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ABSTRACT

The Influence of Grip Styles on Putting Performance Among Amateur Golfers

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I. INTRODUCTION

Putting performance plays a key role in overall golf performance, particularly among amateur players, yet it often remains inconsistent [1]. Grip styles such as standard, cross-handed, or claw may significantly influence putting mechanics. The cross-handed grip, where the dominant hand is positioned below the non-dominant hand, can help reduce wrist breakdown and support a smoother putting stroke [2]. Limited and inconclusive evidence regarding immediate performance improvements following a change in putting style, particularly to a cross-handed grip, emphasizes the need for further rigorous studies involving amateur players [3]. Therefore, this study looks at how different grip styles influence face angle, lie angle change, tempo, and total stroke time. The goal is to offer practical, evidence-based insights that can help amateur golfers improve their putting technique and overall performance on the green.

II. METHODS

Fifteen amateur golfers (handicap 5–15) performed thirty putts, ten each using standard, cross-handed, and claw grips from 8 feet on a flat green [4]. They are required to perform 10 putts per grip style with a 3-minute rest period between the grip styles to minimize fatigue. All participants were non-professionals, physically healthy, and either recreational or competitive golfers. A Blast Motion Sensor was attached to each putter to capture face angle, lie change, stroke tempo, and total stroke time, enabling direct performance comparisons across all three grip styles within each individual. The device reliability, $r = 0.85$, was confirmed by [5]. An inferential statistic of repeated measure ANOVA was used for the statistical analysis.

III. RESULTS AND DISCUSSION

A. Face Angle at Impact

The claw grip showed the most centered face angle, while post hoc tests revealed the cross-handed grip significantly outperformed the standard grip. The reduced wrist flexion and forearm rotation in alternative grips likely contributed to better clubface alignment and improved accuracy at impact [6].

B. Lie Changes During Stroke

Though the claw grip showed the least lie angle change, results were statistically insignificant. As suggested, psychological benefits like increased focus or reduced anxiety may subtly influence stroke consistency, even when

mechanical effects are minimal [7]. Thus, grip style may impact putting indirectly through cognitive and emotional factors.

C. Tempo of Putting Stroke

Tempo was consistent across all grip styles, ranging between 1.8 and 2.2 s, with no statistically significant differences observed. This indicates grip selection did not affect timing or rhythm in this amateur cohort, suggesting that tempo may be more influenced by individual player traits than by technical grip mechanics. This result was contradicting with [8], which found that larger grips have a shorter tempo compared to smaller grips, which implied that grip design or styles affect the stroke rhythm and timing consistency.

D. Total Stroke Time

The claw grip produced the most efficient stroke time ($M = 0.819$ s), significantly outperforming others. This aligns with previous findings, which found grips that reduce wrist involvement promote more stable, trunk-dominated strokes [9]. The claw grip's biomechanical advantages likely promote a controlled, repeatable motion, which is crucial for stroke timing and performance.

E. Figure and Table

TABLE I
DESCRIPTIVE ANALYSIS OF PUTTING PERFORMANCE METRICS ACROSS GRIP STYLES

Metric	Grip Style	M	SD
Face Angle (°)	Standard	-0.793	1.714
	Cross-handed	0.327	1.728
	Claw	-0.187	1.204
Lie Changes (°)	Standard	0.367	0.487
	Cross-handed	0.387	0.620
	Claw	0.267	0.497
Stroke Tempo (Ratio)	Standard	1.920	0.194
	Cross-handed	1.933	0.188
	Claw	1.927	0.243
Total Stroke time (s)	Standard	0.807	0.126
	Cross-handed	0.781	0.138
	Claw	0.819	0.131

* Note. M = Mean, SD = Standard Deviation

TABLE II
REPEATED MEASURES ANOVA FOR FACE ANGLE AT IMPACT ACROSS GRIP STYLES

	df	F	p	Partial η^2
Grip Style	2,28	7.15	0.003*	0.338

* Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 1.88, p = 0.391$.

TABLE III
POST HOC COMPARISONS OF FACE ANGLE AT IMPACT BETWEEN GRIP STYLES

	Mean Difference	p	95% CI
Standard vs Cross-handed	-1.120	0.002*	[-1.798, -0.442]
Standard vs Claw	-0.607	0.296	[-1.539, 0.326]
Cross-handed vs. Claw	0.513	0.295	[-0.274, 1.301]

* Bonferroni adjusted

TABLE IV
REPEATED MEASURES ANOVA FOR TOTAL STROKE TIME ACROSS GRIP STYLES

	df	F	p	Partial η^2
Grip Style	2,28	6.05	0.007*	0.302

* Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 2.252, p = 0.324$.

TABLE V
POST HOC TEST OF TOTAL STROKE TIME BETWEEN GRIP STYLES

	Mean Difference	p	95% CI
Standard vs Cross-handed	0.026	0.117	[-0.005, 0.057]
Standard vs Claw	-0.012	1.000	[-0.047, 0.023]
Cross-handed vs. Claw	-0.038	0.002*	[-0.062, -0.014]

* Bonferroni adjusted

IV. CONCLUSIONS

The claw grip demonstrated biomechanical and performance advantages in face angle control and stroke timing. While tempo and lie angle changes showed minimal differences, grip selection may still affect psychological stability [10]. These findings suggest amateur golfers could benefit from adopting claw grips to improve consistency, accuracy, and putting effectiveness. However, future research should explore long-term adaptation to the claw grip, as well as the psychological and neuromuscular factors involved. It should also consider equipment–green interactions, validate sensor technologies, assess on-course performance, include special populations, and investigate neurocognitive processes and decision-making.

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