

# Persistence in Testimony


Brinda Narayanan<sup>1-4\*</sup>, Alexis Burke<sup>3</sup>, Aarthi Popat, Federico Rossano<sup>1-4</sup>

<sup>1</sup>Department of Cognitive Science, <sup>2</sup>Cognitive Science, <sup>3</sup>Cognitive Science Honors Program, <sup>4</sup>Comparative Cognition Lab, University of California, San Diego, La Jolla, CA, USA 92093.

\*e-mail: bnarayanan@ucsd.edu

## Data availability

All code used for all analyses and plots are publicly available on Google Sheets at

 [pit data sheet](#)

**Competing interests** the authors declare no competing interests.

## Abstract

Persistence, defined as an approach to strive for goals despite prevailing challenges, is a crucial aspect of child development. It is linked to academic achievement, problem-solving skills, and overall well-being. According to developmental psychology, methods for promoting persistence can be informed by researching the factors behind a child's developing resilience. One of these factors being expectation setting, which is how a mentor talks to a child about how they expect a child to perform on a challenging task before they begin. Prior research indicates that expectation setting creates a sense of failure, especially through adult testimony, where the framing of expectations may influence children's intrinsic motivation. These frames can include praise, and realistic goal-setting. Therefore, it is essential to comprehend how mentors convey expectations to children in order to encourage greater persistence when confronting obstacles. This study intends to evaluate the impact of expectation setting on children's persistence in the face of a challenging activity, contributing to our understanding of motivational processes in childhood development. It draws upon theories of adult testimony and social learning. Here, we demonstrate that children who continue to rely solely on the researcher's expectations setting as a factor exhibit only a slight age difference. Better results can be obtained by extending time for the study, placing greater emphasis on the language used for expectation setting, and changing the demographic of the children so it is more generalizable. Because the main results unveils a subtle age discrepancy, this finding challenges underscores the need for better considerations when examining the effects of expectation setting on children's behavior. In the interplay between age and external influences, understanding tailored approaches to motivation and resilience in developmental research can help the future generation.

## Introduction

Persistence is a critical trait in child development with strong connections to academic achievement and overall well-being. It has been extensively studied through parental presence and the general environment a child grows up in. One researcher who has made pivotal studies in it is Julia Leonard. In Leonard, Garcia, and Schulz's study, the authors examined how adult effort and success influence children's willingness to persist. They found that children are more likely to persist when they observe adults modeling effort and achieving success, emphasizing the role of adult behavior in shaping children's perseverance (Leonard, Garcia, and Schulz, 2019).

In parallel, Shen, Liao, Abraham, and Weng's study titled "Parental pressure and support toward Asian Americans' self-efficacy," explored the impact of parental pressure and support on Asian American students' self-efficacy and occupational outcomes. Their findings demonstrated that living up to parental expectations considerably influences the relationship between parental pressure and children's self-efficacy and career ambitions. When parental expectations are communicated in a supportive manner, they can boost a child's self-efficacy, while when parental expectations are excessively high or unrealistic, they can lead to stress, anxiety, and a fear of failure undermining self-efficacy. This emphasizes how crucial it is to comprehend how parental expectations should be expressed and how that affects children's perseverance (Shen, Liao, Abraham, and Weng, 2014).

Furthering this, Lucca's study, investigating the influence of parental language on infants' persistence, revealed that infants aged at 18 months whose parents frequently used process praise and motivational language showed higher levels of persistence. This research suggests that the way parents talk to their children about effort and success plays a crucial role in developing persistence from a very young age (Lucca et al, 2019).

Looking into process and person based praise, Brummelman and his colleagues looked at how those kinds of praise were provided to kids who had different degrees of self-esteem. He discovered that parents typically compliment children with poor self-esteem more on their personal attributes and children with high self-esteem more on their conduct through process praise. Person based praise, on the other hand, has been demonstrated to put kids at risk for feeling shameful after not succeeding, particularly those with low self-esteem. This implies that, Person-based praise, which praises a child's inherent qualities (such as saying "You're so smart!"), has been shown to be less effective than process-based praise, which acknowledges effort and strategies (such as saying, "You worked so hard!"), in promoting children's motivation and persistence (Brummelman et al, 2013).

Henderlong and Lepper argued against defining praise solely in terms of behavior, arguing instead that praise's motivational effects depend on a number of conceptual factors, such as its sincerity. They go beyond the attributes of praise and claim that praise is particularly effective when it sets realistic standards, while avoiding excessive or elevated social comparisons. These findings show the importance of how praise being framed and delivered influences children's motivation (Henderlong and Lepper, 2002).

However, existing work has yet to explore how elevated praise directly impacts children's motivation. Building on these findings, my study explores how expectation setting affects a child's persistence on a difficult puzzle task. In understanding how different ways of expectation setting impact persistence across the ages of four to six, Leonard's work points to the significant influence of adult behavior, yet it does not fully explain how expectation setting interacts to shape persistence. Shen's research provides insights into the cultural dimensions of parental expectations on self-motivation, but does not address the broader applicability of these findings to challenging tasks that younger children would face early on. Lucca's study highlights the role of parental language in infancy but leaves questions about how these effects evolve as children grow into elementary school age.

Giving children practical expectations affects their resiliency. Without a thorough awareness of the best practices for various age groups, parents and teachers could find it difficult to give kids the best kind of support they need to overcome obstacles. These obstacles include various situations such as academic and personal issues.

To address this, we proposed a study that systematically examines the impact of different levels of expectation-setting strategies on children's persistence. Building on the work of Leonard the

research will examine how verbal expectation setting—elevated vs practical—effects kids' motivation and task engagement by a controlled experiment involving a tangram puzzle.

Specifically, this study aims to:

1. Assess the impact of an elevated and practical expectation setting from a stranger (researcher).
2. Examine the role of age in moderating the effects of expectation setting on persistence.

We hypothesize that children who receive the realistic setting will show higher levels of persistence compared to those who receive elevated praise or observe low effort. Additionally, we predict that the effectiveness of these strategies will vary with age, with older children benefiting more from verbal encouragement.

In terms of the results, age is a major factor in how children are likely to persist. The praises given to children before each task did not seem to affect them too much, indicating that more research is needed to refine expectation-setting strategies and better understand their impact on persistence across different age groups. Clearly, there were challenges in this study that need to be addressed in future research.

Additionally, for ages 5 and 6, those who were given the practical condition subtly performed better, but the difference was not statistically significant. Children in the control group consistently persisted for about five minutes. In conclusion, this study provides beginning insights into the mechanisms through which expectation setting influences children's persistence, and looking into the many factors that play into overcoming simple challenging tasks, can help children get through even bigger challenges they could face in the future.



Figure 1. Tangram puzzle (challenging task) that children were asked to do

## Methods

### Human subjects information

In compliance with the guidelines authorized by the University of California, San Diego Human Research Protections Program, each subject provided their informed consent.

## Participants

The study focused on children aged four to six, an age group known to be responsive to praise and adult testimony based on Julia Leonard and Brummelman. This age range is critical as it marks the development of self-concept and self-esteem while children remain highly imitative of their parents, beginning to form lasting habits and attitudes (Leonard, Garcia, and Schulz, 2019).

## Materials and Procedure

### Task

Participants were asked to complete a tangram puzzle, a dissection puzzle consisting of geometric shapes that must be arranged to form a specific shape without overlapping. The primary measure was the length of time each child persisted in solving the puzzle, operationalized as the time before they either completed the puzzle or requested assistance or gave up on the task, with a maximum persistence time capped at five minutes.

### Expectation Setting

Before starting the tangram puzzle, children were exposed to one of three expectation-setting conditions:

- **Elevated Praise:** "I think you're going to be a natural at this. You'll get it right away."
- **Practical Praise:** "This is going to be hard, but I think you can do it."
- **Control:** No expectation verbalized

### Procedure

The study was counterbalanced by age and type of expectation setting (elevated, practical, and control) to control for developmental differences that might affect children's responses to expectations, ensuring unbiased results. Each session followed a standardized procedure:

1. **Introduction:** The experimenter explained how to complete the tangram puzzle, ensuring consistency in instructions across all sessions.
2. **Expectation Setting:** Depending on the assigned condition, the experimenter delivered the respective praise or verbalized nothing for the control group.
3. **Task Initiation:** The tangram puzzle pieces were dumped out, and the timer was started immediately as the child began the task.
4. **Timing:** The experimenter recorded the time until the child either asked for help or reached the five-minute limit.

### Recruitment and Location

All participants were recruited and tested at the Fleet Science Museum in Balboa Park. This venue was chosen for its accessibility and the opportunity it provided to engage children in a structured yet stimulating environment.

## Hypotheses

The study hypothesized that:

- **Elevated Praise:** Would lead to less persistence due to the pressure and subconscious fear of failure associated with person-based praise (Brummelman et al, 2013).
- **Practical Praise:** Would result in greater persistence by reducing pressure and not assuming anything about the child's inherent ability (Brummelman et al, 2013).
- **Control Condition:** Would yield mixed results, reflecting a general population response, as existing research suggests that parental language can predict a child's persistence from as early as eighteen months (Lucca et al, 2019).

By examining these hypotheses, the study aimed to understand how different types of expectation settings influence young children's persistence on challenging tasks.

## Results

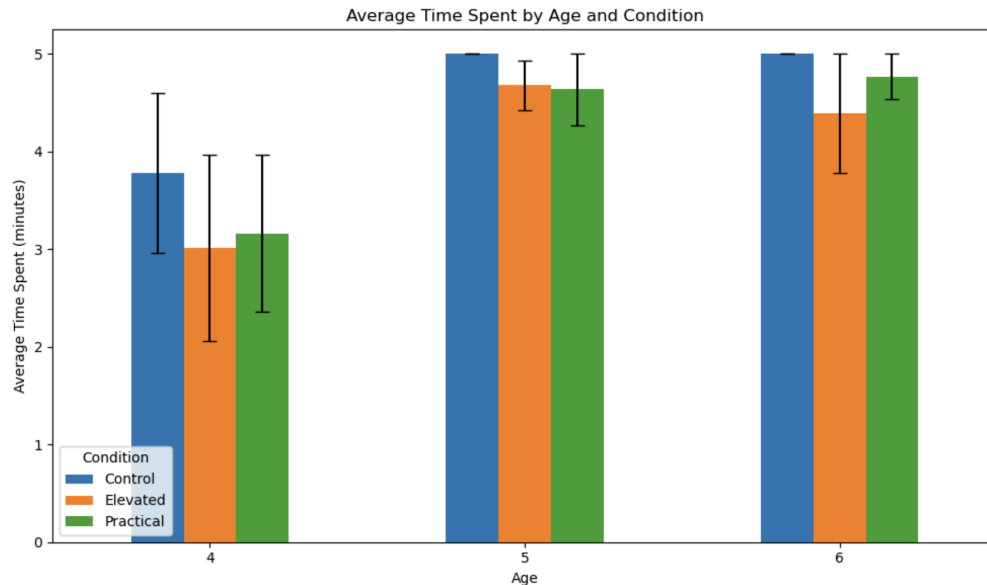
A total of fifty-six participants were included in this study, with data from almost sixty participants collected so far. It is important to note that the study is ongoing, and additional participants are needed to further validate the findings. However, preliminary results are available and are presented here.

### Participant Distribution

The table below shows the distribution of participants across different conditions and age groups.

Total Amount of Kids Tested				
	Conditions			
Age	Elevated	Practical	Control	Total
4	7	6	6	19
5	6	5	7	18
6	7	7	6	19
<b>Total</b>	<b>20</b>	<b>18</b>	<b>18</b>	<b>56</b>

The distribution is relatively even, as reflected in the accompanying graph.



The graph illustrates the average time children persisted on a puzzle task before giving up or asking for help. The y-axis represents the average persistence time in minutes, while the x-axis categorizes participants into three age groups (4, 5, and 6 years old). Different bar colors indicate the conditions: control, elevated praise, and practical praise.

### Statistical Analysis

A linear regression analysis was performed to determine the statistical significance of the results. The analysis revealed no significant differences in persistence times among the three conditions (control, elevated praise, and practical praise). The p-values for these comparisons were all significantly higher than the threshold of 0.05.

### Observations and Trends

- **Age-related Trends:** While there is a trend suggesting that younger children (4 years old) tend to persist less than older children, this trend is not statistically significant ( $p = 0.09218$ ).
- **Condition Impact:** There is no significant effect of the expectation-setting conditions on the persistence times of the children.
- **Study Limitation:** For the control condition, both five and six-year-olds often persisted for the full five minutes allotted, indicating that the time cap may have been a limiting factor in this study.

### Conclusion

Although preliminary results do not show significant differences between conditions, trends observed suggest that with a larger sample size, significant effects might emerge. The ongoing

nature of the study aims to address this by including more participants to enhance the robustness of the findings.

## Discussion

### Limitations

This study encountered several challenges that impacted its execution and outcomes.

1. **Language Use in Expectation Settings:** The phrases used to communicate expectations to children, such as "you're a natural" versus "you can do it," required stronger differentiation to elicit clear differences in responses. The subtlety of these phrases rendered them statistically insignificant, indicating a need for more explicit language to better highlight the impact of expectation settings.
2. **Data Collection Constraints:** The study was conducted within a limited timeframe at the Fleet Science Museum, which may not represent the broader San Diego population. The museum's visitors might inherently encourage curiosity in their children, potentially biasing the results. Additionally, the cost of entry likely skewed the sample towards families with greater financial means. Future studies should aim to include more diverse locations and demographics to ensure broader applicability of the findings.
3. **Time Limitations:** The imposed 5-minute time cap restricted the potential for observing significant differences in persistence. Allowing children to engage with the task without a time limit might reveal more substantial variations in their persistence behaviors.

### Future Directions

Future research should consider examining the impact of parental presence on children's persistence. Observations suggested that children persisted longer when their parents remained in the room compared to when parents explored the museum. Although this study lacked sufficient data to conclusively analyze this effect, it aligns with existing literature indicating that parental presence and expectations significantly influence children's persistence and development. For example, parents who offer encouragement and model persistent behavior can positively influence their children's approach to challenging tasks (Leonard, Garcia, and Schulz, 2019).

Further exploration into how expectation settings can be made more salient and how diverse settings influence children's persistence is warranted. Understanding the role of parental presence in these scenarios can deepen our insights into early childhood development and persistence.

### Grand Conclusion

In summary, future research should focus on enhancing the clarity of expectation settings, diversifying participant demographics, and conducting studies in multiple locations to ensure generalizability. This research is vital in understanding the interplay between parental and



teacher expectations and children's persistence, which can foster a generation better equipped to overcome challenges. By implementing these findings, we can develop tailored educational approaches that support and encourage every child to reach their full potential.

Ultimately, this work contributes to a broader vision where children grow up with the confidence and determination to tackle challenges, leading to a more resilient and adaptive society for the upcoming citizens of the world. Understanding and leveraging the factors that influence children's persistence can help cultivate a future characterized by resilience and continuous growth.

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