

Analysis Project I Answers

Brief Introduction

In any partnership it is important to evaluate the quality of the relationship. A good quality relationship may give birth to a more cohesive partnership that one can view as one unit. These characteristics are crucial factors when considering forming a dyad in competitive sports. The bond that unites the dyad is assumed to be stronger if the individuals in the dyad both consider the partnership cohesive and good in quality. However, in a dyad the individuals may still differ in motivation which can be a factor that shines through the dyad's unity when talking about individual performance in sports. Therefore, I hypothesize the following:

- 1.) The quality of relationship will be a significant predictor of individual performance. Specifically, the better-quality relationships will be associated with a significant increase in individual performance.
- 2.) The sense of cohesion will be a significant predictor of individual performance when controlling for relationship quality. Higher sense of cohesion will lead to better individual performance.
- 3.) I expect individual motivation to be a significant predictor of individual performance when controlling for relationship quality and cohesion. Higher individual motivation will result in higher individual performance. I expect this to have the highest effect size.

Methods

A mixed model was used to model the data, as a substantial portion of the variance in individual performance was accounted for by the dyad ($ICC = 0.44$). The analyses included two level one variables (dyad relationship and dyad cohesion) which are at the dyad (group) level, and the factor of most interest, individual motivation, which is a level one variable. A random intercept was included to account for the difference between subjects who belong to dyads. Mixed models were estimated using maximum likelihood, and effects tested using likelihood ratio.

Three mixed model analyses were ran to evaluate each factor's significance in predicting differences in individual performance. First, dyad's relationship quality was examined to predictor individual differences in performance (model1). Then the dyad's sense of cohesion was used as a predictor, controlling for relationship quality (model2). Finally, individual motivation was evaluated as a predictor when controlling for the other two variables (model3). Effect sizes were calculated by comparing the predictor coefficients to the outcome variable's standard deviation ($M_{IndPerformance} = 3.75$, $SD_{IndPerformance} = 1.17$).

Model 1: $(IndPerformance)_{ij} = b_0i + b_1(DyadRealQuality)_i$

Model 2: $(IndPerformance)_{ij} = b_0i + b_1(DyadRealQuality)_i + b_2(DyadCohesion)_i$

Model 3: $(IndPerformance)_{ij} = b_0i + b_1(DyadRealQuality)_i + b_2(DyadCohesion)_i + b_3(IndMotivation)_{ij}$

Results

In Appendix, a histogram of individual performance shows a slightly right skewed but within the normal range distribution of scores and thus errors can be assumed normally distributed (Figure 1). Table 1 shows the descriptive statistics of all variables included in the analyses.

The results of the first model showed that dyad relationship quality significantly predicted individual performance ($\chi^2(1) = 17.77, p < .001$). One score higher evaluations resulted in a .65 score increase in individual performance ($B = .65, SE = .15, t(139) = 4.50$), which is a medium effect. Model 2 showed that dyad cohesion was a significant predictor of individual performance when controlling for relationship quality ($\chi^2(1) = 16.09, p < .001$). An additional score in dyad cohesion resulted in a .67 increase in individual performance ($B = .67, SE = .16, t(139) = 4.25$), which is also a medium effect. Finally, the third model predicting individual motivation on individual performance when controlling for the other two factors showed a significant result ($\chi^2(1) = 12.58, p < .003$). One score increase in individual motivation resulted in a .06 score increase in individual performance ($B = .06, SE = .02, t(139) = 3.63$), which is a small effect.

Brief Discussion

When predicting individual performance in an Olympic dyad, two dyad level and one individual level factors were considered for this analysis. The first hypothesis of dyad stated that relationship quality would be a significant predictor of individual performance, and this was confirmed. Better relationship quality of the dyad resulted in better individual performance. Additionally, higher cohesion in a dyad also resulted in better individual performance, which confirms the second hypothesis. These two group-level variables showed to play an important role in predicting individual performance with a medium effect. The question of outermost interest was whether individual motivation predicts individual performance when controlling for dyad-level variables. Indeed, it was found that higher individual motivation showed higher individual performance. This effect was small, not as high as it was predicted. Therefore, when predicting the individual performance of Olympic dyads, dyad-level factors like relationship quality and cohesion play an important role. However, individual motivation beyond these dyad-level variables can further predict individual performance. This can be viewed as that the people's motivation inside the dyads can outshine the importance of the dyad regardless of the quality or cohesion of the dyad.

Appendix

Descriptive Statistics

Variables	<i>N</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Individual Performance	190	3.75	3.90	1.17	-.40	5.90
Individual Motivation	190	16.30	17.35	4.85	3.90	25.80
Dyad Relationship Quality	190	3.93	3.95	.72	2.30	5.70
Dyad Cohesion	190	4.07	4.15	.63	2.50	5.35

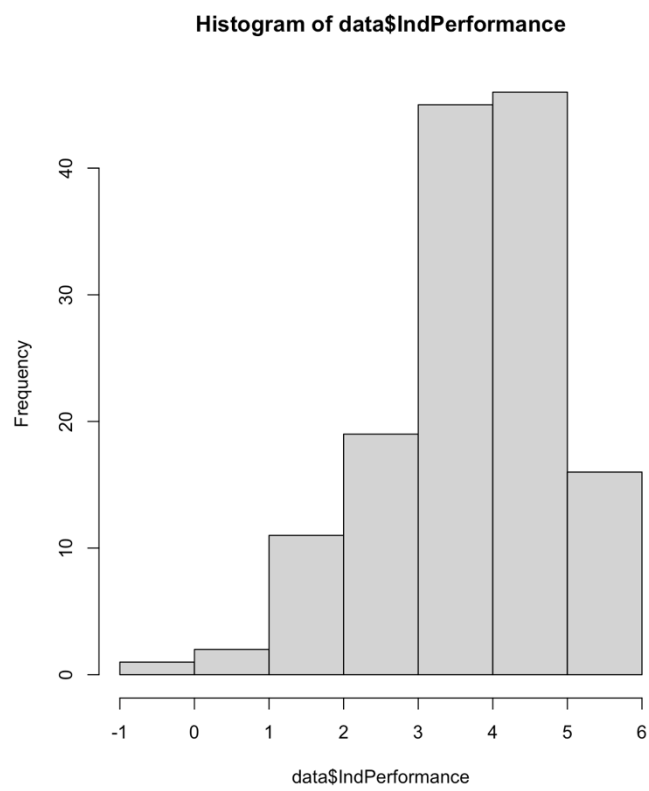


Figure 1. Histogram of the dependent variable, individual performance.