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Social Appearance Anxiety as a Mediator between Self-Confidence and Self-Reported Athletic Performance

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ABSTRACT

Objective: This study examined associations among self-confidence, social appearance anxiety (SAA), and self-reported athletic performance, including the proposed mediating role of SAA.

Methods and Materials: A cross-sectional correlational study was conducted among 140 athletes recruited through purposive sampling across Sumatra, Indonesia. Participants had at least one year of formal training and provincial-level competitive experience. Data were collected using adapted measures of self-confidence, SAA, and subjective athletic performance. Partial least squares structural equation modeling (PLS-SEM) was performed using SmartPLS 4.

Findings: Self-confidence was negatively associated with SAA (β = −.576, p < .001, 95% CI [−.677, −.453]) and positively associated with self-reported athletic performance (β = .226, p = .029, 95% CI [.024, .430]). The association between SAA and performance was nonsignificant (β = .143, p = .164, 95% CI [−.059, .347]). The indirect association between self-confidence and performance through SAA was also nonsignificant (β = −.082, p = .168, 95% CI [−.200, .035]), indicating no statistical support for mediation. The model explained 33.2% of the variance in SAA (R^2 = .332) but only 3.4% in self-reported performance (R^2 = .034).

Conclusion: Higher self-confidence was associated with lower social appearance anxiety and more favorable perceived athletic performance. However, SAA did not significantly mediate this association. The cross-sectional design and limited explained variance warrant cautious interpretation.

Keywords: Self-Confidence, Social Appearance Anxiety, Athletic Performance, Athletes, Structural Equation Modeling, Indonesia.

Introduction

Athletic performance reflects physical preparation, technical and tactical skills, health, and psychological processes. Research on health systems in high-performance sport and the interplay of nutrition, body composition, and performance illustrates this broader context (Drew et al., 2023; Martín-Rodríguez et al., 2024). Within sport psychology, self-confidence has received particular attention as a correlate of performance, including in meta-analytic work (Jekauc et al., 2025). However, a positive association does not establish that confidence alone determines competitive outcomes.

Anxiety in sport is also multidimensional. Social appearance anxiety (SAA) refers to fear of negative evaluation concerning one's overall appearance and is distinct from general competitive anxiety (Hart et al., 2008). Athletes may encounter scrutiny from spectators, media, peers, and social platforms. Research on media and elite athletes' accounts of sport-related social pressures supports examining these experiences alongside performance concerns (Ng et al., 2024; Stoyel et al., 2021). Appearance-related distress can also carry culturally shaped meanings, making local context relevant to its interpretation (Seyed Alitabar, 2025).

Self-confidence and self-efficacy are related constructs but should not be treated as interchangeable. Research in elite athletes has examined their relationship alongside emotional intelligence (Çetin et al., 2021). Other work has considered confidence in relation to perfectionism and anxiety in young athletes (González-Hernández et al., 2024). Indonesian research has also investigated confidence, anxiety, stress, motivation, and goal setting among young swimmers (Afifah et al., 2025). These studies motivate examining the relationships among psychological variables while preserving distinctions between different forms of confidence and anxiety.

A plausible hypothesis is that athletes with greater self-confidence report less concern about others' evaluation of their appearance, and that such concerns are associated with perceived performance. However, the specific role of SAA cannot be inferred from studies of competitive trait anxiety, self-esteem, or emotional regulation. For example, differences in competitive anxiety have been examined across sport types and gender (Sanader et al., 2021). Psychometric investigation of the SAAS among adults who exercise further emphasizes the importance of assessing this construct in the population under study (Donofre et al., 2023).

The present study examined self-confidence, SAA, and self-reported athletic performance among athletes in Sumatra, Indonesia. It tested four hypotheses: a positive association between self-confidence and performance (H1); a negative association between self-confidence and SAA (H2); a negative association between SAA and performance (H3); and an indirect association between self-confidence and performance through SAA (H4). The proposed model concerns statistical mediation, not moderation. Because the data are cross-sectional, the directional paths do not establish temporal ordering or a causal mechanism (Maxwell & Cole, 2007).

Methods and Materials

Study Design and Participants

A quantitative cross-sectional mediation design was used. A purposive sample comprised 140 athletes from different regions of Sumatra, Indonesia. Eligibility required at least one year of formal training and competitive experience at the provincial level. There were 68 male athletes (48.6%) and 72 female athletes (51.4%). Most reported three years of training (n = 101, 72.1%). Sixty-four athletes (45.7%) reported more than five competitive achievements, 51 (36.4%) reported one to five, and 25 (17.9%) reported none.

For descriptive purposes, athletes were grouped into team sports (n = 90, 64.3%) and individual/combat sports (n = 50, 35.7%). The team group included volleyball, futsal, soccer, hockey, badminton doubles/team events, sepak takraw, and basketball. The individual/combat group included taekwondo, karate, wushu, pencak silat, boxing, track and field, swimming, archery, roller skating, gymnastics, and lion dance. These groupings describe the sample; sport-specific

or between-group structural effects were not tested. Participant characteristics are presented in Table 1.

Table 1

Participant characteristics

Category	Sub-category	n	Percentage (%)
Sex	Male	68	48.6%
Sex	Female	72	51.4%
Training Experience	1 Year	28	20.0%
Training Experience	2 Years	11	7.9%
Training Experience	3 Years	101	72.1%
Competitive Achievement	Never	25	17.9%
Competitive Achievement	1–5 Times	51	36.4%
Competitive Achievement	>5 Times	64	45.7%
Sport Type	Team Sports	90	64.3%
Sport Type	Individual/Combat	50	35.7%

Note. N = 140. Percentages are rounded to one decimal place. Competitive achievement is the number of reported achievements; sport categories reflect the study grouping.

Measures and Cultural Adaptation

The self-confidence and SAA items used five response options from 1 (strongly disagree) to 5 (strongly agree). Performance items used five options from 1 (very dissatisfied) to 5 (very satisfied). The adaptation process included forward translation, comparison and synthesis of translations, back-translation, and contextual item selection. Two linguists and a sport psychologist were involved in adapting the confidence measure. Participants were assured anonymity to encourage candid self-report.

Self-confidence was assessed using a 14-item Lauster-based measure adapted with reference to Indonesian work on body image and confidence (Maulida & Astuti, 2025). Eleven items were removed during measurement-model refinement because their outer loadings were below .70; SC3, SC5, and SC6 remained. This substantial reduction narrows the construct represented by the final score. The final model is therefore interpreted as a brief adapted confidence measure rather than an established comprehensive measure of sport-specific confidence.

SAA was assessed with an adapted Social Appearance Anxiety Scale (SAAS; Hart et al., 2008). The original measure contains 16 items. Thirteen adapted items were considered in this study, and eight indicators (AX6–AX13) remained in the final model. A pilot involving 20 athletes assessed the comprehensibility and face relevance of the Indonesian wording. This pilot does not by itself establish the full psychometric validity of the adapted form.

Self-reported performance was measured using a six-item adaptation of the Athlete's Subjective Performance Scale (ASPS; Nahum et al., 2016). The instrument concerns perceived performance satisfaction, including general performance, contribution, and personal ability. Its original development concerned team sports; applying it to individual and combat athletes therefore requires attention to item relevance. Subsequent Rasch research has examined its functioning and response categories in university team-sport athletes (Lee et al., 2023). The five-category version used here should be treated as an adaptation. It was not validated against objective competition results in the present sample.

Data Analysis

Partial least squares structural equation modeling (PLS-SEM) was conducted using SmartPLS 4.0. The analysis proceeded through measurement-model assessment and structural-path estimation. Outer loadings, average variance

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extracted (AVE), Cronbach's alpha, and composite reliability (CR) were examined. Loadings above .70, AVE above .50, and reliability coefficients above .70 were used as reference criteria (Hair et al., 2021). Statistical thresholds were considered alongside the content implications of item deletion.

Discriminant validity was examined using the Fornell–Larcker comparison of square roots of AVE with construct correlations and the heterotrait–monotrait ratio (HTMT) (Fornell & Larcker, 1981; Henseler et al., 2015). A conservative HTMT threshold of .85 was specified. Such criteria provide evidence relevant to construct distinction but do not replace a broader assessment of measurement validity (Rönkkö & Cho, 2022).

Structural results are reported as standardized path coefficients (β), t statistics, p values, and 95% confidence intervals. Statistical significance was evaluated at $p < .05$. The indirect association was the product of the self-confidence–SAA and SAA–performance paths. Bias-corrected confidence intervals were used for the mediation assessment, following resampling-based guidance (Preacher & Hayes, 2008). R^2 and adjusted R^2 summarize the in-sample variance explained in the endogenous constructs; they are not measures of causality or out-of-sample predictive accuracy.

Table 2

Final indicator loadings and reliability estimates

Construct	Item	Loading	Cronbach's α	Composite Reliability (CR)	AVE
Social Appearance Anxiety	AX6	0.789	0.949	0.949	0.700
	AX7	0.843			
	AX8	0.845			
	AX9	0.792			
	AX10	0.854			
	AX11	0.881			
	AX12	0.835			
	AX13	0.851			
Athlete Performance	Perf1	0.842	0.931	0.931	0.692
	Perf2	0.869			
	Perf3	0.841			
	Perf4	0.854			
	Perf5	0.817			

Ethical Considerations

The research protocol was approved by the Institutional Review Board of Padang State University and was conducted in accordance with the Declaration of Helsinki. Anonymity was used to protect participants' identities. The approval identifier and the specific consent procedures were not detailed in the study documentation.

Findings and Results

Measurement Model

The final measurement model contained eight SAA indicators, six performance indicators, and three self-confidence indicators (Table 2). Standardized loadings ranged from .789 to .881 for SAA, .766 to .869 for performance, and .759 to .807 for confidence. The AVE values were .700, .692, and .602, respectively. Corresponding CR values were .949, .931, and .819, and the reported alpha coefficients were .949, .931, and .819. These values satisfy the specified numerical reference criteria, although the extensive confidence-item reduction limits the breadth of the construct.

	Perf6	0.766			
Self-Confidence	SC3	0.760	0.819	0.819	0.602
	SC5	0.807			
	SC6	0.759			

Note. N = 140. AVE = average variance extracted; CR = composite reliability. Reliability and AVE entries apply to each construct. Indicator loadings are standardized. Alpha coefficients are the estimates reported for the final model.

Figure 1 presents the final measurement and structural model. The square roots of AVE exceeded the absolute construct correlations in the reported matrix (Table 3). The reported HTMT values were .103 for SAA–performance and .711 for SAA–confidence, both below .85. The confidence–performance HTMT value was not reported, so the full set of pairwise HTMT comparisons cannot be assessed.

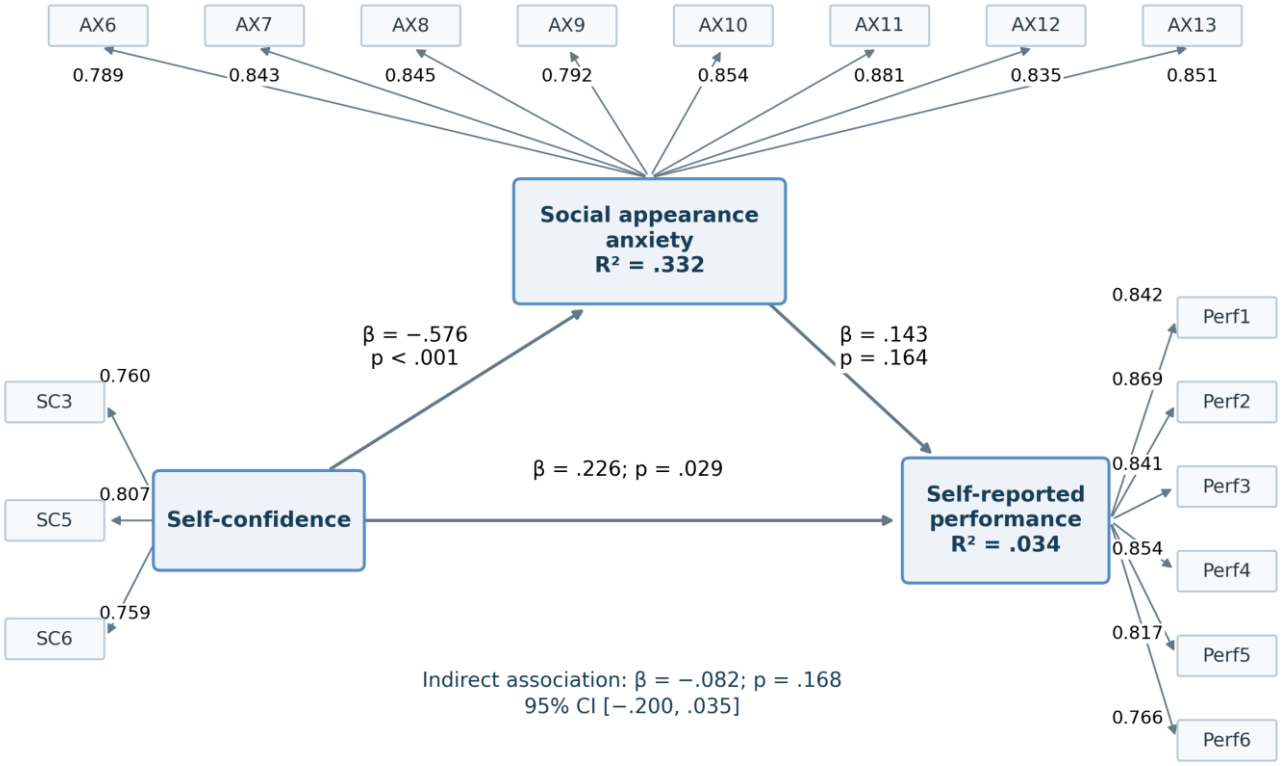


Figure 1

Final measurement and structural model.

Note. Indicator values are standardized loadings; structural arrows show standardized path coefficients and reported p values. R^2 is shown for the endogenous constructs. Path directions represent the hypothesized cross-sectional model and do not establish causal or temporal ordering.

Table 3

Construct correlations and discriminant validity

Construct	SAA	Performance	Self-confidence
SAA	.837	—	—
Performance	.013	.832	—
Self-confidence	−.576	.144	.776

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Note. Diagonal entries are square roots of AVE; lower-triangle entries are construct correlations. Reported HTMT: SAA–performance = .103; SAA–self-confidence = .711. The self-confidence–performance HTMT was not reported. SAA = social appearance anxiety.

Structural Paths and Indirect Association

The direct self-confidence–performance path was positive and statistically significant (β = .226, t = 2.208, p = .029, 95% CI [.024, .430]), supporting H1. The self-confidence–SAA path was negative (β = −.576, t = 8.278, p < .001, 95% CI [−.677, −.453]), supporting H2. These estimates describe conditional associations in the specified cross-sectional model (Table 4).

Table 4

Direct paths and indirect association

Test	Path	β	t	p	95% CI	Decision
H1	Self-confidence → Performance	.226	2.208	.029	[.024, .430]	Supported
H2	Self-confidence → SAA	−.576	8.278	< .001	[−.677, −.453]	Supported
H3	SAA → Performance	.143	1.398	.164	[−.059, .347]	Not supported
H4	Self-confidence → SAA → Performance	−.082	1.379	.168	[−.200, .035]	Not supported

Note. β = standardized coefficient; CI = confidence interval. H4 is the specific indirect association. Confidence intervals are 95% intervals. Statistical decisions refer to the prespecified hypotheses and do not establish causality.

The SAA–performance path was positive rather than the hypothesized negative direction, and its confidence interval included zero (β = .143, t = 1.398, p = .164, 95% CI [−.059, .347]). H3 was not supported. The indirect association through SAA was also not statistically significant (β = −.082, t = 1.379, p = .168, 95% CI [−.200, .035]); thus, H4 was not supported. The findings do not establish that the indirect association is exactly zero or that SAA is beneficial for performance.

Explained Variance

Self-confidence accounted for 33.2% of the in-sample variance in SAA (R^2 = .332, adjusted R^2 = .327). Together, self-confidence and SAA accounted for 3.4% of the variance in self-reported performance (R^2 = .034, adjusted R^2 = .020; Table 5). The latter value indicates limited explanatory power for the performance outcome in this model. The remaining variance includes unmeasured influences, measurement error, and other model limitations; it cannot be attributed quantitatively to specific physical or technical determinants.

Table 5

Explained variance in the endogenous constructs

Outcome	R^2	Adjusted R^2
SAA	.332	.327
Self-reported performance	.034	.020

Note. R^2 represents in-sample explained variance. SAA = social appearance anxiety.

Discussion and Conclusion

This study examined whether SAA statistically mediated the association between self-confidence and self-reported athletic performance. Confidence was negatively associated with SAA and positively associated with perceived performance after accounting for SAA. However, the SAA–performance path and the indirect association were not statistically significant. The principal finding is therefore an absence of evidence for the proposed indirect pathway in this sample, alongside limited explained variance in performance.

The negative confidence–SAA association is consistent with the broader attention given to confidence and evaluative concerns in sport. Research on young athletes has linked confidence with the pattern of perfectionism and

anxiety (González-Hernández et al., 2024). Work on emotional intelligence and confidence also illustrates the relevance of distinguishing related psychological resources (Çetin et al., 2021). Nevertheless, the present association does not show that increasing confidence reduces appearance anxiety. Reverse directionality, shared self-report influences, or other personal and environmental factors remain possible.

The positive confidence–performance coefficient is compatible with meta-analytic research on confidence and sport performance (Jekauc et al., 2025). Its interpretation here is narrower: the outcome was satisfaction with one's own performance, and confidence was represented by three retained items. Shared perceptions or reporting tendencies could contribute to their association. The conditional path also differs from the smaller zero-order construct correlation of .144, because the model includes SAA as an additional predictor. Neither coefficient demonstrates a performance benefit from a confidence-building intervention.

The non-significant SAA–performance estimate should not be interpreted as proof that appearance concerns are unimportant. Its 95% confidence interval includes negative and positive values, and statistical precision is limited by the sample, measurement adaptations, and heterogeneity of sports. Competitive trait anxiety and SAA are distinct constructs, so findings about general sport anxiety cannot be transferred automatically to appearance anxiety (Hart et al., 2008; Sanader et al., 2021). The study also provides no basis for interpreting the positive point estimate as a facilitative effect.

The indirect estimate was negative because the confidence–SAA coefficient was negative while the SAA–performance coefficient was positive. Its confidence interval included zero. This does not identify a causal process or demonstrate that confidence operates primarily through a direct mechanism. Cross-sectional mediation estimates may differ from processes that unfold over time (Maxwell & Cole, 2007). Longitudinal measurements and a defensible temporal design would be necessary to examine whether changes in confidence precede changes in SAA and performance.

The performance R^2 of .034 indicates that the present predictors explain little variation in the self-reported outcome. It does not imply that psychological processes generally explain only 3.4% of athletic success or that physical and technical factors account for the remaining 96.6%. Athletic performance involves many domains, including health, training, nutrition, and sport-specific skills (Drew et al., 2023; Martín-Rodríguez et al., 2024). Their relative contributions were not estimated here, and the low R^2 may also reflect measurement limitations and heterogeneity.

Practical Implications

Athlete support should consider confidence, preparation, and responses to social evaluation without assuming a single performance mechanism. A pressure-training study in women's cricket has examined appraisal, emotional regulation, and confidence, while a systematic review has considered interpersonal development programmes involving coaches and parents (Bengtsson et al., 2024; van Rens et al., 2021). Such work provides possible directions for intervention research; the present observational findings do not establish the effectiveness of a particular programme.

Appearance-related distress can warrant attention even when its relationship with performance is uncertain. Media exposure and social pressures may affect athlete well-being beyond competitive outcomes (Ng et al., 2024; Stoyel et al., 2021). Body-image concerns and rumination have also been examined in relation to somatic symptom severity in adults (Seyed Alitabar & Goli, 2024). That evidence concerns a different population and outcome, but it supports keeping well-being distinct from performance enhancement when considering the significance of appearance-related experiences.

Limitations and Future Research

The cross-sectional design and purposive sample limit causal inference and generalizability. Athletes from heterogeneous disciplines were pooled without tests of measurement invariance or group-specific pathways. The

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ASPS originated in team sports, while this sample included individual and combat athletes; its adapted response categories and cross-sport applicability require further validation (Lee et al., 2023; Nahum et al., 2016). Objective performance measures and coach ratings would help distinguish perceived satisfaction from competitive execution.

The confidence scale retained only three of 14 initial items, creating a substantial content-validity concern. A negatively worded example in the adaptation concerned worry about the future, but detailed item coding and reverse-scoring procedures were not specified. High loadings, AVE, and reliability estimates do not establish that the shortened measure captures the full intended construct. The eight-item SAAS adaptation similarly requires independent validation beyond pilot comprehensibility and the present in-sample measurement assessment (Donofre et al., 2023; Hart et al., 2008).

Reproducibility is further limited by the absence of detailed bootstrap settings, missing-data procedures, and the confidence–performance HTMT value. Confidence intervals for measurement parameters, collinearity diagnostics, and out-of-sample predictive evaluation were not reported. Future research should retain transparent scoring and adaptation records, assess the complete measurement model, and investigate the proposed pathway with repeated observations. These steps would strengthen inference without assuming that a statistically non-significant indirect estimate establishes the absence of a meaningful process.

Conclusion

Among 140 athletes in Sumatra, self-confidence was negatively associated with social appearance anxiety and positively associated with self-reported performance in the specified PLS-SEM model. The SAA–performance path and the indirect association through SAA were not statistically significant. The model explained 33.2% of SAA variance and 3.4% of performance variance. These results do not support the proposed statistical mediation in this sample, but they do not establish causality or the absence of appearance-related effects. Interpretation should account for extensive item refinement, incomplete measurement reporting, heterogeneous sports, and the use of subjective performance ratings. Further longitudinal and measurement-validation work is warranted.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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