Chess, Handshakes, and Post-Conflict Behavior

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Extensive research has been done to understand post-conflict behavior in primates in the context of both human and primate sociability. Post-conflict behavior likely helps preserve valuable relationships in accordance with the Valuable Relationships Hypothesis (VHR). In humans, post-conflict reconciliation has been demonstrated in competitive physical sports. This experiment attempts show similar findings in the context of chess, especially focusing on the game outcome and the game duration. The experiment examines the effect of game length and outcome on the duration of handshake contact in 51 games in the FIDE 2022 Candidates Tournament. The experiment finds no correlations.

1 INTRODUCTION

1.1 Post Conflict Reconciliation

De Waal describes two solutions to maintain friendship despite fierce competition: tolerance and reconciliation. Tolerance prioritizes friendship and reduces competition, while reconciliation prioritizes competition, and salvages friendship afterwards. De Waal argues that together, tolerance and reconciliation form a 'highly developed cooling system that prevents overheating, explosion, or disintegration of the social machinery.' Primates act much like 'human families, many of which are able to cohere... in spite of being veritable battlegrounds.' [de Waal 1989]. Since 1979 when de Waal first published his observations, the behavior has been verified using the PC-MC method [Preuschoft et al. 2002][Watts 2006]. The notable behaviors that de Waal describes include: 'kiss', 'embrace', 'submissive vocalization', 'touch', 'hold-out-hand'. Reconciliation among non-human primates seems strikingly human.

1.2 VRH

The Valuable Relationships Hypothesis (VRH) posits that relationships vary in nature and value. Thus maintaining such relationships should have a proportional derivative value. Reconciliation improves relationships; it reduces aggression and fear from the aggressor and subordinate in macaques [Cords 1992]. Naturally, some relationships are more important. Mutually grooming, allied Chimpanzees, and 'friends' are more likely to reconcile post conflict [Watts 2006] [Preuschoft et al. 2002]. In humans, stronger men are more likely to receive post-conflict conciliatory behavior because the immense risk/cost of fighting [Brown and Neiswender 2022]. Additionally, 'the instrumentality of achieving the participants' goals increases their willingness to make a costly apology,' and they reconcile more with valuable partners [Ohtsubo and Yagi 2015]. Taken together, these suggest humans and primates similarly reconcile to preserve valuable relationships per the VRH and de Waal's original observations.

In the context of chess, perhaps the game models conflict and voluntary post-game contact models conciliatory behavior. This framework is used by professor Benenson in a similar study where post-game contact is a measure of reconciliation [Benenson and Wrangham 2016].

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2 HYPOTHESIS

The general topic is post-conflict reconciliation. The big question is whether the length/intensity and outcome of conflict affects the degree of reconciliation. The specific question looks at chess: the length/intensity is measured in the number of moves, the outcome is whether draw occurred or not, and reconciliation is measured by handshake duration. Therefore, the specific question is whether the length/intensity and outcome of chess games affects the duration of contact during post-game handshakes.

I suspect drawn games results in shorter handshakes. If handshakes serve to mend relationships, then games with a winner and loser might strain the relationship more, thus requiring increased reconciliation in the handshake. The secondary hypothesis is that longer games similarly represent longer/more intense conflict and also require more reconciliation and a longer handshake.

3 METHODS

3.1 Definitions

(1) **handshake duration:** intentional hand-to-hand contact time between adversaries, beginning and ending on physical contact. Handshakes were the only post-game contact observed in the footage. There was no ambiguity.
(2) **post-game:** after the last move before either player leaves the tournament room.
(3) **outcome (win/loss/draw):** there is no distinction between white winning and white losing. This is a binary metric if there is a tie or not.
(4) **game length:** number of moves as defined in chess. This metric was used because there is 2 hours and 1 hour before the 40th and 60th moves, and 15 minutes + 30 seconds for move 61 onwards. Due to the non-uniformity of the timing scheme, the number of moves seemed a simpler/cleaner metric for intensity of conflict.

As noted previously, studies such as Benenson's have similarly used post-game contact to measure reconciliation with promising results. Game length and the outcome seem to be reasonable metrics

for the intensity and outcome of the conflict, directly informing our hypothesis.

3.2 Data Collection

Data was collected by watching all the rounds of the tournament that were posted by FIDE (the International Chess Foundation) on Youtube [chess 2022]. The tournament has 14 rounds of 4 games. Of the 56 games, 5 ended during an ad resulting in no footage. These missing games are assumed to not confound the experiment because they were evenly interspersed throughout the stream (though not quantitatively shown).

To record contact, the video was played at 0.25x speed for increased accuracy, and the exact contact duration was determined by the observer's best judgement; these times are reported and the actual times are a quarter. All observed games finished and had handshakes. Corresponding data (game length, result, etc) was from ChessBase. [ChessBase 2022].

4 RESULTS

4.1 Game Length vs Handshake Duration

A linear regression shows a non-significant negative correlation between game length and handshake duration; the evidence does not support the original hypothesis due to the weak correlation ($R^2 = 0.0116$).

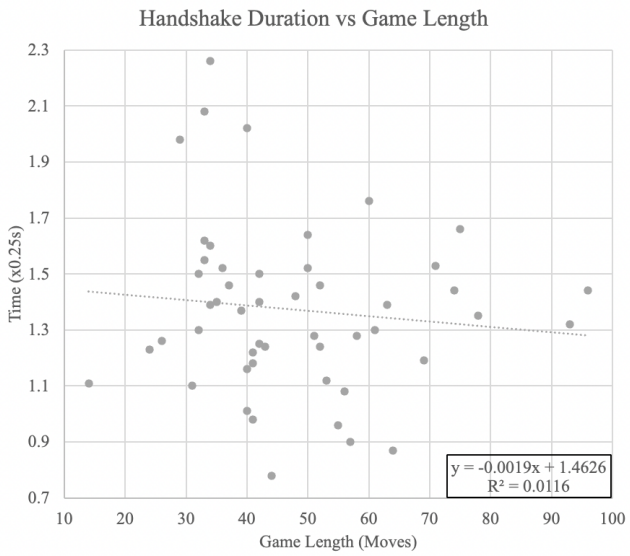

Fig. 1. The effect of the number of moves in a game on average handshake duration

4.2 Game Outcome vs Handshake Duration

Similarly, no significant difference between the handshake duration of winning ($\mu = 1.33$) and drawn ($\mu' = 1.41$) games were found, according to a two-tailed equal-variance difference-in-means t-test ($p = 0.34$). In contrast to the hypothesis, drawn games have slightly longer handshakes (though the data is not statistically significant).

4.3 Additional Data Summary

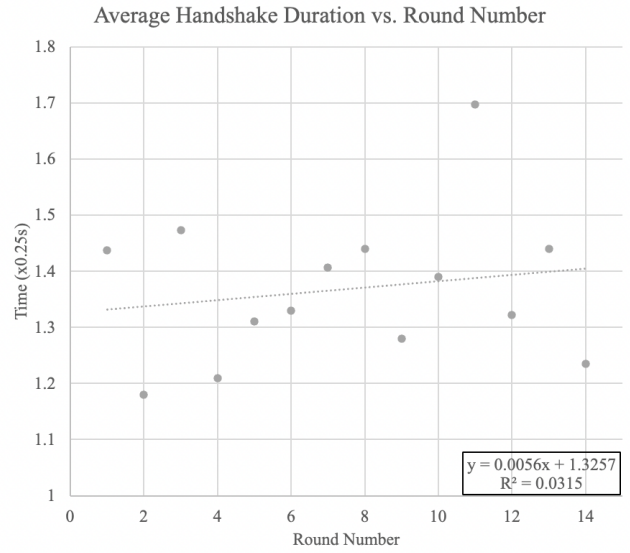

Fig. 2. The effect of the round number on average handshake duration

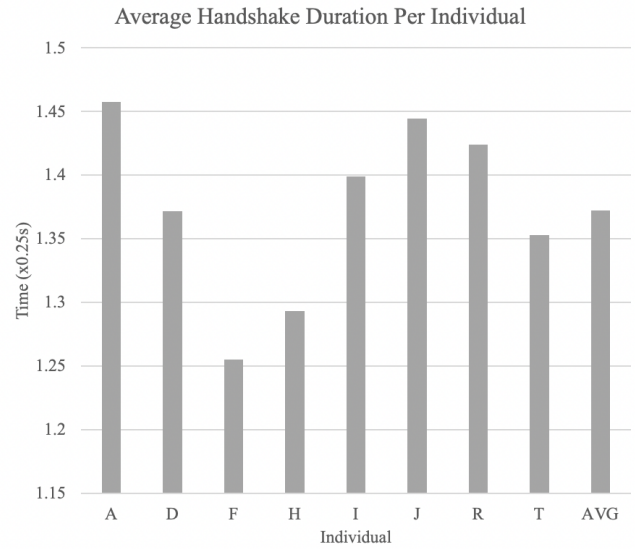

Fig. 3. The average handshake duration per individual

5 DISCUSSION

The data suggests increased game length and imbalanced outcomes do not (or negatively) affect handshake duration. In terms of the larger experiment, this does not support the idea that conflict intensity requires more reconciliation or that imbalanced outcomes requires more reconciliation. I speculate on two new hypotheses for future testing.

5.1 Contact Hypothesis

While chess is a contest, perhaps it is different from physical contests such as tennis or boxing. Perhaps post-conflict reconciliation is needed, but the outcome of a chess game is far removed from direct, physical, male-to-male aggression (the chess players were male) such that the severity of the conflict is not coded in the duration or outcome.

Recall that reconciliation is stronger towards stronger male chimps [Brown and Neiswender 2022]. In chess, perhaps the same concept holds except strength is skill-based. Thus, game length and outcome would not necessarily correspond to how the men gauged eachothers strength (for example cautious, longer games are a sign of weakness), affecting the results.

5.2 Too Soon Hypothesis

Observations made by de Waal and others show that after conflict chimpanzees distance themselves from each other and only reconcile after some time [de Waal 1989][Preuschoft et al. 2002]. In chess, handshakes occurs almost immediately after ending moves. Perhaps the same goes for humans; players are not ready to process the outcome and the implications for the relationship. Therefore, there is no (or a negative) correlation if the reconciliation is forced too soon after conflict.

In the evolutionary context, perhaps it is vital for a primate to have a clear idea of when the conflict has ended, and the reconciliation has begun. Otherwise, the subordinate may risk further injury or negative consequences if the aggression continues. Therefore, reconciliation is more tentative immediately after fierce conflict.

5.3 Limitations

There are many possible limitations. One possible limitation is statistical analysis. The Candidates' Tournament consists of only 8 players who play a series of 54 games. The games are sequential, and perhaps not independent samples. Fig 2 shows the effect of round number on handshake duration.

Moreover, the experiment is sensitive to outliers because while there are many samples, these samples are only over the 8 tournament players. Individual differences could be overshadowing the effect of the intended independent variables. Fig 3 shows the differences in the handshake durations for each player.

6 DATA

All experiment data is publicly accessible on Github. (Word count ≈ 1288 of raw paragraph text).

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