

## Outcome expectancies for collective psychological performance among collegiate athletes

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### Abstract:

**Problem Statement:** Outcome expectancies (OE) are anticipations of the results of one's own behaviors. In social cognitive theory research, there have been few studies on OE and none on OE in groups.

**Approach:** Principal component analysis was used to develop an OE for collective psychological performance scale. Relationships between OE for collective psychological performance and demographic variables were explored. Participants were 309 competitive Japanese university athletes in their first to third years at two-year or four-year colleges or universities. Ten items were adapted from a psychological performance collective efficacy (CE) scale and an online survey was conducted through a Japanese Internet research company. Test-retest reliability was confirmed with collegiate athletes recruited from university classes. Content validity and internal consistency were also verified.

**Purpose:** The goal of this study was to develop a measure of OE for collective psychological performance. Then, I used the scale to perform a cross-sectional examination of the relationships between OE and CE for psychological performance and demographic factors.

**Results:** Female athletes reported significantly higher OE than male athletes and team sport athletes reported higher OE than those in individual sports. For male individual and female team athletes, having more team members was related to higher OE. OE was significantly related to number of training hours and team meetings per year for female individual athletes.

**Conclusions:** OE for collective psychological performance is useful for assessing a sport team's psychological condition. Basic data are needed on OE for collective psychological performance to indicate team status and to inform interventions for building high-performing functional teams.

**Key Words:** social cognitive theory, collective efficacy, team building, psychological skill training, sport psychology

### Introduction

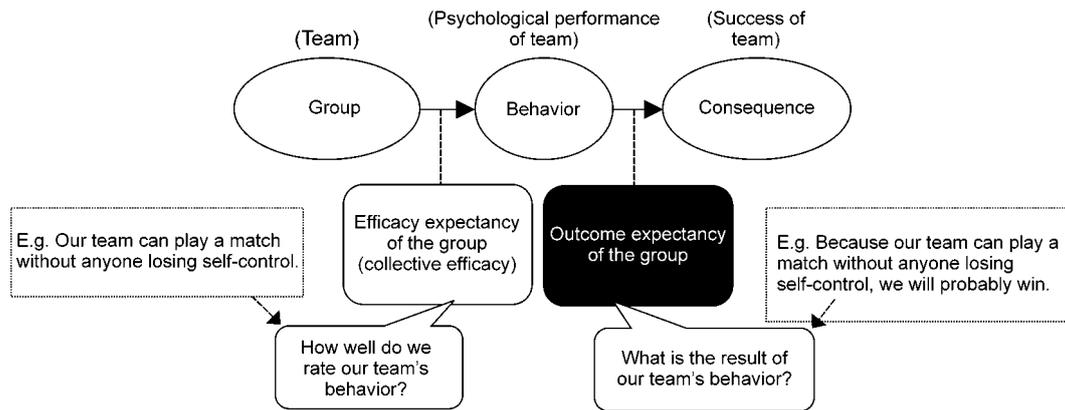
#### Collective efficacy as a variable for evaluating teams

When seeking to improve the competitive ability of sports teams, team building is more important than the strengthening of individual team members' mental and physical condition and skills (Paradis & Martin, 2012). An important component of team strength is the team's psychological performance during competition. In order to predict and improve that performance, Arai (2011) created a validated and reliable scale to measure *collective efficacy* (CE; Bandura, 1982) or the sense of how well a team can psychologically perform.

#### Outcome expectancy: Another important variable

The concept of CE is a group application of social cognitive theory (Bandura, 1977), an influential psychological theory of behavior. At the same time, other principal variables of this theory have not been investigated in terms of applicability to groups. One of these is *outcome expectancy* (OE), a component variable of the predictive function of social cognitive theory (Figure 1). OE is the anticipation of the result of one's own behavior (Bandura, 1978; Fujii, 1991). It is a mechanism of conditioning based on the theory that when one repeats a behavior that previously led to a specific result, the same result is expected (Bolles, 1972).

OE is a separate concept from efficacy expectancy (on which CE is based), but when predicting behavior, it is necessary to consider both (Eastman & Marizillier, 1984). Specifically, Gaitan-Sierra and Hyland (2011) showed that OE predicts changes in positive affectivity. Furthermore, Williams, Anderson, and Winett (2005) suggested that the role of OE in increasing self-efficacy should be explored.



**Figure 1: Relationship between efficacy expectancy and outcome expectancy in a group (based on Bandura, 1977)**

There are several lines of support for the importance of OE. First, compared to self-efficacy (i.e., how well do I rate my behavior?), OE (i.e., what is the result of my behavior?) is more closely related to behavioral intentions (Maddux, Sherer, & Rogers, 1982). Gao, Lee, and Harrison (2008) have also stated that there is a strong possibility that expectancy beliefs are more highly correlated with actual outcomes or performance than is self-efficacy. Second, the possibility has been suggested that in clinical situations, treatment outcomes may be more effective when patients are given positive OE (Lee, 1984). Third, it has been shown that OE has an important role particularly in the initial stage of a behavior. For example, OE initially was more important than was self-efficacy in predicting behavioral intention and actual behavior (Gao, Xiang, Lee, & Harrison, 2008). However, in social cognitive theory research, there have been few studies on OE (Williams et al., 2005) and none whatsoever on OE in groups. In order to study team building empirically and theoretically, research focused on collective OE is needed.

#### Measurement of OE in sports psychology

Previous research on OE in the field of sports psychology have included studies in the context of physical education in schools by Gao, Lee, Solmon, and Zhang (2009), Gao, Lodewyk, and Zhang (2009), and Gao, Liu, Lodewyk, Zhang, and Kosma (2011), as well as Lubans, Aguiar, and Callister's (2010) examination of resistance training in a sample of young people. With regard to research with samples of athletes, Evans, Hardy, and Fleming (2000) performed an action research study of psychological interventions in rehabilitation, Harder (1991) investigated the relationship between OE and performance in a sample of baseball players, Pensgaard and Duda (2002) analyzed the diaries of Norwegian Olympic athletes, and Spink (1992) performed research on a sample of volleyball players. However, problematically, all of these studies of athletes used different measurements of OE, given that a standardized psychological measure has not been created for OE.

#### Purpose of this research

The purpose of this study was to create a scale to measure OE for collective psychological performance, which would correspond to the CE for Psychological Performance Scale (Arai, 2011). Subsequently, the test-retest reliability of this Outcome Expectancy for Collective Psychological Performance Scale was empirically verified. Then, I used the scale to perform a cross-sectional examination by sample subgroup of the relationships between collective OE, CE for psychological performance, and selected demographic factors among collegiate athletes.

#### Material & methods

##### Participants

Participants in the present study were first-year students from two-year colleges and first to third-year students from four-year colleges or universities. They were athletes in competitive sports and belonged to athletic clubs (excluding recreational athletic clubs). Selection criteria for participants were as follows: (1) collegiate students at two- or four-year colleges or universities; (2) athletes in competitive sports who belonged to athletic clubs (excluding recreational athletic clubs) at the two-year or four-year colleges or universities (excluding club staff); and (3) fifth-year students and persons who were 26 years old or older were excluded, to recruit typical student athletes.

##### Measures

Sex, age, grade, place of residence (prefecture), type of sport (individual or team), years of competition experience, group size (number of team members, including coach and support staff), total exercise time per week, and the number of team meetings per year were assessed.

I prepared 10 items on OE for collective psychological performance (Table 1), based on the items from the 10-item psychological performance CE scale (Arai, 2011). The OE for collective psychological performance scale measured the same target performance as did the CE for psychological performance scale. The instruction for the OE for collective psychological performance scale was "Please circle the most applicable number in the right

column regarding your team overall during a game.” Participants chose a number from 0 to 100 (in increments of 10 points) based on the following descriptions: “I completely disagree: 0,” “I neither agree nor disagree: 50,” and “I completely agree: 100.”

The resultant scale measured OE for the following: collective patience, collective aggressiveness, collective volition for self-realization, collective volition for winning, collective self-control, collective ability to relax, collective concentration, collective confidence, collective strategic ability, collective cooperation, and total collective psychological performance.

Table 1.

Outcome expectancy (OE) items for the collective psychological performance scale, mean scores, and results of principal component analysis

Items	Measurement Content**	<i>M</i>	<i>SD</i>	Factor loading
...we persevere and fight to the end.	...patience	78.38	23.51	.90
...we keep our fighting spirit.	...aggressiveness	78.28	23.59	.87
...we focus on achieving our personal objectives in a match.	...volition for self-realization	78.96	23.48	.88
...we have a strong will to win.	...volition for winning	80.32	23.62	.90
...we maintain our self-control during the match.	...self-control	79.55	22.84	.88
...we don't become too anxious about winning or losing.	...ability to relax	78.19	22.36	.80
...we maintain our concentration on the game.	...concentration	82.30	21.93	.88
...we remain confident in ourselves.	...confidence	80.39	23.17	.88
...we have a good strategy and make good decisions.	...strategic ability	79.48	23.34	.85
...we encourage and cooperate with our teammates between and during games.	...cooperation	81.36	22.96	.85

\*All items begin with “I think we can win if...”

\*\*All content begins with “OE for collective...”

Test-retest reliability for the OE for collective psychological performance scale was evaluated with 29 collegiate athletes belonging to an athletic club (excluding recreational athletic clubs) recruited from university classes. Participants completed the OE for collective psychological performance scale twice, with an interval from 14 to 16 days. One participant had missing data, resulting in a sample of 28 collegiate athletes. The mean ( $\pm$  SD) age was 19.96 ( $\pm$  0.92) years and there were twenty-five men and three women. There were six first-year students, eleven second-year students, ten third-year students, and one fourth-year student. The mean years of competition experience was 8.11 ( $\pm$  3.45) years. The correlation coefficient was  $r = .66$  ( $p < .001$ ), confirming the test-retest reliability of the OE for collective psychological performance scale.

CE for psychological performance was assessed using a scale consisting of 10 items. The instruction for the psychological performance CE scale was “Please circle the most applicable number in the right column regarding your team overall during the game.” Participants chose a range of numbers from 0 to 100 (in increments of 10) based on the following descriptions: “I completely disagree: 0,” “I neither agree nor disagree: 50,” and “I completely agree: 100.” The scale’s component structure and validity (content validity) and reliability (internal consistency and stability) have been verified (Arai, 2011).

### Procedure

The study was conducted with the approval of the ethics committee of the Department of Psychology, Faculty of Letters and the Major in Psychology, Graduate School of Humanities, Hosei University.

An online survey was conducted in December 2012 among voluntarily registered individuals of a Japanese Internet research company (Macromill Inc., Japan). Approximately 1.12 million people throughout Japan were voluntarily registered with the company in December 2012. A research guide was posted on the researcher’s page of the Internet research company’s website for the voluntarily registered individuals. Participants who completed the online survey earned points (about 90 points, 1 point to 1 yen) that could be redeemed for reward products from the Internet research company.

Participants were required to provide informed consent prior to participation. Voluntarily registered individuals agreed to the following: 1) maintaining the confidentiality of the survey content, 2) voluntary participation in the study, 3) copyright to be transferred to Macromill, Inc., and 4) results to be delivered as aggregate statistical information without the possibility of identifying specific individuals.

Participants joined the survey after receiving and agreeing (pushing the “agree” button) to explanations regarding the following: general outline of the study, voluntary participation, guarantee of opportunity to

participate and possibility of mental burden, future publication of the study and benefits expected from the study, and handling of personal information (protection of privacy).

### Statistical Analyses

IBM SPSS Statistics Version 21 was used for all analyses. The structure of the OE for collective psychological performance scale was analyzed using principal component analysis, and the reliability of the scale (internal consistency) was examined by calculating the alpha coefficient.

For discrete variables, I employed t-test or ANOVA. Moreover, the relationship between OE for collective psychological performance and correlational factors among segments divided by significant variables were investigated.

## Results

### Participants' demographic data

Participants were 309 collegiate athletes with a mean ( $\pm$  SD) age of 20.04 ( $\pm$  1.20) years; 155 men and 154 women participated. In terms of year of schooling, 112 were first-year students, 98 were second-year students, and 99 were third-year students.

With regard to type of sport, 145 played individual sports and 130 played team sports (thirty-four participants did not indicate one or the other). Mean years of competition experience was  $5.73 \pm 4.35$ , mean group size was  $33.95 \pm 25.02$ , mean total exercise time per week was  $12.57 \pm 9.22$  hours, and the average number of team meetings per year was  $21.85 \pm 35.55$ .

### OE scores for collective psychological performance

Table 1 shows scores for each item of the OE for collective psychological performance scale. The average score for each item ranged from 78 to 83 points and the standard deviation ranged from 21 to 24 points.

### Principal component analysis of OE for collective psychological performance

Table 1 shows the results of principal component analysis using the score for each item of the OE for collective psychological performance scale. As a result, the OE for collective psychological performance scale was determined to have a one-component structure (contribution ratio = 75.38). The alpha coefficient was .96. Thus, the rating scale for OE for collective psychological performance among collegiate athletes had good construct validity.

### Relationship between OE for collective psychological performance and demographic data

Total scores of the OE for collective psychological performance scale varied by sex and type of sport. On the other hand, total scores did not differ by year in college (Table 2).

Table 2.

Relationship between outcome expectancy (OE) for collective psychological performance and demographic data

Variable	Value	OE for collective psychological performance				
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i> -value or <i>F</i> -value	<i>p</i> -value
Gender	Male	155	68.47	19.38	<i>t</i> = 2.26	.025
	Female	154	73.21	17.53		
Sport type	Individual	145	68.94	20.03	<i>t</i> = 2.43	.016
	Team	130	74.40	16.81		
Year in college	First	112	71.88	17.14	<i>F</i> = 1.66	.192
	Second	98	68.03	19.45		
	Third	99	72.42	19.22		

### Relationships between OE for collective psychological performance and sport variables

As shown in Table 3, an analysis was completed for each of the groups for which a difference was observed. Specifically, participants were divided based on sex and participation in individual or team sport, and correlation analyses were performed in each group.

In all groups, OE for collective psychological performance was associated with CE for psychological performance. In male individual sports and female team sports, group size was related to OE for collective psychological performance. In female individual sports, total exercise time per week and the number of team meetings per year were related to OE for collective psychological performance.

### Discussion

The present study sheds light on variables relating to OE for collective psychological performance. Regarding gender, female athletes' scores of the OE for collective psychological performance scale were higher than were those of male athletes. Scores for team-sport athletes were higher than were those for individual-sport athletes, suggesting that female athletes and athletes who played team sports believed that competition outcomes were linked to their teams' psychological performance. These results differed from those of previous research, which

did not demonstrate a difference in CE for psychological performance by gender (Arai, 2011) or sport category (Arai, 2013).

Table 3.

Correlation coefficients (CC) between outcome expectancy (OE) for collective psychological performance and sport variables by gender and sport type

	Male				Female			
	Individual (n = 72)		Team (n = 68)		Individual (n = 73)		Team (n = 62)	
	CC	p	CC	p	CC	p	CC	p
CE for psychological performance	.40	< .001	.75	< .001	.60	< .001	.69	< .001
Number of years in sport	.10	.383	-.10	.406	.09	.427	.19	.131
Group size (total number of team members)	.24	.040	.06	.610	.08	.507	.25	.0495
Total exercise time per week	.20	.096	.01	.932	.29	.014	.15	.238
Number of team meetings per year	.19	.102	.04	.748	.24	.046	.03	.825

Additionally, the results of the present study showed that the relationships among variables differed by subgroup. Although female athletes in individual sports compete alone, perhaps they used their long training times and frequent meetings as criteria in deciding whether competition outcomes are linked to psychological performance when competing as part of a team. However, results differed for male athletes, which may indicate a tendency to allow male athletes in individual sports to practice in diverse ways.

In addition, for male athletes competing in individual sports and female athletes competing in team sports, the larger the group size, the higher their OE for collective psychological performance. In other words, male athletes who competed alone thought the team's psychological performance was closely linked to winning or losing when their group (team) was large. For female athletes cooperating in team competitions, it was generally acknowledged that winning or losing is linked to how a team performs psychologically. These findings may suggest that athletes' perceptions of the relative importance of team size or team quality (for example, its sense of unity; Yamada et al., 2013) may differ by gender and sport category.

The correlation coefficients for OE for collective psychological performance and CE for psychological performance ranged from .40 to .75, indicating that they are discrete factors. This supports the finding that efficacy (or in this study, CE) and OE are separate constructs (Eastman & Marizillier, 1984), and one can expect that models based on social cognitive theory will be built to explain each. Such knowledge will be helpful when performing interventions for sports teams based on social cognitive theory.

This study had three limitations. First, results were based on a cross-sectional survey; therefore, causal relationships between variables could not be inferred. Second, the number of participants involved in verifying the test-retest reliability was small (n = 28). Third, as suggested by Yasunaga, Ide, Imamura, and Ohe (2006), although Internet surveys have benefits such as speed of data collection and convenience for both the researcher and the respondents, there is a limitation related to sampling error when using Internet research companies as compared with using random sampling.

However, the participant sample was relatively diverse and this was the first study to focus on collective OE in the sport psychology field. Going forward, further research on the nature of collective OE and its related factors (e.g. coach, Gao, Lee et al., 2008; or environmental changes, Williams et al., 2005), and whether OE could predict behavior (Gao, Lee et al., 2008), could contribute to the development of team-building programs. Furthermore, the performance of team-building intervention programs (e.g. Pain & Harwood, 2009; Senécal, Loughhead, & Bloom, 2008) is expected to verify the effect of programs on OE.

### Conclusions

Present study developed a measure of OE for collective psychological performance. Subsequently, I used the scale to examine the relationships between OE and CE for psychological performance and demographic factors. This study revealed OE for collective psychological performance is useful for assessing a sport team's psychological condition. Basic data are needed on OE for collective psychological performance to indicate team status and to inform interventions for building high-performing functional teams.

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