



# Resource Availability and Obsessive Tendencies

## - A Focus on Infection Risk

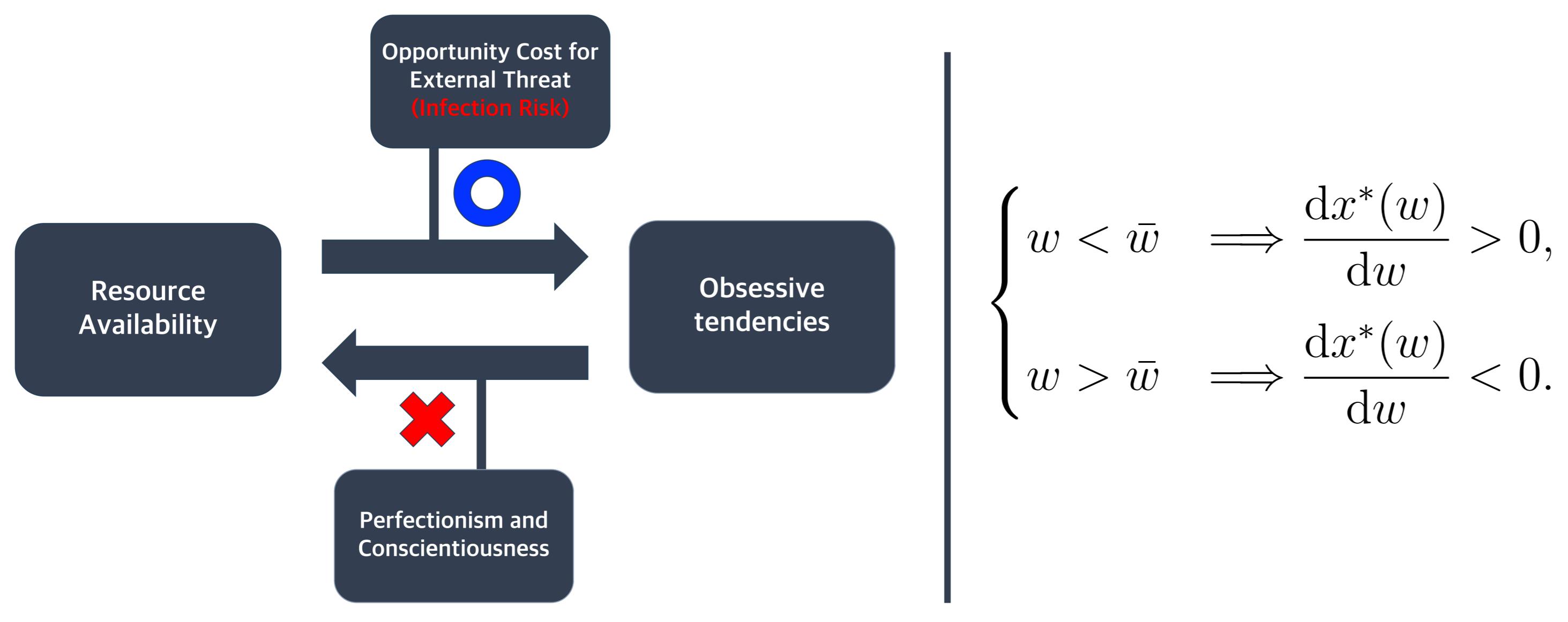
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### Highlights

- This study argues that obsessive tendencies vary with individuals' resource availability, supported by a simple mathematical model and indirect empirical evidence.
- Whereas previous research has associated high obsessive tendencies with personality traits like perfectionism and conscientiousness—thereby presuming a positive correlation with resource levels—we propose an alternative perspective.
- Incorporating infection risk into the model, we suggest that individuals with more resources may exhibit higher obsessive tendencies.
- The existence of a threshold in resource availability may result in a U-shaped relationship between resource levels and obsessive tendencies.

### Concept



### Objectives

- This study conceptualizes obsessive tendencies as a defensive response to external threats, with a particular focus on infection risk, and presents a model explaining how resource availability shapes changes in obsessive tendencies.
- We present supporting evidence consistent with the predicted results.

### The Model

$x^*(w)$  = Optimal contact level for given resource availability

$$x^*(w) = \arg \max_{0 \leq x \leq \bar{x}} \sum_{i=0}^x \binom{x}{i} (p - f(w))^i (1 - (p - f(w)))^{x-i} u[(\sigma - g(w))^{x-i} (w + bx)]$$

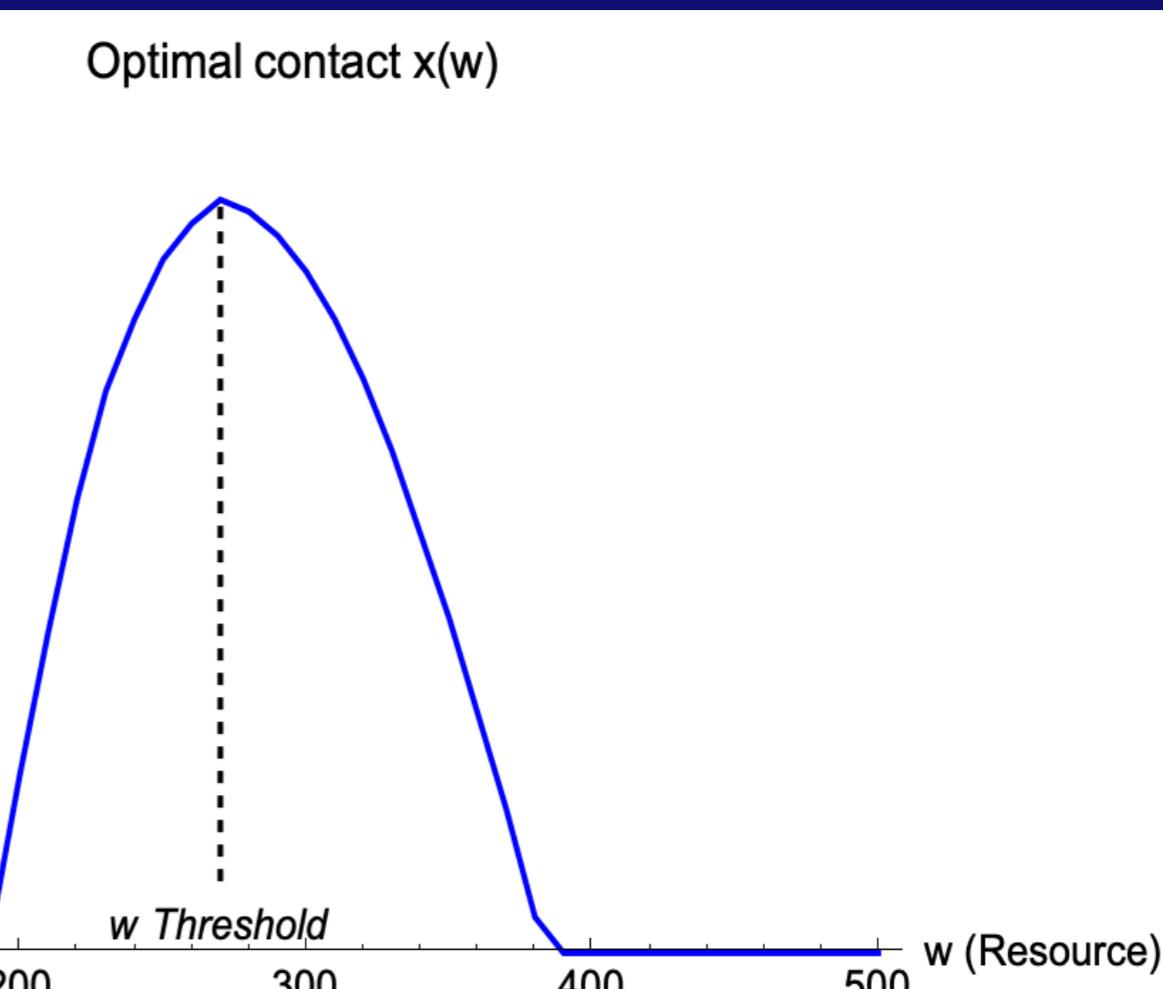
| Model Parameters and Functional Forms | Symbol/Function | Value/Specification |
|---------------------------------------|-----------------|---------------------|
| Infection rate                        | $1 - p$         | 0.05                |
| Mortality rate                        | $1 - \sigma$    | 0.05                |
| Benefit from contact                  | $b$             | 1                   |
| Utility function                      | $u(\cdot)$      | $\ln(\cdot)$        |
| Infection Risk Function               | $f(w)$          | $8^{-w/100}$        |
| Mortality Risk Function               | $g(w)$          | $e^{-w/50}$         |
| Upper Bound of Contact Level          | $\bar{x}$       | 100                 |

### References

- Björkenstam, E., Helgesson, M., Norredam, M., Sijbrandij, M., De Montgomery, C. J., & Mittendorfer-Rutz, E. (2020). Common mental disorders among young refugees in Sweden: the role of education and duration of residency. *Journal of Affective Disorders*, 270, 189-197.
- Del Giudice, M. (2018). Evolutionary psychopathology: A unified approach. Oxford University Press.
- Rintala, H., Chudal, R., Leppämäki, S., Leivonen, S., Hinkka-Yli-Salomäki, S., & Sourander, A. (2017). Register-based study of the incidence, comorbidities and demographics of obsessive-compulsive disorder in specialist healthcare. *BMC psychiatry*, 17, 1-8.

### Results

#### Numerical Analysis

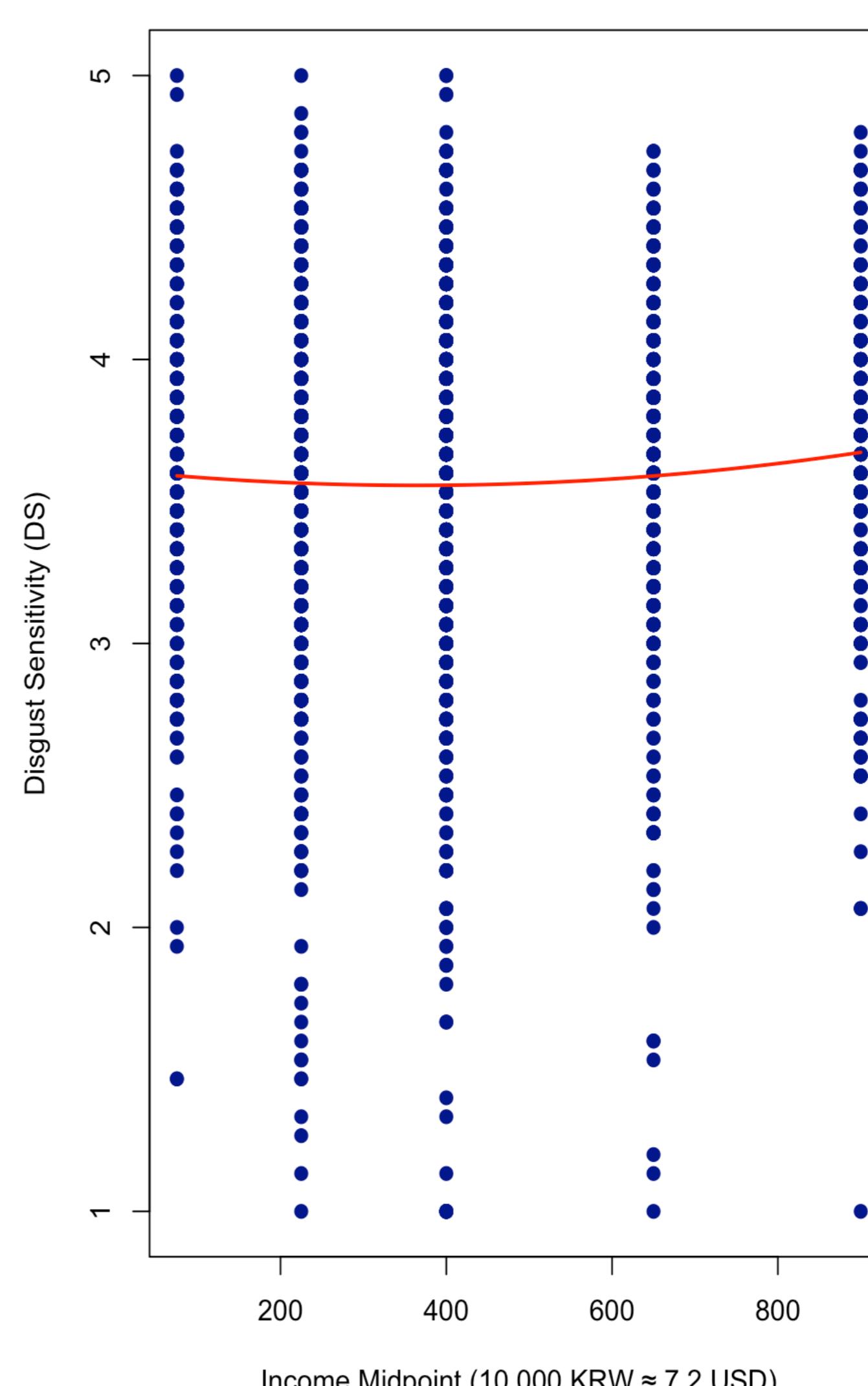


#### Empirical Analysis

| Variables                  | B       | SE     | t      | p-value    |
|----------------------------|---------|--------|--------|------------|
| Intercept                  | 0.629   | 0.0134 | 46.964 | < 2e-16*** |
| Income <sup>2</sup>        | -0.048  | 0.0361 | -1.335 | 0.182      |
| Income <sup>2</sup>        | 0.0688  | 0.0348 | 1.976  | 0.048*     |
| Age                        | 0.0026  | 0.0002 | 10.748 | < 2e-16*** |
| Sex (Female)               | 0.0942  | 0.0063 | 14.875 | < 2e-16*** |
| Evolutionary Fitness (EFS) | -0.0108 | 0.0039 | -2.786 | 0.005**    |

Note: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001

#### Income and Disgust Sensitivity: U-shaped Relationship



### Discussion

- Individuals with lower resource availability perceive higher infection risk due to greater exposure to harsh environments, leading to heightened obsessive tendencies as an adaptive response.
- Conversely, individuals with more resources face higher potential losses from infection, which increases perceived infection risk and obsessive tendencies.
- These contrasting effects suggest a threshold in resource availability, resulting in a U-shaped relationship between resources and obsessive tendencies.
- This pattern corresponds with the U-shaped distribution of D-type disorders (defensive activation disorders) described in Del Giudice's (2018) FSD model.
- (Limitations) We provide indirect evidence supporting our model, which is merely suggestive and lack statistical significance. Future research should apply exogenous income shocks to test whether changes in resource availability affect obsessive tendencies.

