

Title	ゲーム洗練度の理論：サッカーとチェスの比較
Author(s)	樋口, 土生
Citation	
Issue Date	2013-09
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/11487
Rights	
Description	Supervisor:飯田弘之, 情報科学研究科, 修士

Game-Refinement Theory in Sports: Football and Chess Compared

Tadaki Higuchi (1110049)

School of Information Science,
Japan Advanced Institute of Science and Technology

August 8, 2013

Keywords: Football, Chess, Game Refinement, Game resemblance.

Football is often compared to chess, but football is team sports and chess is two-person board game. Both are enormously popular games: the television audience of the FIFA World Cup is tenfold that of the Olympics. Chess is played by an estimated three hundred or five hundred million players. We have tried disassembling and reassembling each game from various aspects. We noticed both games have a preponderance of draw games and other similar dynamics. Our research is based on an examination of rules, strategy, history, game refinement, and average draw rates.

First, we research each game's rules, history and strategy. Modern-day football was derived from the same root game as rugby, with some significant differences such as the use of hands, and the offside rule. The offside rule of football once disallowed forward passes, but evolved into the rule of three players offside and later two players offside. An ancient Indian strategy game called chaturanga is the common ancestor of the board games chess, xiangqi, and shogi. The different versions arose with influence from different cultures. Chess improved the efficiency in piece movement so that some pieces became stronger, also adding special moves en passant and castling. Rule changes precede tactics changes in gaming. For example when the offside rule changed, the population of forward players between middle fielders and defenders decreased.

In this study, we applied the game-refinement theory to game statistics of football and chess to investigate the acceleration of information. We found that chess, with its historical similarity with xiangqi and Go, was readily quantifiable. However sports such as football could not be easily quantified for verification under the model.

For football, we verified based on the idea of the "small game." That is, rather than considering amalgamated data for whole games, we observed data for shots as "small games" within the context of the larger 90 minute-game. As a result we found that football and chess held similar values for game refinement. We also notice some similar features of players and pieces, draw ratio, and high game refinement.

In conclusion, our study found some similarity for football and Chess.