

## The Relationship Between Adolescents' Participation in Judo, Quality of Life, and Life Satisfaction

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### Abstract

This study examined the relationship between participation in judo and life satisfaction and quality of life. Ninety American adolescents completed the Sport Commitment Measure, the Multidimensional Students' Life Satisfaction Scale, the Comprehensive Quality of Life ? School Version, and a demographic instrument. Judo participation was positively correlated with a number of life satisfaction and quality of life indices, and these relationships were not confounded by demographic differences in age, sex, or school grade. Judo players as a whole were happier than others in almost all indices measured, and within the group, participants who practiced judo longer had higher scores on well being and life satisfaction. These findings provide the first evidence supporting claims concerning the philosophical and educational goals of judo since its inception, and opens the door to further studies documenting the positive benefits, as well as potentially negative aspects, of judo participation.

**Key words :** judo, youth, well-being, quality of life, life satisfaction

### I. Introduction

From its humble beginnings in 1882, judo has grown to become a major, worldwide sport. Currently the International Judo Federation is the second largest international sports federation in the International Olympic Committee, with 187 member nations. Estimates suggest it is second in the world only to football (soccer) in terms of the number of participants<sup>3)</sup>.

Judo is a combat sport derived from the martial arts. Its techniques are adaptations of battlefield maneuvers, but designed to

eliminate the most dangerous elements. As with many martial arts in 19<sup>th</sup> century Japan, judo has philosophical as well as sporting goals, and these involve the development of character and the attainment of values such as sincerity, honesty, courage, compassion, friendship, and respect. The two mottoes of judo, in fact, are "The maximum and efficient use of one's spiritual strength" (精力善用) and "Mutual welfare and benefit" (自他共栄).

For years judo practitioners have touted the positive effects of judo not only physically, but also in terms of mental and psychological

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development. The philosophical and educational aspects of judo are undoubtedly one of the major reasons why judo spread as far and wide as it did in the world since the turn of the 20<sup>th</sup> century. This aspect of judo has become widely accepted as a part of judo, as much as or even moreso than its techniques and sporting aspects.

Despite this widespread acceptance of the positive psychological benefits of judo, however, to our knowledge the scholarly literature actually documenting these effects is sparse. There have been studies examining the physiological substrates of judo, especially related to competition. Most examined changes in hormonal and physiological responses or blood lactate<sup>8) 21) 27) 28) 31) 32) 33)</sup>. A few studies focusing on psychological variables focused on anxiety before and during competition<sup>8) 18) 19) 20) 22)</sup>, and did not address the issue of whether judo participation is actually associated with the philosophical or educational goals it touts.

In fact there have only been eight studies in the published literature approaching, but not directly addressing, this topic. Five involved children with developmental disabilities such as mental retardation, visual handicaps, or emotional disturbances<sup>6) 9) 11) 12) 13)</sup>. All five reported positive effects of judo participation, including improvements in adjustment, anxiety, coping, self-esteem, well-being, body image, anxiety reduction, social attitudes, interpersonal relations, and physical fitness. The remaining three studies examined the relationship between judo participation and aggression, and produced mixed results. One found that there was no relationship between judo practice and aggression<sup>24)</sup>. Another found a negative relationship, suggesting that individuals who practiced judo longer were less aggressive<sup>17)</sup>.

The third found a positive relationship between judo and aggression, suggesting that individuals who practiced judo longer became more aggressive<sup>25)</sup>.

While these previous studies are undoubtedly important in their own right, what is conspicuously absent from the literature (at least in English) is any study directly examining the relationship between judo participation and positive subjective (e.g., well-being, life satisfaction, quality of life) or academic outcomes in normal children and adults, as is touted by the well-accepted philosophical goals of judo. Actually there is a large literature in youth sports documenting these kinds of benefits as a result of their participation in other sporting activities<sup>1) 2) 4) 7) 23)</sup>. But given that such claims are at the heart of judo, the lack of such studies constitutes a gap in the literature concerning this sport and martial art.

The purpose of this study is to begin to address that gap. Adolescents participating in judo in the US completed measures designed to assess their degree of participation in judo, life satisfaction, and quality of life in multiple domains, and self-reported academic performance. While many outcome variables could be studied, we opted in this first study to examine global reports of life satisfaction and well-being, reckoning that they would reflect overall indices of positive functioning and life evaluation, giving a broad-stroke view of positive psychological outcomes potentially related to judo. We believe that this study is the first to address the goal of documenting the potential positive effects of judo participation in everyday children participating in recreational judo programs in the US.

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## II. Methods

### 1. Participants

The participants included 90 adolescents from around the US between the ages of 11 and 18 (mean age = 14.41,  $sd = 1.73$ ) who were participating in local judo programs around the country. They represented 16 different states; the largest  $N$ s were from California (29), Massachusetts (16), and Hawaii (14). Forty-seven were male while 41 were female; two did not respond. Forty-two self-reported themselves as "white," 23 as "Asian," 9 as "Hispanic/Latino," and 13 as "Other;" the remainder did not respond. The participants had been participating in judo for an average of 3.80 years ( $SD = 4.14$ ), practicing 3.36 times per week for an average of 102.59 minutes each session. Given the approximately 6,000 members of the US Judo Federation under the age of 19, the sample represented a 3.17% response rate.

### 2. Instruments

Judo participation was measured by the Sport Commitment Measure (SCM), a 14-item measure designed to assess four aspects of commitment to sport: Enjoyment (4 items), Social Constraints (3 items), Involvement Opportunities (3 items), and Commitment (4 items). It is a widely used scale in the sport psychology literature, and there is substantial evidence for its reliability and validity, especially for use with American youth<sup>29) 30)</sup>. Commitment assessed the psychological desire and resolve to continue participation. Enjoyment measured the general affective evaluation of the respondent's participation in judo. Involvement Opportunities assessed aspects of participation that are not direct goals but that become qualities of the experience that are highly valued (e.g., making

and maintaining friendships). Social Constraints assessed the degrees of feelings of obligation to continue participating in judo due to social expectations or norms. The original measure was validated on multiple samples of youth involved with various sports, and modified to refer to judo. The  $\alpha$ s for this sample for the four scales were .97, .76, .83, and .92, respectively.

Judo participation was also assessed by questions on the demographic questionnaire. Participants were asked to indicate how long they had played judo in years and months, their rank (belt color), the number of hours they spend each day participating in or practicing judo, and the highest level tournament in which they had competed by checking one from the following list: None, Local Level, Regional Level, National Level, or International Level.

Adolescents' quality of life was assessed by using the Comprehensive Quality of Life Scale - School Version (ComQoL-S5)<sup>5) 14)</sup>. The COMQoL-S5 assesses quality of life in seven domains: material well-being, health, productivity, intimacy, safety, community, and emotional well-being. It is a widely used scale in the sport psychology literature, and there is substantial evidence for its reliability and validity<sup>5) 14)</sup>. Participants rated not only their satisfaction level but also each domain's level of importance. Because we focused on life satisfaction and quality of life, we used the Satisfaction and Subjective Quality of Life (QOL) scores (computed by multiplying the importance and satisfaction ratings) for all seven domains, as well as across domains. We also computed scores representing Intimacy, Safety, and Emotional Well-Being from the objective data in Section 1 of the measure. All scores were computed according to procedures

described in the available manuals<sup>5) 14)</sup>.

Adolescents' life satisfaction was assessed by the Multidimensional Students' Life Satisfaction Scale (MSLSS)<sup>15)</sup>. The MSLSS is a 40 item instrument that assesses psychological well-being in children and adolescents in five domains: self (7 items), family (7 items), friends (9 items), school (8 items), and living environment (9 items). We computed a score for each of these five scales ( $\alpha = .86, .90, .81, .85, .85$ , respectively) as well as a Total score averaging all items (after reverse coding) ( $\alpha = .93$ ).

The participants also completed a brief demographic questionnaire in which they provided data concerning their age, sex, and ethnicity; judo-related information (described above); school grade and GPA; self-rating in how good they are in math, reading, music and sports using a 4-point scale anchored 1, Not at All, 2, Somewhat, 3, Moderately, and 4, Very Much; and a comparison of themselves to their classmates in the same four subject areas using a 5-point scale anchored 1, One of the Worst, 3, Average, and 5, One of the Best.

### 3. Procedures

Data were collected in two ways: hardcopy and online. Hardcopy collection ( $N = 47$ ) occurred by printing the packet of instruments in four random orders and providing them to participants who were recruited at local judo clubs around the country via instructors of those clubs. Participation was entirely voluntary, and those who completed the measures in this fashion mailed them back to the researchers at a specified address. Online data collection ( $N = 43$ ) occurred in the same fashion, by loading electronic versions of the exact same packets on the website of the U.S. Judo Federation. Notices were then sent to

judo instructors around the country requesting them to refer students to the website, and respondents were randomly given one of the four versions to complete. All responses were entirely anonymous in both collection procedures.

## III. Results

### 1. *The Relationship Between Judo Participation, Life Satisfaction, Quality of Life, and Self-Reported Academic Success*

We first examined whether adolescents who participated in judo were different in their life satisfaction or quality of life by computing means on the MSLSS and ComQOL-S5 scales and comparing them to published norms. As seen in Table 1, the adolescents in this sample had significantly higher means on nearly all scales, indicating that they were happier in general compared to non-judo participant norm groups.

We then computed product moment correlations between the judo participation variables (four SCM scales and four variables in the demographics) and the scales on the ComQOL-S5 (Table 2). SCM Commitment, Enjoyment, and Involvement Opportunities were all significantly and positively correlated with Overall Emotional Well-Being, Overall Satisfaction, and Subjective QOL scores. Adolescents who were more deeply committed to their judo participation had better quality of life indices. Social Constraints was negatively correlated with Emotional Well-Being, suggesting that adolescents who experienced greater feelings of obligation to continue judo had lower well-being. Judo rank was positively correlated with Intimacy and Emotional Well-Being suggesting that those who were in judo longer had a better quality of life on these indices.

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**Table 1 Means, Standard Deviations, and Single Sample *t* Tests for the ComQOL-S5 and MSLSS**

Scale	Subscale	Grade	Mean	<i>Sd</i>	One sample <i>t</i>
ComQOL-S5	Intimacy	All	76.45	18.13	.76
	Safety	All	78.93	14.55	2.55*
	Emotional Well-Being	All	51.87	17.98	1.88+
	Overall Importance	All	74.80	12.76	-.14
	Overall Satisfaction	All	80.60	12.79	4.11***
	Subjective QOL	All	77.63	10.99	2.24*
MSLSS	Total	6-8	4.89	.67	2.71**
		9-12	4.71	.62	4.12***
	Family	6-8	4.94	.85	3.21**
		9-12	4.72	.94	3.58***
	Friend	6-8	5.18	.75	1.01
		9-12	5.35	.56	2.88**
	School	6-8	4.57	.91	4.16***
		9-12	4.20	1.02	3.28**
	Living Environment	6-8	4.74	.91	3.16***
		9-12	4.34	.94	5.08***
	Self	6-8	5.04	.80	-1.15
		9-12	4.96	.81	-1.61

\*\*\*\* *t* is significant at the 0.0001 level (2-tailed)  
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 \*\* *t* is significant at the 0.01 level (2-tailed).  
 \* *t* is significant at the 0.05 level (2-tailed).  
 + *t* is marginally significant at the 0.10 level (2-tailed).

**Table 2 Correlations Between Judo Participation and the Comprehensive Quality of Life (ComQOL-S5) Overall Scale Scores**

	ComQOL-S5 Scale				
	Intimacy	Safety	Emotional Well-being	Overall Satisfaction	Subjective QOL
Commitment	.191+	.102	.324**	.300**	.232*
Enjoyment	.088	.007	.222*	.363**	.295**
Social Constraints	.094	.000	-.210*	-.017	-.004
Involvement Opportunities	.301**	.096	.296**	.303**	.291**
Rank	.248*	-.051	.259*	.126	.087

\*\* Correlation is significant at the 0.01 level (2-tailed).  
 \* Correlation is significant at the 0.05 level (2-tailed).

We also computed these correlations separately for each of the seven domains of the ComQOL-S5 (Table 3). SCM Commitment, Enjoyment, and Involvement Opportunities were significantly and positively correlated

with satisfaction with health and happiness. Commitment and Enjoyment were positively correlated with doing things with people outside of home. Most of these correlations replicated in the Subjective QOL domain as

well.

We computed the same correlations using the MSLSS (Table 4). SCM Commitment, Enjoyment, and Involvement Opportunities were all positively correlated with Total satisfaction, and with satisfaction with School and Self. Judo rank was positively correlated with almost all MSLSS indices, while Involvement Opportunities was positively correlated with all MSLSS scores.

Finally we also computed the same correlations on the adolescents' self-reported GPA; abilities in math, reading, music, and sports; and comparisons with others in the

same subjects (Table 5). All judo participation variables with the exception of SCM Social Constraints were positively correlated with ratings in math and sports.

2. *Controlling for Possible Demographic Confounds*

To examine whether the above findings were confounded by any demographic differences within the sample, we correlated the available demographic data (age, sex, ethnicity, and school grade) with the MSLSS and ComQOL-S5. Age and school grade were both negatively correlated with the MSLSS

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**Table 3 Correlations Between Judo Participation and the Comprehensive Quality of Life (ComQOL-S5) Satisfaction and Overall Subjective Scores Separately for the Seven Domains**

ComQOL-S5 Domain		SCM Scale			
		Commitment	Enjoyment	Social Constraints	Involvement Opportunities
Satisfaction	Things you own	.167	.226*	-.040	.158
	Your health	.291**	.285**	.009	.319**
	Your achievements in life	.220*	.268*	-.073	.299**
	Close relationship w/family or friends	.055	.174	.107	.101
	How safe you feel	.097	.137	.028	.262*
	Doing things w/ people outside your home	.357**	.395**	-.058	.144
	Your own happiness	.331**	.361**	-.049	.294**
Subjective QOL	Things you own	.107	.127	.020	.172
	Your health	.244*	.247*	-.070	.271*
	Your achievements in life	.174	.213*	-.035	.278**
	Close relationships with your family or friends	.003	.102	.121	.078
	How safe you feel	.082	.124	.044	.264*
	Doing things w/ people outside your home	.278**	.353**	-.012	.146
	Your own happiness	.275*	.329**	-.076	.290**

\* Correlation is significant at the 0.05 level (2-tailed).  
 \*\* Correlation is significant at the 0.01 level (2-tailed).

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**Table 4 Correlations Between Judo Participation and the MSLSS**

MSLSS Scale	SCM Scale					Judo Rank
	Sport Commitment	Sport Enjoyment	Social Constraints	Involvement Opportunities		
Total Score	.339**	.240*	-.139	.465***		.326**
Family	.199	.156	-.142	.296**		.292**
Friend	.085	.077	.034	.313**		.199+
School	.268*	.220*	-.149	.293**		.134
Living Environment	.306**	.133	-.164	.369**		.239*
Self	.315**	.244*	-.058	.441**		.329**

\*\* Correlation is significant at the 0.01 level (2-tailed).  
 \* Correlation is significant at the 0.05 level (2-tailed).

**Table 5 Correlations Between Judo Participation and Academic Self-Ratings**

	GPA	Self-Ratings				Comparisons With Others				
		Math	Reading	Music	Sports	Math	Reading	Music	Sports	
SCM Scales	Commitment	.040	.308**	.073	-.043	.214*	.269*	.056	-.066	.269*
	Enjoyment	-.180	.112	.018	-.044	.073	.151	-.023	-.078	.224*
	Social Constraints	.114	-.279**	-.108	.087	.101	-.109	-.150	.086	.038
	Involvement Opportunities	.138	.176+	-.015	.063	.229*	.161	-.128	.048	.269*
Judo Demographics	Length	.046	.224*	-.117	-.154	.238*	.200+	-.084	-.035	.210+
	Rank	.112	.283**	.064	.053	.346**	.295**	.001	.010	.304**
	Amount of Practice	.008	.204+	.025	.004	.152	.272*	.114	-.017	.219*
	Highest Level Tournament	-.015	.274**	-.104	-.088	.402**	.256*	-.094	-.070	.424**

\*\* Correlation is significant at the 0.01 level (2-tailed).  
 \* Correlation is significant at the 0.05 level (2-tailed).

School, Living Environment, Self, and Total scales,  $r(87)$ s ranging from  $-.179, p < .10$ , to  $-.279, p < .001$ . Age and school grade were also correlated with ComQOL-S5 Safety,  $r(87) = -.21, p < .05$ ; and  $r(87) = -.25, p < .05$ , respectively, and with the Overall Satisfaction and

Subjective QOL scores,  $r(87)$ s ranging from  $-.22, p < .05$ , to  $-.29, p < .01$ . Older students had significantly less satisfaction on these variables.

We also computed correlations between the same demographic variables and the

adolescents' self-reported school abilities in math, reading, music, and sports. The only variable to correlate with math and sports, the two variables predicted by judo participation, was gender; boys tended to rate themselves better than girls in both categories,  $r(87) = .20$ ,  $p < .05$ ; and  $r(87) = .27$ ,  $p < .05$ , respectively. Boys also compared themselves to others more favorably than did girls in sports,  $r(87) = .25$ ,  $p < .05$ .

Although it was unlikely that the main findings relating to judo participation reported above were confounded by age/grade differences because the directions of the reported correlations were opposite (age was *negatively* correlated with outcomes while judo participation was *positively* correlated), we nevertheless recomputed all of the analyses reported earlier involving the MSLSS and ComQOL-S5 partialling the effects of age, and that involving the self-ratings of math and sports partialling the effects of gender. (Because age and school grade were essentially redundant,  $r(87) = .94$ , we deemed it appropriate to just control for one of them.) All of the significant correlations between the SCM and ComQOL-S5 reported in Tables 2 and 3 were still significant. In addition, two correlations that were previously not significant became significant: judo rank and Overall Satisfaction,  $r(78) = .28$ ,  $p < .05$ ; and judo rank and Overall Subjective Domain,  $r(78) = .27$ ,  $p < .05$ .

All of the significant correlations between judo participation and the MSLSS reported in Table 4 remained significant after partialling the effects of age. In addition, four correlations that were previously not significant became significant: SCM Commitment and MSLSS Family,  $r(82) = .26$ ,  $p < .05$ ; SCM Enjoyment and MSLSS Family,  $r(82) = .21$ ,  $p < .05$ ; judo

rank and MSLSS Friend,  $r(78) = .32$ ,  $p < .01$ ; and judo rank and MSLSS School,  $r(78) = .25$ ,  $p < .05$ .

Finally all but two (SCM Commitment and self-rating of sports; amount of judo practice and comparison with others in math) of the significant correlations between judo participation and the self-ratings of academic performance reported in Table 5 were still significant after the effects of gender were partialled. Collectively these results provided strong support that the previously reported relationships between judo participation and life satisfaction, quality of life, and self-ratings of academic performance were not confounded by demographic variables.

#### IV. Discussion

This study is the first to document that participation in judo is associated with positive well-being outcomes. Judo players as a whole were happier than others in almost all indices measured by the ComQOL-S5 and MSLSS, and judo participation was positively correlated with well being and life satisfaction, indicating that those who participated in judo longer had significantly better indices of life satisfaction and well being than those who did not.

Several aspects of the methodology speak to the strength of the findings. First the sample was quite diverse, spanning many states of the country and in two different data collection procedures (hardcopy and online). The inclusion of two measures of well being – the ComQOL-S5 and the MSLSS – ensured that the findings were robust and not limited to specific measures. And the assessment and control of demographic variables such as age and sex ensured that the findings are not confounded by them.

Although the correlations between age and

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life satisfaction we obtained were contrary to previous studies that have reported no relationship between them<sup>10)</sup>, the findings do concur with others that have documented a decline in self-perceptions of competence and subjective task values with age<sup>16)26)</sup>. Nevertheless the relationships between judo participation and life satisfaction and well being survived even after the potential influence of these confounding demographic variables were statistically eliminated.

As described in the introduction, the positive psychological benefits of judo participation have been touted for years, and were undoubtedly one of the reasons for the immense popularity of judo around the world. Despite the widespread acceptance of these positive benefits, however, and despite the existence of a robust literature on this topic involving other sports<sup>1) 2) 4) 7) 23)</sup>, to date there had not been a single study on everyday adolescents demonstrating a link between judo participation and any positive psychological outcomes in personality, values, or attitudes. The results of the current study, therefore, fill a gap by providing the first evidence of such a linkage.

In addition to the correlations between judo participation and the psychological variables, the correlations between judo participation and the self-ratings of academic ability, notably with math, were interesting. That the correlations occurred with math and sports and not with reading or music suggests that judo participation may have differential effects on different academic subjects, or that individuals who have an affinity to one also take to the other. Both math and judo require a certain degree of discipline, and both involve considerable repetition that is necessary for mastery. Judo, unlike many other sports, is not

seasonal, and many judo players practice judo throughout the year without rest. Much of judo practice is filled with activities used to perfect and master techniques, and much of this can be repetitive. Future research will need to flesh out this relationship even more in order to examine whether judo participation is related to actual differences in math abilities (or limited to self-reported math abilities as in this study), and the causal linkage between them.

Future studies will need to replicate the findings reported here with other samples using other measures, and to expand this line of work by assessing other variables more directly related to the philosophical goals of judo, such as sincerity, honesty, courage, friendship, and respect. It will be particularly important for future studies to examine the potential development of these constructs behaviorally as well as in verbal response: it is entirely possible that these values develop as behaviors in children first before they become verbalized and internalized as abstract principles. Future research can also investigate the degree to which these specific constructs mediate the relationship between judo participation and overall well being that we documented in this study. In particular this study should be replicated in Japan, to determine if the positive correlates of judo documented here occur in the country of judo's origin as well.

To be sure the correlations we report in this article cannot be used to infer that judo participation caused better well being indices. It is entirely possible, for example, that adolescents who were happier to begin with chose to play judo, and that these adolescents who were happier simply self-selected themselves for participation in this study. Some research in fact has shown that athletic

participation is positively correlated with academic performance, and some (but not all) of this linkage is accounted for by the fact that better students choose to participate in athletics<sup>34)</sup>. Moreover we recognize the multiple factors that contribute to the well-being of the youth in any country, and the complexity of the interrelationships among those multiple factors. Judo participation alone is most likely not the only variable that affects well being and quality of life, and future studies will need to examine what these other variables may be and the causal paths among them.

The possibility that happier students chose to do judo and participate in this study in the first place tempers the interpretation of the comparison of the judo participants' means to the norms on the ComQOL-S5 and MSLSS. It cannot, however, explain the numerous correlational findings. That those who participated in judo less had lower indices of well being and life satisfaction than those who participated in judo longer speaks to the potential causal linkage between judo and these outcomes.

Nevertheless it is clear that what is sorely needed is a study that assesses judo participants before and after their initial engagement with judo in an experimental design to determine if judo actually produces the outcomes it purports to. Moreover future studies will need to examine why and how judo produces these positive benefits. Do these positive benefits accrue from a process of modeling positive behaviors in senior members and instructors? Do they develop sequentially and after improvement in physical fitness, strength, stamina, and endurance, or simultaneously? At what ages do they develop, and what is the linkage between these positive outcomes as abstract principles and actual

behaviors?

**Conclusions**

1. To this date there has not been a study documenting the positive, or negative, benefits of judo participation, despite the importance of this claims in the intellectual and moral educational goals of judo.
2. In this study, 90 adolescents participating in judo in the US completed surveys designed to measure their commitment to judo, quality of life, and life satisfaction.
3. As a whole, this group of judo participants had significantly higher well being and life satisfaction scores than normative samples.
4. Judo participation measured in a variety of ways was positively correlated with well being, quality of life, and life satisfaction.
5. These data fill a void in the literature that addresses these outcomes in judo practitioners.

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**References**

- 1) Alfermann, D., and Stoll, O. : Effects of physical exercise on self-concept and well-being. *International Journal of Sport Psychology*, 31(1), 47-65, 2000.
- 2) Biddle, S. J. H. et al. (Eds.). : *Physical Activity and Psychological Well-being*. London: Routledge, 2001.
- 3) Brousse, M., and Matsumoto, D. : *Judo: A sport*

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- and a way of life*. Seoul, Korea: International Judo Federation, 1999.
- 4) Connor, J. M. : Physical activity and well-being. In M. H. Bornstein and L. Davidson (Eds.), *Well-being: Positive development across the life course*. (pp. 65-79). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers, 2003.
  - 5) Cummins, R. A. : Comprehensive Quality of Life Scale -School Version (5th ed.). Victoria, Australia: School of Psychology, Deakin University, 1997.
  - 6) Davis, B., and Byrd, R. J. : Effects of judo on the educable mentally retarded. *Journal of Sports Medicine and Physical Fitness*, 15(4), 337-341, 1975.
  - 7) Ewing, M. E. et al. : The role of sports in youth development. In M. Gatz and M. A. Messner (Eds.), *Paradoxes of youth and sport* (pp. 31-47). Albany, NY: State University of New York Press, 2002.
  - 8) Filaire, E. et al. : Anxiety, hormonal responses and coping during a judo competition. *Aggressive Behavior*, 27(1), 55-63, 2001.
  - 9) Fleisher, S. J. et al. : Evaluation of a judo/community organization program to treat predelinquent Hispanic immigrant early adolescents. *Hispanic Journal of Behavioral Sciences*, 17(2), 237-248, 1995.
  - 10) Gilman, R., and Huebner, S. : A review of life satisfaction research with children and adolescents. *School Psychology Quarterly*, 18(2), 192-205, 2003.
  - 11) Gleser, J. M., and Brown, P. : Modified judo for visually handicapped people. *Journal of Visual Impairment and Blindness*, 80(5), 749-750, 1986.
  - 12) Gleser, J. M., and Lison, S. : Judo as therapy for emotionally disturbed adolescents: A pilot study. *International Journal of Adolescent Medicine and Health*, 2(1), 63-72, 1986.
  - 13) Gleser, J. M. et al. : Physical and psychosocial benefits of modified Judo practice for blind, mentally retarded children: A pilot study. *Perceptual and Motor Skills*, 74(3), 915-925, 1992.
  - 14) Gullone, E., and Cummins, R. A. : The Comprehensive *Quality of Life Scale: A psychometric evaluation with an adolescent sample*. *Behaviour Change*, 16(2), 127-139, 1999.
  - 15) Huebner, S. : Manual for the Multidimensional Students' Life Satisfaction Scale (pp. 9). Columbia, South Carolina, 2001.
  - 16) Jacobs, J. E. et al. : Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development*, 73(2), 509-527, 2002.
  - 17) Lamarre, B. W., and Nosanchuk, T. A. : Judo-The gentle way: A replication of studies on martial arts and aggression. *Perceptual and Motor Skills*, 88(3), 992-996, 1999.
  - 18) Matsumoto, D., and Takeuchi, M. : Psychological correlates of training and performance in senior and junior elite judo athletes. *Budogaku Kenkyu*, 33, 11-19, 2000.
  - 19) Matsumoto, D. et al. : Competition anxiety, self-confidence, personality, and competition performance of American elite and non-elite judo athletes. *Budogaku Kenkyu*, 32(3), 12-21, 2000.
  - 20) Matsumoto, D. et al. : The relationship between psychological characteristics, physical fitness, and physiology in judo athletes. *Budogaku Kenkyu*, 33(3), 1-11, 2001.
  - 21) Mikheev, M. et al. : Motor control and cerebral hemispheric specialization in highly qualified judo wrestlers. *Neuropsychologia*, 40(8), 1209-1219, 2002.
  - 22) Murphy, S. M. et al. : Psychological and performance concomitants of increased volume training in elite athletes. *Journal of Applied Sport Psychology*, 2(1), 34-50, 1990.
  - 23) Mutrie, N., and Biddle, S. J. H. : The effects of exercise on mental health in nonclinical populations. In S. J. H. Biddle (Ed.), *European perspectives on exercise and sport psychology* (pp. 50-70). Champaign, IL: Human Kinetics Publishers, 1995.
  - 24) Reynes, E., and Lorant, J. : Do competitive

- martial arts attract aggressive children?  
*Perceptual and Motor Skills*, 93(2), 382-386, 2001.
- 25) Reynes, E., and Lorant, J. : Effect of traditional judo training on aggressiveness among young boys. *Perceptual and Motor Skills*, 94(1), 21-25, 2002.
- 26) Rodriguez, D. et al. : Changing competence perceptions, changing values: Implications for youth sports. *Journal of Applied Sport Psychology*, 15, 67-81, 2003.
- 27) Salvador, A. et al. : Anticipatory cortisol, testosterone and psychological responses to judo competition in young men. *Psychoneuroendocrinology*, 28(3), 364-375, 2003.
- 28) Salvador, A. et al. : Correlating testosterone and fighting in male participants in judo contests. *Physiology and Behavior*, 68(1-2), 205-209, 1999.
- 29) Scanlan, T. K., Carpenter, P. J. et al. : An introduction to the sport commitment model. *Journal of Sport and Exercise Psychology*, 15, 1-15, 1993.
- 30) Scanlan, T. K., Simons, J. P. et al. : The sport commitment model: Measurement development for the youth-sport domain. *Journal of Sport and Exercise Psychology*, 15, 16-39, 1993.
- 31) Serrano, M. A. et al. : Relationships between recall of perceived exertion and blood lactate concentration in a judo competition. *Perceptual and Motor Skills*, 92(3), 1139-1148, 2001.
- 32) Suay, F. et al. : Effects of competition and its outcome on serum testosterone, cortisol and prolactin. *Psychoneuroendocrinology*, 24(5), 551-566, 1999.
- 33) Szabo, A. et al. : Blood pressure and heart rate reactivity to mental strain in adolescent judo athletes. *Physiology and Behavior*, 56(2), 219-224, 1994.
- 34) Videon, T. M. : Who plays and who benefits: Gender, interscholastic athletics, and academic outcomes. *Sociological Perspectives*, 45(4), 415-444, 2002.

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