



To kill or not to kill: Competition, aggression, and videogames, in adolescents

Alexander Ask (B.Ec., B.A.(Hons))

**Thesis submitted for the degree of Doctor of Philosophy,
University of Adelaide, 1999**

Table of Contents

	<u>PAGE</u>
<u>ACKNOWLEDGMENTS</u>	<u>II</u>
<u>TABLE OF CONTENTS</u>	<u>III</u>
<u>LIST OF FIGURES</u>	<u>VIII</u>
<u>LIST OF TABLES</u>	<u>IX</u>
<u>ABSTRACT</u>	<u>XI</u>
 <u>CHAPTER 1: COMPETITION IS LINKED WITH AGGRESSION</u>	 <u>1</u>
1.1 OVERVIEW	1
1.2 TYSON SINKS TEETH	2
1.3 STRUCTURE OF THIS THESIS	4
1.4 CONCEPTUALISING THE COMPETITION-AGGRESSION LINK	6
1.5 SUMMARY	10
 <u>CHAPTER 2: DEFINITIONS, CONCEPTS, AND CONSTRUCTS</u>	 <u>11</u>
2.1 INTRODUCTION	11
2.2 COOPERATION, COMPETITION, AND CONFLICT	12
2.3 ANGER, HOSTILITY, AND AGGRESSION	18
2.4 VIDEOGAME PLAY AS AGGRESSIVE BEHAVIOUR: THE 'KILL RATIO'	26
2.5 SUMMARY AND CONCLUSIONS	30
 <u>CHAPTER 3: LITERATURE ON THE COMPETITION-AGGRESSION LINK</u>	 <u>33</u>
3.1 INTRODUCTION	33
3.2 METHODOLOGY	34
3.2.1 CRITERIA FOR ENTRY	34
3.2.2 SEARCH PROCESS AND RESULTS	35
3.2.3 CRITERIA FOR ANALYSING THE LITERATURE	37
3.3 REVIEW OF THE LITERATURE ON THE COMPETITION-AGGRESSION LINK	39

3.3.1 LABORATORY-BASED STUDIES	39
3.3.2 TAYLOR'S COMPETITIVE REACTION TIME PROCEDURE	59
Introduction	59
Personality, Individual, and Gender, Differences	64
Situational factors	86
Methods for reducing competitive aggression	102
Summary and conclusions	111
3.3.3 NON-LABORATORY STUDIES	114
3.3.4 SUMMARY OF THE FINDINGS	133
3.4 CONCLUSIONS	138

CHAPTER 4: THEORIES OF THE COMPETITION-AGGRESSION LINK 141

4.1 INTRODUCTION	141
4.2 ANDERSON'S MODEL OF AGGRESSION	142
4.3 PATHWAYS POTENTIATED BY COMPETITIVE SITUATIONS	144
4.4 WHICH THEORY IS THE BEST EXPLANATION?	150
4.5 CONCLUSIONS	152

CHAPTER 5: MALE AND FEMALE ADOLESCENT VIDEOGAME PLAY 153

5.1 OVERVIEW	153
5.2 STUDY 1: COMPETITION AND COOPERATION SCHEMAS (A QUESTIONNAIRE STUDY)	155
5.2.1 INTRODUCTION	155
5.2.2 METHODOLOGY	157
Participants.	157
Materials.	157
Procedure.	158
5.2.3 RESULTS	158
Sample Characteristics.	158
Competition, Cooperation, and Aggression.	159
5.2.4 DISCUSSION	160
5.3 STUDY 2: KILL RATIOS DURING COMPETITIVE AND COOPERATIVE SITUATIONS	163
5.3.1 INTRODUCTION	163
5.3.2 METHODOLOGY	165
Power Analysis.	165
Participants.	165
Materials.	165
Procedure.	167
Scoring Kill Ratios.	168
Data Analysis.	169
5.3.3 RESULTS	169
Sample Characteristics.	169
Videogame Experience.	170
Kill Ratios.	171
Reliability Analysis.	172
The Efficacy of Treatment.	173
Videogame Perceptions.	174
5.3.4 DISCUSSION	174

5.4 STUDY 3: DONKEY KONG COUNTRY AS A SALIENT VIDEOGAME	176
5.4.1 INTRODUCTION	176
5.4.2 METHODOLOGY	176
Participants.	176
Materials.	177
Procedure.	178
Scoring Kill Ratios.	179
Data Analysis.	179
5.4.3 RESULTS	179
Sample Characteristics.	179
Videogame Experience.	180
Kill Ratios.	181
Reliability Analysis.	182
The Efficacy of Treatment.	182
Videogame Perceptions.	183
5.4.4 DISCUSSION	184
5.5 STUDY 4: A REPEATED MEASURES DESIGN	186
5.5.1 INTRODUCTION	186
5.5.2 METHODOLOGY	187
Participants.	187
Materials.	187
Procedure.	187
Scoring Kill Ratios.	188
Data Analysis.	188
5.5.3 RESULTS	189
Sample Characteristics.	189
Videogame Experience.	189
Kill Ratios.	191
Reliability Analysis.	192
The Efficacy of Treatment.	192
Videogame Perceptions.	193
5.5.4 DISCUSSION	194
5.6 SUMMARY AND DISCUSSION	194
5.7 CONCLUSIONS	199

CHAPTER 6: ECOLOGICAL COMPETITION 201

6.1 OVERVIEW	201
6.2 STUDY 5: COMPARATIVE ANALYSIS OF GENERAL ADOLESCENT SAMPLE AND MORTAL KOMBAT GROUP ON SCHEMAS	203
6.2.1 INTRODUCTION	203
6.2.2 METHODOLOGY	204
Participants.	204
Materials.	204
Procedure.	204
6.2.3 RESULTS	205
Sample Characteristics.	205
Competition, Cooperation, and Aggression.	207
6.2.4 DISCUSSION	209

6.3 STUDY 6: MORTAL KOMBAT 3 TOURNAMENT FOR PRIZES	211
6.3.1 INTRODUCTION	211
6.3.2 METHODOLOGY	212
Participants.	212
Recruitment.	212
Mortal Kombat 3.	213
Procedure.	215
Kill Ratios.	218
6.3.3 RESULTS	219
6.3.4 DISCUSSION	220
6.4 STUDY 7: MORTAL KOMBAT TOURNAMENT WITHOUT PRIZES	222
6.4.1 INTRODUCTION	222
6.4.2 METHODOLOGY	223
Participants.	223
Recruitment.	223
Procedure.	224
Kill Ratios.	224
6.4.3 RESULTS	224
6.4.4 DISCUSSION	225
6.5 STUDY 8: THE "CHALLENGE" (COMPETITION WITHOUT AN AUDIENCE)	227
6.5.1 INTRODUCTION	227
6.5.2 METHODOLOGY	229
Participants.	229
Recruitment.	229
Materials.	229
Procedure.	230
Kill Ratios.	232
6.5.3 RESULTS	232
Kill Ratios.	232
Positive Affect, Negative Affect, & Angry Feelings.	233
6.5.4 DISCUSSION	235
6.6 STUDY 9: VALIDATION OF THE MORTAL KOMBAT KILL RATIO	239
6.6.1 INTRODUCTION	239
6.6.2 METHODOLOGY	241
Participants & Survey.	241
Teacher Ratings.	242
Kill Ratios.	244
6.6.3 RESULTS	244
6.6.4 DISCUSSION	245
6.7 SUMMARY AND DISCUSSION	246
6.8 CONCLUSIONS	250
CHAPTER 7: SUMMARY, CONCLUSIONS & RECOMMENDATIONS	253
7.1 SUMMARY	253
7.2 CONCLUSIONS	259
7.3 RECOMMENDATIONS	260
7.3.1 GENERAL RECOMMENDATIONS	260

7.3.2 SPECIFIC DOMAIN: VIDEOGAMES	265
7.4 TYSON'S EAR BITE REVISITED	272

<u>REFERENCES</u>	<u>273</u>
--------------------------	-------------------

<u>APPENDICES</u>	<u>301</u>
--------------------------	-------------------

Abstract

The competition-aggression link is a hypothesis that competition increases the probability of aggressive behaviour. The current investigation was focussed on this idea. There were two approaches utilised to conduct this investigation. Firstly, a literature review of empirical research was conducted using a critical procedure. Secondly, a series of studies were carried out that were guided by past research in the field.

The literature review entailed the search for and collection of empirical research on competitive aggression. There were 41 independent studies on this topic published between 1949 to 1997. Over half of these studies (68%) utilised Taylor's competitive reaction procedure. A number of conclusions were reached from a review of the literature. The competition-aggression link has been consistently demonstrated across a number of studies, and a number of situational and personality factors have been found to mediate the link. However, few studies have validated the dependent measure of aggression. One study explored competitors' angry feelings. Nearly all data were collected in North America and no studies have been published from the Australian context. Finally, few studies have been conducted on adolescents. A series of studies were thus conducted to fill a knowledge gap on this topic. These studies were based on Australian adolescents.

Two survey studies (Studies 1 and 5) were conducted on a general sample of adolescents and a specific sample of videogame players (viz, highly experienced *Mortal Kombat* players). The methodology was derived from a study by Anderson and Morrow (Study 1; 1995) who devised two measures to evaluate perceptions of competition and cooperation i.e., the Dimensional Ratings Questionnaire (DRQ) and the Common Features Questionnaire (CFQ). Data from the DRQ and CFQ revealed that all participants perceived competitive situations as aggressive, and cooperative situations as less aggressive. There was no variation in these perceptions across gender or videogame playing frequency groups. However, *Mortal Kombat* players tended to perceive cooperative situations as more aggressive in comparison to the

general sample of adolescents. These findings provide suggestive evidence for underlying competition and cooperation schemas that are consistent with the competition-aggression link.

A series of studies (Studies 2 to 4) was conducted on adolescents using videogame play as a measure of aggression. The procedure was derived from a study by Anderson and Morrow (Study 2; 1995). Paired participants were randomly assigned to either a competitive or cooperation situation. The dependent measure was the 'kill ratio' (defined as the number of videogame characters the participant kills divided by the total number of characters encountered i.e., killed plus avoided). It was consistently revealed across all three studies that male and female competitive participants did not demonstrate a higher 'kill ratio' than male and female cooperative participants (with the exception of an interaction effect in Study 2). These findings were reported despite the wide variation in utilised videogames and methodological designs.

Another series of studies of greater experimental power was conducted. Participants were self-selected males who were highly experienced at *Mortal Kombat*. The utilised videogame, which is a martial arts simulation, provides the winner the choice either to kill or not kill the opponent's videogame character. Study 6 revealed that winning participants were more likely to select the option to kill their opponent's videogame character during a high competitive situation (a tournament for prizes) than during a low competitive situation (i.e., a trial period). Study 7 was a replication of the previous study but excluded the prizes awarded during the tournament. Killing tendencies did not vary across the tournament and trial periods. This implies that a reward is an important element in the competition-aggression link. Study 8 replicated the findings of Study 6 in a non-tournament situation, thus increasing the reliability of the effect and discounting the influence of extraneous factors in the tournament situation (e.g., an audience). Study 8 also revealed that competitive aggression was displayed in the absence of self-reported angry feelings as measured by the State-Anger Scale (Spielberger, 1991). That is, the competitive aggression was 'affectless'. Study 9 showed that the kill ratio is a valid measure of aggressive behaviour by correlating *Mortal Kombat* videogame aggression with teacher ratings of participants' aggressive behaviour at school.

A number of conclusions were reached on the basis of the literature review and these studies. These include: Adolescents and adults perceive competitive situations as aggressive, and perceive cooperative situations as less aggressive; children, male adolescents, and adults, behave more aggressively during competitive situations relative to cooperative situations, and behave less aggressively during low competitive situations relative to high competitive situations; competitive aggression is 'affectless' amongst experienced videogame playing adolescent males and less experienced videogame playing university students. Recommendations were proposed for future research in this field, and strategies were formulated for preventing and reducing competitive aggression.