

Introduction

Background

- Childhood maltreatment may change how children interact with and learn from their environments, which potentially leads to suboptimal outcomes later in life. Yet **the mediating mechanism between childhood experiences and learning remains unclear**.
- Adaptive learning requires flexibly executing or inhibiting actions based on feedback. However, stressful experiences may lead individuals to develop an **inaction bias**, such as freezing or resorting to default options, as it helps conserve energy and avoid new threats (de Berker et al., 2016; Lenow et al., 2017). It is possible that the inaction bias leads children to refrain from initiating new actions and exploring their environments following childhood adversity.
- In particular, **childhood unpredictability**, characterized by unpredictable caregiving and unstable living environments, is an important but currently understudied dimension of childhood adversity (Glynn et al., 2019). Understanding how it alters learning and approach/avoid motivations, will shed light on the mediating mechanism (Smith & Pollak, 2022).
- Also, individual sensitivity to different types of feedback may shape learning differently. While most past research used monetary feedback, such as point rewards, as an incentive for learning, less is known about **affective feedback**, such as pictures that elicit positive or negative moods.

Current study

- In this current study, we explored **whether childhood unpredictability alters action learning in the context of affective feedback**. We attempted to cross-validate the effect of unpredictability by measuring it from both children's and parents' perspectives.

References

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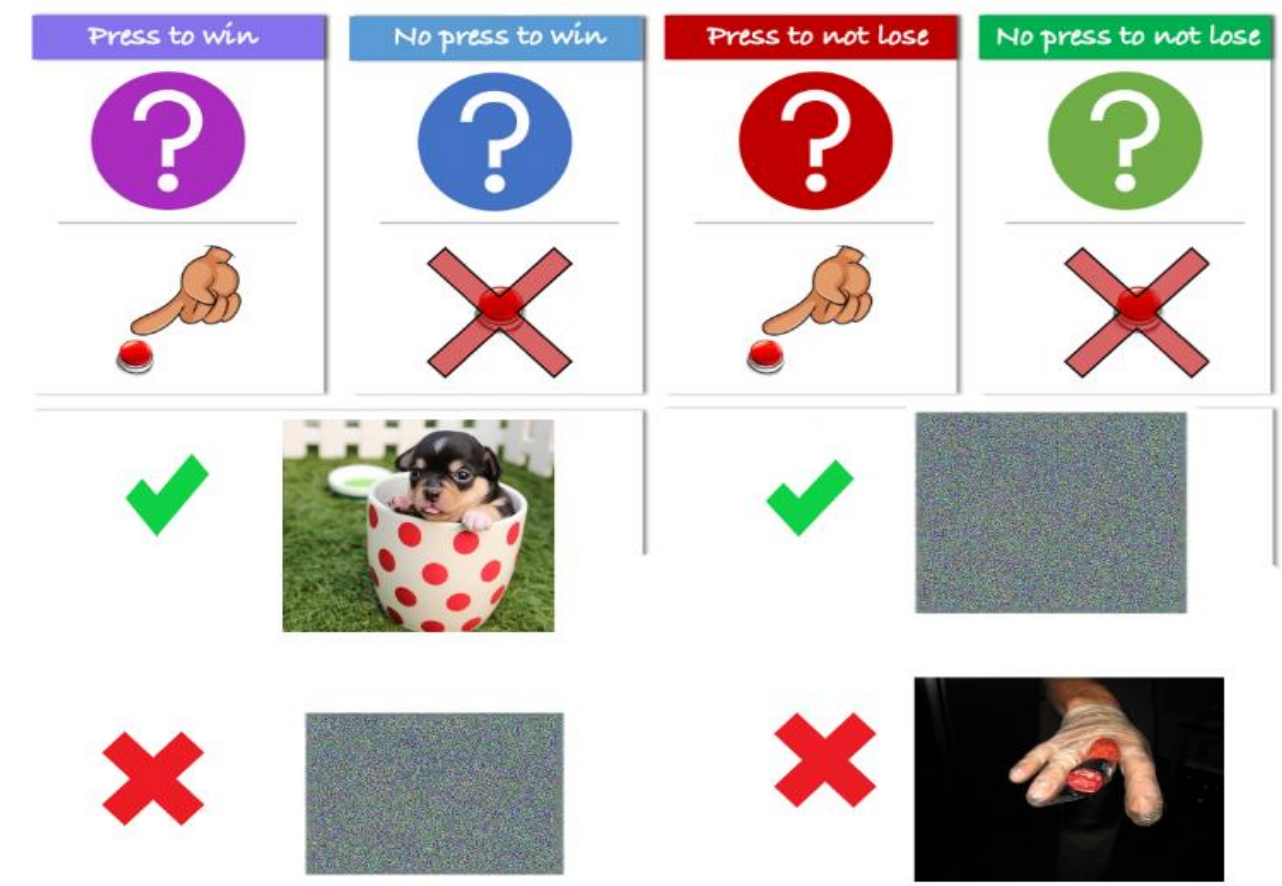
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Method

DV: Action Learning



Modified Go-NoGo task (deBerker et al., 2016) On each trial, one of four animal cues in the first row will be presented. Each cue is associated with an initially unknown **correct action** (Go or NoGo) and an **outcome** (a **positive image**, such as a cute puppy, or a **negative image**, such as a cut finger). Children will learn the correct actions based on the outcomes. which overcomes the instinctive Pavlovian bias (i.e., press the button for rewards, and not press the button to avoid punishments). Following the animal cue, a target (not shown in this paradigm) will be presented on the left or right side of the screen and children will choose whether to press a button corresponding to the side of the target presentation. In 20% of trials, the actual feedback will be incongruent with the expected outcome.

IV: Childhood Unpredictability

- Child report: Questionnaire of Unpredictability in Childhood** (QUIC; Glynn et al., 2018). Items from the 5 subscales of parental involvement, parental predictability, parental environment, physical environment, and safety and security are examined separately.
- Parent report: Family Unpredictability Scale** (FUS; Ross et al. 2000). Items from subscales nurturance, discipline, meals, and money are examined separately.

Controlling variables

Working memory: Digit-Span test (WISC-III; Wechsler, 1991)

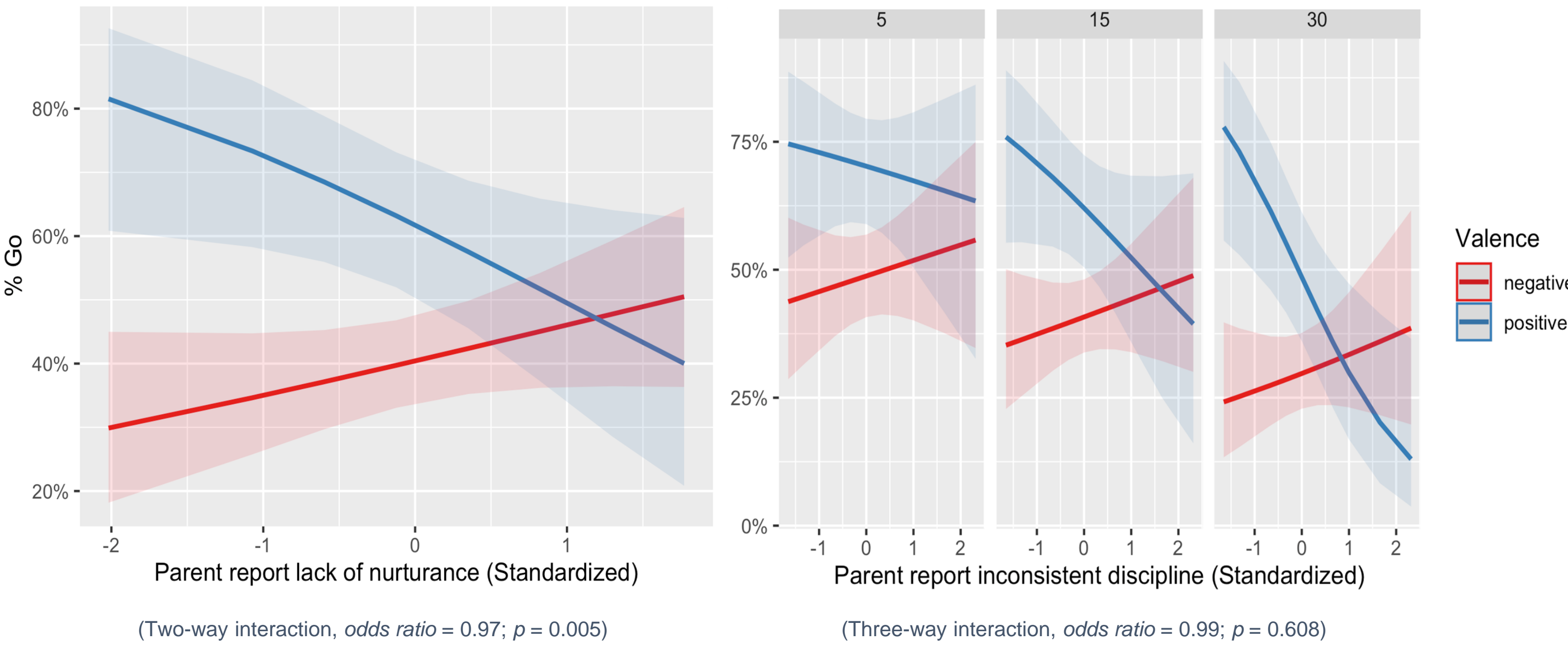
SES: family income

Participants (ongoing data collection)

30 youth recruited from a community sample (mean age = 11.27, range = 10.0-13.3, 75% white)

Results

Children with less nurturing or predictable parents were more flexible in learning the correct actions.



Acknowledgements

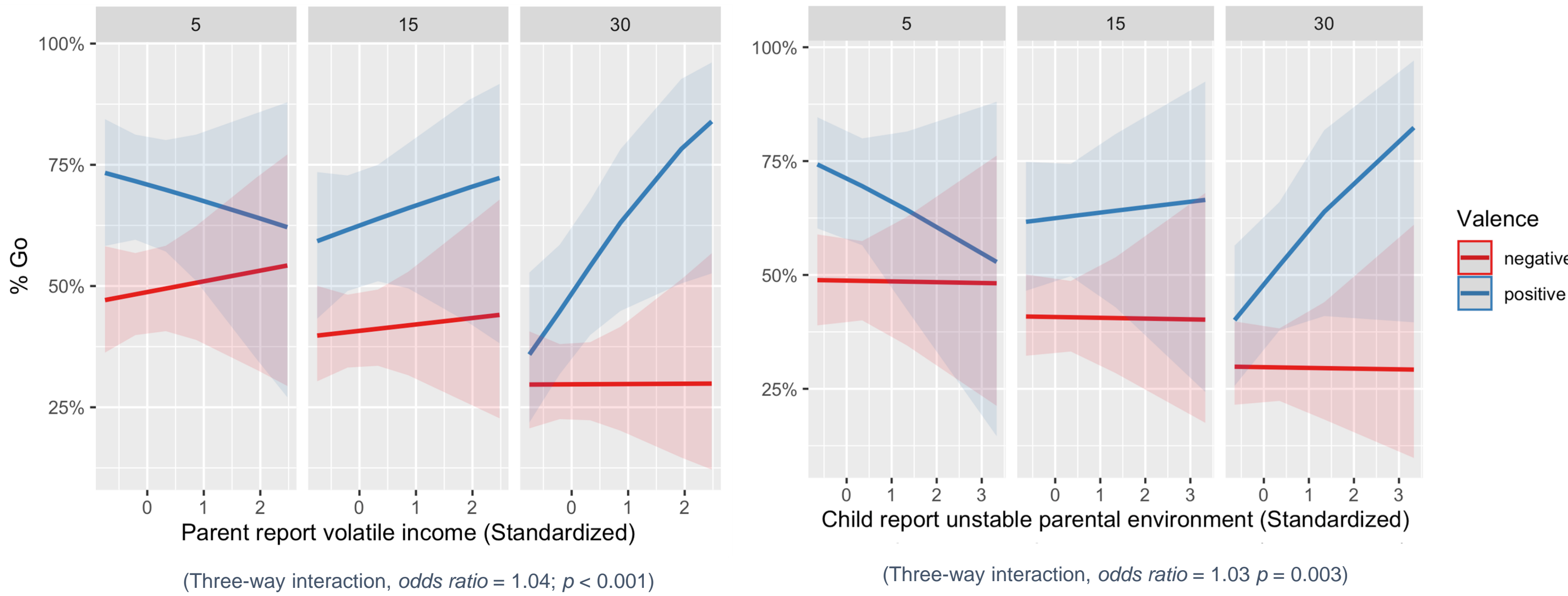
Research was supported by the National Institute of Mental Health (R01MH61285 to SDP). Infrastructure support was provided by the Waisman Center at the University of Wisconsin-Madison through the National Institute of Child Health and Human Development (U54 HD090256).

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Results (cont.)

Children who experienced volatile income or change of parental environment were less flexible



Conclusions & Discussion

Different aspects of childhood unpredictability may have opposite effect on action learning

In these preliminary data, **suboptimal parenting practices**, i.e., lack of nurturance and inconsistent disciplines, were associated with **more accurate and flexible instrumental learning**. That is, children with less nurturing or predictable parents learned to withhold approaching behaviors to get rewards and to execute actions to avoid punishments, which overcomes the instinctive Pavlovian bias (i.e., press the button for rewards, and not press the button to avoid punishments).

On the contrary, **unstable living environments**, i.e., volatile income and changing parental environments (e.g., parental custody, divorce), were associated with **less** accurate or flexible instrumental learning. That is, children who experienced volatile income or change of parental custody were more reliant on Pavlovian bias when responding to stimuli. This finding suggests that childhood unpredictability is a **multi-faceted concept** that needs more fine-tuning to understand its effect on child development.

Parent and child report of unpredictability differentially associate with learning outcomes

In these preliminary data, the significant effect of unpredictable **parenting practices and family income** came from **parent report**, whereas significant effect of **parental environment** came from **child report**. This lack of consistency between parent and child report suggests the importance of measuring **perceived experiences** (Smith & Pollak, 2021a).

Individual sensitivity to different types of feedback shapes learning

The **interference of Pavlovian bias to instrumental learning** is more evident in the context of **affective feedback** than monetary feedback (Xu et al., in prep), suggesting that childhood experiences may prime individual differences in **motivational processes**.