

## Neurocognitive and Psychiatric Contributors to Resilience: A Preliminary Case Series

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Although the role of psychosocial factors in promoting resilience has been well-characterized, the impact of neurocognitive factors (e.g., attention, working memory, and impulse control) has been relatively understudied. Here, we present neurocognitive and psychiatric profiles of several individuals from an underserved urban youth population who have all experienced varying levels of poverty and trauma. Each individual was administered the CYRM; questionnaires on trauma exposure, self-perception, goals, and family/community involvement and structure; modules from a structured psychiatric interview; and a battery of neurocognitive measures. \* = Co-first authors

**GIRLS**

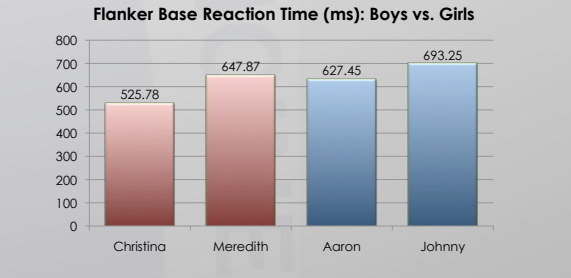
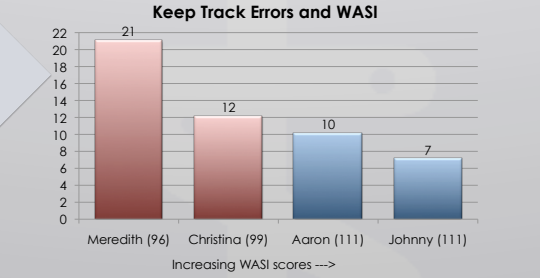
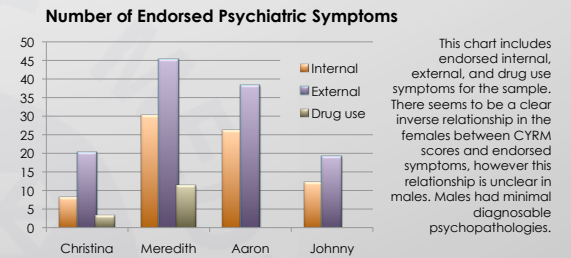
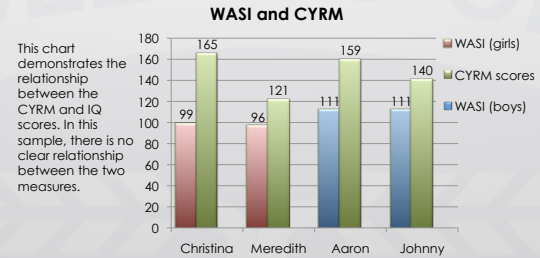
**Christina** is a 17 year old, Hispanic female in the 12<sup>th</sup> grade. She lives with her mother, 2 younger brothers and a friend of the family in a 2 bedroom apartment, and has 1 older brother that lives away from home. Christina's father passed away as the result of a workplace accident when she was twelve years old. Christina has no history of academic trouble, and is a consistent B/C student. Clinically, she has no positive diagnoses on the C-DISC, but does endorse recreational drug use.

**Meredith** is a 15 year old, Hispanic female, in the 7<sup>th</sup> grade. She lives with her biological mother and father in a one bedroom apartment, and has 4 brothers and 4 sisters that live elsewhere. Meredith has a history of academic troubles, and was held back twice (1<sup>st</sup> and 2<sup>nd</sup> grade). Clinically, she has positive diagnoses on the C-DISC for Generalized Anxiety Disorder, Major Depressive Episode, Oppositional Defiant Disorder, Conduct Disorder, and alcohol dependence.

**BOYS**

**Aaron** is a 17 year old, Vietnamese male in the 12<sup>th</sup> grade. He lives with both biological parents, 1 brother, 1 sister and his grandmother in a 4 bedroom house. Aaron has no history of academic troubles and is a consistent A/B student. Clinically, Aaron has a positive diagnosis on the C-DISC for Conduct Disorder, and endorses recreational use of marijuana.

**Johnny** is an 18 year old, African American male in the 12<sup>th</sup> grade. He lives with his biological mother in a 1 bedroom apartment. Johnny has little history of academic troubles (i.e., he attended summer school once for not doing well during the school year), and is a consistent A/B/C student. Clinically, he has no positive diagnoses as determined by the C-DISC.



The Keeptrack task involves working memory, inhibition, and semantic processing. On each trial participants, see a set of two to four target categories (e.g., Metals) and 15 words, only some of which are exemplars of the target categories. Then a participant is asked to recall the last two (Load 2), three (Load 3), or four words (Load 4) presented that belong to each of the target categories. The graph shows a positive relationship between IQ and Keeptrack performance in both resilient and non-resilient youth.

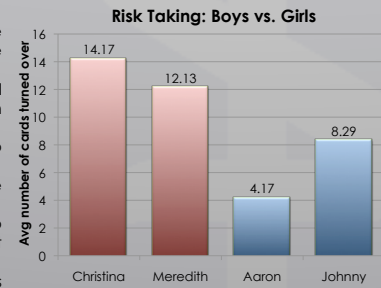
The Flanker task is a measure of reaction time and cognitive inhibition. In this task, a central arrow appears with other symbols next to it. The participant is asked to press a key corresponding to the direction of the arrow as quickly and accurately as possible except when the central arrow had an X next to it, in which case no key press was necessary. The graph shows a negative correlation between reaction time on the Flanker and scores on the CYRM (i.e., faster reaction time is related to higher CYRM scores).

These case examples illustrate several interesting points regarding the relationship of resilience (as measured by CYRM scores) and neurocognitive variables.

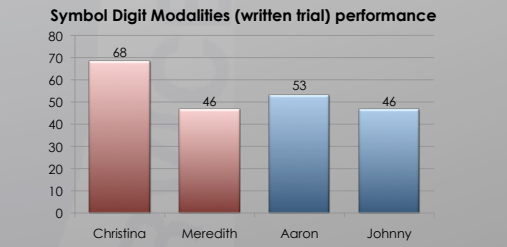
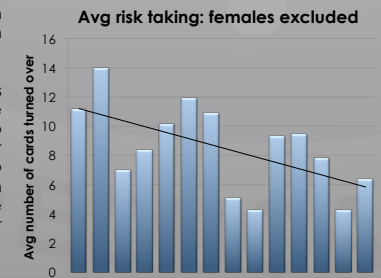
- CYRM scores do not appear strongly related to IQ in this small sample although it is likely that this relationship could emerge with the addition of more participants.
- Second, CYRM scores appear to be positively related to measures of processing speed/reaction time (Flanker and SDMT).
- CYRM scores may be related to working memory performance as indexed by KeepTrack performance.
- The relationship between CYRM scores and risk taking appears to differ by sex. That is, a negative correlation emerges for males but no clear relationship emerges for females.

Similarly, the relationship between psychiatric symptoms and CYRM scores may also differ by sex with females showing a negative relationship between CYRM scores and number of psychiatric symptoms whereas the relationship in males is less clear especially with regard to externalizing symptoms.

Because these observations involve a small number of cases, caution is necessary when interpreting these data. Nevertheless, these findings provide interesting initial data that can be used to guide future investigations. It will also be important to investigate other cognitive domains to see if the present correlations between resilience and neurocognitive performance continue to be observed. In addition, the possible contribution of sex differences with regard to risk taking and psychopathology is an area that deserves future investigation as these variables may have significant implications for intervention.



The Columbia Card Task (CCT) is a measure of risk taking and decision making. On this task, the participant is given 32 cards face down and is told that each card is worth a certain value; however, there are random loss cards in the deck that will wipe out any gains. The participant is then asked to turn over cards and instructed that they can stop at any time. The more cards the participant turns over the more risk taking they display. The trial terminates when the participant decides to stop turning over cards or once a loss card is encountered. The graph shows a clear negative relationship between risk taking and CYRM scores (more risk taking lower CYRM scores) for males but this relationship becomes less clear when females are included in the sample.



Symbol-Digit Modalities Test (SDMT): Using a reference key, the examinee pairs specific numbers with given geometric figures in 90 seconds (100 maximum pairs). Responses are oral and written. This is a measure of mental processing/motor speed, working memory, and visual scanning. The graph shows a positive relationship between SDMT written performance and CYRM scores.

#### REFERENCES

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