

Inside Out: Can Joy, Sadness, Anger, Fear, or Disgust affect your security?

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FEAR



JOY



DISGUST



ANGER



SADNESS



Disney • PIXAR
**INSIDE
OUT**

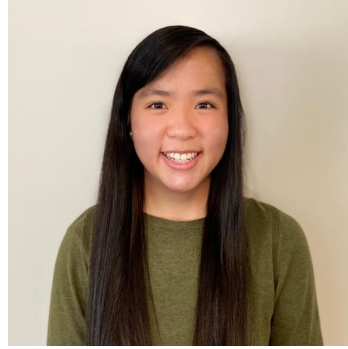
ET Panache

facebook/PixarInsideOut

Collaborators/Acknowledgments



Spencer Johnston



Anna Bakas



Daisy Reyes



Anne Wagner



Shelia Kennison



Research Questions

- Do personality types affect strength of password created?
- Does background security knowledge affect strength of password created?
- Can behavior be changed?

Personality Types

- Big Five
 - Extraversion
 - Openness
 - Agreeableness
 - Neuroticism
 - Conscientiousness
- True Colors
 - Blue
 - Empathetic, compassionate, cooperative
 - Orange
 - Energetic, Spontaneous, charming
 - Gold
 - Punctual, organized, precise
 - Green
 - Analytics, intuitive, visionary

Security Knowledge

- Human Aspects of Information Security Questionnaire (HAIS-Q)
- 9 Questions
 - "It's acceptable to use my social media passwords on my work accounts"
 - "It's a bad idea to share my work passwords, even if a colleague asks for it"
- Scale of 1 to 7
 - Strongly disagree, Disagree, Somewhat disagree, Neither agree/disagree, Somewhat agree, Agree, Strongly agree

Password Strength

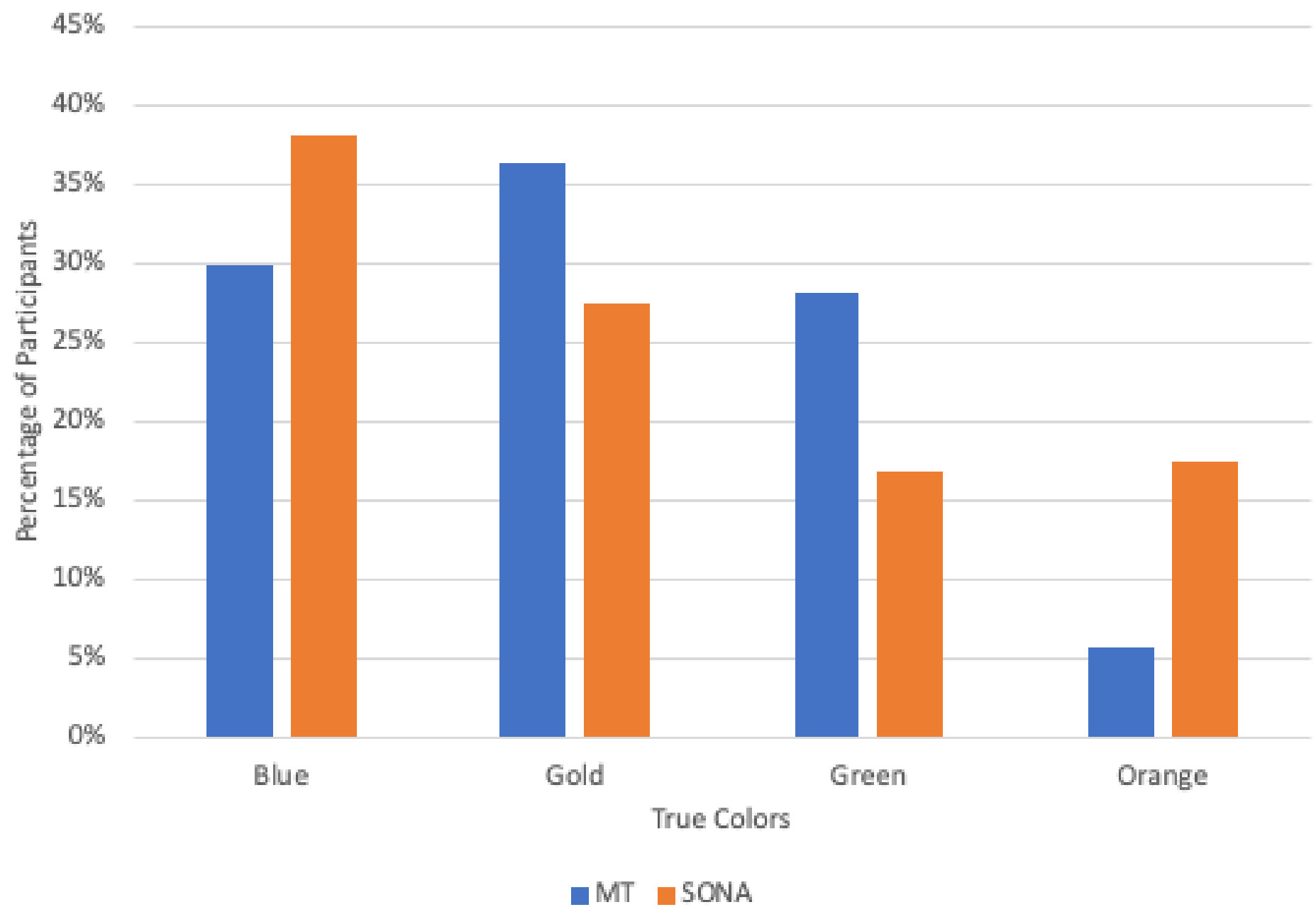
- Dropbox zxcvbn password strength estimator
(0 to 4)
- Our metric (0 to 5)
 - > 8 characters
 - Numbers
 - Special character
 - Upper case
 - No dictionary word

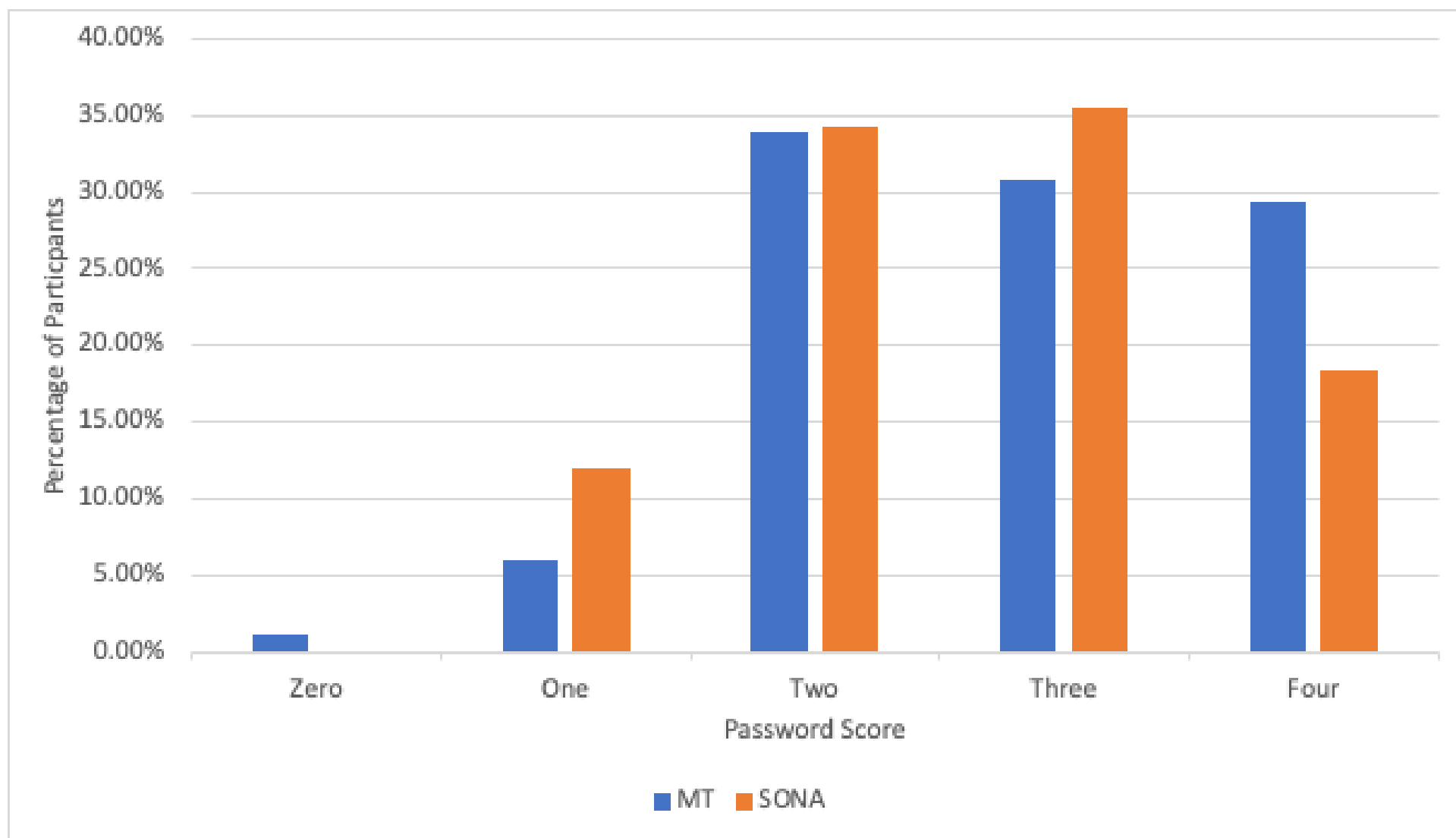
Online Survey

- Qualtrics
- Two parts
 - Part 2: one month later
- SONA participants compensated with credits
- MTurk participants compensated financially

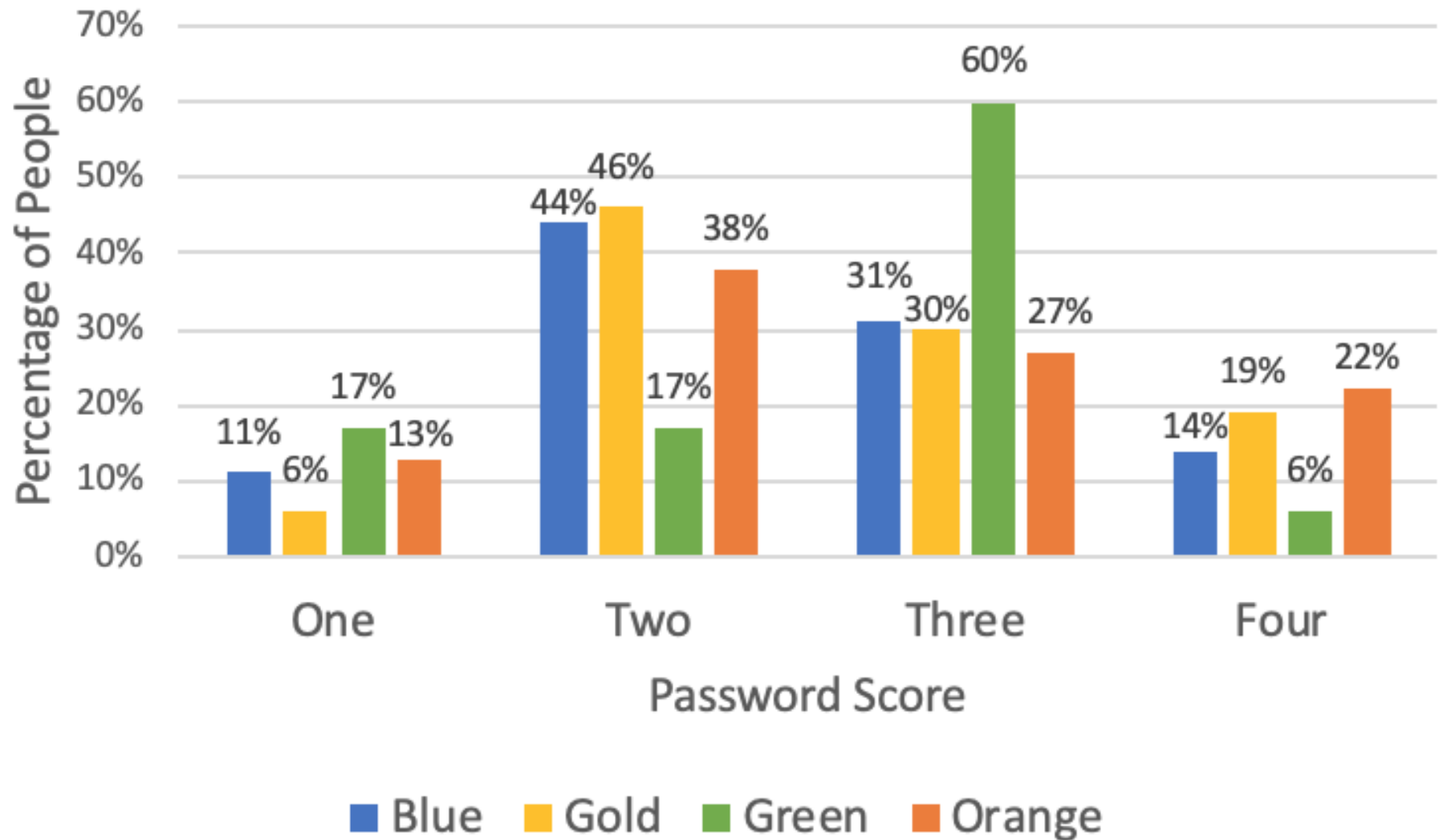
Data Collection

- Starting September 2019
- SONA
 - Intro to Psychology university students
 - 254 participants and counting
- Amazon Mechanical Turk (Mturk)
 - 413 participants and counting

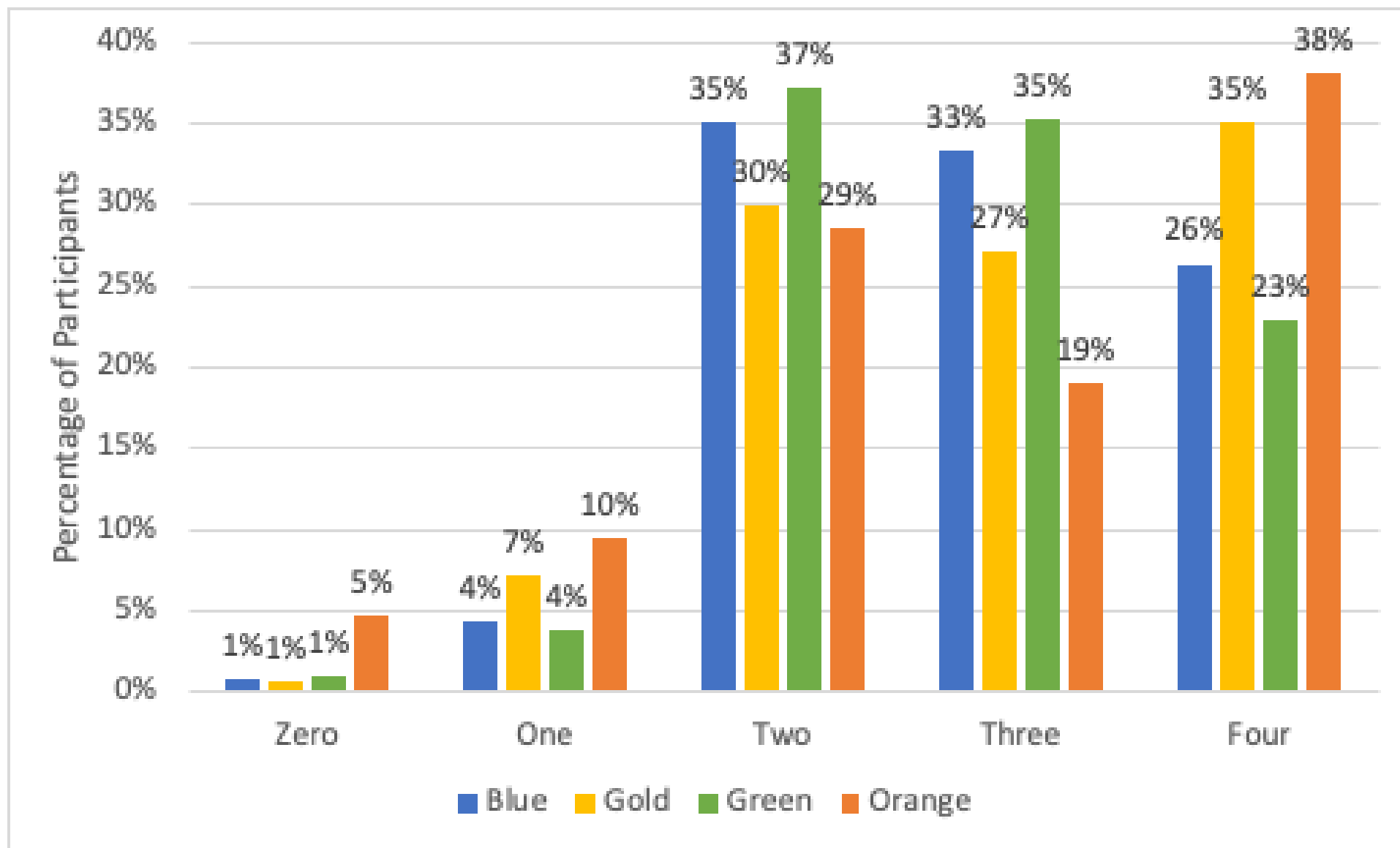




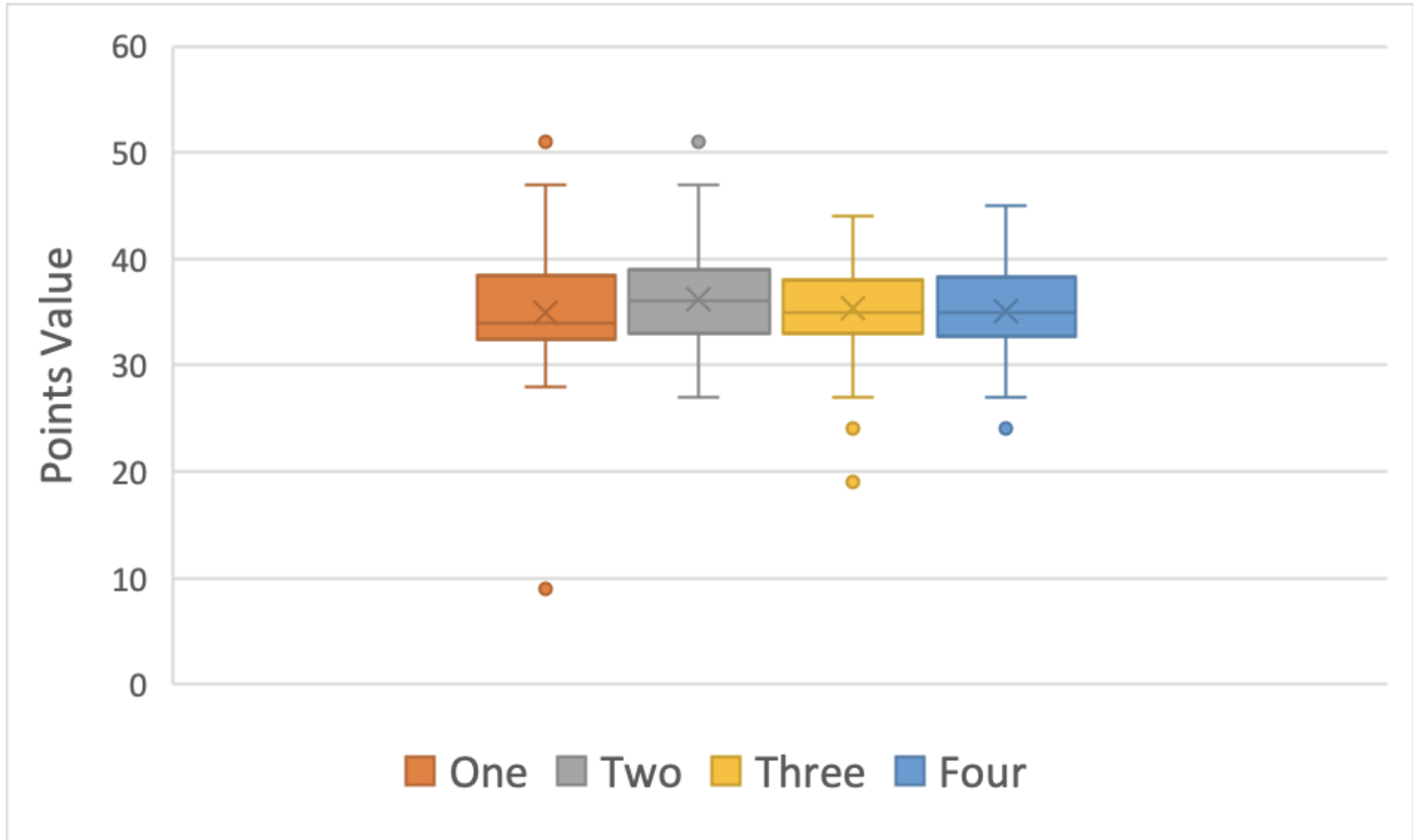
SONA



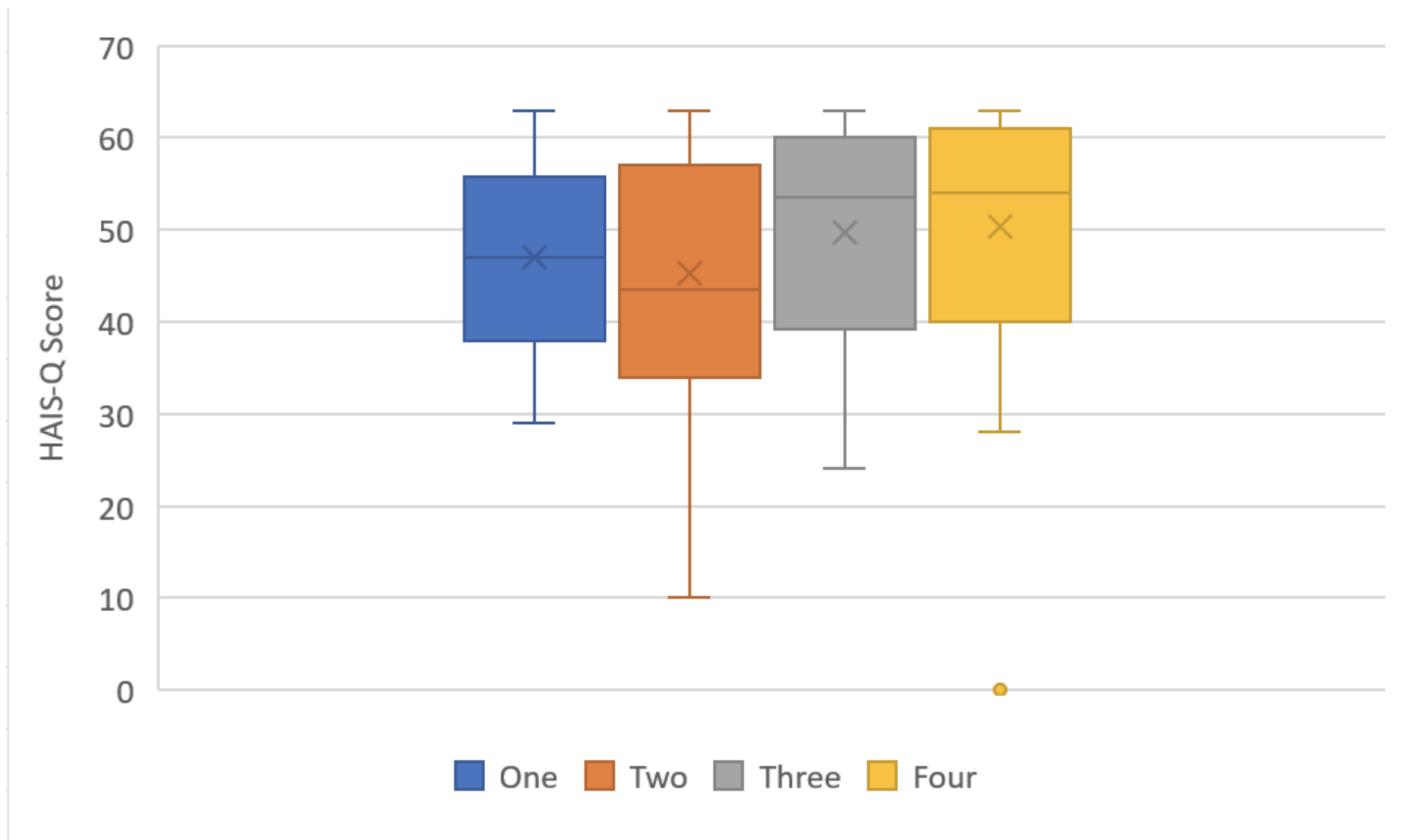
MTurk

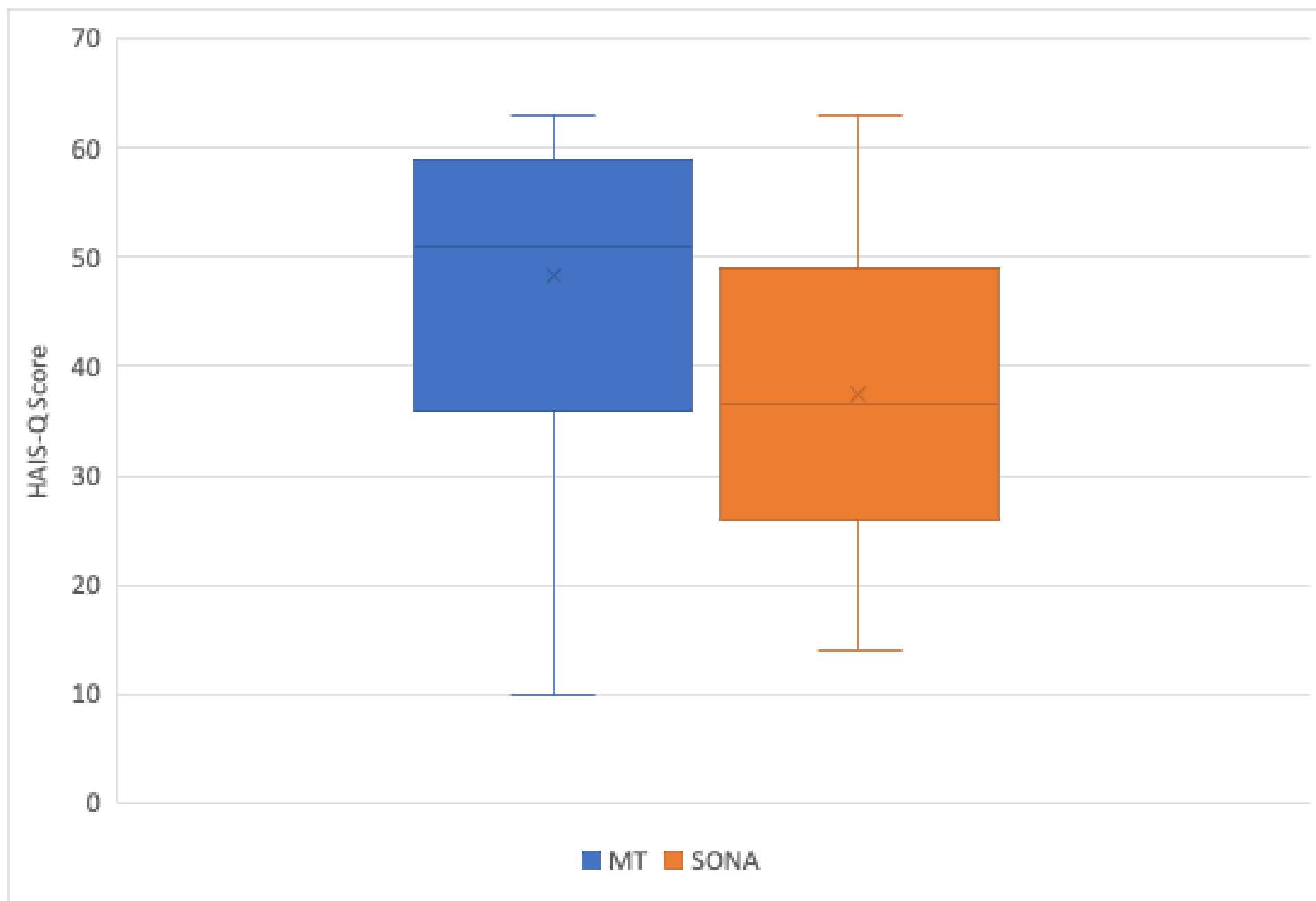


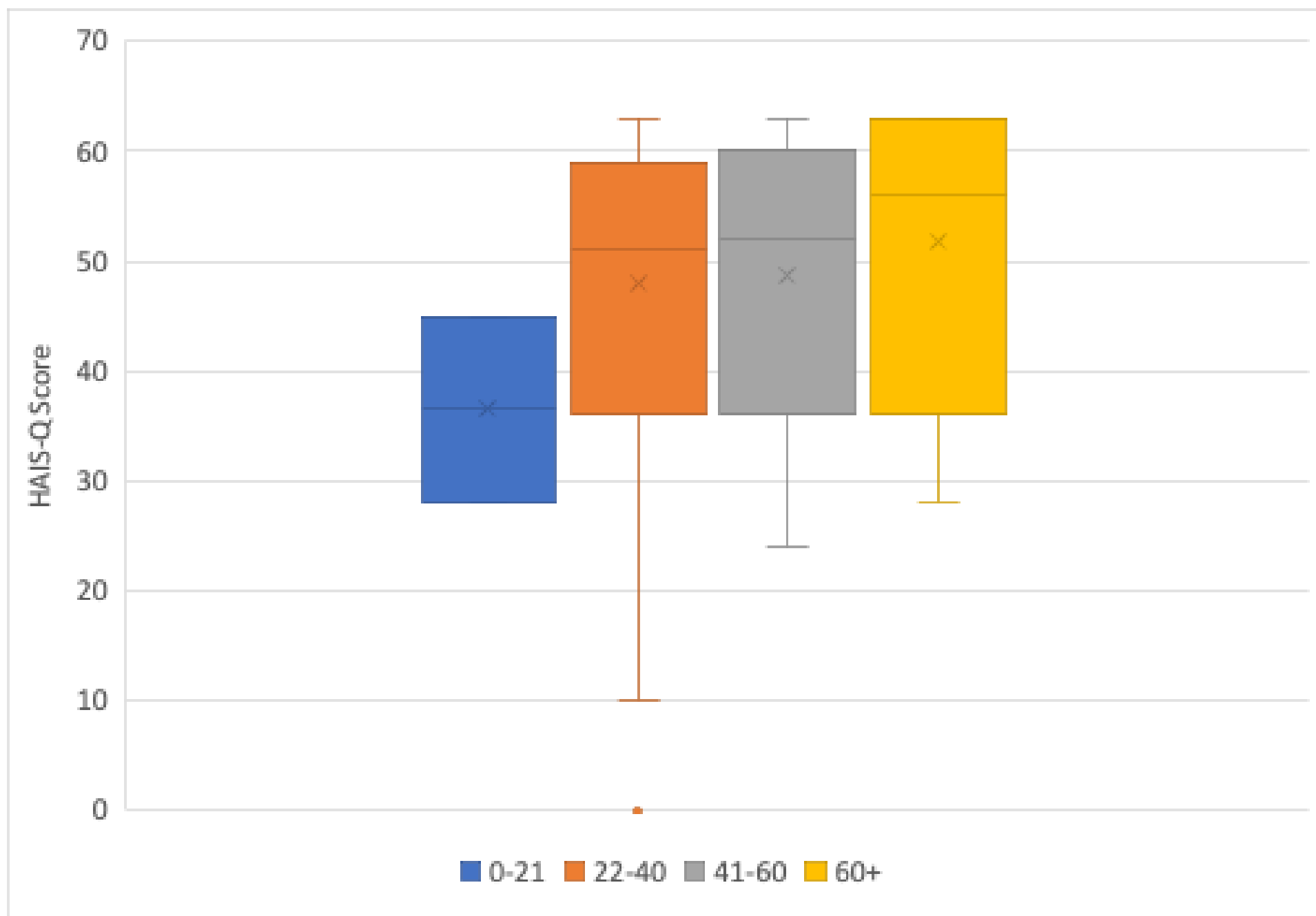
SONA



MTurk







Password Strength Estimator

- Correlation of 0.8 for zxcvbn and our metric

Score	zxcvbn	Our Criteria
Zero	0	0
One	29	11
Two	100	65
Three	85	107
Four	40	66
Five	0	7

Messaging

As you know, all of your online accounts – including social media, email, and banking – require passwords each time you log in. A strong password is the best protection from hackers. The strongest passwords contain uppercase letters, lowercase letters, numbers, and special symbols (e.g., !, &, @, *, etc.). Also, the strongest passwords are used for only one account, so different accounts should have different passwords. Take the time and add the following to your plan as soon as possible: create a strong password for each online account!

Effect of Messaging in HAIS-Q

True Colors Personality Type	HAIS-Q Average Score for Part 1	HAIS-Q Average Score for Part 2
Blue	5.23	5.84
Gold	5.71	5.9
Green	5.12	5.62
Orange	5.16	5.68

Research Questions

- Do personality types affect strength of password created?
 - **YES**
- Does background security knowledge affect strength of password created?
 - **NO**
- Can behavior be changed?
 - **MAYBE**

Future Work

- Strong results
 - Personality can be a strong link to security
- More data is being collected
- Targeted messaging
- Part 2 expansion: create new passwords
- More personality styles: cognitive, anxiety, stress, trust, etc.

Thank you!



Questions?

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