The Effect of Self-Confidence on Service Accuracy in Tennis Athletes

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ABSTRACT

This study aims to obtain information on the direct effect of self-confidence on service accuracy among tennis athletes. The study used a quantitative approach with a survey method and simple linear regression analysis (a single-predictor model, with self-confidence as the independent variable and service accuracy as the dependent variable). The subjects were 30 male tennis athletes from West Sumatra, selected through purposive sampling. Self-confidence data were collected using a Likert-scale questionnaire, while service accuracy was measured using the Hewitt Tennis Achievement Test. Self-confidence showed a positive association with service accuracy, explaining $R^2 = 12.1\%$ of its variance; based on the recalculated exact statistics reported in the Results section, this association [▸ see highlighted note in Results — did not reach conventional statistical significance at $\alpha = .05$ ($p \approx .060$) once the reported F-value was corrected]. These findings suggest that stronger self-confidence tends to be associated with better service accuracy, although the strength of the statistical evidence should be confirmed against the original raw dataset before this claim is finalized.

Keywords: self-confidence; service accuracy; tennis athletes; simple linear regression

INTRODUCTION

The service every tennis player hopes for is one that is effective in scoring points, with the ball landing far from the opponent's reach so that it is difficult to return. A good service is delivered with a powerful stroke, a fast ball speed, and a direction that is hard for the opponent to reach, because the combination of power and speed can undermine the opponent's mental state in the fight for points. In professional tennis, the player holding service has an advantage, as they can control the course of play through a strong and fast service. Besides technique and physical condition, a psychological aspect that also influences an athlete's performance is self-confidence. Without adequate self-confidence, an athlete will struggle to achieve high performance, because achievement motivation and self-confidence are closely interrelated. Self-confidence grows along with an athlete's belief in their ability to complete a given task; the higher the achievement previously attained, the greater the self-confidence that develops. This belief, in turn, shapes a sense of self-worth that reinforces the athlete's self-concept, both physically and mentally, as a tennis player.

According to Lardner (2013), from a psychological standpoint the service should be seen as a means of forcing the opponent to play defensively. A service that is powerful, fast, and well directed has the potential to win points up to 75% of the time if performed consistently, commonly known as an “ace”—a service so fast or sharply angled that it is out of reach for the receiver or their racket. In sport psychology, it is often said that winning a few matches can restore self-confidence that had temporarily declined. Greenwald (2009) even considers winning one of the most concrete ways to build self-confidence, although other strategies are still

needed to boost it when it drops. During a tennis match, confident players are seen striking the ball boldly and acting decisively, with accurate strokes and well-coordinated movements. Conversely, many players who can hit the ball well in practice lose that quality once competing—a clear picture of faltering self-confidence.

Self-confidence is defined as the belief in one's own ability to complete a task (Irawadi, 2009). The higher a tennis player's belief in their own ability, the better their performance tends to be in competition. Self-confidence also has a significant correlation with improved athletic performance (Komarudin, 2013). In line with this, Zinsser asserts that peak performance is directly correlated with high levels of self-confidence and successful sporting performance. This view is well founded, since reaching peak achievement in sport is invariably accompanied by numerous challenges and obstacles. Lauster likewise emphasizes that without self-confidence, many problems will arise within a person.

Self-confidence is a key asset for an athlete's progress, since achieving high performance or breaking a personal record must begin with the belief that one is capable of surpassing previous achievements. Weinberg and Gould define confidence as the belief that one can successfully perform a desired behavior. Without full self-confidence, an athlete will struggle to achieve performance, because achievement motivation and self-confidence are interconnected. A positive self-concept also encourages the growth of belief and self-esteem, helping athletes control themselves based on their own reasoning ability in planning and carrying out desired actions.

Cratty noted that athletes generally face tense situations more often than non-athletes, and such tension can trigger anxiety, which can only be managed with adequate self-confidence. Self-confidence fosters a sense of security reflected in calm, decisive behavior free of hesitation or nervousness. The stronger one's self-confidence, the stronger one's emotional security as well. A distorted self-perception—underestimating one's own ability—tends to prevent an athlete from reaching high achievement.

Syahrastani (2010) states that self-confidence in sport is an attitude capable of overcoming difficulties, change, frustration from failure, disturbance, or emotional crises efficiently and with full conviction. Once an athlete's self-confidence has developed, they are able to place value on their self-image, which further reinforces their self-concept, both physically and mentally, as a tennis athlete.

Self-confidence is a key element in achievement motivation and the main factor distinguishing high from low achievement motivation. It thus serves as a driving force for success and is directly linked to an athlete's peak performance, including the ability to free oneself from the pressures encountered in sporting activity. Athletes with optimal self-confidence remain able to stay composed and focused even when trailing in score or facing pressure from spectators, giving them a greater chance of winning against opponents of comparable ability.

Kelly noted that self-confidence is characterized by an attitude that is not arrogant, rude, or overly ambitious, but rather calm, strong, flexible, and gentle. Self-confidence also shapes how athletes interpret their emotional arousal—as excitement or as fear—since arousal is essentially an emotional experience interpreted cognitively. Self-confidence therefore plays an important role in helping athletes achieve performance, and the responsibility for cultivating it lies largely with the coach. Based on the views outlined above, self-confidence in this study is defined as a person's belief in themselves, the ability to value oneself, the ability to exercise self-control, the ability to cope with situations or master oneself, the ability to realize self-worth, and the ability to build a self-image in the effort to improve performance. An athlete with good self-confidence will perform the service technique better and more efficiently, since the service demands concentration and physical composure as the opening stroke that determines how smoothly the rest of the point unfolds. Conversely, an athlete lacking self-confidence tends to become tense, causing the service to go out, hit the net, miss the target, lack power, or even result in an easy loss of points.

METHODS

This study used a quantitative approach with a survey method. The data analysis technique applied was simple linear regression, a technique used to analyze the direct linear relationship between one independent

(predictor) variable and one dependent (criterion) variable. This model was used to determine the direct effect of self-confidence on service accuracy. The study involved two variables: self-confidence (X_1) as the independent variable and service accuracy (Y) as the dependent variable.

The subjects were 30 male tennis athletes from West Sumatra, selected using purposive sampling. Service accuracy was measured by observing the direction in which the ball landed relative to a predetermined target, on a court divided into several numbered zones behind the service box line, following the first bounce inside the service box. A good service is one that hits the intended target and is difficult for the opponent to reach. Operationally, service accuracy in this study refers to an athlete's ability to hit a service precisely on target so that the ball lands within a numbered target zone while also making it harder for the opponent to return the ball. The instrument used was the Hewitt Tennis Achievement Test, as described in Miller (2013). The tennis court is divided into six zones, as shown in Figure 1. The distance at which the ball lands after a service stroke indicates the level of accuracy relative to the target; the zone in which the ball lands determines the score obtained. Each test participant performed ten trials, and the final score was calculated as the sum of the points earned across all ten trials.

Table 1. Service Test Scoring Criteria

Points	Target
1	If the ball bounces inside target 1.
2	If the ball bounces inside target 2.
3	If the ball bounces inside target 3.
4	If the ball bounces inside target 4.
5	If the ball bounces inside target 5.
6	If the ball bounces inside target 6.

Figure 1. Court Marking for the Hewitt Tennis Achievement Test

Source: Measurement by the Physical Educator (Why and How), David K. Miller

The self-confidence instrument was developed by drafting 40 statement items with five Likert-scale response options: SA (Strongly Agree), A (Agree), U (Undecided), D (Disagree), and SD (Strongly Disagree). Instrument calibration was carried out by analyzing pilot data to determine validity and reliability.

Item validity was analyzed using Pearson's product-moment formula, while the validity of the questionnaire was tested using internal criterion analysis, i.e., calculating the correlation coefficient between each item and the total factor score, and then between each factor score and the total questionnaire score. The instrument trial was carried out through the following steps.

Item validity. Item validity was tested using Pearson's Product-Moment correlation formula (Sudjana):

$$r_{xy} = n\Sigma XY - (\Sigma X)(\Sigma Y) / \sqrt{\{[n\Sigma X^2 - (\Sigma X)^2][n\Sigma Y^2 - (\Sigma Y)^2]\}}$$

where r_{xy} = correlation coefficient; n = sample size; X = item score; Y = total score. Instrument validity was determined at a significance level of 0.05; an item was considered valid if the calculated r value exceeded the r table value.

Reliability. The reliability of the self-confidence instrument was tested using the Cronbach's Alpha formula:

$r_{xx} = [k/(k-1)] \times [1 - (\Sigma\sigma_i^2/\sigma_t^2)]$

where r_{xx} = instrument reliability; k = number of items; $\Sigma\sigma_i^2$ = sum of item variances; σ_t^2 = total variance. The strength of the reliability coefficient was classified according to Guilford's criteria as follows: < 0.20 no correlation; 0.20–0.39 low correlation; 0.40–0.69 moderate correlation; 0.70–0.89 high correlation; 0.90–0.99 very high correlation; and 1.00 perfect correlation. Applying this formula to the pilot data (n = [‣ isi jumlah responden uji coba]) yielded a reliability coefficient of Cronbach's α = [‣ ISI NILAI ALPHA AKTUAL, mis. .xx], which is classified as [‣ isi kategori Guilford yang sesuai, mis. "high"] reliability.

RESULT AND DISCUSSION

A description of the research data is presented to give a general picture of the data distribution, including the maximum value, minimum value, range, mean, standard deviation, and variance, processed using descriptive statistical methods. A summary of the statistical calculations is presented in Table 2.

Table 2. Summary of Descriptive Statistics

Description	Self-Confidence (X_1)	Service Accuracy (Y)
Sample size (n)	30	30
Sum	4950	1010
Maximum value	189	40
Minimum value	133	29
Range	56	11
Mean ($\bar{X}$)	165	33.67
Standard deviation (SD)	15.89	2.64
Variance (s^2)	252.62	6.99

The self-confidence data (X_1) show a minimum score of 133 and a maximum score of 189, giving a range of 56. The calculated mean is 165, with a standard deviation of 15.89 and a variance of 252.62. The frequency distribution of the self-confidence data is presented in Table 3.

Table 3. Frequency Distribution of Self-Confidence (X_1)

No.	Class Interval	Abs. Freq.	Rel. Freq. (%)	Cum. Freq. (%)
1	133–142	2	6.7	6.7
2	143–152	4	13.3	20.0
3	153–162	6	20.0	40.0
4	163–172	7	23.3	63.3
5	173–182	6	20.0	83.3

6	183–192	5	16.7	100.0
Total		30	100	100.00

Of the 30 research subjects, 11 (36.7%) obtained self-confidence scores above the group mean, 12 (40.0%) fell below the group mean, and 7 (23.3%) fell within the mean group. This distribution is shown as a histogram in Figure 2.

Figure 2. Histogram of Self-Confidence (X_1)

The Liliefors normality test on the self-confidence data yielded an L_o value of 0.084, while the critical L_o value from the Liliefors table for n = 30 at α = 0.05 is 0.161. Since the calculated L_o is smaller than the table value, the self-confidence data (X_1) is considered normally distributed.

Prior to hypothesis testing, regression assumptions were checked using diagnostic procedures appropriate for simple linear regression. Linearity was assessed with the deviation-from-linearity F-test, which yielded F = 0.674 against a table value of F = 3.44; since the calculated F is smaller than the table value, the regression of X_1 on Y is considered linear. Homoscedasticity of the residuals — i.e., whether the variance of the regression residuals is constant across the range of predicted values — was assessed using a residual-versus-fitted-value scatterplot and the Breusch–Pagan test. [‣ ISI: sisipkan di sini hasil scatterplot residual dan statistik uji Breusch-Pagan yang sebenarnya, mis. "The Breusch–Pagan test yielded $\chi^2(1)$ = ___, p = ___, indicating [homoscedasticity was/was not] violated; the residual plot showed no evidence of a funnel-shaped pattern."]

The regression significance test (F-test) was used to determine whether self-confidence (X_1) significantly predicts service accuracy (Y). Based on the reported correlation between X_1 and Y (r = 0.348, equal to the standardized regression coefficient β for a single-predictor model) and n = 30, the regression yielded R^2 = .121, F(1, 28) = 3.86, p = .060. The unstandardized regression coefficient was b = 0.058 (SE = 0.029, 95% CI [−0.002, 0.118]), t(28) = 1.96, p = .060, with intercept a = 24.13. Using a table/critical value of F(1,28) = 4.20 (α = .05), the calculated F (3.86) is smaller than the critical value — i.e., the effect of X_1 on Y does not reach conventional statistical significance at α = .05, although it is close to the threshold (p = .060).

The results indicate that self-confidence shows a positive association with service accuracy among tennis athletes; based on the recalculated statistics above, this association is of small-to-moderate size (R^2 = 12.1%) but does not clearly reach conventional statistical significance at α = .05 (p = .060). The magnitude of the association between self-confidence (X_1) and service accuracy (Y) corresponds to a standardized coefficient of 0.348, i.e., $0.348^2 \times 100\%$ = 12.1% of the variance in service accuracy is associated with self-confidence, while the remainder is influenced by other factors outside this research model.

These findings are broadly in line with the theoretical view that positions self-confidence as one of the psychological factors related to service success in tennis. As noted by Irawadi (2009) and Komarudin (2013), an athlete's belief in their own ability is associated with the quality of their competitive performance, including the composure and precision that the service demands, given its high concentration requirements. The 12.1% shared variance indicates that self-confidence is, at most, one of several determinants of service accuracy; technique, physical condition, and match experience also play a role in shaping an athlete's overall service performance. Given that the statistical evidence for this association is borderline (p = .060) once the reported test statistics are corrected, this interpretation should be treated as tentative until confirmed against the original raw data; if confirmed, mental training programs aimed at building self-confidence may still be a reasonable complement to technical training, but the present dataset alone does not provide strong confirmatory evidence for that claim.

CONCLUSION

Based on the analysis above, self-confidence shows a positive association with service accuracy among male tennis athletes from West Sumatra, accounting for $R^2 = 12.1\%$ of the variance in service accuracy. However, once the regression statistics are corrected for internal consistency ($F(1,28) = 3.86$, $p = .060$), this association does not clearly reach conventional statistical significance at $\alpha = .05$. [‣ ISI: setelah Anda memverifikasi angka ini dengan data mentah, tuliskan kesimpulan akhir yang sesuai — misalnya "signifikan" jika verifikasi mengonfirmasi hasil berbeda, atau pertahankan kalimat "tidak signifikan secara konvensional, namun mendekati ambang batas" jika angka di atas terkonfirmasi.] These findings nonetheless point to the potential relevance of the psychological dimension — particularly self-confidence — as part of technical training programs aimed at improving tennis athletes' service accuracy, and they highlight the importance of using internally consistent and fully reported statistics (exact F, t, p, SE, CI) in future studies of this kind.

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