FLIPPING THE SCRIPT: EFFECTS OF POSITIVE SELF-TALK ON ARTISTIC GYMNASTICS PERFORMANCE

by

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ABSTRACT

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Positive self-talk is a widely recognized cognitive tool that enhances athletic performance; however, its application within artistic gymnastics during early developmental stages remains underexplored. The present study employed a within-subjects repeated-measures research design to understand the effects of positive self-talk on performance, state anxiety, and confidence amongst female artistic gymnasts. Participants completed a three-session (n = 7) or single-session intervention (n = 5), with a total sample of N = 12 (Mean age = 10.08). Caregiver data were also collected (N = 11, Mean age = 42.73) to examine associations between caregiver and gymnast psychological characteristics. Participants were measured on performance (by their level-specific uneven bar dismount), state anxiety, and confidence. Wilcoxon signed-ranks test and Spearman correlations indicated that self-talk did not produce statistically significant changes. Future studies should employ larger samples and integrate self-talk interventions within athletes' natural training environments to better evaluate their effectiveness in youth gymnastics.

Keywords: gymnastics, self-talk, anxiety, confidence, performance

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CHAPTER ONE

INTRODUCTION

For many young athletes, sport participation begins as a source of enjoyment, personal growth, and structured physical activity. Beyond these immediate benefits, such engagement supports adolescent development by fostering essential life skills such as teamwork, discipline, and time management, while also promoting stress relief and mental well-being (Back et al., 2022; Holt et al., 2017; Logan & Cuff, 2019; Shull et al., 2020). Yet, despite these advantages, participation frequently declines as athletes grow older and progress to higher levels of competition, with dropout rates varying considerably across sport disciplines during the transition from middle to high school (Shull et al., 2020). Given the developmental benefits of continued sport engagement, these patterns highlight the need for effective strategies to support sustained engagement and long-term participation in youth sports.

Although dropout is a universal phenomenon across youth sports, the specific vulnerabilities that athletes face differ by sport. In particular, early-specialization sports are susceptible to attrition due to high training volumes, intensive skill development, and repetitive practice of specialized movements (Côté et al., 2009; Jayanthi et al., 2013). Predominantly individual-based sports that require early-specialized skill sets can also limit the social support that team-based activities provide, increasing the risk of burnout, mental fatigue, and reduced motivation. These combined demands make some early-specialization sports particularly challenging for young athletes. Among these, artistic gymnastics stands out due to its exceptionally high technical and physical demands, the need to master multiple apparatuses, and the emphasis on precise, flawless performance

from a very young age. Not surprisingly, research indicates that many gymnasts discontinue participation before age nine (Swan et al., 2022), making it one of the earliest-dropout sports among youth athletes.

Understanding the psycho-social risks that gymnasts face, beyond the inherent physical challenges of the sport, highlights the need for interventions that support and foster continued engagement and psychological well-being. One cognitive tool that helps address these common challenges is self-talk—a form of internal dialogue that directs one's thoughts back to oneself, either verbally or internally (Van Raalte et al., 2016). Although previous research has demonstrated the effectiveness of self-talk in other sports, its application in artistic gymnastics remains largely unexplored. The present study investigates how implementing positive self-talk affects performance, anxiety, and confidence in young female artistic gymnasts.

Artistic Gymnastics

Although self-talk has been examined across a range of sports, its function has been shown to vary depending on the cognitive and motor demands of the performance environment (Hatzigeorgiadis et al., 2011; Theodorakis et al., 2000). Artistic gymnastics represents a particularly complex context, as athletes must execute high-precision skills under evaluative pressure while integrating explosive power with fine motor control. These demands, combined with early specialization and structured training environments, suggest that deliberate cognitive regulation strategies may be especially relevant in this sport.

To contextualize these demands, it is first necessary to outline the structure and disciplines of the sport. Artistic gymnastics is a sport that combines strength, flexibility,

and precision through routines performed on various apparatuses (Merriam-Webster, n.d.). It is divided into men's artistic gymnastics (MAG) and women's artistic gymnastics (WAG), which differ in apparatus composition and performance emphasis (Fédération Internationale de Gymnastique [FIG], n.d.). MAG includes floor exercise, pommel horse, still rings, vault, parallel bars, and horizontal bar, whereas WAG consists of vault, uneven bars, balance beam, and floor exercise. Each apparatus assesses different strengths of a gymnast, with some requiring more power and others emphasizing refined, technical movements. At any given moment, a gymnast coordinates complex motor movements while simultaneously maintaining spatial awareness, timing, rhythm, and emotional control under evaluative pressure.

Similar to many other early-specialization sports, artistic gymnastics is an individual sport performed within a team structure. This structure can make it challenging to tailor training to athletes' unique technical, psychological, and developmental needs, as gymnasts often progress at different rates and encounter unique performance challenges (Côté et al., 2009; Jayanthi et al., 2013). Even while training on the same apparatus, athletes may struggle for different underlying reasons, requiring individualized feedback and mental skill support. Without addressing these individual needs over time, gymnasts are more likely to experience unresolved fears, performance anxiety, and mental blocks (Gustafsson et al., 2017; Swan et al., 2022). These challenges can potentially contribute to psychological strain, reduced motivation, and disengagement from the sport altogether.

Recognizing these challenges, USA Gymnastics (USAG) provides a broad range of mental health and sports psychology resources to foster supportive environments for gymnasts and student-athletes. These resources, available on their mental health and sport

psychology webpage, offer general guidance on creating motivational and supportive climates, encouraging resilience, and enhancing communication among athletes, coaches, and parents (Mental Health/Sport Psychology, n.d.). Although these resources provide an important foundation for athletes' well-being, they are largely designed to support broad mental health needs rather than the more individualized psychological challenges that arise within artistic gymnastics. Given its role in regulating athletes' thoughts and emotions, self-talk represents a promising cognitive strategy for addressing these sport-specific demands (Van Raalte et al., 2016). Previous literature has established extensive knowledge of how self-talk functions across different athletic contexts (Van Raalte et al., 2016; Hatzigeorgiadis et al., 2011); however, the knowledge surrounding its role among young artistic gymnasts remains limited.

Sports and Self-Talk

The most extensive body of research on self-talk exists within sport psychology, where it is widely recognized as a cognitive strategy athletes use to regulate performance, emotion, and motivation. Given the wide variety of tasks and challenges athletes face, self-talk has been shown to be effective in enhancing performance and psychological outcomes. For example, Hatzigeorgiadis et al. (2009) conducted a study involving male and female tennis players performing a forehand drive task under competitive conditions. They found that athletes who engaged in self-talk demonstrated significant improvements in task performance and self-confidence, along with reductions in cognitive anxiety across trials. Their findings suggest that self-talk can serve as a practical tool for managing competitive pressure while simultaneously supporting skill execution and emotional control.

Research further indicates that the effectiveness of different types of self-talk is dependent on factors such as athlete experience and task demands. Zourbanos et al. (2013) found that novice undergraduate students learning a new motor skill benefitted from self-talk strategies that supported skill execution and confidence, leading to improvements in both self-efficacy and performance. This suggests that less experienced athletes may rely more on cognitively focused internal dialogue to guide learning and build competence. In contrast, research with more experienced athletes indicates that self-talk is often used to maintain concentration, regulate emotions, and manage competitive pressure in high-stakes environments (Galanis et al., 2016; Van Raalte et al., 2016). Together, these findings suggest that self-talk strategies may need to be tailored to individual needs based on the athletes' developmental stage and performance context.

Beyond performance, self-talk may also play an important role in shaping young athletes' psychological experiences in sport. Adolescence is a critical developmental period characterized by heightened sensitivity to evaluation, increased performance expectations, and evolving self-concept (Brown et al., 2017; Gould et al., 2006; Hansen et al., 2019). During this developmental phase, athletes' confidence, anxiety levels, and motivational patterns are strongly influenced by social environments, including parental and coaching behaviors and expectations (Gould et al., 2006). Research indicates that parental anxiety and pressure surrounding sport participation can contribute to elevated stress, reduced self-esteem, and maladaptive internal dialogue in youth athletes (Hudson et al., 2013). Conversely, supportive parental involvement and positive feedback have been associated with stronger self-confidence, improved emotion regulation, and more adaptive cognitive patterns among athletes. Understanding the relationship between

parental contingent self-worth and child self-esteem is, therefore, critical, as these factors may influence the effectiveness of self-talk interventions. These developmental and environmental factors should be considered when investigating how female artistic gymnasts, who are sometimes more sensitive to parental feedback, experience the impact of self-talk.

Self-Talk in Children

Further contextualizing these developmental effects, an important distinction must be made regarding how the function and form of self-talk differ across developmental stages. Self-talk begins to emerge around age of two; however, early forms are largely external, fragmented, and often reflect language modeled by parents and caregivers rather than internally generated cognition (Berk, 1992; Vygotsky, 1934/1987). As children progress into early to middle childhood, self-talk becomes increasingly internalized, transitioning from overt, externally guided speech, to more covert, self-directed cognitive processes that support self-regulation and problem solving. During this stage, children may still verbalize thoughts aloud, particularly when engaging in challenging or novel tasks, reflecting the ongoing internalization of cognitive control processes (Berk, 1992; Winsler et al., 2009).

Research on self-talk among children suggests that it plays a functional role in guiding behavior, supporting attention, and regulating emotion during task performance (Berk, 1992; Winsler et al., 2009). Unlike adolescents and adults, whose self-talk is typically fully internalized and strategically deployed, children's self-talk is more closely tied to immediate task demands and often reflects recently learned external instructions (Fernyhough, 2008; Winsler et al., 1997). This is particularly relevant in skill-based

domains such as sport, where young athletes frequently rely on coach-provided cues that are gradually incorporated into their own self-directed dialogue. Developmental research further indicates that children use self-directed speech to sequence actions, maintain focus, and inhibit distractions—processes that are essential for coordinating complex motor skills.

Additionally, self-talk in children may differ that of older populations when considering self- and identity-related processes. During middle childhood, children's self-concept is still developing and tends to be more concrete, domain-specific, and externally influenced, rather than stable and internally integrated (Harter, 2012; Marsh & Craven, 2006). As a result, self-evaluative self-talk (e.g., confidence- or identity-based statements) may be less consistent and more susceptible to external feedback compared to adolescents and adults (Harter, 2012). Suggesting that, while children are capable of engaging in self-talk, the meaning and impact of such dialogue may differ depending on their developmental stage.

Children's self-talk is also highly sensitive to social and environmental influences, including caregiver and coach feedback. During this period, repeated external messages are more likely to be internalized, shaping both adaptive and maladaptive self-talk patterns over time (Berk, 1992; Winsler et al., 2009). Within sport contexts, this process may be especially pronounced, as coaching cues, evaluative feedback, and parental expectations are frequently repeated and embedded within training environments (Gould et al., 2006; Horn, 2004). This developmental sensitivity highlights the importance of introducing structured, positive self-talk interventions during middle childhood. Such interventions may not only influence immediate performance and

emotional regulation but also contribute to the long-term formation of adaptive cognitive habits and self-regulatory skills (Hardy, 2006; Van Raalte et al., 2016).

Positive and Negative Self-Talk

Self-talk has been shown to vary in content and impact, commonly differentiated by its valence: positive and negative self-talk. Positive self-talk focuses on encouraging, staying optimistic, or task-directed messages that enhance performance and self-efficacy, including statements such as "*I can do it*" and "*I believe in myself*" (Van Raalte et al., 2016). In contrast, negative self-talk often involves self-criticism, doubt, or frustration, with statements like "*I'm so stupid*" and "*How could I mess that up?*" Consistent with their valence, positive self-talk tends to have positive effects on outcomes such as performance, whereas negative self-talk can hinder them (Hardy, 2006). Moreover, these valence-based effects influence more than performance outcomes, affecting psychological processes such as confidence, motivation, and emotion regulation (Brinthaupt & Morin, 2023; Van Raalte et al., 2016). However, the effects of self-talk are not always straightforward, and outcomes can vary depending on the task, the individual, and the context in which self-talk occurs.

Research exploring these nuances has found that, under certain conditions, negative self-talk may serve as a motivator, whereas positive self-talk may sometimes lead to overconfidence and impulsive decisions. For example, a study investigating the effects of self-talk during a dart-throwing task found that negative self-talk improved participants' future performance expectations (Van Raalte et al., 1995). Although negative self-talk did not impact immediate performance in the same way as positive self-talk in their study, these findings suggest it may serve a more purposeful, motivational

function. On the other hand, Kim et al. (2021) found that certain instances of positive self-talk led participants to develop confidence levels that exceeded their actual ability, which was associated with more impulsive and less accurate decisions during the task.

Evidence from additional studies has extended these nuances beyond environmental factors, suggesting that individual characteristics can influence self-talk outcomes. For example, an athlete's baseline self-esteem, confidence, and anxiety levels may shape how they respond to positive or negative self-talk intervention, with higher self-esteem potentially enhancing the benefits of positive self-talk and higher anxiety increasing susceptibility to the detrimental effects of negative self-talk (Brinthaupt & Morin, 2023; Grzybowski & Brinthaupt, 2022). Furthermore, personality traits such as pessimism and neuroticism are associated with more frequent engagement with negative self-talk (Hyphantis et al., 2013; Mayo Clinic, 2023; Sarig et al., 2023). It is particularly important to consider these individual differences when studying the impact of self-talk among youth athletes, whose psychological profiles are still developing and may interact with self-talk intervention to influence both performance and psychological well-being.

Spontaneous and Deliberate Self-Talk

Beyond valence, there are further distinctions of self-talk focused on how it arises: spontaneously or deliberately (Van Raalte et al., 2016). Spontaneous self-talk is characterized by automatic, intuitive, and emotional messages that arise without conscious effort. For instance, after making a mistake during a performance, an athlete may say to themselves, "*I always make the same mistakes*," reflecting a raw, emotional negative response to the situation. Such spontaneous statements may reflect attributional tendencies characterized by global ("*I always mess this up*"), stable ("*I can't change it*"),

or internal ("*It's my fault*") explanations for performance outcomes (Abramson et al., 1978). Due to its automatic and emotionally reactive nature, spontaneous self-talk often reflects immediate appraisals of success or failure, which can influence how setbacks are interpreted and responded to.

In contrast, deliberate self-talk is intentional, conscious, and purpose-driven, often used intentionally to regulate emotions or enhance focus (Van Raalte et al., 2016). Unlike spontaneous self-talk, deliberate self-talk is chosen and applied strategically to address a specific situation or goal. For example, an athlete might deliberately remind themselves to stay calm before a high-pressure performance, or consciously reframe a mistake by thinking, "*I can adjust and improve next time*." Although an individual may mirror this wording in spontaneous self-talk, the difference lies in the intent behind the behavior. Deliberate self-talk emphasizes directing cognition rather than passively reacting to it. Research indicates that deliberate self-talk functions as a cognitive regulation strategy, supporting attention control, emotional regulation, and the intentional restructuring of performance-related thoughts (Hardy, 2006; Meichenbaum, 1977; Hatzigeorgiadis et al., 2011). Moreover, deliberate self-talk can gradually shape spontaneous self-talk patterns, fostering more adaptive automatic thoughts over time (Hardy, 2006; Brinthaupt & Morin, 2023). Its effectiveness is moderated by individual characteristics such as baseline confidence, self-esteem, and attentional control, making it particularly important to consider in youth athletes whose self-regulatory skills are still developing (Galanis et al., 2016; Grzybowski & Brinthaupt, 2022; Van Raalte et al., 2016).

Despite the seemingly contradictory purposes of spontaneous and deliberate self-talk, overlap starts to emerge when deliberate self-talk is practiced consistently, as it

becomes a habit. By consciously directing one's thoughts in specific situations, individuals can gradually change the nature of their spontaneous self-talk, transforming automatic negative or unhelpful messages into more constructive dialogue (Hardy, 2006; Meichenbaum, 1977). Regular practice of deliberate self-talk has been shown to support emotional regulation, goal-directed behavior, and adaptive coping strategies, enabling individuals to respond more effectively to stress, challenges, or performance demands (Brinthaupt & Morin, 2023; Hardy, 2006). Over time, this process fosters a more adaptive cognitive style, where constructive thought patterns become increasingly automatic and integrated into everyday functioning.

As with other dimensions of self-talk, the expression and function of spontaneous and deliberate self-talk are influenced by individual and environmental factors. The baseline individual characteristics, such as confidence, self-esteem, anxiety, and attentional regulation, may affect an athlete's ability to intentionally apply self-talk strategies and override automatic negative thoughts (Galanis et al., 2016; Grzybowski & Brinthaupt, 2022). Similarly, environmental factors, such as supportive coaching, parental feedback, or competitive pressure, can reinforce or undermine these cognitive strategies. Together, these moderating factors help explain variability in how effectively individuals develop and apply adaptive self-talk, particularly in performance contexts that require the execution of specific skills under high pressure.

Motivational and Instructional Self-Talk

A final distinction within positive self-talk concerns its functional applications, differentiating between motivational and instructional self-talk. Motivational self-talk works to enhance confidence, emotional resilience, and overall positivity by using

phrases such as "*I believe in myself*" or "*Keep going*," which help individuals stay motivated and focused on their goals (Hatzigeorgiadis et al., 2011). This form of positive self-talk has been shown to increase effort and perseverance, particularly in tasks requiring sustained physical or emotional endurance (Theodorakis et al., 2000). For example, motivational self-talk can help individuals manage fatigue and maintain effort in demanding situations by strengthening perceived competence and commitment to success (Zourbanos et al., 2013). It also supports emotion regulation by reframing challenges as opportunities and reinforcing persistence under pressure, making it especially relevant in high-stress performance environments (Hatzigeorgiadis et al., 2009; Zourbanos et al., 2013).

In contrast, instructional self-talk serves a more task-oriented function by guiding movement execution and cognitive control during performance (Hatzigeorgiadis, 2006; Hatzigeorgiadis et al., 2011). It typically involves concise, goal-directed cues such as "*Control the landing*," "*Focus on the steps*," or "*See the target*," which help direct attention toward relevant technical components. Using these phrases can be particularly effective in procedural and precision-based tasks, where maintaining attentional focus and minimizing errors are critical for optimal execution (Zourbanos et al., 2013). Thus, instructional self-talk is especially relevant in technically demanding sports where accuracy and timing are critical to success.

The distinction between motivational and instructional self-talk raises an important research question: which type of self-talk is most useful at different moments during performance, and are there cumulative effects by incorporating both? Research comparing motivational and instructional self-talk highlights that their effectiveness often

depends on the nature of the task and sport-specific demands. For example, Hatzigeorgiadis et al. (2011) found, in a meta-analysis, that instructional self-talk tends to be more effective for precision-based sport skills involving fine motor control, such as dart throwing, golf putting, and basketball shooting. In contrast, motivational self-talk tends to be more effective for sports tasks that emphasize gross motor demands, such as cycling, long-distance running, and shot put. This pattern aligns with the effects of task demands on self-talk efficacy, suggesting that athletes in precision sports benefit more from cues that direct attention to technique, whereas those in endurance- or power-oriented disciplines benefit more from motivational cues that support effort and confidence. Based on these findings, effective self-talk may depend less on choosing a single style and more on the combined effects; however, it remains unknown whether the cumulative effects of both types of self-talk can be observed.

Gymnastics and Self-Talk

Although experimental research on self-talk within artistic gymnastics is limited, related work in rhythmic gymnastics provides preliminary insight into how self-talk may operate within gymnastics training environments. Santos-Rosa et al. (2022) assessed self-talk usage in rhythmic gymnastics—a subsect of gymnastics that focuses on flexibility and artistry while using the ribbon, ball, hoop, and batons—and found that rhythmic gymnasts who reported using more positive self-talk perceived greater support within their motivational climate and were rated higher in performance by their coaches. Notably, the study suggested that coaching style and team dynamics influenced the type and frequency of self-talk they used, with more positive climates fostering more effective

self-dialogue. These findings highlight how self-talk can serve as a bridge between the social environment and the athlete's internal regulation strategies.

Broader sport psychology research complements these findings, indicating that instructional and motivational self-talk differentially influence performance across tasks (Theodorakis et al., 2000). Although some differences exist between rhythmic and artistic gymnastics, both disciplines involve early specialization, technical precision, and performance evaluation, suggesting that similar cognitive mechanisms may be at play. However, Santos-Rosa et al. (2022) did not differentiate between instructional and motivational self-talk, nor did they experimentally examine their effects on performance. Thus, experimental research directly comparing motivational and instructional self-talk, as well as their combined effects, within artistic gymnastics remains needed.

Current Study

The present study examined the effects of instructional and motivational self-talk on performance and psychological outcomes in WAG. Using a within-subjects repeated-measures design, athletes completed their level-specific uneven bar dismount multiple times across different self-talk conditions (i.e., no self-talk, instructional self-talk, motivational self-talk, and/or motivational and instructional self-talk). Dependent variables, including performance, state anxiety, and confidence, were assessed across conditions to determine whether the different types of self-talk interventions differentially affected both objective and psychological outcomes.

In addition to these primary effects of self-talk intervention, the current study explored whether individual characteristics, such as baseline self-esteem and caregiver psychological factors, were associated with variation in child baseline psychological

factors. By examining both immediate experimental effects and relevant individual differences, the study aimed to provide a more comprehensive understanding of how self-talk operates within the context of artistic gymnastics.

Guided by this framework, the following three hypotheses were tested:

Hypotheses

Hypothesis 1: Baseline caregiver psychological characteristics would be associated with gymnasts' corresponding baseline characteristics.

Hypothesis 2: Gymnasts would show improvements in uneven bar dismount performance, reduce state anxiety, and increase confidence, from baseline (i.e., no self-talk) to after engaging in instructional self-talk.

Hypothesis 3: Gymnasts would show improvements in uneven bar dismount performance, reduce state anxiety, and increase confidence, from baseline (i.e., no self-talk) to after engaging in both instructional and motivational self-talk.

These hypotheses are grounded in existing theories conceptualizing self-talk as a cognitive mechanism for performance optimization and emotional regulation. Despite extensive research on self-talk in sport psychology, there remains a lack of understanding of how it functions within artistic gymnastics, and how individual and caregiver characteristics may shape these effects. Previous studies employed cross-sectional correlational research designs, asking athletes how often and what kinds of self-talk they used, and assessing the associations between this self-talk and various outcomes. By examining changes in performance, anxiety, confidence, and self-esteem across different self-talk conditions, the present study investigated how young gymnasts may internalize and apply self-talk strategies within a sport-specific performance context. By

experimentally comparing instructional and motivational self-talk within the same athletes while accounting for individual and caregiver influences, the present study advances understanding of how cognitive regulation strategies function in a technically demanding, evaluative sport context.

CHAPTER TWO

METHODS

Participants

Performance and psychometric data were collected from 12 female artistic gymnasts and 11 caregivers (Note: one caregiver elected not to provide data). Participants were recruited via email from a Midwestern artistic gymnastics facility. Eligible gymnasts were WAG athletes competing in USAG (i.e., USA Gymnastics) Levels 3–10 or Xcel Silver–Platinum. Inclusion criteria required that gymnasts be between 7 and 17 years of age, hold current USAG membership, and have documented child assent, parental consent, and parental permission.

Caregivers. Caregivers averaged 42.73 years of age (SD = 3.95; range = 39–49), and the sample was predominantly female (81.8%). The sample was racially and ethnically diverse: White (41.6%), Black (8.3%), Asian (16.6%), Hispanic/Latino (25.0%), and not reported (8.3%). Most caregivers were married (90.9%), reported having a graduate-level degree (90.9%), and were employed full-time (81.8%). Slightly less than half (45.5%) of the caregivers were born in the U.S., whereas 54.5% were born outside of the U.S. The majority of caregivers reported past sport participation (81.8%) and reported a generally positive experience with sports (M = 7.09, Mdn = 8; 0–10 scale; see Table 1 for the caregiver demographics).

Gymnasts. The gymnast sample had a mean age of 10.08 years (SD = 0.90; range = 8–11) and was all female. The racial and ethnic composition mostly mirrored that of caregivers: White (41.6%), Black (16.6%), Asian (16.6%), and Hispanic/Latino (25.0%).

The majority of gymnasts were born in the United States (81.8%), with 18.2% born outside the United States (n = 2; see Table 2 for gymnast demographics).

In terms of competitive level, participants competed at Level 3 (25.0%), Level 4 (8.3%), Xcel Silver (41.6%), and Xcel Gold (25.0%). Gymnasts reported having an average of 4.45 years of experience (SD = 1.44) and trained approximately 9.38 hours per week (SD = 2.26). The majority reported not currently participating in other organized sports (63.6%; see Table 3 for the sport characteristics of gymnast participants).

Measures and Materials

Equipment. All uneven bar equipment used in the current study met the USAG specifications, including fiberglass rails with wood coverings and a 39 mm (±1 mm) rail diameter (USA Gymnastics, 2024). Adjustments to the bar height and spread were made based on the gymnast's safety and preference. The apparatus area was equipped with magnesium carbonate chalk to assist participants in gripping the bar, and participants were allowed to choose to wear their own gymnastics handgrips when applicable.

A Canon EOS Rebel T7 camera was placed on a tripod in a fixed position and used to record all gymnastics performance data. The camera captured a side view of the uneven bars, with the entire apparatus and the athlete visible for the duration of the video recording. Following each research session, all video data was transferred to and stored on a password-protected external hard drive kept in a locked office at Oakland University. Video recordings were deleted after being transferred to the external hard drive and coded for data analysis.

Performance. Gymnasts completed their level-specific uneven bar dismount as the performance task. This skill was selected for this study because it is required at all competitive levels and increases in difficulty as athletes progress through the sport. Although the specific dismount varies by level, the overarching objective and core evaluation criteria remain similar, allowing for meaningful comparisons across participants with different levels. During each session, participants completed 10 total attempts of their dismount: five before the intervention and five after the intervention.

Performance was evaluated using a custom-designed rubric that aligned with standards outlined in the USA Gymnastics Code of Points (USA Gymnastics, 2021). The rubric included six skill-specific error criteria tailored to the skill being performed by the gymnasts (see Appendix A). Each criterion was scored dichotomously (0 = not completed, 1 = completed), resulting in total performance scores ranging from 0 to 6. A detailed description of the coding criteria provided to research assistants who were systematically trained to independently code the recordings is included in Appendix B.

For example, participants who completed the Squat-on dismount, shown in Figure 1 (A) were evaluated on the following error criteria: (1) reaching a full squat position, (2) pointed toes while in the air, (3) maintaining legs together, (4) reaching a stretched body position, (5) keeping chest up on the landing, and (6) sticking the landing with no steps.

Demographics. Caregivers were asked to respond to several demographic questions regarding themselves and their child, including age, gender, race/ethnicity, and whether they were born in the United States (Appendix C). Caregivers also reported their personal experience with sports, including which sports they participated in, if any, and how long they participated. Additional questions assessed the child's history in

gymnastics, including their current level, current or past injuries, current practice behaviors, and participation in other sports. Lastly, parents reported on the child's health at the time of the session, indicating if they had experienced any injuries, illness, or major life events that would prevent them from participating.

Confidence. Gymnast confidence was assessed using a scale that was designed for the current study. It measured confidence across two domains: belief in their ability to do gymnastics and general confidence toward performance (Appendix D). For example, "I feel sure of myself when I perform my skills" (belief) and "I feel confident in my ability to perform my bar routine" (general confidence). This scale was measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Gymnast participants completed this scale in a pre- and post-test format during each session.

Self-talk. The Automatic Self-Talk Questionnaire for Sports–Short Version (ASTQS) was used to evaluate gymnasts' self-talk usage at the start and end of the study (Zourbanos et al., 2016; Appendix E). This is an 8-item scale rated on a 5-point Likert scale ranging from 1 (Never) to 5 (Very Often). The scale is separated into positive and negative dimensions of self-talk (four questions per dimension; Zourbanos et al., 2009). Internal consistency was demonstrated for positive and negative self-talk ($\alpha = .72$ and .69, respectively). An example item from the positive dimension subscale is "You had thoughts to psych up yourself (e.g., Do your best)," whereas the negative dimension of self-talk includes items, such as "You had thoughts related to worry (e.g., I am not going to make it)" (Zourbanos et al., 2016).

Self-esteem. To assess gymnasts' and caregivers' self-esteem, the Rosenberg Self-Esteem Scale (RSES) was used (Rosenberg, 1979; Appendix F). The RSES is a widely used and well-validated measure of global self-esteem, demonstrating strong internal consistency across samples (α = .80–.85). This is a 10-item scale rated on a 4-point Likert scale ranging from 1 (Strongly Agree) to 4 (Strongly Disagree). An example item is "On the whole, I am satisfied with myself." Gymnast participants completed this scale at the beginning and end of the study, whereas caregivers completed it only at the baseline.

State anxiety. To assess gymnast and caregiver anxiety, the 6-item State-Trait Anxiety Inventory (STAI-6) was used (Marteau & Bekker, 1992; Nilsson et al., 2012; Appendix G). This is a shortened version of the original 20-item scale. The shortened version was developed to reduce the time required for completing the scale. Studies evaluating the validity of the shortened scale have shown strong internal reliability (α = .82) and a high correlation with the original 20-item STAI (r = 0.95; Marteau & Bekker, 1992). Additionally, the scale has been tested with children, showing the strongest internal validity with children 7-9 years old (α = .68) and a moderate correlation between the items (r = 0.36–0.56; Nilsson et al., 2012). Responses on the STAI-6 were rated on a 4-point Likert scale ranging from 1 (Not at All) to 4 (Very Much). An example item is "I feel calm". All gymnast participants completed this scale in each pre- and post-test, responding with how they felt "right now" at the time of the session, "before you do gymnastics," and "when you do gymnastics." Caregivers also completed the scale in a pre- and post-test format; however, they only responded on how they felt "right now" as they were completing the survey.

Caregiver's perception of child anxiety. To better understand how caregivers view their child's emotions, caregivers completed the State-Trait Anxiety Inventory Parent Version (STAI-P; Shain et al., 2019; Appendix H). This scale originally consisted of 20 items directly translated from the original 20-item STAI, with the questions rephrased to assess caregivers' perceptions of their child's anxiety. However, for the purpose of this study, the scale was shortened to the six corresponding items in the STAI-6 to reduce caregivers' burden. The original use of the STAI-P was to garner caregivers' perceptions of their child (ages 7-17 years) with chronic illness' anxiety levels. Although chronic illness was not a focus of the present study, the overall concept remains relevant. Previous research has not reported on the internal consistency of this scale. Similar to the STAI-6, the STAI-P used a 4-point Likert scale, ranging from 1 (Not at All) to 4 (Very Much So). An example item includes, "My child feels calm" (Shain et al., 2019). Caregivers completed this scale once at the baseline of the study, reporting how their child felt "Right now."

Parental contingent self-worth. The Parental Contingent Self-Worth (PCSW) Scale was used to assess how caregivers respond to their child's successes and failures (Grolnick et al., 2007; Appendix I). This is a 9-item scale rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The scale assesses both negative and positive emotions experienced by the parent. A positive example item is "When my child does something good, I feel good about myself," whereas a negative example item is "When my child does something bad, I feel ashamed" (Grolnick et al., 2007). Caregivers completed this scale once at the study baseline.

Procedure

The present study consisted of two groups of participants, with one group completing three 1-hour intervention sessions, each one week apart, and another group completing one 1-hour intervention session and a 2-week follow-up survey. Procedures are described separately based on the group a participant was in.

Three-Session Group. During the first session, the gymnast provided informed assent, and their caregiver provided informed consent and permission for their child to participate. Following consent, both the caregiver and the gymnast participant completed baseline questionnaires. Corresponding participant IDs were used for both caregiver and child self-report questionnaire packets and to label video files to ensure that data were properly matched across caregiver-child dyads and across sessions (e.g., SH0205). The caregiver measures included demographic information for the child and the caregiver, the caregiver's history with sports, the PCSW scale, the RSES, the STAI-P, and the STAI-6. The gymnast pre-test contained the STAI-6, the custom confidence scale, and the RSES. A summary of the measures used by each session is presented in Figure 2.

After completing pre-test measures, gymnast participants proceeded to the performance component of the study. During this phase, the caregivers were asked to remain seated in the performance area and observe their child's performance. Gymnast participants completed a standardized 10-minute warm-up, during which they could run, stretch, and practice their uneven bar dismounts. Throughout the study, caregivers and coaches were instructed not to provide feedback or technical instruction to ensure that external input did not influence performance outcomes. Following the warmup, each gymnast performed five level-specific uneven dismount attempts. No time limit was

imposed, and they were informed that they could proceed at their own pace. Each attempt was video-recorded, starting when the gymnast mounted the uneven bars and ending when the gymnast performed a salute; if no salute occurred, the recording ended when the child participant exited the apparatus area. When multiple gymnasts were present for a session, they alternated turns in performing dismounts.

After the first set of five attempts, gymnast participants took a five-minute break, during which they could drink water, sit, and use the restroom, but were not permitted to engage in any gymnastics-related activity, as this session served as their baseline. At the end of the break, the gymnasts completed an additional five dismount attempts, following the same procedure. Then, with all ten attempts complete, gymnast and caregiver participants completed post-test questionnaires. The caregiver post-test assessed their perceptions of their child's performance and re-assessed the STAI-6. The gymnast post-test included the ASTQS, STAI-6, and the custom confidence scale.

Sessions 2 and 3 followed the same structure, including a brief written pre-test, a 10-minute warm-up, five performance attempts, a five-minute break, five additional performance attempts, and a brief written post-test. The gymnast's pre-test in these sessions differed slightly, including reflections on their performance from the previous session, omitting the RSES. The caregiver pre-test only contained three scales: the STAI-6, reported perceptions of their child's feelings that day, and any recent changes in their child's health. However, unlike the first session, the self-talk intervention was implemented.

The primary procedural difference between Sessions 2 and 3 occurred during the five-minute break, when a research assistant delivered a brief scripted presentation on

self-talk (the scripts are provided in Appendix K). These scripts ensured consistency across sessions and helped gymnasts understand how to apply self-talk strategies. During Session 2, a scripted instructional self-talk presentation was delivered during the five-minute break. The script defined instructional self-talk, provided examples, described its benefits, and instructed gymnasts on how to apply the strategy during the subsequent five attempts. Session 3 followed the same procedure using a motivational self-talk script. Gymnasts then selected three of the provided self-talk phrases or could opt to generate their own to use during the second set of attempts. They then completed five more attempts of their level-specific dismount in the same manner, but now using the self-talk they had learned before completing each attempt.

Single-Session Group. The single-session format followed a similar structure with modifications to reduce participant burden and enhance recruitment feasibility. Pre- and post-test measures mirrored those administered during Session 1 of the three-session intervention, with the addition of a baseline ASTQS for gymnast participants. The performance procedure matched Sessions 2 and 3 of the three-session intervention, including the brief self-talk instruction. To counterbalance intervention effects, the type of self-talk (instructional vs. motivational) was randomized by alternating session assignments.

Two weeks after the initial session, follow-up questionnaires were distributed to participants at their training facility in pre-addressed, stamped envelopes. One envelope contained caregiver measures, including the STAI-6, STAI-P, and an item assessing perceived changes in the child's gymnastics. The second envelope contained child measures, including the STAI-6, ASTQS, RSES, custom confidence scale, and the check-

in measure. Participants were instructed to complete the questionnaires and return them via the U.S. Postal Service. Participation was considered complete upon receipt of the follow-up surveys.

Data Analysis

The present study examined the effects of self-talk interventions on artistic gymnastics performance, confidence, and anxiety. All analyses were conducted using SPSS (Version 31). Descriptive statistics were computed to summarize demographic characteristics and key study variables. Statistical significance was evaluated at $\alpha = .05$.

For performance analyses, mean dismount scores were calculated across the five attempts in the pre- and post-intervention phases of a session to provide a stable estimate of performance and reduce trial-to-trial variability. The mean scores served as the unit of analysis for all inferential tests. Confidence and anxiety scores were computed according to scale guidelines, with total scores calculated for each administration.

Given the small sample size, nonparametric statistical procedures were selected to provide more robust and conservative estimates of intervention effects. Spearman rank-order correlation analyses were conducted to examine associations between caregiver self-esteem, anxiety, perceived child anxiety, and children's reported anxiety and self-esteem (Hypothesis 1). Nonparametric Wilcoxon signed-rank tests were conducted to examine changes in performance, confidence, and anxiety across baseline, instructional self-talk, and motivational self-talk conditions (Hypotheses 2 and 3). Effect sizes (r) were calculated by dividing the standardized test statistic (Z) by the square root of the total number of observations (N). Effect sizes were reported where appropriate, and all

statistical tests were two-tailed to support interpretation given the limited statistical power.

CHAPTER THREE

RESULTS

The present study evaluated the effects of three-session and single-session self-talk interventions on artistic gymnastics performance, state anxiety, and confidence. Analyses were conducted separately for the three-session sample (n = 7) and the single-session sample (n = 5) for all hypotheses except Hypothesis 1, which focused on baseline data. One participant withdrew following Session 2 of the three-session intervention; therefore, the Session 3 analyses only reflect the available data. Missing data were minimal and handled using pairwise deletion for correlational analyses and available-case analysis for nonparametric tests.

Descriptive statistics were computed for all study variables across the three-session and single-session samples. At baseline, gymnasts in the three-session sample demonstrated a mean performance score of 2.06 (SD = 1.43; range = .00–4.60). Baseline confidence scores averaged 4.07 (SD = .26; range = 3.67–4.33), and total state anxiety averaged 1.58 (SD = .26; range = 1.28–1.93). For the single-session sample, baseline performance averaged 3.40 (SD = .76; range = 2.40–4.40), baseline confidence averaged 4.20 (SD = .21; range = 4.00–4.50), and baseline total state anxiety averaged 1.67 (SD = .24; range = 1.33–1.89). Gymnast baseline self-esteem averaged 2.77 (SD = .57; range = 1.80–3.80).

Caregiver baseline self-esteem scores for both three-session and single-session groups averaged 2.66 (SD = .30; range = 2.10–3.00), caregiver self-reported anxiety averaged 1.49 (SD = .47; range = 1.00–2.33), perceived child anxiety averaged 1.58 (SD

= .46; range = 1.00–2.33), and contingent self-worth averaged 3.03 (SD = .41; range = 2.00–3.43).

Hypothesis 1

Hypothesis 1 stated that caregiver baseline psychometric measures, including self-esteem, anxiety, perceptions of child anxiety, and contingent self-worth, would be significantly associated with gymnast baseline psychometric measures of self-esteem and anxiety. Spearman's correlation analyses indicated that caregiver self-esteem was not significantly associated with gymnast self-esteem ($r = .08$, $p = .808$). Caregiver self-reported anxiety was negatively but non-significantly correlated with gymnast total anxiety ($r = -.31$, $p = .35$). Similarly, caregiver perceptions of child anxiety were negatively correlated with gymnast self-reported total anxiety, $r = -.29$, $p = .38$.

Examination of gymnast anxiety subscales ("Right Now," "Before Doing Gymnastics," and "While Doing Gymnastics") revealed small-to-moderate negative correlations with both caregiver anxiety and perceived child anxiety ($|r| = .04–.41$), though none reached statistical significance (all $ps > .22$). In contrast, caregiver self-reported anxiety was strongly and positively correlated with caregiver perceptions of child anxiety, $r = .93$, $p < .001$, suggesting that caregiver emotional states are likely to influence how they interpret their child's anxiety, or vice versa.

Overall, Hypothesis 1 was not supported. Although strong associations emerged between caregiver anxiety and their perceptions of their gymnast's anxiety, the associations between caregiver and gymnast variables were minimal and statistically insignificant, largely due to the small sample size. These findings suggest that caregiver

emotional states may influence caregiver perceptions more than gymnast's self-reported internal experiences.

Hypothesis 2

Hypothesis 2 stated that gymnasts would demonstrate improved performance, reduced state anxiety, and increased confidence following instructional self-talk. When observing effects in the three-session sample, Wilcoxon signed-rank tests indicated no significant improvement in performance from baseline (Mdn = 1.80) to post-instructional self-talk (Mdn = 2.00), $Z = -0.42$, $p = .674$, $r = -.16$. Confidence also did not significantly change from baseline (Mdn = 4.08) to post-intervention (Mdn = 4.00), $Z = -0.21$, $p = .832$, $r = -.08$. Total state anxiety did not significantly decrease from baseline (Mdn = 1.61) to post-intervention (Mdn = 1.39), $Z = -0.42$, $p = .674$, $r = -.16$. Lastly, subscale analyses of anxiety revealed no statistically significant differences for "Right Now," "Before Doing Gymnastics," or "While Doing Gymnastics" anxiety (all $ps > .26$). Effect sizes ranged from small to moderate ($rs = -.16$ to $.43$).

Due to small subgroup sizes within the single-session condition (instructional n = 2; motivational n = 3), inferential comparisons between self-talk types were not conducted. Instead, descriptive change scores were examined. Of the participants who engaged in instructional self-talk, one demonstrated an increase from baseline performance (M = 2.40) to after engaging in instructional self-talk (M = 3.20), whereas the other showed a decrease (from 4.40 to 4.00), replicating the non-significant findings obtained in the three-session condition. With respect to confidence, both participants remained the similar levels or slightly decreased from baseline (M = 4.08) to after engaging in instructional self-talk (M = 3.88). Anxiety also remained at similar levels,

slightly increased from baseline (M = 1.67) to after engaging in instructional self-talk (M = 1.92). These findings should therefore be interpreted as preliminary and exploratory.

Overall, Hypothesis 2 was not supported by either sample at the group level. Although small-to-moderate effect sizes emerged in some comparisons, none of the observed changes reached statistical significance. However, it should be noted that the group-level non-significant changes do not mean that all participants showed no changes; rather, individual-level changes were cancelled out due to a small sample size and large individual differences.

Hypothesis 3

Hypothesis 3 stated that gymnasts would demonstrate improved performance, reduced anxiety, and increased confidence following motivational self-talk, or due to accumulative combined effects of both types of self-talk. Results indicated that, in the three-session sample, performance did not significantly increase from baseline (Mdn = 1.80) to post–motivational self-talk (Mdn = 2.00), $Z = -0.95$, $p = .343$, $r = -.39$. Confidence also did not significantly change from baseline (Mdn = 4.08) to post–motivational self-talk (Mdn = 4.00), $Z = -0.95$, $p = .344$, $r = -.39$. Total anxiety did not significantly decrease from baseline (Mdn = 1.61) to post-intervention (Mdn = 1.55), $Z = .000$, $p = 1.000$, $r = .00$.

Anxiety subscale analyses again showed no statistically significant differences (all $ps > .36$), though effect sizes ranged from small to moderate ($rs = -.17$–$.38$), indicating potential trends that warrant further investigation. Overall, Hypothesis 3 was not supported, though some practical effects may exist.

Of the participants who engaged in motivational self-talk in the single-session group, two demonstrated an increase from baseline performance (M = 3.50) to after engaging in motivational self-talk (M = 4.20), whereas the other decreased (from 3.20 to 2.80). The levels of confidence remained the same for all three participants from baseline (M = 4.28) to after engaging in motivational self-talk (M = 4.32). Anxiety slightly decreased for all three participants from baseline (M = 1.67) to after engaging in instructional self-talk (M = 1.40). Although motivational self-talk appears to have might have contributed to reducing anxiety, these findings should be interpreted as preliminary and exploratory due to the small sample and the exclusive reliance on descriptive statistics.

Overall, Hypothesis 3 was not supported.

CHAPTER FOUR

DISCUSSION

The present study examined the effects of instructional and motivational self-talk on performance, confidence, and state anxiety among competitive youth gymnasts through the implementation of interventions. Across both the three-session and single-session samples, neither form of self-talk produced statistically significant improvements in performance or emotional outcomes. Although several small-to-moderate effect sizes emerged, patterns were characterized by substantial individual variability rather than consistent group-level directional change. Meta-analytic evidence indicates that self-talk enhances performance across sport contexts (Hatzigeorgiadis et al., 2011); however, the current findings did not replicate these effects within youth artistic gymnastics. Instead, the current results suggest that the effectiveness of self-talk may depend more heavily on contextual and developmental factors than prior research has addressed.

In particular, during middle childhood—the stage of development the current sample represents—self-talk is still undergoing a process of internalization and may function more as a scaffold for self-regulation than as a fully automated performance optimization strategy (Berk, 1992; Lev Vygotsky, 1987; Winsler et al., 2009). As a result, self-talk in this population may not yet operate as a stable or consistently accessible cognitive tool under performance conditions, particularly when introduced in a brief, experimental format. This developmental context may help explain both the absence of significant group-level effects and the observed variability in individual responses, as athletes may differ in the extent to which self-talk has been internalized and can be effectively applied during skill execution.

Contrary to expectations, caregiver psychological characteristics were not associated with gymnast anxiety or self-esteem. However, consistent with research demonstrating that parental anxiety influences children's sport-related stress experiences (Hudson et al., 2013), caregiver anxiety was associated with perceptions of child anxiety. Yet, this perception did not align with gymnast's self-report, suggesting that parental interpretations may reflect projection processes rather than direct correspondence with athletes' internal states, highlighting the importance of distinguishing between athlete self-report and caregiver perception in youth sport research.

With respect to intervention effects, the results suggest that brief exposure to self-talk may be insufficient to produce immediate, measurable changes in performance or emotional among youth gymnasts. Self-talk is conceptualized as a cognitive skill that develops through repetition and contextual embedding. From a developmental perspective, this process reflects the continued reliance on externally guided cues that have not yet been fully consolidated into stable, self-directed cognitive regulation, a transition that remains ongoing during middle childhood (Berk, 1992; Winsler et al., 2009). The absence of significant findings may therefore reflect limitations in time to effectively apply self-talk techniques rather than ineffectiveness of the strategy itself, particularly in highly automated, precision-based skills such as artistic gymnastics dismounts. In such contexts, additional cognitive cues may not immediately translate into improved execution.

Developmental considerations further contextualize these findings. Although self-talk emerges early in development and becomes internalized during childhood (Vygotsky, 1934/1987), its refinement and strategic deployment continue across

development. During this period, children's self-talk remains closely tied to immediate task demands and often reflects recently internalized external instructions, rather than fully autonomous cognitive strategies (Fernyhough, 2008; Winsler et al., 1997). Much of the existing self-talk literature has focused on adult or higher-level competitive athletes, populations that may possess greater cognitive capabilities and performance stability. In contrast, the youth gymnasts targeted in the present study may have required more sustained intervention or contextual support to effectively apply self-talk during high-demand performance situations.

Moreover, children's self-regulatory and evaluative capacities are still developing, including their ability to monitor performance, regulate attention, and interpret internal states such as confidence and anxiety (Gould et al., 2006; Hansen et al., 2019). These developmental characteristics may help explain the absence of consistent group-level effects observed in the present study, as well as the substantial heterogeneity in individual responses. Even if self-talk cues are introduced, athletes may not yet possess the fully developed capacity to interpret and regulate their internal states, the immediate impact of a brief self-talk intervention on outcomes such as anxiety and confidence may be limited or inconsistent. Similarly, the ability to effectively apply self-talk during performance may depend on more advanced attentional control and self-monitoring skills than are fully established at this stage.

Collectively, these findings emphasize the complexity of implementing self-talk interventions in early-specialization youth sport. Rather than demonstrating uniform short-term benefits, results point toward contextual sensitivity, developmental influences, and the importance of considering individual variability. These patterns highlight the

need to examine frequency, developmental readiness, and person–environment fit when designing and evaluating self-talk interventions in youth gymnastics.

Limitations

The present study contains several limitations that should be considered when interpreting the findings. Most notably, the small sample size substantially constrained statistical power and data analyses. Although artistic gymnastics is widely practiced, recruitment was limited by its primary location within private club settings, which reduces participant accessibility. As with any small sample, the likelihood of Type II error increases, limiting the ability to detect meaningful intervention effects that might have existed at the individual level. Although several observed effect sizes fell within the small-to-moderate range, the study was underpowered to determine whether these effects reflected true intervention impact.

Intervention frequency and consistency also warrant consideration. Cognitive strategies such as self-talk typically require repeated rehearsal, reinforcement, and contextual integration before producing measurable behavioral change (Theodorakis et al., 2000). Many interventions demonstrating positive effects have involved multi-session training periods or extended implementation phases (Hatzigeorgiadis et al., 2011). In contrast, participants in the current study had limited exposure, and strategy content varied across sessions, potentially restricting consolidation. Participants in the single-session condition, for example, had only five attempts to implement their assigned cue, which may have been insufficient for internalization or for consistent application in performance. Additionally, continued use of self-talk outside the structured sessions was not monitored, limiting control over follow-up outcomes.

Developmental variability within the sample further constrained interpretation. Participants ranged in age from 8 to 11 years and represented multiple competitive levels (e.g., Xcel Silver, Gold, Levels 3 and 4). The literature in developmental sport psychology indicates that self-regulatory and evaluative capacities continue to mature throughout late childhood and early adolescence (Gould et al., 2006; Hansen et al., 2019). Such developmental differences may influence athletes' ability to understand, apply, and benefit from structured psychological strategies. A standardized intervention format may not have optimally matched participants' developmental readiness. Developmentally responsive approaches have been emphasized as important for effective psychological skill instruction in youth sport (Gould et al., 2006), and future research may benefit from narrower age ranges or differentiated intervention formats.

The ecological validity of the performance context also presents limitations. Assessments were conducted at athletes' home training facilities, using familiar equipment and in the presence of known individuals. Although camera recording and caregiver observation introduced elements of evaluative pressure, the environment did not replicate the heightened social comparison and outcome contingencies characteristic of competitive meets, where scores are publicly displayed, and medal placements are determined. In competitive settings, gymnasts typically perform across multiple apparatus within a single meet, accumulating physical fatigue and psychological load. Isolating a single dismount likely reduced both physiological demand and cumulative evaluative pressure, potentially attenuating the contextual conditions under which self-talk might exert stronger effects.

In a similar nature, by focusing exclusively on one skill—the participants' uneven bar dismount—the study's generalizability to other gymnastics events or performance domains was limited. Cognitive strategies may differentially influence skills that vary in complexity, perceived risk, or confidence level. It is possible that the selected skill did not represent an area requiring substantial cognitive support for all participants.

Measurement limitations should also be acknowledged. The study relied on youth self-report measures to assess confidence and anxiety, which are inherently vulnerable to response bias and developmental constraints. Given the age range of participants, variability in emotional insight and language comprehension may have influenced the accuracy and consistency of responses. Furthermore, informant discrepancies between caregivers and children are well documented in youth psychological research (De Los Reyes & Kazdin, 2005), suggesting that differences observed between caregiver perceptions and gymnast self-reports may reflect typical differences in perspective between parents and children rather than true inconsistency in reporting.

Lastly, participant attrition further reduced analytic stability. Given the already limited sample size, the loss of participant data in both intervention conditions did not support stable results across the statistical analyses.

Implications and Future Directions

The present study contributes to the growing body of literature on positive self-talk by implementing the programs and examining their application within youth artistic gymnastics—a sport characterized by early specialization, technical precision, and heightened evaluative demands. By investigating the effects of both instructional and motivational self-talk in a young sample, this research lays important groundwork for the

development of future interventions. The findings highlight the practical and methodological complexities inherent in studying psychological strategies within this population, including developmental variability. Rather than providing a definitive test of self-talk efficacy, the study clarifies critical considerations that must inform future youth-based interventions.

These findings suggest that the effectiveness of self-talk in youth gymnastics may depend less on the distinction between cue types and more on how and when the strategy is integrated into training environments. Psychological skills introduced as isolated techniques may function differently from those embedded within routine coaching practices. When incorporated alongside skill progression, feedback delivery, and competitive preparation, self-talk may be more likely to become a natural component of performance regulation rather than a consciously applied, potentially temporarily add-on strategy. This perspective shifts the applied focus from identifying optimal cue wording to designing developmentally responsive implementation structures.

The results further underscore the importance of viewing the development of youth psychological skills within the broader performance environment. Athletes' responses were shaped not only by the intervention itself but also by developmental stage, coaching climate, and family context. Variability between caregiver perceptions and gymnast self-reports reinforces that youth sport experiences are filtered through multiple interpretive lenses. Future research should examine how coach communication patterns, caregiver evaluative language, and team motivational climate interact with athletes' emerging cognitive strategies. Understanding these interactions is critical because psychological interventions do not operate in isolation; they are embedded

within relational systems that can either reinforce or undermine skill acquisition and emotional regulation.

Methodologically, the study illustrates the necessity of ecologically grounded methodologies when evaluating psychological interventions in youth sport. Assessing performance within a single-skill, low-fatigue context may not capture the cumulative cognitive and physiological demands characteristic of competitive gymnastics. Embedding interventions within full competition simulations or competitive seasons would allow researchers to examine how self-talk functions under sustained pressure, physical fatigue, and repeated evaluative exposure. In addition, longitudinal designs that track week-to-week adaptation could clarify how self-talk strategies demonstrate delayed or gradual effects that are not detectable within short-term measurement windows.

Taken together, the findings suggest that instructional and motivational self-talk interventions in early-specialization sports require developmental alignment, contextual integration, and sustained implementation to produce measurable change. The absence of robust short-term effects should not be interpreted as evidence against the value of self-talk, but rather as an indication that youth performance psychology demands nuanced, systems-aware approaches. By identifying both the challenges and structural considerations involved in applying self-talk in youth gymnastics, this study advances the field toward more sophisticated, developmentally informed intervention models that support both performance and psychological well-being.

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Table 1: Caregiver Demographics

		n	%
Gender			
	Male	2	18.2
	Female	9	81.8
Race			
	White	5	41.6
	Black	1	8.3
	Asian	2	16.6
	Hispanic/Latino	3	25.0
Country of Origin			
	United States	5	45.5
	Elsewhere	6	54.5
Education			
	Post-graduate Degree	10	90.9
	Bachelor's Degree	1	9.1
Employment			
	Full-time	10	90.9
	Part-time	1	9.1
Marital Status			
	Married	10	90.9
	Single	1	9.1

	Mean	SD
Age	42.73	3.95

Table 2: Gymnast Demographics

		n	%
Gender			
	Female	12	100
Race/Ethnicity			
	White	5	41.6
	Black	2	16.6
	Asian	2	16.6
	Hispanic/Latino	3	25.0
Country of Origin			
	United States	10	83.3
	Elsewhere	2	16.7
School Grade			
	3rd	1	8.3
	4th	2	16.7
	5th	3	25.0
	6th	5	41.7
	Not reported	1	8.3

	Mean	SD
Age	10.08	0.90

Table 3: Sport Characteristics of Gymnast Participants

	Mean	SD	
Years of experience	4.45	1.44	
Weekly training hours	9.38	2.26	
		n	%
Competitive level			
	Level 3	3	25.0
	Level 4	1	8.3
	Xcel Silver	5	41.7
	Xcel Gold	3	25.0
Currently in other sports			
	Yes	4	33.3
	No	7	58.3
	Not reported	1	8.3

Table 4: Spearman's Correlations Among Caregiver and Gymnast Psychometric Data

		N	M	SD	1	2	3	4	5	6
1	Perceived Child Anxiety	11	1.57	0.45	–					
2	Caregiver Baseline Anxiety	11	1.48	0.47	.931**	–				
3	PCSW	11	3.04	0.41	-.188	-.134	–			
4	Caregiver Self-Esteem	11	2.66	0.30	-.117	-.180	-.053	–		
5	Gymnast Baseline Self-Esteem	12	2.77	0.57	-.009	-.234	.000	.083	–	
6	Gymnast Baseline Anxiety	12	1.62	0.24	-.292	-.312	.034	.155	.202	–
7	Gymnast Baseline Confidence	12	4.13	0.24	-.164	-.270	-.046	.201	.288	.053

*Note. p<.001***.*

Table 5: Spearman's Correlations Among Baseline and Outcome Variables for the Three Session Intervention

		N	M	SD	1	2	3	4	5	6	7	8	9
1	Self-Esteem	7	2.39	0.33	–								
2	Baseline Performance	7	2.06	1.43	-.198	_							
3	Baseline Anxiety	7	1.58	0.26	.036	-.739	_						
4	Baseline Confidence	7	4.07	0.26	-.090	.545	-.378	_					
5	S2 Performance Change	7	0.00	0.63	-.270	-.155	-.414	-.055	_				
6	S3 Performance Change	6	-0.07	0.37	.439	-.382	.464	-.493	-.544	_			
7	S2 Anxiety Change	7	-0.53	0.13	.144	-.264	-.342	-.273	.836*	-.088	_		
8	S3 Anxiety Change	6	0.02	0.30	-.841*	.015	.058	-.029	.176	-.088	-.118	_	
9	S2 Confidence Change	7	-0.02	0.06	.076	.217	.019	-.387	-.529	.154	-.444	-.308	_
10	S3 Confidence Change	6	-0.33	0.15	-.277	.770	-.638	.820*	.339	-.770	-.154	.400	-.355

Note. $p < .05$. $p < .01$**.*

Table 6: Wilcoxon Signed-Ranks Test Comparing Three-Session Participants Pre- and Post- Instructional Self-Talk Outcomes

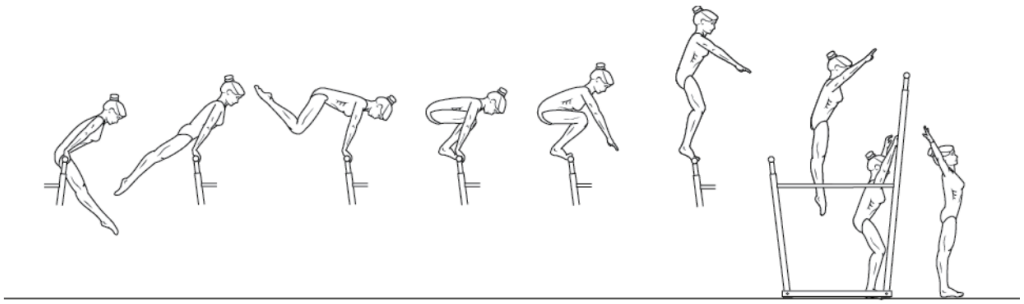
	Median (Pre)	Median (Post)	Z	p	r
Performance	1.80	2.00	-0.42	.674	-.16
Confidence	4.08	4.00	-0.21	.832	-.08
Anxiety	1.61	1.39	-0.42	.674	-.16
“Right Now” Anxiety	1.33	1.33	-0.42	.674	-.16
“Before” Anxiety	1.33	1.33	-0.84	.400	-.32
“While” Anxiety	1.50	1.50	-1.13	.257	-.43

Table 7: Wilcoxon Signed-Ranks Test Comparing Three-Session Participants Pre- and Post- Motivational Self-Talk Outcomes

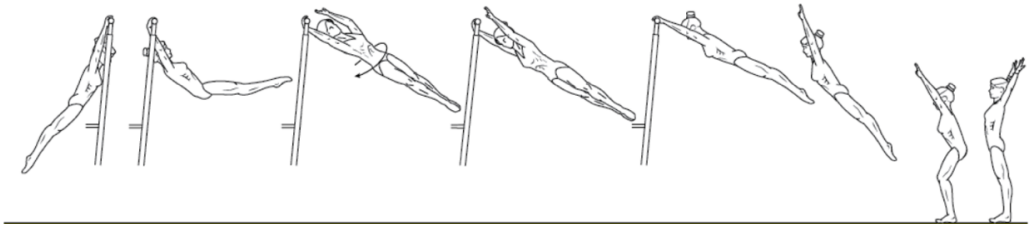
	Median (Pre)	Median (Post)	Z	p	r
Performance	1.80	2.00	-0.95	.343	-.39
Confidence	4.08	4.00	-0.95	.344	-.39
Anxiety	1.61	1.55	0.00	1.00	.00
“Right Now” Anxiety	1.33	1.42	-0.92	.357	-.38
“Before” Anxiety	1.33	1.50	-0.41	.680	-.17
“While” Anxiety	1.50	1.50	-0.82	.414	-.34

Figure 1: Illustrations of Uneven Bar Dismounts

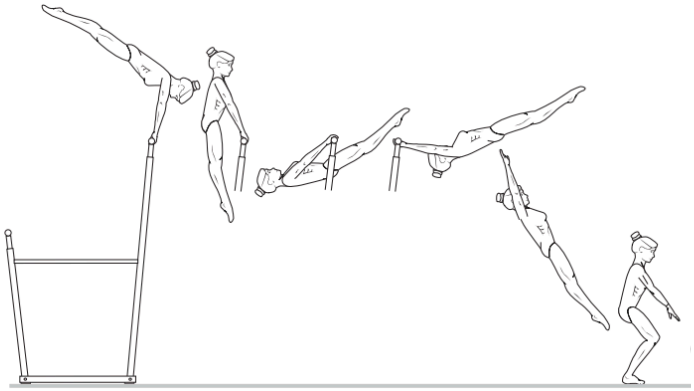
(A) Squat-on, Stretch Jump Dismount



(B) Tap Swing Forward with 1/2 Turn



(C) Underswing (toe-on or clear) to Stand



Note. Images depict three level-specific uneven bars dismounts: (A) squat-on stretch jump dismount, (B) forward tapswing with ½ turn dismount, and (C) underswing dismount. Skill terminology reflects USA Gymnastics classifications (USA Gymnastics, 2021).

Figure 2

Use of scales in three-session group

		Session 1		Session 2		Session 3	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Child	STAI-6	X	X	X	X	X	X
	Confidence	X	X	X	X	X	X
	RSES	X					X
	ASTQS		X		X		X
Caregiver	Demographics	X					
	STAI-6	X	X	X	X	X	X
	STAI-P	X					
	RSES	X					
	Contingent Self-Worth	X					

Note. Table depicts in which session and which test each scale will be used.

Figure 3

Use of scales in single-session group

		Pre-test	Post-test	Follow-up
Child	STAI-6	X	X	X
	Confidence	X	X	X
	RSES	X		X
	ASTQS	X		X
Caregiver	Demographics	X		
	STAI-6	X	X	X
	STAI-P	X		X
	RSES	X		
	Contingent Self-Worth	X		

Note. Table depicts in which questionnaire each scale will be used.

Appendix A

Performance Error Criteria

Each dismount attempt performed by the gymnast participant was rated across 6 criteria. Each item is ranked from 0 (not completed) to 1 (completed), allowing for each dismount attempt to get a total value of 6 for each attempt. There were three different dismounts performed throughout the study. Each dismount has its own criteria, with criteria such as "pointed feet" and "stuck landings" being repeated when applicable.

Squat-on Dismount:

1. Reach a full squat position.
2. Point their feet while in the air.
3. Keep their legs together throughout the entire skill.
4. Reach a stretched body position after leaving the bar.
5. Keep their chest in an upright position on the landing.
6. Stick the landing without moving feet or touching hands on the ground.

Tap-swing Half Turn Dismount:

1. "Tap"/swing legs under the bar.
2. Point their feet while in the air.
3. Keep their legs together throughout the entire skill.
4. Rotate their body at the height of the high bar.
5. Keep their chest in an upright position on the landing.
6. Stick the landing without moving feet or touching hands to the ground.

Toe Swing Dismount:

1. Place feet on the bar (with feet either together or straddled around their hands).
2. Point their feet while in the air.
3. Keep their legs straight throughout the entire skill.
4. Keep their body in a flat or rounded shape (not arched).
5. Keep their chest in an upright position on the landing.
6. Stick the landing without moving feet or touching hands to the ground.

Appendix B

Performance Coding Manual

Squat-on Dismount:

Does the participant reach a full squat?

1 = The participants legs are bent 90 degrees or more.

0 = The participant moved to a standing position on the bar before bending their knees to 90 degrees or more; the participants waist was higher than the height of their knees.

Are the participant's feet pointed throughout the skill, where applicable (i.e., not on the floor or the bar)?

1 = The participants toes are both curled and their ankles are in an extended flat position.

0 = There is a bend in the participants ankle, breaking the straight line from their ankle to their toes, or the participants toes are not curled downward.

Did the participant keep their legs together throughout the entire skill?

1 = The participants legs maintain in contact with each other throughout the duration of the skill, completing the skill simultaneously.

0 = There is a visible separation of the participants legs (feet, knees, or entire legs).

Does the participant reach a fully stretched out "I-body" position?

1 = The participants body position creates a straight line from their fingers to their toes as they jump off of the bar.

0 = The participant does not reach a completely stretched out position or has a bend at any point in their body line (hips, elbows, knees, armpits/shoulders).

Does the participant keep their chest up on the landing?

1 = The participants shoulders remain in an upright position, upon making contact with the landing mat until the salute indicating their completion of the skill.

0 = The participant leans forward, dropping their arms, shoulders, or chest below their waist height.

Does the participant stick the landing?

1 = Upon landing the participants feet remain in the location where they initially make contact with the landing mat and demonstrate control to continue holding the position.

0 = The participant moved their feet forward, backward, or sideways through the motion of a step, hop, jump, slide, or even falling. Or the participant initially demonstrates a "stuck" landing, but rapidly moves their feet to the salute position, not demonstrating control of the landing.

Tap-swing Half Turn Dismount:

Does the participant "tap" under the bar?

1 = While swinging forward underneath the bar, the participant transitions from an arched back position to a hollow/rounded body position.

0 = The participant demonstrates the arch and/or hollow body positions prior to going swinging forward underneath the bar, or they do not demonstrate any body position changes at all, maintaining a flat body position.

Are the child's feet pointed throughout the skill, where applicable (i.e., not on the floor or the bar)? (See Squat-on Dismount for description of this criteria)

Does the child turn with their body at the height of the high bar?

1 = When the participant completes the 1/2 turn, their body was the same height as the bar that their hands are holding on to, from toes, hips, and shoulders.

0 = The participant completes the 1/2 turn when any part of their body is not within reasonable distance from the height of the bar they are holding on to (i.e., toes are below the height of the bar, even if shoulders and hips are at the height of the bar).

Does the child keep their chest up on the landing? (See Squat-on Dismount for description of this criteria)

Does the child stick the landing? (See Squat-on Dismount for description of this criteria)

Toe Swing Dismount:

Does the child place their feet on the bar (with feet either together or straddled around their hands)?

1 = The participant keeps both feet in contact with the bar while swinging underneath the bar.

0 = The participants feet do not make contact with the bar, or their feet leave the bar prior to completing their swing underneath the bar.

Does the child point their feet while in the air where applicable? (See Squat-on Dismount for description of this criteria)

Does the child keep their legs straight throughout the entire skill?

1 = There is no bend in the participants knees from the start of the skill to when they make contact with the landing mat.

0 = The participant bends their knee(s) prior to making contact with the landing mat.

Does the child keep their body in a flat or rounded shape when releasing the bar?

1 = The participants body is in a straight line or slightly upward rounded shape from their head to their toes upon releasing the bar.

0 = There is a bend in the participants hip line or the participant arches their back, dropping their feet toward the floor.

Does the child keep their chest up on the landing? (See Squat-on Dismount for description of this criteria)

Does the child stick the landing? (See Squat-on Dismount for description of this criteria)

Appendix C

Caregiver and Child Demographics

Participants completed a demographic questionnaire assessing parent and child characteristics. Items included:

Caregiver Information:

- Age
- Race (White, Black/African American, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Asian, Mixed, Other)
- Ethnicity (Hispanic/Latino; Not Hispanic/Latino; Prefer not to say)
- Country of origin
- Gender identity
- Marital status
- Employment status
- Education level
- Parental/guardian role
- Past and current sport participation
- Self-rated sport experience (0 = no participation to 10 = excellent experience)

Child Information:

- Age
- Race
- Ethnicity
- Country of origin

- Gender
- Living arrangement
- Grade level

Child Health:

- Illness (yes/no)
- Injury (yes/no)
- Stressful life events (yes/no)

Appendix D

Confidence Scale

This custom 12-item scale evaluated gymnasts confidence related to gymnastics across general beliefs (G) and event specific confidence (E). Gymnast participants were asked to rate how often they feel each statement on a 5-point Likert scale, ranging from 1 (never) to 5 (very often)

1. I feel sure of myself when I perform my skills (G)
2. I believe I am a good gymnast, even when I make mistakes (G)
3. I feel strong and capable during practice (G)
4. I believe I can perform well, even if people are watching me (G)
5. I don't let small mistakes stop me from doing my best (G)
6. I am confident about my ability to do gymnastics (G)
7. I feel confident that I can perform gymnastics skills well today (G)
8. I can make corrections my coach gives me (G)
9. I feel confident in my ability to perform my vault (E)
10. I feel confident in my ability to perform my bar routine (E)
11. I feel confident in my ability to perform my beam routine (E)
12. I feel confident in my ability to perform my floor routine (E)

Appendix E

Automatic Self-Talk Questionnaire for Sports – Short Version (ASTQS)

This 8-item scale assesses the frequency in which an individual uses positive and negative self-talk. It is rated on a 5-point Likert scale ranging from 1 (never) to 5 (very often). Gymnast participants were asked to complete this based on their experiences in the past week leading up to the session.

1. You had thoughts to psych up yourself (e.g., Do your best)
2. You had thoughts to control your feelings (e.g., Calm down)
3. You had thoughts to gain more confidence (e.g., I can make it)
4. You had thought to concentrate (e.g., Concentrate on your game)
5. You had thoughts related to worry (e.g., I am not going to make it)
6. You had thoughts related to drop out (e.g., I want to stop)
7. You had thoughts related to fatigue (e.g., I am tired)
8. You had irrelevant thoughts regarding gymnastics (e.g., What will I do later tonight)

Appendix F

Rosenberg Self-Esteem Scale

This 10-item scale assesses self-esteem and is rated on a 4-point Likert scale, ranging from 1 (strongly agree) to 4 (strongly disagree). Both gymnasts and caregivers completed this scale based on how they feel in general.

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to think that I am a failure.
10. I take a positive attitude toward myself.

Appendix G

6-Item State-Trait Anxiety Inventory (STAI-6)

This 6-item scale assesses anxiety on a 4-point Likert scale, ranging from 1 (not at all) to 4 (very much). Caregiver participants responded based on how they felt "right now" at the time of data collection. Gymnast participants responded to three separate prompts: how they felt "right now" at the time of data collection, how they feel before they do gymnastics, and how they feel while they are doing gymnastics.

1. I feel calm
2. I am tense
3. I feel upset
4. I am relaxed
5. I feel content
6. I am worried

Appendix H

State-Trait Anxiety Inventory Parent Version (STAI-P)

This scale, originally 20-items but now adjusted to match the six items on the STAI-6, assesses caregivers' perceptions of their child's anxiety. It is rated on a 4-point Likert scale, ranging from 1 (not at all) to 4 (very much). Caregivers completed this scale based on how they thought their participating child felt "right now" at the time of the study.

1. My child feels calm
2. My child is tense
3. My child feels upset
4. My child is relaxed
5. My child feels content
6. My child is worried

Appendix I

Parental Contingent Self-Worth

This 9-item scale evaluates how contingent caregiver's self-worth is on their child's success and or failure. Each item is ranked on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Caregivers were asked to indicate how much they agree with each statement.

1. My child's successes make me feel proud of myself.
2. When my child fails, I feel bad about myself.
3. My child's failures can make me feel ashamed.
4. When my child does something good, I feel good about myself.
5. When my child does something bad, I feel ashamed.
6. My child's successes have very little influence on how I feel about myself.
7. Although I care about what happens to my child, their successes do not reflect on my worth as a person.
8. How I feel about myself does not depend on what my child does.
9. My child's successes are a reflection of my own worth.

Appendix J

Self-Talk Scripts

Instructional Self Talk

"Hi everyone! Today, we're going to talk about something really cool called self-talk! Do any of you know what self-talk is? [Child participation]. Exactly! Self-talk is like having a conversation with yourself to help keep you focused and calm. Today, we are going to learn about and practice a specific type of self-talk, instructional self-talk. Have you ever made a checklist of things you need to do? Well, this is a type of self-talk that is like a checklist; it helps you focus on how to do something step by step.

For example, we have Suzy here. She is about to do a cartwheel. What are some of the necessary steps for her to do a cartwheel? [Child Participation] Perfect! Some other steps she could think of are:

- 'Hand, Hand, Foot, Foot'
- 'Point my toes and keep my arms straight.'
- 'See my landing!'

The first statement is a good example of how to use short step-by-step statements, but the others are quite long. Do you have any ideas on how we can make "Point my toes and keep my arms straight" and "See my landing" shorter? [Child Participation]. Good! What you could say is:

- Point
- Squeeze
- Look

These words are like giving your brain clear instructions so your body knows what to do. Using instructional self-talk is like being your own coach. It helps you stay focused and remember everything you've practiced. It's perfect for helping you stay calm and do your best when trying new skills. So, let's practice! Can you think about what steps are necessary to do a good bar dismount? [Child participation]. Right! We also have this list of other things you could say, like: [the 6-criteria they are being rated on].

But each of these phrases are a little long, so just like we shortened down Suzy's phrases, we can do the same for your dismount! You could say: [Shorten statements of the criteria].

So, on your next set of dismount attempts, we would like you to use instructional self-talk. You can either use the statements we have provided, OR if you have something else you know you need to think of, or a coach has told you before, you can put that in the "Other" option. Before we practice using this instructional self-talk talk, I would like you to rank these 7 statements from 1, most helpful to you, to 7, least helpful to you (rating the "other" option as 7 if you do not have any other statements to include). I would like you to remind yourself of your three most helpful statements before each time you try your dismount today. So, when you walk up to the bar, either out loud or in your head, please say each of these goals to yourself."

Motivational Self-Talk

Hi everyone! Today, we're going to talk about something really cool called self-talk! Do any of you know what self-talk is? [Child participation]. Exactly! Self-talk is like having a conversation with yourself to help keep you focused and calm. Today, we are going to

learn about and practice a specific type of self-talk, motivational self-talk. Have you ever cheered for their friend, saying things like, 'You've got this!' or 'Keep going!'? Well, did you know you can do the same thing for yourself?

Motivational self-talk is like being your own cheerleader. Let's look at Suzy here. She is trying a cartwheel for the first time, and for her, it might feel tricky and nerve-racking. So, saying encouraging words to herself might help her be more focused and calm. That's when motivational self-talk comes in to help. You can say things to yourself like:

- 'I can do this!'
- 'I have practiced'
- And 'I'll try my best!'

These words are powerful because they give you a boost of confidence and energy. Can you think of some other phrases we could say? [Child participation]. Great! So, for your next five attempts, I would like you to use motivational self-talk before each dismount attempt. We have some examples for you here, like:

- I can do it
- I believe in myself
- I got this
- I am capable
- I am in control
- I am strong.

Or if you have something else you think would fit better, you can put that in the other column. Before we practice using this motivational self-talk talk I would like you to rank these 7 statements from 1, most helpful to you, to 7, least helpful to you (putting your

"other" option as 7 if you do not have any other statements you'd like to include). I would like you to remind yourself of your three most helpful statements before each time you try your dismount today. So, when you walk up to the bar, either out loud or in your head, please say each of these goals to yourself.

Appendix K

IRB Approval Letter

OAKLAND UNIVERSITY

Institutional Review Board

Date: May 8, 2025

Study #: IRB-FY2025-241

Study Title: Tipping Points in Self-Talk Interventions: Performance and Psychological Outcomes in Gymnastics

Submission Type: Initial

IRB Decision: Approved

Research Team:
Samantha Hart
Kanako Taku
Gina Reyes

Based on applicable federal regulations, the above referenced study has been determined to involve no more than minimal risk to participants and to be Approved, with the following expedited categories:
4. Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications.)
6. Collection of data from voice, video, digital, or image recordings made for research purposes.
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)

This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Notes for Researcher(s):
This submission includes the following approved documents

- Recruitment email
- Child Assent V 5/8/2025
- Parent Consent & Parental permission V 5/8/2025
- Data collection tools

Letter and Consent Document:

This letter along with the IRB approved (date-stamped) consent document can be found in Cayuse in the Submission Details page under Letters and Attachments, respectively.

The IRB approved version of the consent document must be used in consenting participants. Federal regulations require that each participant receive a copy of the consent document unless a waiver is granted by the IRB. Signed consent forms must be retained for a minimum of three years after the completion of the project. Please remember that informed consent is a process that continues throughout the project, starting with recruitment and assurance of participant understanding of the project, and followed by a signed consent form when applicable.

Permission from Research Sites:
Please note the following:

- This IRB approval letter means that the research has met the federal criteria for approval per 45 CFR 46.111 Criteria for IRB Approval of Research.
- Before the research is initiated, permission to conduct research at a given site must be obtained from all research locations listed in the IRB submission. You must keep copies of all such permission letters for your records.
- It is the responsibility of each researcher to follow all applicable policies and procedures of any outside institution where the research will be conducted.

Modifications:
Any changes to the approved project must be approved by the IRB prior to initiation by submitting a MODIFICATION request. Do not collect data while the changes are being reviewed. Data collected during this time cannot be used in research.

Incidents:
All unanticipated problems involving risks to participants or others, serious and unexpected adverse events, non-compliance issues and/or serious complaints regarding this project must be reported promptly to the IRB by submitting an INCIDENT report.

You are approved to start the research. Please retain a copy of this notification for your records.

If you have any questions, please contact the IRB office.

Thank you.

The Oakland University IRB