

## Formation of resilience in Japanese athletes: Relevance to personality traits and day-to-day resilience

YUKI UENO<sup>1</sup>, ATSUSHI OSHIO<sup>2</sup>

<sup>1</sup>Research Fellow of the Japan Society for the Promotion of Science (PD), JAPAN

<sup>2</sup>Faculty of Letters, Arts and Sciences, Waseda University, JAPAN

Published online: September 30, 2017

(Accepted for publication September 20, 2017)

DOI:10.7752/jpes.2017.03204

### Abstract:

This study examines the relationship among personality traits, day-to-day resilience, and athletes' resilience among Japanese athletes. Participants, comprising 165 Japanese athletes (male = 57, female = 108, mean age = 19.4 years,  $SD = 1.2$ ), were asked to complete a questionnaire. The results of structural equation modeling indicated that the personality traits of "Extroversion," "Agreeableness," "Conscientiousness," and "Openness" were significantly associated with athletes' resilience and related concepts such as "Athletic Mental Toughness," "Athletic Self-understanding," and "Athletic Physical Toughness," which develop through innate resilience. Their personality traits were also significantly associated with concepts such as "Athletic Motivation and Challenge" and "Athletic Self-understanding," which develop through acquired resilience. In addition, "Neuroticism" showed a significant negative association with athletes' resilience developed through innate resilience. The findings of our study support our hypothesis that the personality traits of athletes, owing to their resilience, may vary based on whether they are involved in day-to-day life situations or in competitive situations.

**Key words:** athletes' resilience, day-to-day resilience, personality traits, Japanese athletes

### Introduction

Resilience has been defined as "the mental ability to recover from negative psychological states caused by stressful incidents" (Ishige & Muto, 2005). Hirano (2010) argues that resilience is affected by individual temperament and character, based on the Model of Temperament and Character developed by Cloninger, Svrakic, and Przybeck (1993). According to Hirano (2010), resilience is classified into two types—innate resilience and acquired resilience. The former is maintained innately, and is more closely related to temperament than to character, including optimism and control, among other factors. The latter is more closely related to character than to temperament, including problem-solving and self-understanding among other factors that are utilized in difficult day-to-day situations. Hirano (2011) conducted a study using the twin method and indicated the values of intraclass correlation coefficients of innate resilience factors in dizygotic twins and identical twins. The values were .67 ( $p < .001$ ) and .07 (*n.s.*), respectively, suggesting that even though innate resilience might be affected by temperament, it is not an inherent factor. In contrast, Lepore and Revenson (2006) have reported that the development of resilience is affected by personality traits, suggesting that the development of individual resilience in daily settings is largely determined by one's personality.

Psychopathological problems in athletes such as depression and suicide have also been investigated (Iwasa & Kishi, 1992), and the concept of resilience is seen as a preventive measure as well as a part of solution strategies. There are four factors of inner resilience characteristic of athletes, namely, "Athletic Motivation and Challenge," "Athletic Mental Toughness," "Athletic Self-understanding," and "Athletic Physical Toughness" (Ueno & Shimizu, 2012). It has been indicated that these factors contribute to the improvement of athletes' mental health and athletic performances (Ueno & Oshio, 2015). However, the development of resilience in athletes has not been sufficiently investigated, and concrete measures for acquiring resilience have not been established to date. Fletcher and Sarker (2012) and Sarker and Fletcher (2014) state that positive personality traits such as adaptive perfectionism and optimism among athletes might protect them from negative effects of stressors that are associated with challenging assessments and metacognitions, which form the basis of the resilience model (stress-resilience-performance). These positive traits might also adjust their performance appropriately and enable them to demonstrate their athletic abilities to the fullest possible extent. Furthermore, Galli and Vealey (2008) have reported that positive personality traits could function as cues to develop resilience for recovering from maladaptive states and acquiring new resilience for athletes in difficult conditions, including mental breakdowns. That is, the personality traits of athletes are related to the ability to display resilience in athletic competitions and in the development of resilience factors.

On the contrary, it has also been suggested that resilience is acquired through learning and that the quality of resilience changes according to human development and the environment that one occupies (Nakamura, 2030

Umabayashi, & Takinno, 2010). It has also been suggested that resilience differs from person to person (Grotberg, 2003). Moreover, it has been reported that athletes have acquired various types of resilience from everyday life situations (Kasai & Ishikawa, 2013; Sugita, 2013). Their resilience might display qualitative differences based on environmental changes in their daily lives, which would in turn improve their mental health and athletic performances. It is worth noting that athletic resilience might not develop in parallel with basic resilience in daily life (day-to-day resilience). Resilience might develop in other specific domains depending on basic resilience. Development of athletes' resilience might also be directly or indirectly affected by personality traits and day-to-day innate/acquired resilience. This study investigated correlations among athletes' personality traits, day-to-day resilience, and athletes' resilience using the following hypothetical model: personality traits affect athletes' resilience, mediated by day-to-day innate/acquired resilience.

## Methods and Materials

### *Participants and Period of Study*

The survey was conducted from mid-April to mid-May in 2014. Participants comprised 165 Japanese athletes belonging to university athletic clubs (57 men and 108 women, mean age = 19.4 years,  $SD = 1.2$ ). They were enrolled in competition-oriented athletic clubs and participated in various athletic events from individual to team events and represented diverse athletic levels, including international, national, and regional competition levels.

### *Procedures*

The survey was conducted using a questionnaire. Approval for conducting the study was obtained from the Ethics Committee of the first author's affiliated institution. The anonymity of the participants was safeguarded as an ethical consideration. Participants were requested to respond to the questionnaire based on their free will. Furthermore, an explanation was given to the participants in advance about the purpose of the survey, steps for the protection of personal information, and the obligation of confidentiality.

### *Questionnaire Sheet*

*Athletes' Resilience:* This study involved the use of the internal factors of the Psychological Resilience Scale for University Athletes (Ueno & Shimizu, 2012). This scale consists of four subscales that include the following 16 items. "Athletic Motivation and Challenge" (e.g., I like being challenged by new plays.), "Athletic Mental Toughness" (e.g., I don't get depressed even if I lose a game.), "Athletic Self-understanding" (e.g., I understand my strong and weak points as an athlete.), and "Athletic Physical Toughness" (e.g., I can endure physical pain and fatigue.). The reliability and validity of the scale were confirmed. Participants were required to answer using the five-point scale, ranging from "No (1 point)" to "Yes (5 points)." When the scores of the subscales were higher, internal factors of athletes' resilience were considered to be higher as well.

*Personality Traits:* The study involved the use of the Japanese version of the Ten Item Personality Inventory (Oshio, Abe, & Cutrone, 2012). This scale comprises the following five subscales that further include 10 items: "Extroversion," "Agreeableness," "Conscientiousness," "Neuroticism," and "Openness." The reliability and the validity of the scale were confirmed. Participants were required to answer using the seven-point scale, ranging from "Disagree strongly (1 point)" to "Agree strongly (7 points)." When the scores of the subscales were higher, athletes' personality traits of each subscale were also considered to be higher.

*Day-to-day Resilience:* The study also involved the use of the Bidimensional Resilience Scale (Hirano, 2010). This scale consists of innate resilience ("Optimism," "Control," "Sociability," and "Vitality") and acquired resilience ("Solve a Problem," "Self-understanding," and "Understanding Others"), and, in sum, it consists of seven subscales that in turn include 21 items. The reliability and validity of the scale were confirmed. Following Hirano (2010), each total score of innate/acquired resilience was used for the analyses. Participants were required to answer using the five-point scale, ranging from "Strongly disagree (1 point)" to "Strongly agree (5 points)." When the scores of the subscales were higher, athletes' day-to-day innate/acquired resilience was also considered to be higher.

## Results

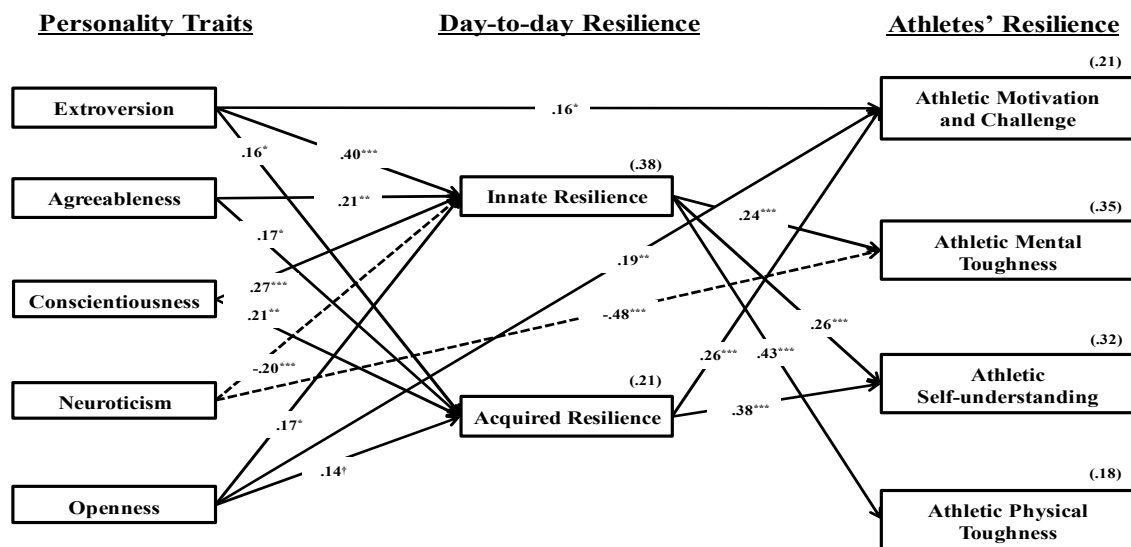
Data were analyzed using IBM SPSS Statistics Ver. 22.0 and IBM SPSS AMOS Ver. 22.0, which is statistical analysis software. Pearson's product-moment correlation coefficients ( $r$ ) between variables were calculated and correlations were confirmed (Table 1). In order to examine the hypothesis model, i.e., personality traits  $\rightarrow$  day-to-day resilience  $\rightarrow$  athletes' resilience, a path analysis was conducted using a covariance structure analysis. While conducting the covariance structure analysis, paths of error covariance were drawn between subscales of personality traits, day-to-day innate/acquired resilience, and athletes' resilience. Moreover, the following multiple models listed below were constructed and compared to confirm the validity of the hypothesis model: Model 1: a complete mediation model, i.e., the hypothesis model; Model 2: a direct effect model excluding the variable of day-to-day innate/acquired resilience, drawing a direct path from personality traits to athletes' resilience; and Model 3: a partial mediation model, adding a direct path from personality traits to athletes' resilience to Model 1. Insignificant paths were analyzed by excluding them from the models. The goodness-of-fit indices of the models were as follows: Model 1:  $\chi^2 = 86.48$ ,  $df = 24$ ,  $p < .001$ , GFI = .92, AGFI = .79, CFI = .86, RMSEA = .13, and AIC = 170.48. Model 2:  $\chi^2 = 15.45$ ,  $df = 14$ ,  $p = .35$ , GFI = .98, AGFI = .94,

CFI = .99, RMSEA = .03, and AIC = 77.45. Model 3:  $\chi^2 = 21.71$ ,  $df = 21$ ,  $p = .42$ , GFI = .98, AGFI = .93, CFI = 1.00, RMSEA = .01, and AIC = 111.71. These results indicated that the goodness-of-fit indices of Model 3 were higher than the other two models. The states of direct effects are shown in Figure 1. Moreover, examination of indirect effects using the bootstrap method (the number of bootstrap samples = 5000) indicated positive correlations of Extroversion, Agreeableness, Conscientiousness, and Openness with athletes' resilience (Athletic Mental Toughness, Athletic Self-understanding, and Athletic Physical Toughness), mediated by day-to-day innate resilience. Furthermore, positive correlations of personality traits with athletes' Athletic Motivation and Challenge as well as Athletic Self-understanding were confirmed, mediated by day-to-day acquired resilience. In contrast, Neuroticism had a negative correlation to athletes' Athletic Mental Toughness, mediated by day-to-day innate resilience. Significance levels of indirect effects of the models (personality traits → day-to-day resilience → athletes' resilience) ranged between 0.1% and 5%, which were significant.

**Table 1 Results of Pearson's product-moment correlation coefficients (r)**

	1	2	3	4	5	6	7	8	9	10	11
<b>Athletes' Resilience</b>											
1. Athletic Motivation and Challenge	-										
2. Athletic Mental Toughness	.06	-									
3. Athletic Self-understanding	.49**	.16*	-								
4. Athletic Physical Toughness	.39**	.09	.45**	-							
<b>Personality Traits</b>											
5. Extroversion	.31**	.07	.26**	.11	-						
6. Agreeableness	-.06	.22**	.04	.05	-.20*	-					
7. Conscientiousness	.17*	.06	.29**	.18*	.11	.07	-				
8. Neuroticism	.10	-.55**	-.08	-.03	.04	-.25**	-.13	-			
9. Openness	.31**	.09	.19*	.04	.43**	-.05	.24**	.02	-		
<b>Day-to-day Resilience</b>											
10. Innate Resilience	.34**	.38**	.49**	.44**	.43**	.19*	.32**	-.28**	.34**	-	
11. Acquired Resilience	.34**	.19*	.51**	.19*	.23**	.15	.34**	-.14	.30**	.57**	-

\* $p < .05$ , \*\* $p < .01$



Note. Numerical values express standardized estimates. Error variables and paths of error covariance between subscales have been omitted.  
 Model fit indices:  $\chi^2 = 21.71$ ,  $df = 21$ ,  $p = .42$ , GFI = .98, AGFI = .93, CFI = 1.00, RMSEA = .01, AIC = 111.71  
 † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

**Figure 1 Results of covariance structure analysis**

**Discussion**

The above results indicated correlations between five sub-concepts of athletes' personality traits and innate resilience and correlations between sub-concepts excluding Neuroticism and acquired resilience. Moreover, correlations between innate resilience and athletes' resilience excluding Athletic Motivation and Challenge were indicated, whereas acquired resilience was correlated only to Athletic Motivation and Challenge as well as Athletic Self-understanding. Previous studies (Lepore & Revenson, 2006; Nakamura et al., 2010) also reported that the quality of resilience would change in accordance with human development and environment. It

was suggested that resilience specific to athletic domains might be formed based on the basic resilience held by individuals.

There are some problems in this study. First, there are personality traits directly correlated to athletes' resilience but not mediated by variables suggested in the present model. Second, findings of this study are based on the samples collected in the same period, and it should be carefully examined as to which variables are the antecedent factors. In contrast, it is considered significant that this study dealt with athletes' resilience as dependent variables, though various studies had dealt with athletes' resilience as independent variables.

### Conclusions

It was indicated that personality traits might be correlated to resilience in athletic competitions, mediated by day-to-day resilience. Moreover, basic resilience might be applied to various situations, and resilience specific to a certain domain might be formed based on an individual's basic resilience. In the future, practical use of this model should be examined through a long-term panel survey.

### Acknowledgement

This study was supported by a Grant-in-Aid JSPS Fellows (No. 13J08999 and 16J00972).

### References

- Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, *50*, 975-990.
- Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Psychology of Sport and Exercise*, *13*, 669-678.
- Hirano, M. (2010). A study of the classification of resilience factors: Development of the Bidimensional Resilience Scale (BRS). *Japanese Journal of Personality*, *19*, 94-106. (in Japanese)
- Hirano, M. (2011). Validity of the Bidimensional Resilience Scale for junior high and high school students: An analysis using the twin method. *Japanese Journal of Personality*, *20*, 50-52. (in Japanese)
- Ishige, M., & Muto, T. (2005). Development of the Resiliency Scale for Junior High School Students. *Japanese Journal of Counseling Science*, *38*, 235-246. (in Japanese)
- Iwasa, M., & Kishi, J. (1992). The relationship between burnout and psychiatric symptoms among athlete. *Japanese Society of Sport Psychology 19th Annual Conference Proceedings*, 8-9. (in Japanese)
- Galli, N., & Vealey, R. S. (2008). "Bouncing back" from adversity: Athletes' experience of resilience. *Sport Psychologist*, *22*, 316-335.
- Grotberg, E. H. (2003). What is resilience? How do you promote it? How do you use it? In E. H. Grotberg (Ed.), *Resilience for today: Gaining strength from adversity* (pp. 1-30). Westport, CT: Praeger Publishers.
- Kasai, M., & Ishikawa, Y. (2013). Relationships between school club activities and resilience in Japanese students. *Bulletin of Center for Collaboration in Community Naruto University of Education*, *28*, 1-10. (in Japanese)
- Lepore, S. J., & Revenson, T. A. (2006). Resilience and posttraumatic growth: Recovery, resistance, and reconfiguration. In L. G. Calhoun & R.G. Tedeschi (Eds.), *Handbook of posttraumatic growth: Research & practice* (pp. 24-46). Lawrence Erlbaum Associates Publishers.
- Oshio, A., Abe, S., & Cutrone, P. (2012). Development, reliability, and validity of the Japanese version of Ten Item Personality Inventory (TIPI-J). *Japanese Journal of Personality*, *21*, 40-52. (in Japanese)
- Nakamura, Y., Umebayashi, A., & Takino, Y. (2010). Resilience research trends in Japan by developmental stage: From infancy to adolescence. *Research of School Crisis and Mental Care*, *2*, 35-46. (in Japanese)
- Sarkar, M., & Fletcher, D. (2014). Psychological resilience in sport performers: A review of stressors and protective factors. *Journal of Sports Sciences*, *32*, 1419-1434.
- Sugita, I. (2013). Effects of physical education club activities experience has on the daily life skills and resilience of college students. *Bulletin of Hijiya University*, *20*, 111-119. (in Japanese)
- Ueno, Y., Shimizu, Y. (2012). Development of psychological resilience scale for university athletes. *Japanese Journal of Sports Psychiatry*, *9*, 68-85. (in Japanese)
- Ueno, Y., & Oshio, A. (2015). Examination of the dual processing model of psychological resilience among university athletes. *Japanese Journal of Personality*, *21*, 151-154. (in Japanese)