Profiles of Intolerance of Uncertainty, Cognitive Control, and Punishment Sensitivity in Adolescents: Associations with Mental Health

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INTRODUCTION

INTOLERANCE OF UNCERTAINTY (IU)

The tendency to perceive uncertainty as threatening or distressing; associated with anxiety and depressive symptoms[1].

IU encompasses two dimensions:

Prospective IU
Anticipatory worry and a desire for predictability.

Inhibitory IU
Avoidance or difficulty acting when faced with uncertainty.

RELATED CHARACTERISTICS

Punishment Sensitivity
Sensitivity to potentially negative or aversive experiences[2].

Heightened anticipation of threats may be particularly relevant to **prospective IU.**

Cognitive Control
The ability to regulate behaviour toward goal achievement[3].

Difficulty maintaining action under uncertainty may be **particularly relevant to inhibitory IU.**

RESEARCH GAP

While cognitive control, punishment sensitivity, and IU each predict mental health, **how they co-occur in adolescents,** and **how distinct combinations** shape risk, remains **unclear.**

WHY DOES THIS MATTER?

Adolescence is a critical window for emerging mental health challenges.

Identifying trait combinations uncovers hidden vulnerability patterns **missed** by studying traits in isolation.

RESEARCH GOALS

1. To identify distinct adolescent profiles based on prospective IU, inhibitory IU, cognitive control, and punishment sensitivity.
2. Examine differences in mental health (worry, social anxiety, and depression) across profiles.

HYPOTHESES

1. **Profile identification:** Multiple profiles reflecting distinct combinations of the four characteristics were expected.
2. **Mental Health:** Profiles characterized by higher IU and punishment sensitivity and lower cognitive control were expected to report greater mental health challenges.

METHODS

ANALYSIS – LATENT PROFILE ANALYSIS (LPA)

What is a Latent Profile Analysis (LPA)? A person-centered statistical approach used to identify distinct, unobserved subgroups (profiles) within a population based on characteristics.

Why use LPA? Unlike population-level averages, LPA identifies distinct patterns among individuals, revealing subgroups that may otherwise go unnoticed.

PARTICIPANTS

- 724 adolescents
- Ages 13–19
- *M* = 15.61 years
- 53% female

Participants were recruited from elementary schools as part of a larger longitudinal study.

PROFILE CHARACTERISTICS

- **Prospective IU** ("Unforeseen events upset me greatly")[1]
- **Inhibitory IU** ("When I am uncertain, I can't function very well")[1]
- **Punishment Sensitivity** ("Criticism hurts me quite a bit")[2]
- **Cognitive Control** ("I do things without thinking") [3]

OUTCOMES

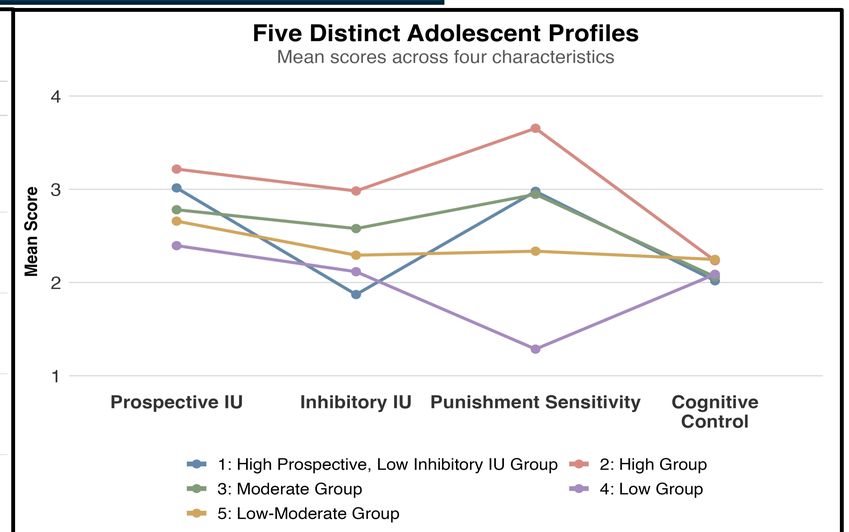
- **General Worry** ("Once I start worrying, I cannot stop")[4]
- **Social Anxiety** ("I am quiet when I am with a group of other students my age") [5]
- **Depression** ("I felt down and unhappy") [6]

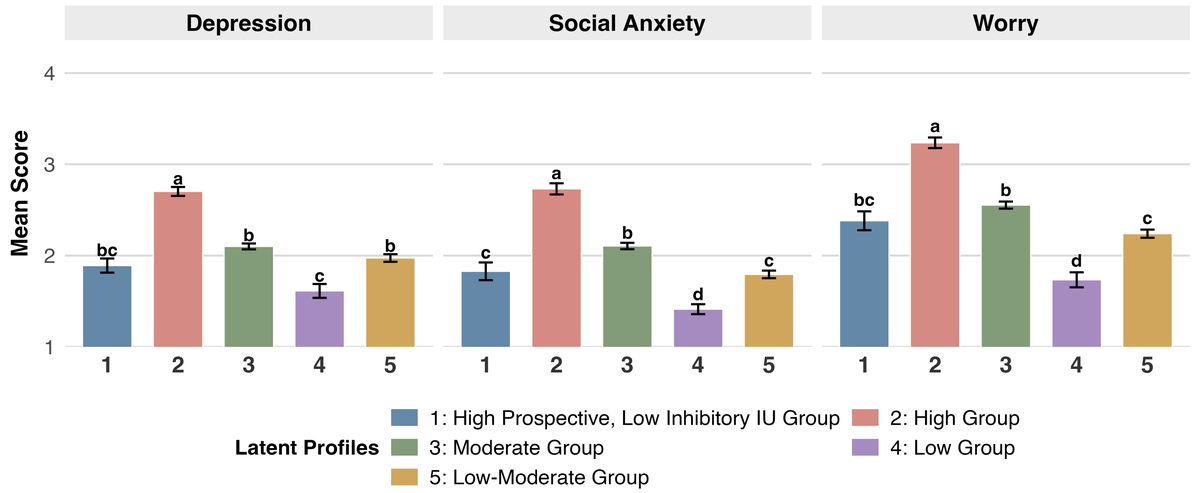
RESULTS

Five Distinct Adolescent Profiles

Profile labels, key trait patterns, and sample size

Profile	Key Trait Pattern	n	%
1: High Prospective, Low Inhibitory IU Group	High prospective IU / Low inhibitory IU / Moderate punishment sensitivity / Moderate cognitive control	54	7.5
2: High Group	High IU / High punishment sensitivity / Moderate cognitive control	128	17.7
3: Moderate Group	Moderate IU / Moderate punishment sensitivity / Lower cognitive control	292	40.3
4: Low Group	Low IU / Low punishment sensitivity / Moderate cognitive control	46	6.4
5: Low-Moderate Group	Lower IU / Lower punishment sensitivity / Higher cognitive control	204	28.2





Note. Profiles sharing a letter do not differ significantly (Tukey-adjusted $p < .05$).

KEY TAKEAWAYS

17.7% (Profile 2): Highest Distress Group

Exhibited the highest worry, social anxiety, and depressive symptoms (*ps* < .001), driven by elevated prospective/inhibitory IU and punishment sensitivity, even with relatively higher cognitive control.

- **Five Distinct Adolescent Profiles:** Adolescents clustered into five unique patterns across prospective IU, inhibitory IU, punishment sensitivity, and cognitive control.
- **Profile 4 (Low Vulnerability)** reported the lowest mental health symptoms, while **Profile 2 (High Vulnerability)** reported the highest, even with relatively higher cognitive control.
- **Takeaway:** Adolescents show *distinct* combinations of IU, punishment sensitivity, and cognitive control, with different combinations corresponding to different patterns of mental health.

SCAN HERE FOR REFERENCES