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Autodiálogo y creencias implícitas en atletas de resistencia: explorando las dimensiones cognitivas y motivacionales

Self-Talk and Implicit Beliefs in Endurance Athletes: Exploring the Cognitive and Motivational Dimensions

Auto-fala e crenças implícitas em atletas de resistência: explorando as dimensões cognitivas e motivacionais

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RESUMEN

Este estudio tuvo como objetivo analizar la frecuencia del autodiálogo cognitivo y motivacional en atletas de resistencia (duatletas y triatletas) en diferentes niveles de competencia (regional a internacional) y examinar la relación entre el autodiálogo y las creencias implícitas sobre la capacidad deportiva. La muestra consistió en 447 atletas (201 triatletas y 246 duatletas) con edades de 18 a 59 años, incluyendo tanto hombres (78.10% de triatletas, 71.14% de duatletas) como mujeres (21.90% de triatletas, 28.86% de duatletas). Se encontraron diferencias significativas entre duatletas y triatletas en términos de edad, frecuencia de entrenamiento y creencias incrementales, siendo los duatletas los que obtuvieron puntajes más altos en estas últimas. Los atletas masculinos puntuaron más alto en creencias de entidad que las atletas femeninas. La frecuencia del autodiálogo se asoció positivamente con creencias incrementales y satisfacción con el rendimiento deportivo. El autodiálogo motivacional se vinculó a una mayor satisfacción y a creencias incrementales más fuertes, mientras que el autodiálogo cognitivo se asoció con la edad y los años de competición. Estos hallazgos sugieren que tanto el autodiálogo motivacional como el cognitivo están asociados con creencias incrementales y satisfacción con el rendimiento en deportes de resistencia. Estos resultados destacan la importancia de que los atletas comprendan sus procesos de autodiálogo para mejorar su rendimiento deportivo.

Palabras clave: triatlón, duatlón, rendimiento deportivo, cognición, motivación.

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ABSTRACT

This study aimed to analyze the frequency of cognitive and motivational self-talk in endurance athletes (duathletes and triathletes) across different competition levels (regional to international) and to examine the relationship between self-talk and implicit beliefs about sports ability. The sample consisted of 447 athletes (201 triathletes and 246 duathletes) aged 18 to 59 years, including both males (78.10% of triathletes, 71.14% of duathletes) and females (21.90% of triathletes, 28.86% of duathletes). Significant differences were found between duathletes and triathletes in terms of age, training frequency, and incremental beliefs, with duathletes scoring higher on the latter. Male athletes scored higher on entity beliefs than did female athletes. Frequency of self-talk was positively associated with incremental beliefs and satisfaction with sports performance. Motivational self-talk was linked to greater satisfaction and stronger incremental beliefs, whereas cognitive self-talk was associated with age and years of competition. These findings suggest that both motivational and cognitive self-talk are associated with incremental beliefs and satisfaction with performance in endurance sports. These results highlight the importance of athletes understanding their self-talk processes to enhance their sports performance.

Keywords: triathlon, duathlon, sports performance, cognition, motivation.

RESUMO

Este estudo teve como objetivo analisar a frequência do autodiálogo cognitivo e motivacional em atletas de resistência (duatletas e triatletas) em diferentes níveis de competição (regional a internacional) e examinar a relação entre o autodiálogo e as crenças implícitas sobre a capacidade esportiva. A amostra consistiu em 447 atletas (201 triatletas e 246 duatletas) com idades de 18 a 59 anos, incluindo tanto homens (78,10% dos triatletas, 71,14% dos duatletas) quanto mulheres (21,90% dos triatletas, 28,86% dos duatletas). Foram encontradas diferenças significativas entre duatletas e triatletas em termos de idade, frequência de treinamento e crenças incrementais, com os duatletas apresentando escores mais altos nessas últimas. Atletas masculinos pontuaram mais alto em crenças de entidade do que as atletas femininas. A frequência do autodiálogo foi positivamente associada a crenças incrementais e satisfação com o desempenho esportivo. O autodiálogo motivacional foi vinculado a uma maior satisfação e a crenças incrementais mais fortes, enquanto o autodiálogo cognitivo foi associado à idade e aos anos de competição. Esses achados sugerem que tanto o autodiálogo motivacional quanto o cognitivo estão associados a crenças incrementais e satisfação com o desempenho em esportes de resistência. Esses resultados destacam a importância de os atletas compreenderem seus processos de autodiálogo para melhorar seu desempenho esportivo.

Palavras chave: triatlo, duatlo, desempenho esportivo, cognição, motivação.

INTRODUCTION

Multiple studies underscore the importance of self-talk in improving athletic performance, particularly its impact on managing emotions, controlling anxiety, and improving focus (Hardy et al., 2009; Hatzigeorgiadis et al., 2011; Parsons-Smith et al., 2022; Santos-Rosa et al., 2022; Theodorakis et al., 2000). Psychologists and sports scientists are increasingly focusing on the psychological aspects of self-talk that affect performance, including implicit beliefs about abilities (Ribó & Sánchez, 2023; Van Raalte et al., 2016, 2017). Recently, self-talk has emerged as a successful method to counteract ego depletion effects that have been shown to impair sport task performance (Galanis et al., 2022). Although the benefits of self-talk are well documented in skill-based and technically challenging sports (Hardy et al., 2001; Tod et al., 2011), its exploration among endurance athletes, such as

triathletes, is limited (Matos et al., 2020), especially in studies on the relationship between automatic self-talk and implicit beliefs about sports ability.

Self-talk is an internal or external dialogue that reflects the habitual dialogue used in practice and events before, during, or after training or competition (Garbey, 2013; Van Raalte et al. 2016). It ranges from cue words to short phrases or statements aimed at influencing performance, either out loud or silently, positively or negatively, with various functions (motivational and instructional), contents (positive and negative), and impacts (facilitative and debilitative) based on their origins (Hardy, 2006). However, the term 'self-talk' refers to various, often conflated processes, complicating its definition (Latinjak et al., 2018). Van Raalte et al. (2016) distinguish two primary forms: automatic (or organic) and strategic self-talk. Automatic self-talk is spontaneous, intuitive, occurs without premeditation during practice, is fast, and requires no conscious effort (Christoff, 2012; Latinjak et al., 2014; Zourbanos et al., 2009). Strategic self-talk, in contrast, is the result of deliberate practice, involving repeating keywords and phrases to boost performance and learning, not arising spontaneously (Hatzigeorgiadis et al., 2011).

Bridging ability beliefs in sport performance, as Dweck (1999, 2002) states, fall into two categories: incremental and entity. Incremental beliefs view sports abilities as skills that can be honed with practice, whereas entity beliefs view them as innate and immutable. The interplay between self-talk and these beliefs becomes apparent when motivation and performance are considered. Athletes with incremental beliefs, who see potential for growth, tend to benefit more from positive self-talk, aligning with findings that they exhibit higher intrinsic motivation than their counterparts with entity or fixed beliefs (Wang & Biddle, 2001). This mindset not only improves enjoyment in practice but also fosters resilience, as athletes are more likely to engage in constructive self-talk that propels them toward their goals, as observed in marathon runners (Jaenes & Caracuel, 2016). Conversely, those with a fixed mindset, viewing their abilities as static, might experience frustration and demotivation, particularly when the outcomes do not meet their expectations. This highlights the crucial role of aligning self-talk strategies with underlying beliefs about the ability to optimize sports performance.

Triathlon and duathlon are sports events with which participants are generally very satisfied (Jacinto et al., 2024), although there is a notable probability of high levels of social anxiety due to the combination of factors such as perfectionism, worries, and catastrophic thinking after experiencing a severe injury (Gil-Caselles et al., 2023). Despite the growing popularity of triathlon, research on the sport, particularly the interaction between ability beliefs and self-talk, remains limited. Dolan et al. (2011) highlighted that positive self-talk is a prevalent mental strategy among triathletes. Turner and Davis (2019) explored how rational emotive behavior therapy (REBT), as part of a Psychological Skills Training (PST) program, affects self-determined motivation in triathletes and found that REBT reduces irrational beliefs and improves self-determined motivation (Corrêa et al., 2023). Given the importance of these findings, our study aimed to further explore self-talk in endurance sports, focusing on athletes and triathletes. Specifically, it seeks to examine automatic self-talk within the context of sports performance and investigate its potential relationship with beliefs about sports ability, both intrinsic and entity—among athletes. Our primary hypothesis posits that the frequency and nature of self-talk, whether cognitive or motivational, correlate with incremental ability beliefs and satisfaction with sports performance.

MATERIALS AND METHODS

Study Design

This study employed a descriptive and cross-sectional design (Ato et al., 2013) to analyze the frequency of cognitive and motivational self-talk among endurance athletes (duathletes and triathletes) at different levels of competition (regional to international).

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Participants

In the present study, a total of 447 athletes participated (201 triathletes and 246 duathletes), both male (78.10% and 71.14%, respectively) and female (21.90% and 28.86%, respectively), aged between 18 and 59 years, who competed in events of the National Triathlon and Duathlon League of the Spanish Federation and the Andalusian circuits of both sports, and organized by the Federation of Andalusia. 67.1% of the athletes were from the Community of Andalusia Although triathletes and duathle, 67.1% of the athletes were from Andalusiates from all the Regional Communities of Spain participated. By gender, different levels of competition are distinguished from those considered age groups to the elite category, which are those who compete at the national and international levels. In the case of triathlon, 15.92% have competed at international level, 44.78% at national level, and 39.30% at regional community level. In duathlon, 15.04% competed in international events, 52.03% in national events, and 32.93% competed at the regional level.

Instruments

The administered questionnaire scrutinized sociodemographic variables, encompassing gender, age, and locality of residence. At the athletic level, inquiries were incorporated regarding participants' involvement in duathlon or triathlon events, duration of competitive engagement (athletic experience), the apex of individual sporting achievement attained, contentment with the caliber of athletic performance, placement in competitive events, and queries pertaining to training regimens (frequency and duration of training sessions per week, weekly cycling or running sessions, transition practices and strength training, alongside accessibility to equipment commensurate with the training level).

The Spanish adaptation of the Scale of Implicit Beliefs of Ability (CNAAQ-2) (Biddle et al., 2003), which has undergone validation in Spanish by Moreno-Murcia et al. (2013), was employed in this study. This instrument has been utilized to investigate incremental and entity beliefs across various contexts (educational, recreational, and athletic). The instrument was derived from an antecedent questionnaire known as the Conceptions of the Nature of Athletic Ability Questionnaire (CNAAQ), formulated by Sarrazin et al. (1996). Incremental beliefs were evaluated through two subscales that encapsulate learning (three items; e.g., achieving success in sports necessitates the acquisition and regular practice of techniques and skills) and enhancement (three items; e.g., one's proficiency in a sport is subject to improvement given adequate effort). Entity beliefs were quantified via two subscales reflecting stability (three items; e.g., altering one's aptitude in sports is inherently challenging) and innate talent (three items; e.g., excelling in sports requires inherent gifts). The questionnaire comprised a total of 12 items. All participant responses were recorded on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's alpha coefficients were .83 for incremental beliefs and .87 for entity beliefs, respectively.

The second evaluative tool utilized was the Self-Talk Questionnaire (S-TQ) tailored for sports, validated by Zervas et al. (2007). The S-TQ implemented in this research encompassed 11 items, representing two distinct factors (motivational and cognitive). The motivational items assess cognitive strategies that can enhance self-encouragement among individuals striving for elevated performance levels, whereas the cognitive items evaluate mental strategies that assist individuals in concentrating their attention, comprehending causal relationships, constructing novel knowledge paradigms, and addressing problems (Bandura, 1977, cited in Zervas et al., 2007). Seven items correspond to the motivational function (items 4-9 and 10), while four items pertain to the cognitive function (items 1-3 and 11). The scoring methodology employed a 5-point scale, ranging from 1 (never) to 5 (always), to indicate the frequency with which participants experienced each statement. The Cronbach’s alpha for the comprehensive S-TQ was determined to be .92, with .91 assigned to motivational self-talk and .84 to cognitive self-talk.

Procedure

The original S-TQ was translated into Spanish, and the translation was sent to an English translator who translated the Spanish version into English again. Both the original and the translations result in the same text. After that, following Osterling (1989), the Spanish version was sent to four experienced triathlon and duathlon certificate coaches, with more than ten years of experience in coaching, as well as four Sport Psychologists who are Ph.D. in Psychology, experienced in developing questionnaires, and teach Sports Psychology and Physical Activity in Spanish public universities. Ten experienced competitors (five females) with long experience in national competitions with university-level studies were invited to complete the questionnaire and comment, all of which were considered experts. Based on this procedure, some minor suggestions and revisions have been made.

This study was approved by the Ethical Committee of the [University Name] code 23/6-2 and was conducted according to the Declaration of Helsinki. The questionnaire included an introduction to the aims of the research, specific instructions to fill it out, the aims of the survey, ethics information for participants, and informed consent for adults and parent permission for athletes under 18. All participants completed the questionnaires between 12 and 48 hours after completing the competition.

Data Analysis

Statistical analyses were performed with version 2.3 of the Jamovi software (The jamovi project, 2022). Frequency analysis was used to describe the sample as well as to compare the means. Student's t-test was used to determine the differences according to the sport practiced (duathlon or triathlon) and according to the category of competition (female or male), and the one-factor ANOVA test was used to determine the differences in means according to the highest individual level of competition (autonomic, national or international). Finally, a linear regression model was used to explain the use of motivational self-talk, cognitive self-talk, and total self-talk in relation to the following possible predictor variables: age, years competing, days of training per week, sport modality (triathlon or duathlon), category (female or male), level of competition (regional, national, or international), availability of adequate material for the level of training, satisfaction with the level of sport performance, position in the last competition, entity beliefs, and incremental beliefs.

The data obtained for the different measures show a distribution within normal ranges according to the criteria of skewness and kurtosis (Field, 2009; Hinkle, 1988). The skewness values are within the acceptable range of -1 to +1, indicating that the distributions are mostly symmetric. Additionally, the kurtosis values are close to 0, within the generally accepted interval of -2 to +2, suggesting that the distributions do not exhibit excessive tails or peaks. To confirm the normality of the sample, the Kolmogorov-Smirnov statistic was used in the mean comparison tests, which did not reveal significant deviations from normality in the analyzed variables.

RESULTS

Demographic information

The results showed significant differences between athletes and triathletes (see Table 1) with respect to mean age (t = - 2.62; p < .01), number of training days per week (t = 3.24; p < .01), number of running sessions per week (t = 2.20; p < .05) and number of strength sessions per week (t = 1.99; p < .05). However, no significant differences were found in the number of years competing, number of hours of training per week, number of cycling sessions per week, number of transitions per week, availability of equipment appropriate to the level of training, satisfaction with the level of sports performance, or position in the last competition.

Table 1
Differences between Duathlon and Triathlon Athletes by Gender and Competition Level

	Sports			Category			Competition level			
	Duathlon Mean (S.D.)	Triathlon Mean (S.D.)	t^a	Female Mean (S.D.)	Male Mean (S.D.)	t^a	Regional Mean (S.D.)	National Mean (S.D.)	International Mean (S.D.)	F^b
Age	30.80 (11.86)	33.73 (11.60)	-2.62**	29.11 (13.15)	33.16 (11.16)	-3.20**	37.86 (0.89)	28.62 (0.74)	29.87 (1.30)	33.44***
Years competing	7.33 (5.82)	8.28 (6.29)	-1.66	6.54 (5.84)	8.17 (6.07)	-2.51*	6.77 (0.46)	7.45 (0.36)	11.00 (0.89)	8.87***
No. of training days	6.28 (0.86)	5.98 (1.12)	3.24**	6.07 (0.87)	6.17 (1.04)	-0.97	5.59 (0.09)	6.38 (0.05)	6.70 (0.09)	45.04***
No. of training hours	11.96 (4.33)	11.73 (5.80)	0.48	11.42 (6.46)	12.00 (4.44)	-1.07	9.77 (0.28)	12.21 (0.37)	15.57 (0.55)	48.54***
No. of cycling sessions	2.83 (1.14)	2.63 (1.14)	1.86	2.50 (1.12)	2.83 (1.14)	-2.62**	2.44 (0.07)	2.78 (0.08)	3.33 (0.14)	17.71***
No. of career sessions	3.09 (1.05)	2.87 (1.09)	2.20*	2.88 (0.82)	3.03 (1.15)	-1.28	2.60 (0.06)	3.05 (0.07)	3.71 (0.16)	26.17***
No. of sessions transitions	1.06 (1.52)	1.00 (1.38)	0.37	0.81 (0.53)	1.11 (1.66)	-1.92	0.95 (0.09)	1.05 (0.10)	1.19 (0.24)	0.56
No. of sessions strength	1.58 (0.97)	1.39 (1.03)	1.99*	1.57 (1.08)	1.46 (0.98)	1.02	1.36 (0.08)	1.55 (0.07)	1.61 (0.12)	2.33
Material suitable for performance	4.28 (0.82)	4.24 (0.86)	0.52	4.21 (0.84)	4.28 (0.84)	-0.79	4.32 (0.06)	4.23 (0.06)	4.25 (0.10)	0.61
Satisfaction with performance level	4.14 (0.82)	3.99 (0.88)	1.91	3.96 (0.92)	4.11 (0.82)	-1.66	4.04 (0.07)	4.01 (0.06)	4.32 (0.08)	5.14**
Position	60.60 (92.30)	94.10 (387)	-1.31	35.48 (42.81)	89.56 (309.41)	-1.87	120.10 (408.40)	59.4 (151.90)	23.9 (12.0)	9.31***

Note. [a]Student's T-test for Independent Samples. [b]One-factor ANOVA (Welch). *p < .05; **p < .01; ***p < .001

Significant differences were also found between the female and male categories in the mean age (t = -3.20; p < .01), number of years competing (t = -2.51; p < .05), and number of cycling sessions per week (t = -2.62, p < .01). No significant differences were observed in the number of days or hours of training per week, the number of running sessions, transitions, or weekly strength. No significant differences were observed in the availability of equipment appropriate to the level of training, satisfaction with the level of sports performance, or position in the last competition. The majority of male and female athletes consider that they have adequate equipment for their level of sports performance.

Analyzing the statistical differences in relation to the highest individual sport level in which they have competed (only absolute competitions, do not consider age group tests), significant differences were found in the mean age (F = 33.44; p < .001), in the number of years competing (F = 8.87; p < .001), in the number of training days per week (F = 45.04; p < .001), in the number of weekly training hours (F = 48.54; p < .001), in the weekly number of cycling sessions (F = 17.71; p < .001), in the number of running sessions per week (F = 26.17; p < .001), in satisfaction with the level of sports performance (F = 5.14; p < .01) and in the position in the last competition (F = 9.31; p < .001). However, there were no significant differences in the number of transitions or strength sessions as a function of the maximum level of competition. No significant differences were found in the provision of materials appropriate for the level of performance. Regardless of the maximum level of sports achieved, all athletes in the autonomic, national, and international categories considered that they had adequate equipment for their level of performance.

Beliefs and self-talk

Table 2 shows the significant differences between the two groups in incremental beliefs (t = 2.28; p < .05), with duathletes having higher scores. No significant differences were found in entity beliefs, total belief score, or self-talk as a function of sport type. Significant differences were found between the male and female categories in entity beliefs (t = -2.46; p < .05), with higher scores in the male category than in the female category. However, no significant differences were found among the remaining variables analyzed. No significant differences were observed in beliefs or self-talk according to the maximum level achieved by the athletes.

Table 2
Differences in beliefs and self-talk as a function of sport type, category and competition level.

	Sports			Category			Competition level			
	Duathlon Mean (S.D.)	Triathlon Mean (S.D.)	t^a	Female Mean (S.D.)	Male Mean (S.D.)	t^a	Regional Mean (S.D.)	National Mean (S.D.)	International Mean (S.D.)	F^b
Entity beliefs	2.71 (0.80)	2.75 (0.91)	-0.49	2.56 (0.88)	2.78 (0.83)	-2.46*	2.75 (0.88)	2.73 (0.82)	2.65 (0.87)	0.31
Incremental beliefs	4.56 (0.43)	4.47 (0.48)	2.28*	4.56 (0.44)	4.51 (0.46)	1.15	4.56 (0.45)	4.50 (0.44)	4.49 (0.49)	0.87
Total ability beliefs	3.64 (0.43)	3.61 0.45)	0.70	3.56 (0.46)	3.65 (0.43)	-1.78	3.66 (0.43)	3.62 (0.44)	3.57 (0.47)	0.89
Cognition self-talk	3.51 (0.98)	3.41 (0.96)	1.10	3.59 (0.97)	3.42 (0.97)	1.64	3.33 (1.03)	3.52 (0.89)	3.58 (1.06)	2.29
Motivation self-talk	3.73 (0.99)	3.68 (0.95)	0.56	3.85 (0.94)	3.66 (0.98)	1.83	3.63 (1.02)	3.78 (0.89)	3.65 (1.12)	1.19
Total self-talk	3.62 (0.93)	3.54 (0.89)	0.88	3.72 (0.87)	3.54 (0.92)	1.85	3.48 (0.98)	3.65 (0.83)	3.62 (1.00)	1.62

Note. [a]Student's T-test for Independent Samples. [b]One-factor ANOVA (Welch). *$p < .05$

Linear regression model

Table 3 shows the results of the linear regression analysis of the predictor variables for motivational self-talk. Satisfaction with the level of sports performance (β = 0.11; t = 2.21; p < .05) and incremental ability beliefs (β = 0.11; t = 2.27; p < .05) were found to be positively and significantly associated with the frequency of self-talk in reference to the total frequency of motivational self-talk. The regression model explained 5% of the variance in motivational self-talk (R^2 = .05; F = 2.04; p < .05).

Table 3

Linear regression model for predictor variables of motivational self-talk.

STQmotivation	Estimate	SE	*t*	*p*	β
Age	-0.00	0.00	-0.55	.58	-0.03
Years competing	-0.00	0.01	-0.01	.99	-0.00
Training days per week	0.06	0.05	1.07	.29	0.06
Sports: Triathlon - Duathlon	0.04	0.09	0.46	.65	0.04
Category: Female - Male	0.17	0.11	1.60	.11	0.18
Competition level: National - Regional	0.06	0.12	0.54	.59	0.07
Competition level: International - Regional	-0.12	0.16	-0.73	.47	-0.12
Material suitable for performance	0.03	0.06	0.59	.56	0.03
Satisfaction with performance level	0.13	0.06	2.21	< .05	0.11
Position	-0.00	0.00	-1.00	.32	-0.05
Entity beliefs	-0.03	0.06	-0.57	.57	-0.03
Incremental beliefs	0.24	0.11	2.27	< .05	0.11

						Global Model Test			
	R	R^2	AIC	BIC	RMSE	*F*	gl1	gl2	*p*
Model	.23	.05	1246	1304	0.95	2.04	12	434	< .05

Table 4 shows the results of the linear regression analysis of the predictor variables of cognitive self-talk. Age (β = -0.12; t = -1.99; p < .05) was found to be negatively and significantly associated with the frequency of cognitive self-talk. In contrast, the number of years competing (β = 0.13; t = 2.40; p < .05), satisfaction with the level of sports performance (β = 0.12; t = 2.45; p < .05), and incremental ability beliefs (β = 0.18; t = 3.72; p < .001) were positively and significantly associated with the frequency of self-talk of cognition. The regression model explained 9% of the variance in cognitive self-talk (R^2 = .09; F = 3.44; p < .001).

Table 4

Linear regression model for predictor variables of self-talk cognition.

STQcognition	Estimate	SE	*t*	*p*	β
Age	-0.01	0.00	-1.99	< .05	-0.12
Years competing	0.02	0.01	2.40	< .05	0.13
Training days per week	0.04	0.05	0.80	.43	0.04
Sports: Triathlon - Duathlon	-0.00	0.09	-0.02	.98	-0.00
Category: Female - Male	0.16	0.11	1.50	.14	0.16
Competition level: National - Regional	0.05	0.12	0.43	.67	0.05
Competition level: International - Regional	-0.00	0.16	-0.01	.99	-0.00
Material suitable for performance	-0.02	0.06	-0.37	.71	-0.02
Satisfaction with performance level	0.14	0.06	2.45	< .05	0.12
Position	-0.00	0.00	-1.29	.20	-0.06
Entity beliefs	0.05	0.06	0.87	.39	0.04
Incremental beliefs	0.39	0.10	3.72	< .001	0.18

						Global Model Test			
	R	R^2	AIC	BIC	RMSE	*F*	gl1	gl2	*p*
Model	.30	.09	1230	1288	0.93	3.44	12	434	< .001

Finally, Table 5 presents the results of the linear regression model for total self-talk. Satisfaction with the level of sport performance (β = 0.12; t = 2.48; p < .05) and incremental ability beliefs (β = 0.16; t = 3.19; p < .01) were found to be positively and significantly associated with the frequency of self-talk referred to the total frequency of self-talk. The regression model explained 7% of the variance in total self-talk (R^2 = .07; F = 2.79; p < .001).

Table 5

Linear regression model for predictor variables of total self-talk

STQtotal	Estimate	SE	*t*	*p*	β
Age	-0.01	0.00	-1.35	.18	-0.08
Years competing	0.01	0.01	1.26	.21	0.07
Training days per week	0.05	0.05	1.00	.32	0.05
Sports: Triathlon - Duathlon	0.02	0.09	0.23	.82	0.02
Category: Female - Male	0.17	0.10	1.66	.10	0.18
Competition level: National - Regional	0.06	0.11	0.52	.60	0.06
Competition level: International - Regional	-0.06	0.15	-0.40	.69	-0.07
Material suitable for performance	0.01	0.05	0.12	.91	0.01
Satisfaction with performance level	0.13	0.05	2.48	< .05	0.12
Position	-0.00	0.00	-1.22	.22	-0.06
Entity beliefs	0.01	0.05	0.15	.88	0.01
Incremental beliefs	0.32	0.10	3.19	< .01	0.16

						Global Model Test			
	R	R^2	AIC	BIC	RMSE	*F*	gl1	gl2	*p*
Model	.27	.07	1180	1237	0.88	2.79	12	434	< .001

DISCUSSION

The aim of this study was to determine the frequency of cognitive and motivational self-talk in endurance sports, such as duathlon and triathlon, at various levels of competition—from regional to international—in both male and female athletes. Additionally, this study sought to explore the potential relationship between self-talk and implicit beliefs about sports ability. The main hypothesis proposes that the frequency of cognitive and motivational self-talk is associated with incremental ability beliefs and satisfaction with sports performance. The results support this hypothesis, providing relevant insights into the use of automatic self-talk among endurance athletes. These findings align with those of previous studies on self-talk and sports performance (Latinjak et al. 2018; Zourbanos et al. 2014).

First, it was found that the total frequency of self-talk was positively associated with both incremental ability beliefs and satisfaction with performance. This suggests that athletes who frequently engage in both motivational and cognitive self-talk tend to be more satisfied with their performance. Additionally, these athletes perceive that their performance can improve with effort and regular practice. The importance of implicit ability beliefs in sports has been confirmed by various studies (Biddle et al., 1999; Chian & Wang, 2008; Jowett & Spray, 2013; Pires et al, 2022; Wang & Biddle, 2001), which also indicate that these beliefs can be key determinants in acquiring motor skills (Cury et al., 2006). Moreover, existing evidence suggests that self-talk has beneficial effects on cognitive functions, particularly on concentration (Tod et al., 2011), attentional focus (Hatzigeorgiadis, 2006), and thought processes (Latinjak et al., 2011).

When distinguishing between cognitive and motivational self-talk, motivational self-talk was positively associated with satisfaction with performance and incremental ability beliefs. Cognitive self-talk also showed a positive association with satisfaction, incremental beliefs, age, and number of years of competition. This finding is noteworthy, indicating that regardless of the sport—whether duathlon or triathlon—athletes who use motivational self-talk more frequently tend to be more satisfied with their performance and have stronger incremental beliefs. In

other words, athletes who believe that their sports ability can be improved through daily practice and effort are more likely to engage in automatic motivational self-talk. Previous research has shown that motivational self-talk can increase arousal levels (Theodorakis et al., 2000), reduce cognitive anxiety (Hatzigeorgiadis et al., 2009), boost confidence (Hatzigeorgiadis et al., 2008), and help sustain effort (Díaz-Ocejo & Mora-Merida, 2013). Using specific psychological strategies may help athletes resist slowing down or stopping, which is crucial in endurance sports like triathlon. Indeed, motivational self-talk may relate to athletes' desire to push through when performing at a high intensity or for extended durations (Meijen et al., 2023).

Other findings of our study revealed significant differences based on the highest level of performance achieved. International athletes trained more days and hours per week and had more cycling and running sessions than did regional athletes. These international-level athletes had also been competing for more years despite being relatively younger. They reported greater satisfaction with their performance and achieved better rankings in the most recent competitions. However, no differences were found in the number of weekly sessions for transitions or strength training, or in the availability of adequate equipment for performance.

Duathletes scored higher on incremental beliefs than triathletes, whereas male athletes had higher scores on entity beliefs than female athletes. Regardless of sex or competition level, both duathletes and triathletes exhibited a high frequency of internal dialogue (Lepers, 2019; Olmedilla et al. 2018). This underscores the importance of athletes' understanding of their thought processes and components of Van Raalte et al.'s (2016) internal model. Being aware of their automatic self-talk (Christoff et al., 2011; Latinjak et al., 2014; Zourbanos et al., 2009), athletes can effectively utilize strategic self-talk (Hatzigeorgiadis et al., 2014; Johnson et al., 2004), can help manage emotions, reduce anxiety (Jaenes & Caracuel, 2016), improve concentration (Galanis et al., 2016), and prompt appropriate actions (Latinjak et al., 2009).

Further research is needed to validate the findings of this study, as it is one of the first to examine the influence of self-talk frequency and implicit ability beliefs in endurance sports like duathlon and triathlon. Future interventions could focus on using instructional self-talk with keywords to assist athletes in specific situations during competition. Additionally, investigating the relationship between self-talk and other psychological skills across various sports, categories, and age groups would be valuable (Carron & Eys, 2012; Ferris-Valero et al., 2020), especially because psychological interventions have been shown to moderately improve sports performance (Brown & Fletcher, 2017).

One limitation of this study is the lack of analysis of self-talk use during endurance events. Triathlon and duathlon involve multiple segments with transitions, so it would be valuable to explore different types of self-talk during various phases of the competition, including spontaneous and directed self-talk (Latinjak et al., 2014; Van Raalte et al., 2016). This approach would allow for a comparison of the effects of different types of self-talk on performance in each segment, helping to identify the most effective strategies for specific situations and actions in various sports.

CONCLUSION

This study represents a preliminary attempt to analyze the role of internal dialogue and implicit ability beliefs in triathletes and athletes. The results indicated that the frequency of motivational and cognitive self-talk is associated with incremental beliefs about sports ability and satisfaction with performance. These findings highlight the importance of educating athletes about the significance of self-talk and its practical applications. By understanding that athletes' abilities can be enhanced through effort, training, and practice, they may positively influence their motor skills and overall performance.

PRACTICAL APPLICATIONS

The results of this study underscore the importance of self-talk and its effects on satisfaction and sports performance. By implementing these findings in applied practices, athletes' performance and experience can be enhanced, thus contributing to a more positive and productive sports environment. Collaboration among different

sports professionals is key to maximizing the impact of these strategies.

AUTHOR CONTRIBUTIONS

S.O.V. and J.C.J. conceived the study, designed the questionnaire and collected the data, and wrote the initial manuscript. D.A. and M.J.A. analyzed the data, wrote the results, and provided critical revisions on the successive drafts. All authors accepted the final version of the article.

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