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The Relationship Between Participation Motivation and Intention to Continue Volunteering Among University Student Volunteers in Marathon Events: The Serial Mediating Roles of Psychological Contract and Work Engagement

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Article

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Abstract

Objective

To examine the direct and indirect associations between participation motivation and intention to continue volunteering among university student volunteers at a marathon event, with particular attention to the indirect associations through psychological contract and work engagement.

Method

A cluster sampling method was used to survey university student volunteers who participated in the 2025 Hefei International Marathon in China. A total of 1,458 valid questionnaires were obtained. SPSS 27.0 and PROCESS macro Model 6 were used to conduct descriptive statistics, group difference tests, correlation analyses, hierarchical regression analyses, and Bootstrap tests of mediation effects.

Results

Participation motivation, psychological contract, work engagement, and intention to continue volunteering were significantly and positively correlated with one another. The total association between participation motivation and intention to continue volunteering was positive and statistically significant (Effect = 0.6674). The indirect associations through psychological contract (Effect = 0.1917), work engagement (Effect = 0.2133), and the serial pathway through psychological contract and work engagement (Effect = 0.3456) were all statistically significant. The serial indirect association accounted for 46.04% of the total indirect effect. After psychological contract and work engagement were included in the model, the direct association became negative (Effect = − 0.0832), indicating a pattern of inconsistent mediation.

Conclusion

Participation motivation was positively associated with intention to continue volunteering, with significant indirect associations through psychological contract and work engagement. Psychological contract and work engagement also showed a significant serial indirect association between participation motivation and intention to continue volunteering. Given the cross-sectional design, these indirect pathways should be interpreted as statistical associations rather than evidence of causal mediation.

1. Introduction

Marathon events serve multiple functions, including competitive sport, city image promotion, and the advancement of mass participation in physical activity, and their successful operation relies heavily on

well-organized volunteer service systems. University student volunteers constitute an important component of the volunteer workforce at large-scale road-running events. The quality of their service not only affects participants' event experience and organizational efficiency, but also relates to the effectiveness of practice-based education in universities, youth social participation, and the development of sports volunteer service systems. Accordingly, enhancing university student volunteers' intention to continue volunteering has become an important issue in both marathon volunteer management and research on university-based sports volunteering [1].

Participation motivation is an important antecedent of volunteer participation behavior. Previous research has shown that volunteering may serve multiple functions, including value expression, learning and understanding, social interaction, career development, self-enhancement, and protective motives [2]. However, whether participation motivation can be translated into an intention to continue volunteering may depend not only on the strength of initial motivation, but also on volunteers' organizational perceptions, role experiences, and level of engagement during event service. Thus, the relationship between "why volunteers participate" and "whether they are willing to continue participating" may involve additional psychological and role-related processes. Psychological contract refers to individuals' subjective perceptions of reciprocal obligations and expectations within their relationship with an organization [3], whereas work engagement reflects the degree of vigor, dedication, and absorption displayed during service activities [4]. Among university student volunteers at marathon events, Stronger participation motivation may be associated with a more positive psychological contract, which may in turn be associated with greater work engagement and stronger intention to continue volunteering. Drawing primarily on social exchange theory, the present study conceptualizes continued volunteering intention as the outcome of a sequential process that begins with initial participation motivation and unfolds through volunteers' perceptions of their reciprocal relationship with the event organization and their subsequent engagement in the volunteer role. Psychological contract theory, the job demands–resources model, and self-determination theory are used as complementary perspectives to explain specific stages of this process. Based on this rationale, the present study examined university student volunteers participating in the 2025 Hefei International Marathon and constructed a serial mediation model of participation motivation–psychological contract–work engagement–intention to continue volunteering. The study aimed to examine the direct and indirect associations between participation motivation and intention to continue volunteering and to provide empirical evidence for understanding continued volunteering among university student volunteers at marathon events.

2. Literature Review and Hypotheses

2.1 Participation Motivation and Intention to Continue Volunteering

Participation motivation refers to the psychological reasons and orientations that lead individuals to engage in volunteer activities. In the context of sports event volunteering, these motivations may include

value expression, interpersonal interaction, personal development, career-related needs, and extrinsic incentives [5]. For university student volunteers at marathon events, participation may therefore be driven by both value-oriented motives, such as serving society and supporting sporting events, and developmental motives, such as gaining practical experience, improving personal competencies, and expanding social networks. Participation motivation provides the initial psychological basis for entering volunteer service. However, continued volunteering may depend not only on why individuals initially participate, but also on how they evaluate their subsequent experiences within the event organization. From a social exchange perspective, volunteers' positive and negative experiences during a sporting event may shape their future volunteering intentions [6]. Thus, continued volunteering intention may be understood as the result of a process that begins with initial motivation and develops through volunteers' subsequent experiences during service.

Previous studies have shown that participation motivation is associated not only with initial volunteer participation but also with subsequent satisfaction and intention to continue volunteering [7]. Self-determination theory further suggests that behavioral persistence is closely related to the quality of motivation and to the extent to which participation experiences satisfy individuals' needs for autonomy, competence, and relatedness [8]. University student volunteers with stronger participation motivation may therefore be more likely to perceive value in marathon volunteering and maintain stronger intentions to participate in similar activities in the future. Accordingly, the following hypothesis was proposed:

H1: Participation motivation is positively associated with intention to continue volunteering.

2.2 Mediating Role of Psychological Contract

Psychological contract refers to individuals' subjective perceptions of implicit and explicit promises, expectations, and reciprocal obligations within their relationship with an organization [9]. Although marathon volunteers usually receive limited financial compensation, they may still hold expectations regarding reasonable task allocation, adequate training, effective communication, organizational support, respectful treatment, and recognition of their contributions. These experiences may shape volunteers' perceptions of the quality of their relationship with the event organization. From the perspective of social exchange theory, such perceptions represent an important part of the reciprocal relationship between volunteers and organizers [10]. Participation motivation may encourage university students to enter the volunteering context, but their subsequent intention to continue volunteering may also depend on how they evaluate this exchange relationship.

Previous research on sports event volunteers has shown that organizational support, role clarity, recognition, and interaction quality are associated with volunteers' perceptions of the organization [11]. Psychological contract has also been identified as relevant to sustained participation among sports volunteers [12]. When volunteers perceive that their expectations are appropriately addressed and that their contributions are valued, they may develop stronger organizational trust, role identification, and willingness to maintain their relationship with the organization. Psychological contract may therefore

represent an organizational-cognitive mechanism through which initial participation motivation is associated with continued volunteering intention. Accordingly:

H2: Psychological contract mediates the association between participation motivation and intention to continue volunteering.

2.3 Mediating Role of Work Engagement

Work engagement refers to a positive psychological state characterized by the investment of physical, cognitive, and emotional resources in role performance [13]. In volunteering contexts, engagement reflects not only the completion of assigned tasks but also the extent to which volunteers invest energy, attention, and psychological involvement in their service roles. Participation motivation may provide the initial willingness to engage in marathon volunteering, whereas the extent to which this motivation is associated with future volunteering intention may depend partly on volunteers' actual engagement during service. According to the job demands–resources model, organizational and personal resources can facilitate engagement and contribute to more positive behavioral outcomes [14]. Clear role expectations, meaningful tasks, organizational support, positive interactions, and recognition may therefore function as resources that facilitate engagement among marathon volunteers.

Previous research on sports event volunteers has also indicated that volunteer management, service satisfaction, and intention to continue participating are closely related [15]. Volunteers with stronger participation motivation may be more willing to invest effort in their assigned roles, while greater engagement may enhance their positive evaluation of the volunteering experience and correspond with stronger intentions to participate again. Work engagement may therefore represent a role-based mechanism linking initial participation motivation with continued volunteering intention. Accordingly:

H3: Work engagement mediates the association between participation motivation and intention to continue volunteering.

2.4 Serial Mediating Roles of Psychological Contract and Work Engagement

Psychological contract and work engagement may operate sequentially rather than independently in the association between participation motivation and intention to continue volunteering. Social exchange theory suggests that favorable perceptions of organizational support, fulfilled reciprocal expectations, and recognition may be reciprocated through more positive attitudes and greater behavioral investment [16]. In marathon volunteering, psychological contract captures volunteers' cognitive evaluation of their reciprocal relationship with the event organization, whereas work engagement reflects their subsequent psychological and behavioral investment in the volunteer role. Because psychological contracts develop dynamically through interactions between individuals and organizations [17], favorable organizational experiences may provide relational and psychological resources that support greater engagement.

Previous research has shown that psychological contract breach is associated with lower work engagement [18], while studies in volunteering contexts have linked organizational support with volunteer engagement and favorable volunteering outcomes [18]. Taken together, these findings support a sequential process in which participation motivation provides the initial basis for volunteering, psychological contract reflects volunteers' subsequent evaluation of the volunteer–organization relationship, and work engagement represents their investment in the volunteer role. Participation motivation may therefore be associated with a more positive psychological contract, which may in turn be associated with greater work engagement and ultimately stronger intention to continue volunteering. Accordingly:

H4: Participation motivation is indirectly associated with intention to continue volunteering through the serial pathway of psychological contract and work engagement.

Based on the existing literature and theoretical framework, this study developed the research model shown in Fig. 1.

3. Methods

3.1 Participants and Data Collection

University student volunteers who participated in the 2025 Hefei International Marathon in Hefei, China, were recruited after completing their event-related volunteer service. The questionnaire was administered through the participating volunteer teams one day after the event. A total of 1,460 questionnaires were distributed and returned. All returned questionnaires were screened for data quality. Questionnaires were excluded if they contained substantial missing responses, showed obvious invariant response patterns across the main scales, or contained responses that failed the predefined validity checks. After excluding invalid questionnaires, 1,458 valid questionnaires were retained, yielding an effective response rate of 99.86%.

Among the participants, 535 (36.7%) were male and 923 (63.3%) were female. In terms of year of study, 799 (54.8%) were first-year students, 488 (33.5%) were second-year students, and 171 (11.7%) were in their third year or above. Regarding previous volunteering experience, 589 participants (40.4%) were volunteering for the first time, 345 (23.7%) had volunteered twice, 355 (24.3%) had volunteered three to four times, and 169 (11.6%) had volunteered five or more times.

3.2 Measurement Instruments

3.2.1 Participation Motivation

Participation motivation was assessed using the Motivation Scale for University Student Volunteers Participating in Marathon Events developed by Yin and Huang [20]. The scale is based on push–pull theory and comprises two broad components: push factors and pull factors. The push factors include

four dimensions: experiential learning, self-realization, relaxation and leisure, and value expression. The pull factors include three dimensions: incentive inducement, developmental needs, and event environment. The scale consists of 18 items in total. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher mean scores indicating higher levels of participation motivation. In the present study, the scale demonstrated good internal consistency, with a Cronbach's α coefficient of 0.920.

3.2.2 Psychological Contract

Psychological contract was assessed using the psychological contract measure applied to volunteers by Liao-Troth [21]. The scale comprises two dimensions: relational psychological contract and transactional psychological contract, with a total of 12 items. The relational psychological contract dimension contains 5 items, whereas the transactional psychological contract dimension contains 7 items. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher mean scores indicating higher levels of psychological contract. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.967.

3.2.3 Work Engagement

Work engagement was assessed using the 17-item Utrecht Work Engagement Scale (UWES-17) developed by Schaufeli et al. [22]. The scale comprises three dimensions: vigor, dedication, and absorption, with a total of 17 items. The vigor and absorption dimensions each contain 6 items, whereas the dedication dimension contains 5 items. In the present study, all items were rated on a 7-point frequency scale ranging from 0 (never) to 6 (always/every day), with higher mean scores indicating higher levels of work engagement. The scale demonstrated excellent internal consistency in the present sample, with a Cronbach's α coefficient of 0.967.

3.2.4 Intention to Continue Volunteering

Intention to continue volunteering was assessed using a five-item scale adapted from previous studies by Wang and Luo et al. [23, 24]. The scale was revised to fit the context of university student volunteers participating in marathon events and was treated as a unidimensional measure. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher mean scores indicating a stronger intention to continue volunteering. In the present study, the scale demonstrated excellent internal consistency, with a Cronbach's α coefficient of 0.952.

3.3 Statistical Analysis

After the returned questionnaires were screened and invalid responses were excluded, the data were analyzed using SPSS version 27.0 and AMOS version 24.0. Descriptive statistics were first used to summarize the demographic characteristics of the participants and the distributions of the study variables. The internal consistency of the scales was assessed using Cronbach's α coefficients. Confirmatory factor analysis (CFA) was conducted to examine the measurement model. Model fit was evaluated using the chi-square to degrees-of-freedom ratio (χ^2/df), root mean square error of

approximation (RMSEA), normed fit index (NFI), incremental fit index (IFI), Tucker–Lewis index (TLI), and comparative fit index (CFI).

Second, independent-samples t tests and one-way analysis of variance (ANOVA) were conducted to examine differences in the study variables according to sex, year of study, and previous volunteering frequency. Pearson correlation analyses were subsequently performed to examine the associations among participation motivation, psychological contract, work engagement, and intention to continue volunteering.

Finally, hierarchical multiple regression analyses were conducted to examine the associations among the study variables. A serial mediation model was then tested using Model 6 of the PROCESS macro. Bootstrap analysis with 5,000 resamples was performed to estimate the indirect effects of psychological contract and work engagement, as well as their serial indirect effect, in the association between participation motivation and intention to continue volunteering. A two-sided p value < 0.05 was considered statistically significant. An indirect effect was considered statistically significant when its bootstrapped 95% confidence interval (CI) did not include zero.

4. Results

4.1 Measurement Model

Confirmatory factor analysis (CFA) was conducted to examine the measurement model. The results indicated that the model demonstrated a good fit to the data ($\chi^2/df = 2.995$, RMSEA = 0.030, NFI = 0.987, IFI = 0.991, TLI = 0.985, and CFI = 0.991). All fit indices met the predefined criteria, supporting the adequacy of the measurement model. Table 1

Table 1
Goodness-of-fit indices for the measurement model

Fit Index	χ2/df	RMSEA	NFI	IFI	TLI	CFI
Criteria	< 3	< 0.08	> 0.9	> 0.9	> 0.9	> 0.9
Model fit results	2.995	0.030	0.987	0.991	0.985	0.991
Note: RMSEA = root mean square error of approximation; NFI = normed fit index;						

IFI = incremental fit index; TLI = Tucker–Lewis index; CFI = comparative fit index.

4.2 Differences in study variables by demographic characteristics

As shown in Table 2, significant sex differences were observed in psychological contract, work engagement, and intention to continue volunteering. Specifically, psychological contract scores differed significantly between male and female participants (t = -2.272, p < 0.05), as did work engagement (t =

-2.180, $p < 0.05$) and intention to continue volunteering ($t = -3.352$, $p < 0.01$). No significant sex difference was observed in participation motivation.

Significant differences across years of study were found for psychological contract, work engagement, and intention to continue volunteering. Psychological contract differed significantly across year groups ($F = 6.907$, $p < 0.01$), as did work engagement ($F = 3.132$, $p < 0.05$) and intention to continue volunteering ($F = 11.355$, $p < 0.001$). In contrast, no significant difference across years of study was observed for participation motivation.

Significant differences according to previous volunteering experience were observed for all four study variables. Specifically, participation motivation differed significantly across volunteering experience groups ($F = 2.612$, $p < 0.05$), as did psychological contract ($F = 3.233$, $p < 0.05$), work engagement ($F = 5.549$, $p < 0.01$), and intention to continue volunteering ($F = 6.455$, $p < 0.001$). Overall, sex-related differences were observed primarily in psychological contract, work engagement, and intention to continue volunteering; year-of-study differences were observed in psychological contract and intention to continue volunteering; and previous volunteering experience was associated with significant differences across all four study variables.

Table 2
Differences in study variables by demographic characteristics

Characteristic	Category	Participation motivation, M ± SD	Psychological contract, M ± SD	Work engagement, M ± SD	Intention to continue volunteering, M ± SD
Sex	Male	4.053 ± 0.637	4.321 ± 0.659	4.186 ± 0.673	4.361 ± 0.682
	Female	4.061 ± 0.517	4.396 ± 0.563	4.259 ± 0.557	4.471 ± 0.549
	t	-0.234	-2.272*	-2.180*	-3.352**
Year of study	First-year	4.063 ± 0.530	4.422 ± 0.560	4.267 ± 0.572	4.496 ± 0.565
	Second-year	4.063 ± 0.581	4.320 ± 0.608	4.207 ± 0.603	4.379 ± 0.589
	Third year or above	4.049 ± 0.608	4.273 ± 0.687	4.155 ± 0.685	4.287 ± 0.724
	F	0.027	6.907***	3.132*	11.355***
Previous volunteering experience	First time	4.066 ± 0.548	4.382 ± 0.580	4.233 ± 0.596	4.448 ± 0.585
	Twice	4.035 ± 0.569	4.324 ± 0.603	4.178 ± 0.617	4.353 ± 0.627
	3–4 timese	4.032 ± 0.573	4.340 ± 0.625	4.210 ± 0.613	4.406 ± 0.618
	≥ 5 times	4.167 ± 0.517	4.487 ± 0.552	4.399 ± 0.496	4.592 ± 0.504
		2.612*	3.233*	5.549**	6.455***

Note: M, mean; SD, standard deviation. *p < 0.05, **p < 0.01, ***p < 0.001.

4.3 Descriptive Statistics and Correlation Analysis

As shown in Table 3, participation motivation, psychological contract, work engagement, and intention to continue volunteering were all significantly and positively correlated with one another. Specifically, participation motivation was positively correlated with psychological contract ($r = 0.731$, $p < 0.01$), work engagement ($r = 0.751$, $p < 0.01$), and intention to continue volunteering ($r = 0.624$, $p < 0.01$). Psychological contract was positively correlated with work engagement ($r = 0.850$, $p < 0.01$) and intention to continue volunteering ($r = 0.785$, $p < 0.01$). Work engagement was also positively correlated with intention to continue volunteering ($r = 0.849$, $p < 0.01$). Overall, participation motivation, psychological contract, and work engagement were all closely associated with intention to continue volunteering. Relatively strong correlations were observed between psychological contract and work engagement and between work engagement and intention to continue volunteering.

Table 3
Means, standard deviations, and correlations among the study variables

Variable	M ± SD	1	2	3	4
1. Participation motivation	4.058 ± 0.564	1			
2. Psychological contract	4.368 ± 0.601	0.731**	1		
3. Work engagement	4.232 ± 0.603	0.751**	0.850**	1	
4. Intention to continue volunteering	4.431 ± 0.604	0.624**	0.785**	0.849**	1

Note: M, mean; SD, standard deviation. Numbers 1–4 in the column headings correspond to the variables listed in the first column. **$p < 0.01$ (two-tailed).

4.4 Hierarchical Regression Analysis

After controlling for sex, year of study, and previous volunteering frequency, hierarchical regression analysis was conducted to examine the associations of participation motivation, psychological contract, and work engagement with intention to continue volunteering. As shown in Table 4, in Model 1, participation motivation was positively associated with intention to continue volunteering ($\beta = 0.626$, $p < 0.001$), and the model explained 42.4% of the variance in intention to continue volunteering. After psychological contract was added in Model 2, psychological contract was positively associated with intention to continue volunteering ($\beta = 0.690$, $p < 0.001$). The standardized regression coefficient for participation motivation decreased from 0.626 to 0.121 but remained statistically significant ($p < 0.001$). The proportion of explained variance increased to 63.8%, representing an increase of 21.3 percentage points compared with Model 1. In Model 3, after work engagement was additionally entered, work engagement was positively associated with intention to continue volunteering ($\beta = 0.692$, $p < 0.001$), while psychological contract remained positively associated with intention to continue volunteering ($\beta = 0.248$, $p < 0.001$). The standardized regression coefficient for participation motivation became negative and remained statistically significant ($\beta = -0.077$, $p < 0.001$), whereas previous volunteering frequency was no longer significantly associated with intention to continue volunteering ($\beta = 0.025$, $p = 0.085$). The proportion of explained variance further increased to 75.0%, an increase of 11.2 percentage points compared with Model 2.

Overall, as psychological contract and work engagement were sequentially added to the regression models, the proportion of variance explained in intention to continue volunteering increased from 42.4% to 75.0%. Both variables significantly improved the explanatory power of the models. In the final model, work engagement had the largest standardized regression coefficient, followed by psychological contract.

Table 4
Hierarchical regression analysis of intention to continue volunteering

Predictor	Model 1		Model 2		Model 3	
	β	t	β	t	β	t
Sex	0.073	3.630***	0.040	2.481*	0.030	2.234*
Year of study	-0.158	-7.200***	-0.080	-4.532***	-0.066	-4.476***
Previous volunteering frequency	0.086	3.896***	0.051	2.894**	0.025	1.722
Participation motivation	0.626	31.459***	0.121	5.170***	-0.077	-3.679***
Psychological contract	-	-	0.690	29.227***	0.248	9.468***
Work engagement	-	-	-	-	0.692	25.505***
R^2	0.424		0.638		0.750	
Adjusted R^2	0.423		0.636		0.749	
ΔR^2	0.424		0.213		0.112	
F	267.822***		510.921***		724.637***	

Note: β, standardized regression coefficient. *p < 0.05, **p < 0.01, ***p < 0.001.

4.5 Serial Mediation Analysis

After controlling for sex, year of study, and previous volunteering frequency, a serial mediation model was tested using Model 6 of the PROCESS macro with 5,000 bootstrap resamples. As shown in Table 5, the indirect association between participation motivation and intention to continue volunteering through psychological contract was statistically significant (Ind1 = 0.1917, 95% CI = [0.1405, 0.2474]), as was the indirect association through work engagement (Ind2 = 0.2133, 95% CI = [0.1741, 0.2533]). The serial indirect association through psychological contract and work engagement was also statistically significant (Ind3 = 0.3456, 95% CI = [0.3016, 0.3907]). None of the 95% bootstrap confidence intervals for the three indirect effects included zero. The indirect effects through psychological contract, work engagement, and the serial pathway accounted for 25.54%, 28.42%, and 46.04% of the total indirect effect, respectively, with the serial pathway accounting for the largest proportion.

Comparisons among the indirect effects showed that the difference between Ind1 and Ind2 was not statistically significant (C1 = -0.0216, 95% CI = [-0.0954, 0.0584]). In contrast, the difference between Ind1 and Ind3 was statistically significant (C2 = -0.1540, 95% CI = [-0.2352, -0.0681]), as was the difference between Ind2 and Ind3 (C3 = -0.1324, 95% CI = [-0.1913, -0.0772]). Based on the direction of these contrasts, the serial indirect effect was significantly larger than either of the two specific indirect

effects, indicating a relatively prominent statistical indirect association through the sequential pathway of psychological contract and work engagement.

The total effect of participation motivation on intention to continue volunteering was positive and statistically significant (Effect = 0.6674, 95% CI = [0.6250, 0.7098]), whereas the direct effect became negative and remained statistically significant after psychological contract and work engagement were included in the model (Effect = -0.0832, 95% CI = [-0.1278, -0.0385]). Because the direct effect and the total indirect effect were in opposite directions, the model exhibited a pattern of inconsistent mediation. Given the cross-sectional design of the present study, these findings should be interpreted as statistical indirect associations rather than evidence of causal mediation.

Table 5
Direct, indirect, and total effects in the serial mediation model

Effect path	Effect	SE	Lower 95% CI	Upper 95% CI	Proportion of total indirect effect
PM → PC → ICV (Ind1)	0.1917	0.0273	0.1405	0.2474	25.54%
PM → WE → ICV (Ind2)	0.2133	0.0202	0.1741	0.2533	28.42%
PM → PC → WE → ICV (Ind3)	0.3456	0.0227	0.3016	0.3907	46.04%
Total indirect effect	0.7506	0.0283	0.6930	0.8048	100.00%
Direct effect	-0.0832	0.0228	-0.1278	-0.0385	-
Total effect	0.6674	0.0216	0.6250	0.7098	-
C1(Ind1 - Ind2)	-0.0216	0.0397	-0.0954	0.0584	-
C2(Ind1 - Ind3)	-0.1540	0.0421	-0.2352	-0.0681	-
C3(Ind2 - Ind3)	-0.1324	0.0291	-0.1913	-0.0772	-

Note: Sex, year of study, and previous volunteering frequency were included as covariates. PM, participation motivation; PC, psychological contract; WE, work engagement; ICV, intention to continue volunteering. C1 = Ind1 − Ind2; C2 = Ind1 − Ind3; C3 = Ind2 − Ind3. The proportion of each indirect effect was calculated as the corresponding indirect effect divided by the total indirect effect × 100%. Bootstrap standard errors and 95% confidence intervals for the indirect effects and contrasts were estimated using 5,000 bootstrap resamples.

5. Discussion

5.1 Association Between Participation Motivation and Intention to Continue Volunteering

The present study found a significant positive overall association between participation motivation and intention to continue volunteering among university student volunteers at a marathon event. Before psychological contract and work engagement were included in the model, participation motivation remained positively associated with intention to continue volunteering after controlling for sex, year of study, and previous volunteering frequency. This finding is consistent with previous research suggesting that volunteers' willingness to continue participating is related not only to organizational arrangements and event conditions, but also to motivational factors associated with participation, including value identification, helping orientation, personal development, and social interaction needs [25]. In the context of marathon volunteering, university student volunteers may have relatively diverse and multidimensional motivations. On the one hand, marathon events involve public service, city promotion, and the promotion of physical activity, and students may be motivated by opportunities to serve society, support sporting events, experience the event atmosphere, and participate in urban public activities. On the other hand, university students also have salient developmental needs, and their participation in event volunteering may be associated with expanding social networks, improving organizational and communication skills, accumulating social practice experience, and enriching their personal résumés. Previous research on sports event volunteers has similarly shown that participation motivation is rarely driven by a single factor, but instead reflects a combination of value expression, interpersonal interaction, personal growth, career development, and external incentives [26]. Accordingly, university student volunteers with stronger participation motivation may be more likely to develop positive expectations toward marathon volunteering and a stronger willingness to participate in similar events in the future.

From a theoretical perspective, self-determination theory proposes that behavioral persistence is closely related to the quality of motivation. When individuals experience autonomy, competence, and relatedness during an activity, their participation is more likely to develop from short-term involvement into sustained engagement [27]. For university student volunteers at marathon events, intention to continue volunteering may therefore be strengthened when participation motivation extends beyond task completion, obtaining certificates, or accumulating experience and becomes more closely connected with perceived service value, personal development, and social connectedness. Previous studies have also indicated that the fulfillment of volunteer motives is associated with volunteering satisfaction and subsequent behavioral intentions, suggesting that volunteers may be more willing to continue participating when their underlying needs are adequately met during the service process [28]. These findings imply that efforts to strengthen university student volunteers' intention to continue volunteering should not rely solely on recruitment-stage mobilization and promotion. Greater attention should also be paid to identifying, maintaining, and guiding volunteers' participation motivation throughout recruitment, training, role allocation, and service feedback. Event organizers and universities may therefore benefit from helping student volunteers recognize both the public-service value and personal-development value of marathon volunteering, while also providing appropriate role matching, on-site support, and timely feedback to facilitate more positive volunteering experiences and support future participation intentions.

5.2 Mediating Role of Psychological Contract

The present study found a significant indirect association between participation motivation and intention to continue volunteering through psychological contract among university student volunteers at a marathon event. This finding suggests that the association between participation motivation and intention to continue volunteering may not operate solely through a direct pathway, but may also be partly explained by volunteers' psychological perceptions of their relationship with the event organization. Psychological contract refers to individuals' subjective perceptions formed around organizational commitments, fulfillment of responsibilities, and reciprocal obligations, and reflects their psychological evaluation of the quality of the relationship with an organization [8]. Although university student volunteers at marathon events are not primarily motivated by financial compensation, they may nevertheless develop expectations regarding whether role assignments are appropriate, training and communication are clear, they are treated with respect during service, and their contributions are recognized. When these expectations are adequately fulfilled, volunteers may be more likely to develop a positive psychological contract and, in turn, a stronger intention to participate in similar volunteering activities in the future. Previous research has suggested that psychological contracts in volunteering may extend beyond general expectations and obligations in organizational relationships to include value congruence, a sense of mission, and alignment with organizational goals, which may enhance their explanatory relevance in volunteer settings [29].

This finding is also consistent with previous research on volunteer management and sports volunteering. Existing studies have suggested that volunteers' functional motives and personality characteristics may shape how they perceive organizational responsibilities and mutual obligations, indicating a close conceptual link between participation motivation and psychological contract [30]. For university student volunteers at marathon events, participation motivation may represent the initial basis for entering the volunteering context, whereas psychological contract reflects their subsequent organizational experiences and evaluations during service. When event organizers provide effective support throughout recruitment, training, role allocation, on-site management, and service feedback, volunteers may be more likely to perceive the importance of their roles and to develop more favorable evaluations of their relationship with the organization, which may in turn be associated with a stronger intention to continue volunteering. Research on sports volunteer management has also indicated that psychological contract theory provides a useful framework for understanding volunteers' perceptions of expectations and obligations during service and for improving volunteer management practices [31]. In addition, organizational support and the fulfillment of expectations have been associated with the maintenance of volunteer participation and lower intentions to withdraw [32]. These findings suggest that strengthening university student volunteers' intention to continue volunteering requires attention not only to recruitment-stage mobilization and promotion, but also to the fulfillment of organizational commitments, role support, organizational feedback, and role identification throughout the service process, thereby facilitating the development of a more stable and positive psychological contract.

5.3 Mediating Role of Work Engagement

The present study found a significant indirect association between participation motivation and intention to continue volunteering through work engagement among university student volunteers at a marathon event. This finding suggests that the association between participation motivation and intention to continue volunteering may be partly explained by volunteers' role engagement and positive experiences during the service process. Work engagement is generally characterized by vigor, absorption, and dedication in task performance and reflects the extent to which individuals invest cognitive, emotional, and behavioral resources in specific role-related activities [33]. In the context of marathon volunteering, participation motivation provides the initial impetus for university students to enter the service setting; however, whether this motivation is associated with a stronger intention to continue participating in similar events may also depend on the level of engagement they develop in their actual volunteer roles. When volunteers have a clear understanding of their responsibilities, perceive value in their assigned roles, and gain positive experiences through interactions with athletes, participants, spectators, and event staff, they may be more likely to exhibit higher levels of work engagement and, consequently, a stronger intention to continue volunteering. Previous research has indicated that meaningfulness, psychological safety, and the availability of resources are important conditions associated with individual engagement, suggesting that engagement depends not only on personal motivation but also on experiences within the task environment [34].

This finding is broadly consistent with previous research on work engagement and volunteer management. According to the job demands–resources model, both organizational and personal resources can facilitate work engagement, which is in turn generally associated with more positive behavioral outcomes [12]. For university student volunteers at marathon events, work engagement reflects not only the behavioral performance of assigned duties but also the degree of identification with the volunteer role and the psychological energy invested in the service process. Given that volunteering is typically voluntary and involves limited financial rewards, clear role descriptions, appropriate task matching, effective on-site support, and timely service feedback may help volunteers develop a stronger sense of engagement, achievement, and responsibility during the event. Previous studies have also shown that greater volunteer engagement is associated with more positive volunteering outcomes and lower intentions to withdraw [17]. Therefore, efforts to strengthen university student volunteers' intention to continue volunteering should extend beyond stimulating participation motivation during recruitment and should also focus on role support, task-related experiences, and role identification throughout the service process, thereby encouraging a transition from passive task completion to more active and sustained involvement.

5.4 Serial Mediating Roles of Psychological Contract and Work Engagement

The present study found a significant serial indirect association between participation motivation and intention to continue volunteering through psychological contract and work engagement among university student volunteers at a marathon event. Among the three indirect pathways, the serial pathway of participation motivation → psychological contract → work engagement → intention to continue

volunteering showed the largest relative effect. This finding suggests that the formation of intention to continue volunteering may involve a sequential process of organizational perception and service engagement rather than a single direct pathway from participation motivation. Notably, although the total effect of participation motivation on intention to continue volunteering was positive and statistically significant, the direct effect became negative and remained significant after psychological contract and work engagement were included in the model. This result does not imply that participation motivation reduces university student volunteers' intention to continue volunteering. Rather, it indicates that the residual component of participation motivation that was not accounted for by psychological contract and work engagement was negatively associated with intention to continue volunteering. According to mediation research, when the direct and indirect effects operate in opposite directions, the pattern may be interpreted as inconsistent mediation or competitive mediation [35]. Given that all three indirect pathways in the present study were positive and statistically significant, the findings suggest the positive total association coexisted with substantial positive indirect associations through psychological contract and work engagement, whereas the residual direct association was negative. Specifically, stronger participation motivation was associated with a more positive psychological contract, which in turn was associated with greater work engagement and, ultimately, a stronger intention to continue volunteering. Previous research has also shown that psychological contract fulfillment may be associated with organizational commitment and turnover intention through work engagement, providing theoretical support for the sequential role of psychological contract and work engagement observed in the present study [36].

In the context of marathon volunteering, university student volunteers may enter event service with varying levels of participation motivation; however, whether this initial motivation is associated with subsequent intention to continue volunteering may depend on whether volunteers develop positive perceptions of the organization and subsequently become highly engaged in their service roles. Such organizational experiences may be associated with more favorable perceptions of the volunteer–organization relationship, including greater organizational trust, role identification, and perceived responsibility. These positive perceptions may, in turn, be associated with greater engagement in specific service tasks and stronger feelings of value and achievement, which may ultimately correspond to a greater willingness to participate in similar volunteering activities in the future. Previous studies have suggested that autonomous motivation is associated with greater volunteer effort, indicating that volunteer motivation may be more likely to translate into actual engagement when it is activated and maintained throughout the service process [37]. Volunteer engagement has also been associated with satisfaction, organizational commitment, and intention to continue volunteering [38]. Therefore, efforts to strengthen university student volunteers' intention to continue volunteering should extend beyond stimulating participation motivation during recruitment and should also address the sequential process linking psychological contract and work engagement throughout the volunteering experience. Optimizing role design, strengthening organizational support, improving ongoing feedback, and enhancing role identification may help facilitate a more stable transition from initial participation motivation to sustained volunteering intentions.

6. Implications and Limitations

From a practical perspective, the findings suggest that volunteer management should not focus exclusively on stimulating participation motivation during recruitment. Attention may also be directed toward volunteers' perceptions of their relationship with the event organization and their engagement in assigned roles. Practices such as clear role communication, appropriate task allocation, training, on-site support, feedback, and recognition may be relevant to these experiences and could be considered when developing volunteer-management strategies. However, because these management practices were not directly measured or experimentally manipulated in the present study, their effects on psychological contract, work engagement, or continued volunteering intention require further empirical evaluation.

First, the study employed a cross-sectional design, and participation motivation, psychological contract, work engagement, and intention to continue volunteering were measured at the same time. Consequently, the temporal ordering and causal relationships among these variables cannot be established. Although the serial mediation analysis identified statistically significant indirect associations, the ordering of psychological contract and work engagement should be regarded as theoretically specified rather than temporally demonstrated. Longitudinal or prospective studies with repeated measurements are needed to examine whether these relationships persist over time and to clarify their temporal sequence.

7. Conclusion

University student marathon volunteers' participation motivation, psychological contract, work engagement, and intention to continue volunteering were significantly and positively associated with one another. Participation motivation showed a positive total association with intention to continue volunteering, together with significant positive indirect associations through psychological contract and work engagement. The serial indirect association through psychological contract and work engagement accounted for the largest proportion of the total indirect effect. Notably, the direct association between participation motivation and intention to continue volunteering became negative after psychological contract and work engagement were included in the model, indicating a pattern of inconsistent mediation. This finding suggests that the motivational basis associated with initial participation may differ from the organizational and role-related experiences associated with continued volunteering intention. However, because the study was cross-sectional, the proposed ordering of psychological contract and work engagement should be interpreted as theoretically specified rather than temporally or causally established. From a practical perspective, the findings highlight the relevance of participation motivation, psychological contract, and work engagement when developing strategies to support continued participation in marathon volunteering.

Declarations

Ethics approval and consent to participate:

The researchers confirm that all research was performed in accordance with relevant guidelines/regulations applicable when human participants are involved (e.g., Declaration of Helsinki or similar). **This study was approved by the Ethics Committee of Hefei Normal University (Approval No. 2024LLSC030).** The participants received oral and written information and provided written informed consent before participating in the study.

Consent for publication:

Not applicable.

Competing interests:

The authors have no competing interests to declare that are relevant to the content of this article.

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Author Contribution

JL: Data curation, writing—original draft, writing—review & editing. LX: Writing – original draft, Writing – review & editing. YW: Writing—original draft, Writing—review & editing, Data curation, Formal analysis, Resources.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Figures

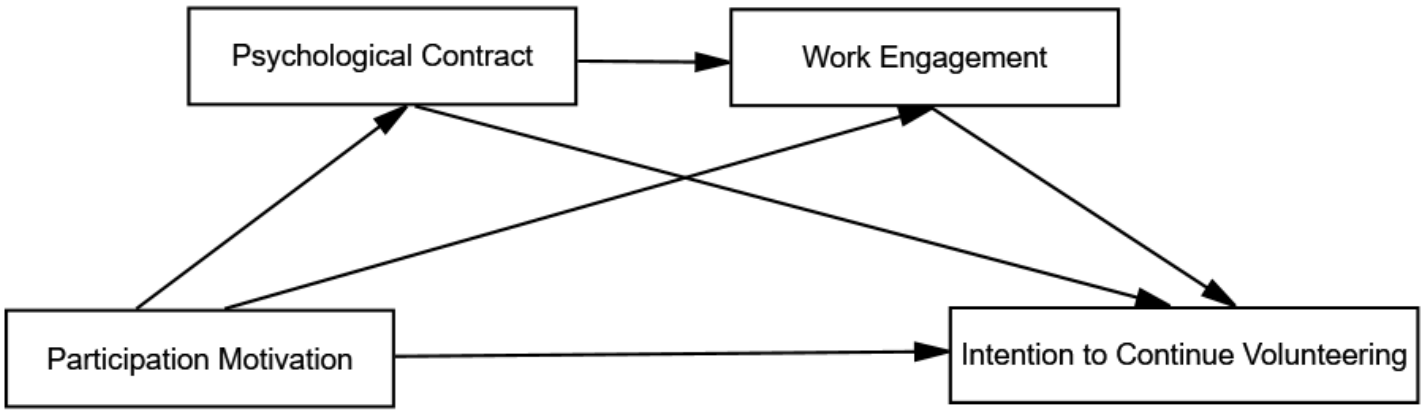


Figure 1

Theoretical model