.
- However, we are not able to explain much of the variance.
- **Not much is known about** the sources of variance of **need for closure** despite its relevance in social psychological research.
- There was no evidence of age or educational attainment moderating individual scores or individual differences in need for closure.

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Thank you for joining!

Acknowledgments

Supervisory team
Prof Sarah Medland
A/Prof Fiona Barlow
A/Prof Lucia Colodro-Conde

Thanks to the Psychiatric Genetics group at QIMRB

Funding

QIMR Berghofer PhD International Scholarship

John Templeton Foundation
Genetics and Human Agency project