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Runninghead: CHARITY SPORT EVENTS

**Bifactor Analysis of Motivation for Charity Sport Event Participation**

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**Abstract**

1  
2 The purpose of this study was to examine the utility of the existing subscales of charity sport  
3 events (CSEs) participation motivation by adopting both a second-order modeling and a  
4 bifactor modeling approaches. The results with 488 college students revealed that the bifactor  
5 model provided a better interpretation of the data compared to second-order model. The  
6  
7 five-factor CSE motivation significantly predict the intention to participate in CSEs along  
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9 with two domain-specific motivations, namely 'sport and event' and 'cause' while other three  
10 domain-specific motivations including 'philanthropic', 'social interaction', and 'reference  
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12 group' are not statistically significant predictors. The results suggest that the bifactor model is  
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14 more useful in predicting this group's participation in charity sport events.  
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27 **Keywords:** charity sport events; bifactor modeling; participation motivation; nonprofit  
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### **Bifactor Analysis of Motivation for Charity Sport Event Participation**

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With increasing competition in the fundraising marketplace, today's nonprofit organizations have developed and implemented a variety of fundraising programs. Among all fundraising methods, charity sport events (CSEs) which combine sport and charitable activities have been one of the most popular types (Filo, Spence, & Sparvero, 2013; Gladden, Mahony, & Apostolopoulou, 2005; Hendriks & Peelen, 2013). Research reports that charity sport events not only introduce the organization to new donors and strengthen the relationships with the current donors through participation in sport activities, but they also generate publicity for the organization and its mission (Filo et al., 2013; Grantspace 2014; Won & Park, 2010). Susan G. Komen's Race for the Cure and the American Heart Association's Heart Walk are examples of such events. In 2013, the top 30 nonprofit sports events raised \$1.667 billion in the United States (Sullivan and Clolery 2014). One thing that all CSEs have in common is that they depend extensively on voluntary event participants given NPOs' strong reliance on donor funding and their need to enhance public awareness. Consequently, understanding the motivation behind participation in CSEs is critical to the successful administration of these types of events.

In response to such demands, researchers have examined motivation with regard to participation in CSEs (Bennett et al. 2007; Filo et al. 2011; Scott and Solomon 2003; Won and Park 2010; Won et al. 2010). Their studies examine various types of motivation to attend CSEs from the perspectives of sport participation, helping behavior, and donor behavior (Bennett et al. 2007; Filo et al. 2011; Snelgrove and Wood 2010; Taylor and Shanka 2008; Won and Park 2010). For instance, Won and Park (2010) characterize CSE motivation as a multifaceted construct composed of several distinct but related facets, such as a philanthropic motive, sport-related motive, supporting a cause, social interaction, and joining a reference group. Similarly, Filo et al. (2011) found that social interaction and a desire to help others are

1 major motives behind the participation in CSEs. This study empirically tests how well the  
2 existing CSE motivation constructs predict actual participation. In doing so, this study  
3  
4 employs two methodologically different ways – the second-order and bifactor models – to  
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6  
7 test which model better explains the participation.  
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### 9 **CSE motivation construct**

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12 Research has identified five motivational dimensions for participation in CSEs: a  
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14 philanthropic motive, a sport-related motive, supporting a cause, social interaction, and  
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16 joining a reference group, as noted above. First, the philanthropic motive refers to a desire to  
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18 help others and is considered one of the major motives behind CSE participation. A large  
19  
20 number of CSE studies have indicated that the philanthropic motive is an important reason  
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22 for an individual to participate in a CSE (Bennett et al. 2007; Filo et al. 2011). Second, the  
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24 sport-related motive denotes a desire to engage in physical activity to stay fit and healthy;  
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26 such recreational motives can also be a critical reason for participating in CSEs (Filo et al.  
27  
28 2011; Scott and Solomon 2003; Won and Park 2010). Activities related to sport and fitness  
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30 are the core elements of CSEs; therefore, sport or physical motives can also be a crucial  
31  
32 factor behind the participation by individuals in CSEs. This is consistent with Webber's (2004)  
33  
34 finding that participation in fundraising activities are motivated by various non-charitable  
35  
36 reasons including simply having fun. Third, the cause motive represents support of a good  
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38 cause which is considered one of reasons for participation in CSEs in the sense that all CSEs,  
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40 regardless of the type, scope of the event, or level of sport intensity, are designed to increase  
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42 awareness of and to support a specific cause or causes sponsored by an NPO (Bennett et al.  
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44 2007; Scott and Solomon 2003; Won and Park 2010). Fourth, social interaction denotes a  
45  
46 personal connection with other participants. The need for social interaction with others was  
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48 found to be a primary motive in this regard (Bennett et al. 2007; Filo et al. 2008; Scott and  
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50 Solomon 2003). Finally, a reference group, which is an external and environmental factor,  
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1 indicates the influence of reference groups, such as parents or friends. This motive has been  
2 shown often to play a significant role in CSE participation (Taylor and Shanka 2008; Won  
3 and Park 2010).  
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6  
7 Although existing studies have contributed to identifying various personal and  
8 contextual attributes of participation in CSEs, the specific dimensions of motivation adopted  
9 in existing research may have limited utility with regard to a full understanding of the  
10 multiple aspects of CSE participant motivation. When using multi-faceted constructs,  
11 scholars argue that testing the predictive validity of both the general construct and the unique  
12 functions of sub-constructs is critical given that using either the general construct or the  
13 individual sub-constructs alone introduces a new set of limitations in each case (Chen et al.  
14 2013). Thus, experts recommend that studies simultaneously test the unique contribution of  
15 the general construct and the individual facets on related outcome variables in order to  
16 minimize conceptual ambiguity (Chen et al. 2013; Yang et al. 2013). Following this  
17 suggestion, the current study adopts a bifactor model in order to examine the utility of the  
18 existing subscales of CSE participation motivation given that bifactor modeling  
19 simultaneously examines both general and specific effects of a multifaceted psychometrics  
20 (Chen et al. 2006). A second-order model was also run to compare two  
21 approaches in terms of model fits and beta coefficients.  
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#### 44 **Testing the utility of the CSE motivation construct: Bifactor model vs. second-order** 45 **model** 46 47

48 Bifactor models, also known as general-specific models or nested models, represent an  
49 approach that is particularly well-suited to testing multifaceted constructs which are  
50 composed of multiple related yet distinct facets (Chen et al. 2006; Reise et al. 2007). As  
51 shown in Figure 1, the model consists of both general and domain-specific constructs on the  
52 same level, and the outcome is predicted by both constructs (McInerney et al. 2009). The  
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general factor is hypothesized to account for the *commonality of the items measured* and represents the individual differences on the target dimension that a researcher is most interested in. Moreover, specific factors (or dimensions) each account for the item variance of a specific domain over and above the general factor (Chen et al. 2012). In other words, each observable indicator is a reflective indicator of both a general factor and a more narrowly definite specific factor that is not correlated with the general factor (Reise et al. 2010). This approach therefore allows researchers to explore the extent to which items reflects a common target trait (i.e., general factor) and the extent to which they reflect a primary or subtrait (i.e., specific factor).

The second-order model is similar conceptually with the bifactor model when used to test multifaceted constructs (Gustafsson and Balke 1993). As shown in Figure 1, the second-order model includes a higher-order factor that that accounts for the commonality shared by lower-order factors (i.e., first-order factors). The higher-order factor resembles the general factor in the bifactor model, and the disturbance of the lower-order factors is similar to that of the specific factors in the bifactor model. Despite the conceptual similarities, scholars argued that bifactor models have significant advantages over second-order models for testing multifaceted constructs and the relationships with external variables (Chen et al. 2006; Gignac and Watkins 2013; van Dinther et al. 2013; Wiesner and Schanding 2013). Most notably, only bifactor models can separate the specific factors from the general factor and examine the relationships with external variables, such as antecedents and consequences. Because the second-order model estimates the paths only between higher-factor and external variables, it cannot distinguish the different influences of general and specific factors on external variables. Research also suggests that the bifactor model provides a more accurate representation of the data, as it fits the data better than the second-order model. In sum, the literature suggests that the bifactor model is a more useful approach to represent the

1 multifaceted constructs of CSE motivation when examining the utility of multi-dimensional  
2 constructs. The present study compares the results from the bifactor model and the  
3  
4 second-order model for the CSE motivation constructs.  
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7 [Insert Figure 1]  
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## 9 **Methods** 10 **Sample and procedure**

11 This study uses data from undergraduate students attending a Southeastern university in  
12 the U.S. Respondents participated in this study on a voluntary basis and completed a  
13 paper-and-pencil survey. Among the 494 returned surveys, 488 valid questionnaires were  
14 retained for further analysis. Of the 488 respondents, 53% ( $n = 257$ ) were male and 47% ( $n =$   
15 231) were female. The average age of the participants was 20.4 years old ( $SD = 2.09$ ), and the  
16 vast majority of the respondents were Caucasian-Americans ( $n = 378$ ; 77.5%). Moreover, 67  
17 % ( $n = 325$ ) of respondents have the experience of participating in CSEs.  
18

19 To ensure the robustness of the study, we explained the concept of the CSEs to the study  
20 participants before administering the survey. The meaning and examples of CSEs were also  
21 provided in the survey cover letter. These included the ‘Avon Walk for Breast Cancer’, a  
22 ‘charity golf tournament’, a ‘charity 3 on 3 basketball tournament’ and ‘Relay for Life’.  
23

## 24 **Outcome variable**

25 This study relies on the outcome of the intention to participate in a CSE. The theory of  
26 planned behavior posits that behavioral intention leads to overt behavior, and a person’s  
27 intention to participate predicts his or her actual behavior (Ajzen 1991, 2011; Manning, 2009).  
28 This study investigates the relationships pertaining to the general factor and specific factors  
29 of CSE motivation using participation intention information.  
30

## 31 **Measures**

32 The instrument of CSE motivation was constructed based on earlier work (Billing et al.  
33 1985; Filo et al. 2011; Gladden et al. 2005; Shank 2008; Snelgrove and Wood 2010; Taylor  
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1 and Shanka 2008; Won and Park 2010). A total of 16 items were included in the scale,  
2 reflecting five factors of CSE motivation, i.e., philanthropic, sport-related, cause, social  
3 interaction, and reference group. Moreover, the respondents' behavioral intention to  
4 participate in a future CSE of any type was measured through three questions adopted from  
5 Luo's 2005 study (See Appendix 1). The response format for CSE motivation and behavioral  
6 intention was a seven-point Likert-type scale anchored by 1 = *strongly disagree* and 7 =  
7 *strongly agree*. A final questionnaire also included items regarding demographic information,  
8 in this case gender, age and ethnicity.

### 19 **Data analysis**

21 Data analysis was performed using Mplus 6.11 (Muthén and Muthén 2010). First, a  
22 confirmatory factor analysis (CFA) was conducted to test the reliability and validity of all  
23 measures. Second, the bifactor and second-order models of CSE motivation were compared.  
24 Finally, their relationships with the external outcome, i.e., behavioral intention, were  
25 examined in a simultaneous equation model.

## 36 **Results**

### 39 **Data screening**

41 The data was examined through a non-normality test, which is commonly used in  
42 structural equation modeling (Wang and Wang 2012). A univariate distribution of 25 out of  
43 28 observed variables, however, showed that the test results for both multivariate skewness  
44 and kurtosis were statistically significant ( $p < 0.01$ ), indicating a violation of the multivariate  
45 normality assumption. Consequently, Satorra and Bentler's (1994; 2001) rescaling method  
46 was used with the MLR robust estimator (Wang and Wang 2012). The Satorra and Bentler  
47 scaled  $\chi^2$  (S-B  $\chi^2$ ) statistic has been shown to be robust under a violation of the normality  
48 assumption (Curran et al. 1996; Yuan and Bentler 2000).

### Measurement model

The measurement model of CSE motivation and behavioral intention was evaluated by a CFA. The measurement model revealed an adequate model fit to the data (S-B  $\chi^2 = 291.515$ ,  $df = 137$ ,  $\chi^2/df = 2.12$ , CFI = 0.939, TLI = 0.924, RMSEA = 0.049 (90% CI: 0.041 – 0.056), and SRMR = 0.049.

In the next step, scale reliability and validity were examined. The measurement scales revealed adequate psychometric properties, as indicated by all significant factor loadings in the predicted direction ( $p < 0.001$ ). All subscales had reliability values which exceeded 0.70, with a range of 0.70 to 0.85 (Nunnally 1978), except for one subscale, ‘sport and event’ (0.67). The composite reliability (CR) values ranged from 0.585 to 0.839. Pearson correlations among the variables were also calculated to determine the presence of linear relationships between these constructs. All of the values were under 0.8, which indicates that these constructs are not highly correlated. This result suggests that collinearity is not a serious issue in the analysis.

[Insert Table 1]

### Bifactor model and second-order model

A bifactor model (Figure 2) and a second-order model (Figure 3) were both tested and then compared. As the existing research suggests that second-order models are nested within bifactor models (Rindskopf and Rose 1988), a  $\chi^2$  difference test was conducted for a statistical comparison of the two models. As shown in Figure 1, the items from the CSE motivation scale could be explained by one general factor, in addition to a number of specific factors corresponding to each of the construct’s facets. The bifactor model fit the data adequately, with S-B  $\chi^2 = 173.992$ ,  $df = 88$ ,  $\chi^2/df = 1.97$ , CFI = 0.959, TLI = 0.944, RMSEA = 0.045 (90% CI: 0.035 – 0.055), and SRMR = 0.049. On the other hand, second-order model, as illustrated in Figure 2, also fit the data well, with S-B  $\chi^2 = 249.444$ ,  $df = 99$ ,  $\chi^2/df = 2.51$ ,

CFI = 0.928, TLI = 0.913, RMSEA = 0.056 (90% CI: 0.048 – 0.065), and SRMR = 0.074.

The  $\chi^2$  difference test for a comparison of the bifactor model and the second-order model was significant, with  $\Delta S-B \chi^2 = 74.452$  ( $\Delta df = 11$ ),  $p < 0.001$ . In addition, the fit indices of the bifactor model showed better values than those of the second-order model. The significant findings of the  $\chi^2$  difference test and fit indices suggest that the bifactor model provided a better interpretation of the data compared to second-order model. For this reason, the bifactor model was chosen for further analysis. As shown in Figure 3, all factor loadings for the general CSE motivation and specific motivation factors were significant. These results imply that the variance of each CSE motivation item was accounted for by domain-specific factors and by the general factor of CSE motivation, in addition to measurement error (Chen et al. 2006).

### **Relationships between the CSE motivation and behavioral intention**

The bifactor simultaneous equation model (see Figure 4), which consisted of one general CSE motivation factor, five domain-specific CSE motivation factors, and behavioral intention, achieved a good fit of the data, with  $\chi^2 = 239.985$ ,  $df = 130$ ,  $\chi^2 / df = 1.84$ , CFI = 0.960, TLI = 0.947, RMSEA = 0.042 (90% CI: 0.034 – 0.050), and SRMR = 0.045.

General CSE motivation significantly predicted a positive effect on behavioral intention ( $\beta = 0.48$ ,  $p < 0.001$ ). Among the domain-specific factors of CSE motivation, the direct path from the specific factor of sport and event to behavioral intention was significant ( $\beta = 0.26$ ,  $p < 0.001$ ). In addition, the direct path from the specific factor of cause to behavioral intention was also significant ( $\beta = 0.19$ ,  $p < 0.05$ ). However, the direct paths from the specific factors of philanthropic, social interaction, and reference group to behavioral intention were not significant. Overall, general CSE motivation and the specific factors of sport and event and cause collectively explained 33.41% of the variance in intention to participate in CSEs.

On the other hand, the second-order simultaneous equation model was illustrated in Figure 5,

1 yielding an adequate model fit:  $\chi^2 = 322.253$ ,  $df = 146$ ,  $\chi^2 / df = 2.20$ , CFI = 0.936, TLI =  
2 0.925, RMSEA = 0.050 (90% CI: 0.043 – 0.058), SRMR = 0.067. The general CSE  
3 motivation which consists of underlying factors (i.e., a philanthropic, sport-related, cause,  
4 social interaction, and reference group factors) had a positive and significant influence on  
5 behavioral intention ( $\beta = 0.68$ ,  $p < 0.01$ ) and explained 48.8% of variance intention to  
6 participate in CSEs.  
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13 [Insert Figure 3 and Figure 4]  
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## 17 Discussion

18 This study empirically examined the conceptual structure of CSE motivation by  
19 comparing a bifactor model to a second-order model. The results suggest that the bifactor  
20 model provides a significantly better fit to the data. This finding is consistent with the  
21 findings of other researchers (Chen et al. 2012; Gignac and Watkins 2013; van Dinther et al.  
22 2013; Wiesner and Schanding 2013), suggesting that bifactor models offer a more precise  
23 representation of this type of data than second-order models using multidimensional  
24 constructs. All of the observable indicators have significant loadings on both sides of the  
25 general factor and specific factors (Chen et al., 2012), supporting the scale construction of  
26 CSE motivation conceptualized in this study. In addition, the bifactor simultaneous equations  
27 model provides more informative statistics than the second-order model simultaneous  
28 equations model because bifactor simultaneous equations model distinguish the influences of  
29 general CSE motivation and its specific factors on behavioral intention. As suggested by  
30 scholars, adopting bifactor models gives the advantage of exploring the unique contribution  
31 of the general and specific factors to the prediction of external variables at the same time  
32 (Reise et al. 2010). The most significant finding of the bifactor simultaneous equations model  
33 is that general CSE motivation was found to be significantly associated with behavioral  
34 intention to participate in CSEs. While the existing research examined each motivating factor  
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1 separately, the findings of this study suggest that general CSE motivation has a strong and  
2 significant influence on behavioral intention to participate in CSEs above and beyond the  
3 sub-factors.  
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7 The present study further explores the influence of specific-domain factors of CSE  
8 motivation on behavioral intention. A surprising finding is that the philanthropic motive is not  
9 a significant predictor of participation. This suggests that the other factors rather than  
10 charitable motives shape college students' CSE participation. The literature on charitable  
11 giving and volunteering indeed suggests that various motivations are behind participation in  
12 charitable activities (Webber 2004; Wilson and Musick 1997). In this study, the findings show  
13 that the *sport-related motive*, which is a desire to enjoy sport and recreational activities, was  
14 the most prominent factor among the CSE motivating factors. This result is consistent with  
15 previous studies (Bennett et al. 2007; Won and Park 2010; Won et al. 2010) which identified  
16 a sport-related motive as a significant participation motive in CSEs..  
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31 The results also indicate that support for a particular social issue is significantly  
32 associated with intention to participate in CSEs. The importance of this motivation with  
33 regard to behavioral intention is supported by previous studies on CSEs (e.g., Won and Park  
34 2010). Considering that many CSEs are related to health issues (e.g., breast cancer),  
35 participants appear to share the same concerns for health and living. The findings of this  
36 study suggest that nonprofits should design their CSEs while considering cause-related  
37 marketing.  
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48 Lastly, the findings show that the influence of social interaction and a reference group  
49 are not associated with an intention to participate in CSEs. These findings are not unexpected,  
50 however, as researchers have found that social relationships have little effect on participation  
51 in CSEs (Taylor and Shanka 2008; Won and Park 2010).  
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58 While research on older citizens' charitable behavior points to socialization as a major  
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incentive for participating in charity events by this group, social interaction may not be a significant source of motivation for younger populations, who have many alternative opportunities to interact with others. Overall, these findings emphasize the centrality of sport and physical activities in relation to CSE motivations.

## Conclusion

This study empirically tested and validated a conceptual model of CSE motivation and its influence on behavioral intention to participate in CSEs. The findings contribute to the current literature in a number of ways. First, they contribute to the cumulative knowledge on CSE motivation and confirm the five-dimensional model of CSE motivation. The five-dimensional model, containing a philanthropic motive, a sport-related motive, support for a cause, social interaction, and a reference group construct, reveals a distinct aspect of CSE motivation and, moreover, the common nature of CSE motivation. The five CSE motivation constructs help researchers comprehensively understand the nature of CSE motivation. First, each construct of CSE motivation is not vague but distinct and separate from all others, with its own characteristics. Second, general CSE motivation, which is an amalgamation of multiple dimensions, is more holistic and captures the overall strength of the psychometrics.

Additionally, the approach with the bifactor model provides more detailed and practical knowledge about the influence of CSE motivation on behavioral intention. The double-edge of general and specific factors of CSE motivation not only provides stronger empirical support for previous theoretical propositions, but it also reveals new findings to help reconcile inconsistencies in the existing research in this area.

The results of this study suggest that organizations that use CSE for fundraising can utilize the existing constructs for motivation when attracting (prospective) participants for

1 fund raising events and, thus, CSE organizers or coordinators need to understand the  
2 importance of each motivating factor for their event participants. The findings also suggest  
3 that college students do not participate in CSEs for charitable reasons only. Rather, the results  
4 imply that various motives explain CSE participation, which suggests that organizations must  
5 understand the various motivations behind CSE participation in order to design their events,  
6 attract (potential) participants, recruit more volunteers, and lead a successful event. For  
7 instance, sport-related motivation is a major reason behind college students' participation in  
8 CSEs. Hence, nonprofit organizations may want to target young adults who are already  
9 involved in sport. For instance, they can promote their events through community  
10 recreational facilities or sports-related websites. Future studies may also examine the validity  
11 of each construct across different groups of populations and social settings.  
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27         Despite the contributions, it should be noted that the comprehensive scope of this study  
28 may not reflect the specific unique aspects of CSEs, as every CSE has unique characteristics  
29 in terms of the type of sport at the event and/or the type(s) of services provided by the  
30 organization. Future research may explore CSE motivations across different types of sports  
31 and different types of nonprofit organizations. In addition, the findings may not be  
32 generalizable to a wider population because this study only assessed on a particular group –  
33 college students. Future research may examine the issue of participation in CSEs by different  
34 subgroups of the population for a better understanding of the motivation behind it.  
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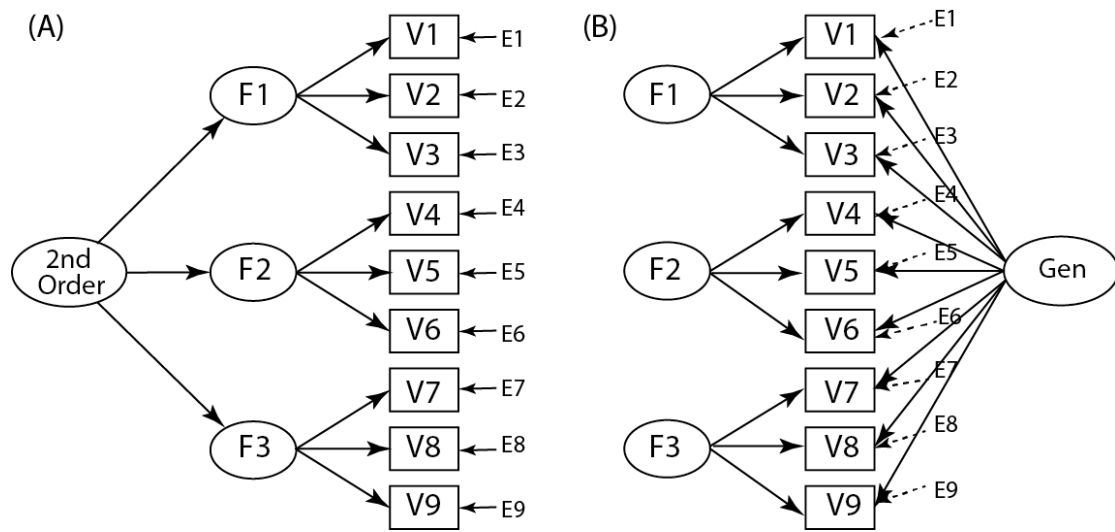
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Figure 1

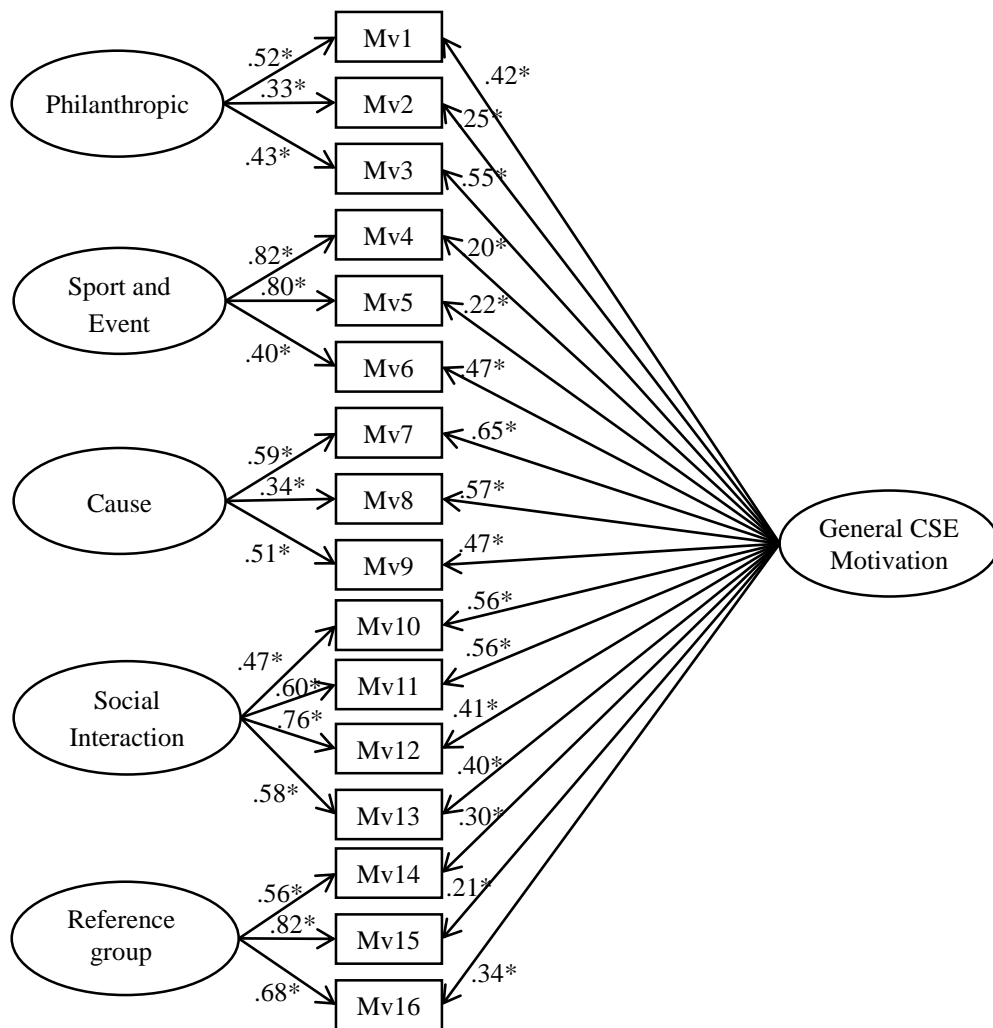


Model A: a second-order model; Model B: a bifactor model. F = factor, E = error; V = observable indicator

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Figure 2

Bifactor model of CSE motivation



\* $p < .001$

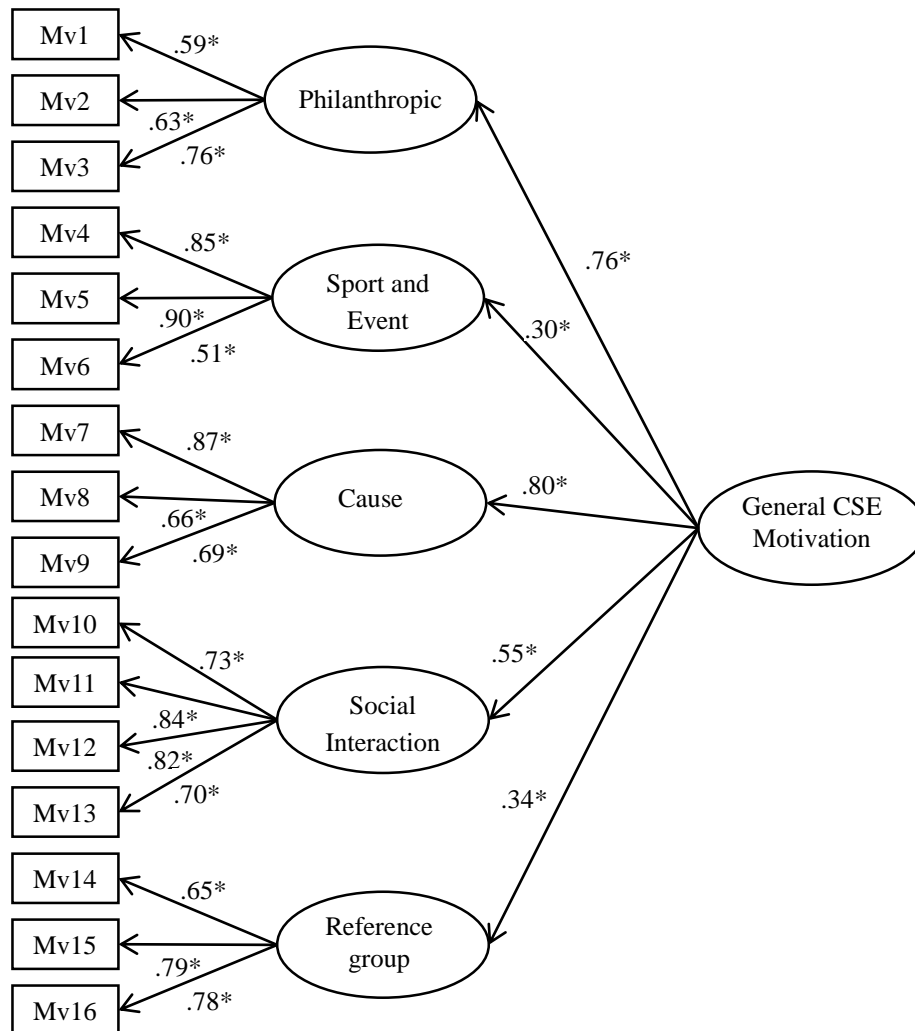
S-B  $\chi^2 = 173.992$ ,  $df = 88$ ,  $\chi^2 / df = 1.97$ , CFI = .959,

TLI = .944, RMSEA = .045 (90% CI: .035 – .055), SRMR = .049

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Figure 3

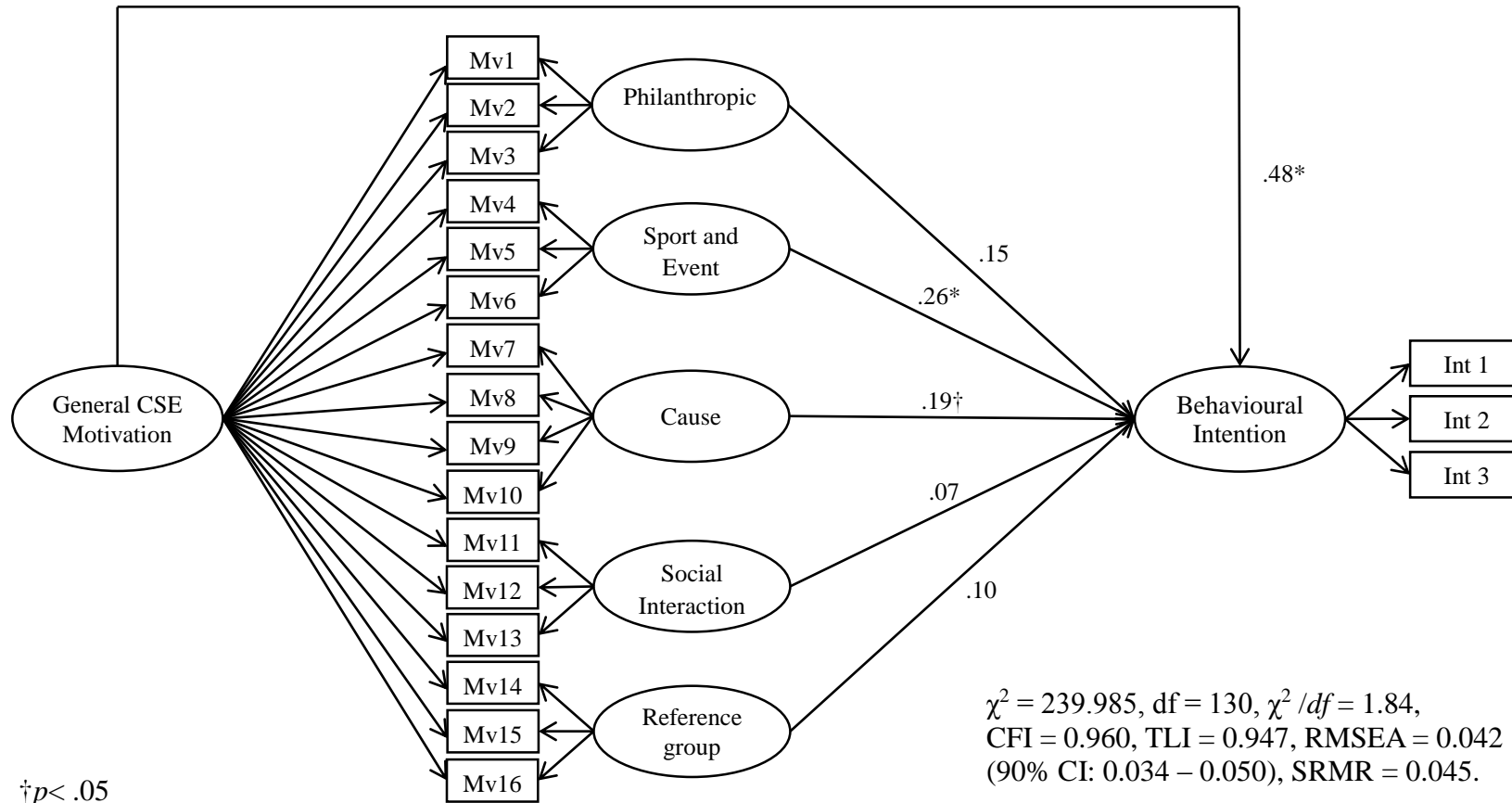
Second-order model of CSE motivation



\* $p < .001$

S-B  $\chi^2 = 249.444$ ,  $df = 99$ ,  $\chi^2 / df = 2.51$ , CFI = .928,

TLI = .913, RMSEA = .056 (90% CI: .048 – .065), SRMR = .074.



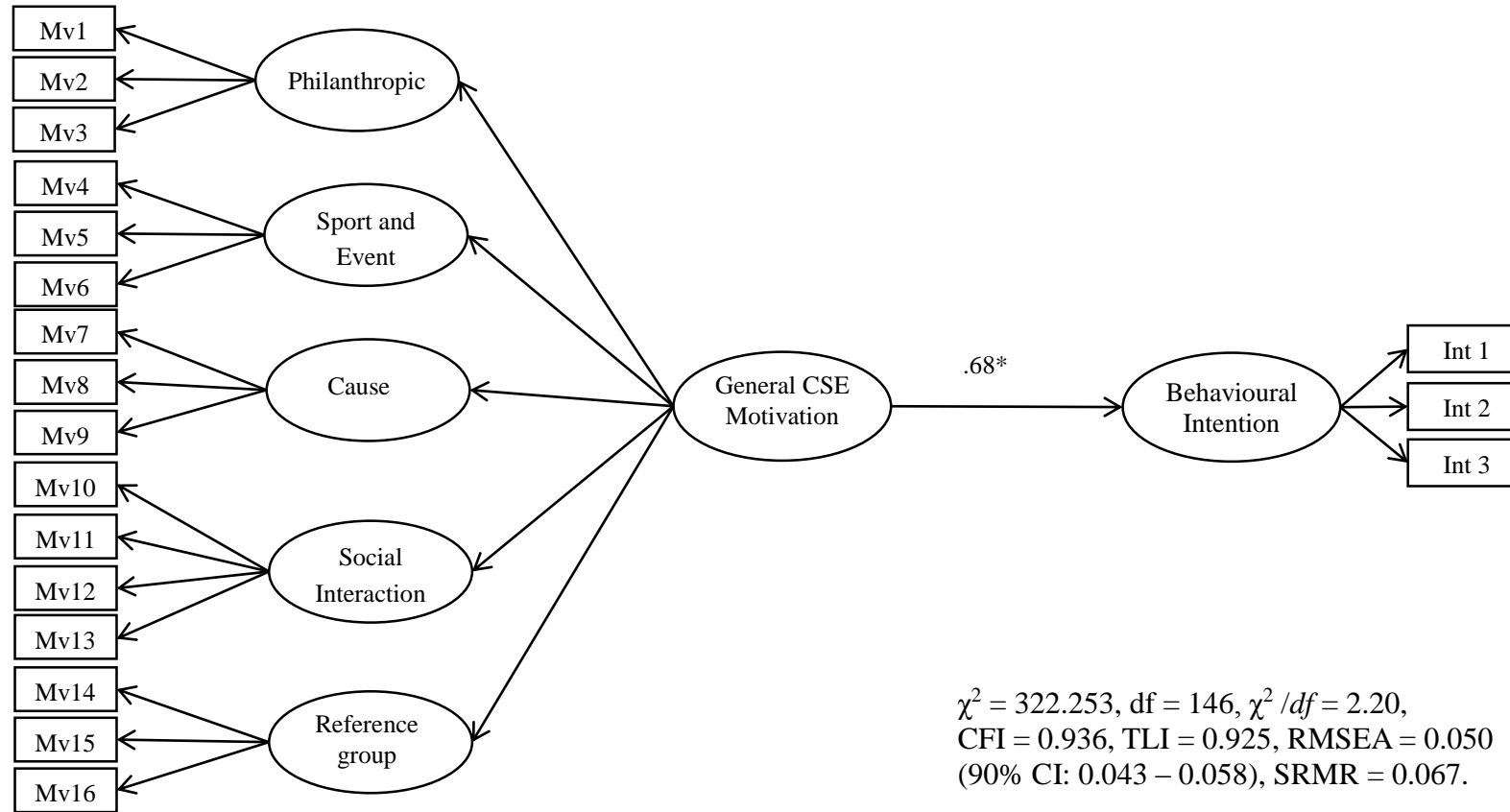
† $p < .05$

\* $p < .001$

Figure 4

Bifactor Simultaneous Equations Model

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$\chi^2 = 322.253, df = 146, \chi^2 / df = 2.20,$   
 $CFI = 0.936, TLI = 0.925, RMSEA = 0.050$   
 $(90\% CI: 0.043 - 0.058), SRMR = 0.067.$

\* $p < .001$

Figure 5

Second-Order Simultaneous Equations Model

Table 1

Results of the means, standard deviation, and correlations of the constructs

Variables	1	2	3	4	5	6	7
1. Philanthropic	1						
2. Sport/event	.12†	1					
3. Cause	.41†	.35†	1				
4. Social interaction	.30†	.36†	.36†	1			
5. Reference group	.18†	.21†	.19†	.31†	1		
6. Behavioral intention	.31†	.30†	.45†	.30†	.26†	1	
7. Actual participation	.14†	.11†	.23†	.12†	.14†	.46†	1
<i>Mean</i>	4.62	5.43	5.30	4.72	4.01	4.69	1.95
<i>SD</i>	1.06	1.04	1.06	1.17	1.32	1.26	1.02

† $p < .05$



## Appendix 1

## Measurement items

Construct	Items
Philanthropic	I believe philanthropy is everyone's responsibility.
	Giving/Helping is a religious act.
	It is important to give to non-profits organizations.
Sport /Event	I enjoy the competitive nature of sports.
	I like sports.
	I can be included in special events provided by the charity organizations.
Cause	I am proud to be a contributor to the cause or the organization.
	I am a worthy member of the charity (cause) I support.
	I believe in the cause I support.
Social interaction	I participate in this event because I can share the experience with others.
	It makes me feel like I belong to a group or community.
	I participate in this event to work with others as a team.
	It gives me a chance to spend time with my friends/family.
Reference group	Someone asks/asked me to participate in a CSE.
	Peer influence is an important reason why I participate in this event.
	My friends or family encourage me to join the event.
Behavioral intention	I'm planning to participate in a charity sporting event (CSE) in the near future.
	I'm very interested in charity sporting events.
	I'm willing to participate in a CSE if someone asks me to do.