Relationship between psychological resilience and stress coping strategies in karate athletes

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Abstract
The aim of this research was to examine the psychological resilience and stress coping strategies of Karate athletes according to some demographic variables and to determine the relationship between them. A sample of 104 (54 females and 50 males, mean age 19.85±4.10 years) Karate athletes who trained in different sport clubs in Turkey were recruited. The Brief Resilience Scale (BRS) (Smith et al., 2008) and the Stress Coping Scale (SCS) (Şahin & Durak, 1995) were used for data collection. Descriptive statistics, t-test and correlation analyses were used for data analysis. Participants’ psychological resilience was at mid-level, while the SCS self-confident approach and seeking social support sub-dimensions were at high and low level respectively. The athletes’ psychological resilience and stress coping strategies differed significantly according to gender. There was a positive and low significant correlation between experience and psychological resilience, in contrast to a negative and low significant correlation found between experience and helpless approach SCS sub-dimension. Middle and positive correlation was observed between age and psychological resilience. Finally, there were positive and middle significant correlations between psychological resilience and self-confident approach and optimistic approach, and a negative and middle significant correlation between psychological resilience and helpless approach SCS sub-dimensions.

Keywords: Martial arts; combat sports; karate; stress; resilience; coping strategies.

Resumen
Esta investigación analiza la resiliencia psicológica y las estrategias de afrontamiento del estrés en karatecas según diversas variables demográficas y determina la relación entre ellas. Un total de 104 karatecas (54 mujeres y 50 hombres, edad media 19,85 ± 4,10 años) de diferentes clubes deportivos turcos participaron en el estudio, en el que se aplicó la Brief Resilience Scale [BRS] (Smith et al., 2008) y la Stress Coping Scale [SCS] (Şahin & Durak, 1995). El análisis estadístico incluyó estadísticas descriptivas, pruebas t y correlaciones. La resiliencia psicológica de los participantes se situó en un nivel medio, mientras que sus niveles de autoconfianza y búsqueda de apoyo social, en relación al afrontamiento del estrés, fueron altos y bajos respectivamente. La resiliencia psicológica y las estrategias de afrontamiento del estrés difirieron significativamente según el género. Se observó una correlación positiva y baja significativa entre nivel de experiencia y resiliencia psicológica, en contraste con la correlación negativa y baja significativa hallada entre nivel de experiencia y la subdimensión del SCS de indefensión. Se observó una correlación media y positiva entre edad y resiliencia psicológica. Finalmente, se hallaron correlaciones positivas y medias significativas entre resiliencia psicológica y autoconfianza y optimismo, y una correlación positiva y media con el autoeficaz. La resiliencia psicológica de los karatecas fue de nivel medio, mientras que los niveles de autoconfianza y búsqueda de apoyo social fueron altos y bajos, respectivamente. La resiliencia psicológica y las estrategias de afrontamiento del estrés difirieron de acuerdo con el género significativamente. Una correlación positiva y baja significativa observó-se entre nivel de experiencia y resiliencia psicológica, en contraste con la correlación negativa y baja significativa encontrada entre nivel de experiencia y subdimensión SCS de desamparo. Se observó una correlación media y positiva entre edad y resiliencia psicológica. Finalmente, correlaciones positivas y medias significativas fueron encontradas entre resiliencia psicológica y autoconfianza y optimismo, y una correlación positiva y media...
1. Introduction

The concept of psychological resilience, which includes individuals’ capacity to cope with difficulties in their daily life and the ability to recover themselves after difficult experiences (Jin & Wang, 2018), has been increasingly addressed in the fields of psychology (Karairmak, 2006), education (Aydin, Oncu, Akbulut & Kucuk Kilic, 2019; Cetin, 2019), work (Terte & Stephens, 2014) and sport (Erim & Kucuk, 2017; Galli & Gonzalez, 2014; Garcia, Vallerino, & Montero, 2014; Greco, Cataldi & Fischetti, 2019; Ortega et al., 2017; Ramirez-Granizo et al., 2020; Ruiz-Barquin, Garcia Remis & Gutierrez Garcia, 2018; Ruiz-Barquin, Plura Malandono & Gutierrez Garcia, 2019; Ruiz, de la Vega, Poveda, Rosado, & Serpa, 2012; Ruiz-Barquin, del Campo Vecino, & de la Vega Marcos, 2015; Ruiz-Barquin, Robles, Garcia & Gutierrez-Garcia, 2018; Sarkar, 2017; Sahin & Guclu, 2018). Especially in the studies in the psychology literature in recent years, positive perspectives that investigate and reveal the strengths of individuals rather than their weaknesses have become dominant (Karairmak, 2006). In this context, the concept of psychological resilience is also associated with positive psychology and it is defined as the positive psychological capacity that the individual has to recover from uncertainty, conflict, failure and increased responsibility (Luthans, 2002). Psychological resilience is also defined as the rapid recovery of the individual after a negative event (Bonanno, Brewin, Kaniasty, & La Greca, 2010), or that the individual remains psychologically healthy and stable despite being exposed to a negative event (Bonanno, 2004). On the other hand, it can be defined as the individual’s self-recovery ability against difficult life conditions (Garmezy, 1991) and factors that reduce the negative effects of stress on the individual and support the adaptation of the individual (Jacelon, 1997).

Psychological resilience has become an important concept in terms of sports psychology (Solomon, 2015) and studies on psychological resilience of athletes have started to increase in recent years (Bingol & Bayansalduz, 2016; Cikut, Beyleroglu, Hazar, Akkus Cikut & Bezci, 2017; Fletcher & Sarkar, 2012; Galli & Gonzalez, 2015; Galli & Vealey, 2008; Hosseini & Besharat, 2010; Johnson, 2015). In this context, it has been thought that not only physical capacity can be sufficient for an athlete to succeed in sport, but also high psychological resilience is needed (Sahin & Guclu as cited in Kucuk et al., 2015). Similarly, it is stated that an effective performance including the technical, tactical, conditional and psychological preparation of the athlete is required for succeeding in sports and, for this reason, the athletes prepare psychologically as well as physically before competition (Ozdemir, 2019). Research shows that athletes with high psychological resilience have lower anxiety levels compared to those with low resilience (Martin-Krumm, Sarrazin, Petersone & Famoze, 2003), they use strategies to face and solve problems rather than avoid them (Belem et al., 2015; Yi, Smith & Vitaliano, 2005) and have higher self-concept and self-esteem (Mummary, Schofield & Perry, 2004). It is also stated that psychological resilience plays an important role in dealing with and relieving stress, which is accepted as a determinant of success in sports (Codonhato, Vissoci, junior, Mizooguchi & Fiorese, 2018). On the other hand, it is thought that resilience is a factor that positively interferes in the athletes’ stress/recovery processes. Thus, resilience can be considered one of the essential characteristics for athletes to deal and overcome demands of competitive sport (Codonhato et al., 2018). Psychological resilience is frequently mentioned in studies to determine the reactions of individuals to stress (Moran & Eckenrode, 1992; Rew, Taylor-Seehafer, Thomas & Yockey, 2001; Tugade & Frederickson, 2004), and the effect of psychological factors in the context of stress process is generally conceptualized as psychological resilience (Fletcher & Sarkar, 2013). In this context, it is stated that athletes under stress should especially recognize their stress and choose and use coping strategies that will enable them to effectively cope with stress (Dugdale, Eklund & Gordon, 2002). Coping with stress is a concept frequently used in sports in recent years (Arsan & Koruc, 2009), defined as behavioral and cognitive efforts to overcome the difficulties and needs in the world of the individual and to keep him under control (Lazarus & Folkman, 1984). It is stated that the positive effect of sports, especially in the physiological and psychological sense, positively affects their ability to cope with stress (Yeltepe, 2007). In this context, studies have shown that people who exercise...
regularly have low levels of depression and anxiety, have higher ability to cope with stress (Scully, Kremer, Meade, Graham & Dudgeon, 1998; Hassmen, Koivula & Uutela, 2000) and higher resilience (Greco, Fischetti, Cataldi & Latino, 2019; Johnson, 2015).

As a result of the literature review, despite the importance of psychological resilience and stress coping strategies in sport, few studies have examined these variables in athletes (Akman, 2019; Alıncak & Abakay, 2015; Arsan & Koruç, 2009; Arslan, 2016; Campen & Roberts, 2001; Codonhato et al., 2018; Erim & Küçük, 2017; Fletcher & Sarkar, 2012; Fountain, 2017; Hammermeister & Burton, 2004; Hosseini & Besharat, 2010; Karademir & Açak, 2019; Özdemir, 2019; Sarkar & Fletcher, 2014; Sécades et al., 2016; Şahin & Güçlü, 2018; Tazegül, 2015; Yoo, 2001). Moreover, there has been little research on the martial arts (Greco, Fischetti, Cataldi & Latino, 2019; Litwic-Kaminska, 2013; Özdevecioğlu & Yalçın, 2010; Radochonski, Cynarski, Perenc & Siorek-Maslanka, 2011; Üstün, Gümüşgül, Demirel & Göral, 2014), especially about Karate (Boghrabadi, Arabameri & Sheikh, 2015; Turgut, 2016). In this context, it is thought that knowing psychological resilience and stress coping strategies will contribute to increase performance and fill an important gap in the literature. The performances of athletes may differ across competitions under the pressure of heavy training and anxiety for success. In order to minimize these performance fluctuations, deal with sport-specific challenges and eventually succeed, the athlete must increase its levels of psychological endurance (Sheard, 2013). And beside this, it is stated that psychological resilience has a relevant role in coping with stress and the athletes’ recovery, highlighting its importance in the understanding of these variables (Codonhato et al., 2018). From this point of view, the aim of this research was to examine the psychological resilience and stress coping strategies of Karate athletes according to some variables and to determine the relationship between them. For this purpose, answers to the following questions were sought.

1. What are the levels of coping and psychological resilience of the participants?
2. Do the participants' coping with stress and resilience differ significantly by gender?
3. Are there significant relationships between the participants' experience in practicing sports and their coping with stress and psychological resilience?
4. Are there significant relationships between the participants' age and their coping with stress and psychological resilience?
5. Is there a significant relationship between the participants' age and their coping with stress and psychological resilience?

2. Methods

This was an empirical, quantitative, cross-sectional, descriptive study of populations through survey research (Montero & León 2007).

2.1. Participants

A total of 104 (54 women, 50 men) Karate athletes, selected by easy sampling method in Turkey, 2019, participated in this study. Their average age was 19.85±4.10 years-old and their mean experience in doing sports was 6.51±4.56 years. Up to 92 participants were licensed athletes, while 12 of them were not. In addition, 15 participants stated that they were national-level athletes. It was considered that the experience and the belt level usually develop in parallel, so no differentiation was made according to belt rank.

2.2. Data collection tools

Socio-demographic questionnaire: A simple socio-demographic questionnaire was used. It consisted of questions about the participants' gender, age, status of being a licensed athlete, experience and being a national athlete.

Brief Resilience Scale (BRS): The BRS developed by Smith et al. (2008) and adapted to Turkish by Doğan (2015) was used to measure the participants' psychological resilience levels. Although there are different scales developed on the subject in the literature, the BRS was selected as it is
widely used, it composed of few items and is an up-to-date tool. The scale, which is a self-report measurement tool, has a single sub-dimension structure consisting of six items, and is scored in a 5-point Likert scale. Items 2, 4 and 6 in the scale are coded in reverse. The lowest score that can be obtained from the scale is 6 and the highest score is 30. Higher scores indicate higher psychological resilience, while lower scores indicate lower psychological resilience. The Cronbach Alpha internal consistency coefficient of the scale calculated on the data collected within the evaluated research was 0.76.

Coping Style Scale (SCS): The Ways of Coping Inventory questionnaire, developed by Folkman and Lazarus (1980) and adapted to Turkish as Stress Coping Scale by Şahin and Durak (1995), was used to measure the way athletes coped with stress. This scale was used because it has been widely used and fitted well to our study purposes. The scale consists of 30 items and 5 sub-dimensions: self-confident approach (7 items), optimistic approach (5 items), helpless approach (8 items), submissive approach (6 items) and seeking social support (4 items). It is scored in a 4-point Likert scale. The Cronbach Alpha internal consistency coefficients of the scale calculated on the data collected within the evaluated research were 0.82 for the self-confident approach, 0.63 for the optimistic approach, 0.74 for the helpless approach, 0.62 for the submissive approach and 0.62 for the seeking of social support sub-dimensions. According to Özdamar (2002), these were acceptable (between 0.60≤α<0.70) or medium (0.61<α<0.80) reliability levels.

2.4. Procedure

The principle of volunteering was taken as a basis for participation. All participants were informed verbally and in writing about the study purposes and procedures, and also that they could quit the study at any time. Once informed content was obtained the questionnaires were administered in a single session for each participant or group. They were also informed that parental consent form was not taken, for those participants under 18 years-old, because of using of noninvasive methods, keeping participant information confidential and not using methods such as voice/image recording or interview. The full procedure was developed with the knowledge of the club coaches and the Turkish Karate Federation.

2.5. Statistical analysis

The statistical analyses were carried out with SPSS 21 program. Descriptive statistics (frequency, mean, standard deviation), t-test and Pearson's correlation tests were used. Skewness and kurtosis values were examined in deciding whether the data satisfied or not the prerequisites for conducting parametric test. The normality coefficient value was taken as |1| in this study (Büyüköztürk, 2012). Cronbach Alpha internal consistency coefficients were also calculated to determine the reliability of the scales. The significance level was set at p < 0.05.

3. Results

Participants’ mean score for BRS was 3.50 ± 0.71. The scores for SCS subdimensions showed that the self-confident approach sub-dimension had the highest mean (3.36), while the seeking for social support sub-dimension had the lowest (2.05). The skewness and kurtosis values showed that the data were distributed within the area of normalcy (Table 1).

<p>| Table 1. Descriptive Statistics for the BRS and SCS. |</p>
<table>
<thead>
<tr>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRS</td>
<td>3.50</td>
<td>0.71</td>
<td>0.05</td>
<td>0.45</td>
<td>1.17</td>
</tr>
<tr>
<td>Self-confident approach</td>
<td>3.36</td>
<td>0.41</td>
<td>-0.11</td>
<td>-0.11</td>
<td>2.14</td>
</tr>
<tr>
<td>Optimistic approach</td>
<td>3.10</td>
<td>0.45</td>
<td>-0.18</td>
<td>0.42</td>
<td>1.80</td>
</tr>
<tr>
<td>Helpless approach</td>
<td>2.65</td>
<td>0.53</td>
<td>-0.31</td>
<td>0.24</td>
<td>1.00</td>
</tr>
<tr>
<td>Submissive approach</td>
<td>2.92</td>
<td>0.49</td>
<td>-0.24</td>
<td>0.13</td>
<td>1.33</td>
</tr>
<tr>
<td>Seeking for social support</td>
<td>2.05</td>
<td>0.55</td>
<td>0.46</td>
<td>0.81</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Results from the t-tests indicated that males scored significantly higher than females in the BRS and the self-confident approach and optimistic approach SCS sub-dimensions (Table 2).
**Table 2.** Results of t-test according to gender.

<table>
<thead>
<tr>
<th></th>
<th>Female (n=54)</th>
<th>Male (n=50)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRS</td>
<td>3.32 (0.73)</td>
<td>3.70 (0.65)</td>
<td>2.74</td>
<td>0.007**</td>
</tr>
<tr>
<td>Self-confident</td>
<td>3.27 (0.36)</td>
<td>3.46 (0.43)</td>
<td>2.47</td>
<td>0.015*</td>
</tr>
<tr>
<td>Optimistic approach</td>
<td>2.95 (0.40)</td>
<td>3.25 (0.44)</td>
<td>3.60</td>
<td>0.000***</td>
</tr>
<tr>
<td>Helpless approach</td>
<td>2.70 (0.51)</td>
<td>2.60 (0.55)</td>
<td>0.97</td>
<td>0.336</td>
</tr>
<tr>
<td>Submissive approach</td>
<td>2.98 (0.44)</td>
<td>2.86 (0.54)</td>
<td>1.16</td>
<td>0.247</td>
</tr>
<tr>
<td>Seeking for social</td>
<td>2.07 (0.59)</td>
<td>2.03 (0.50)</td>
<td>0.37</td>
<td>0.715</td>
</tr>
</tbody>
</table>

* p<0.05; ** p<0.01; *** p<0.001

A positive, low significant correlation was found between experience and psychological resilience, while there was a negative, low significant correlation between experience and helplessness SCS sub-dimension. There was a positive and middle significant correlation between age and psychological resilience (Table 3).

**Table 3.** Correlations between experience and age with BRS and SCS.

<table>
<thead>
<tr>
<th></th>
<th>Experience</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BRS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>0.20</td>
<td>0.31</td>
</tr>
<tr>
<td>p</td>
<td>0.042*</td>
<td>0.002**</td>
</tr>
<tr>
<td><strong>Self-confident approach</strong></td>
<td>0.15</td>
<td>0.19</td>
</tr>
<tr>
<td>correlation</td>
<td>0.119</td>
<td>0.054</td>
</tr>
<tr>
<td><strong>Optimistic approach</strong></td>
<td>0.07</td>
<td>0.16</td>
</tr>
<tr>
<td>correlation</td>
<td>0.510</td>
<td>0.112</td>
</tr>
<tr>
<td><strong>Helpless approach</strong></td>
<td>-0.22</td>
<td>-0.09</td>
</tr>
<tr>
<td>correlation</td>
<td>0.025*</td>
<td>0.367</td>
</tr>
<tr>
<td><strong>Submissive approach</strong></td>
<td>-0.11</td>
<td>-0.17</td>
</tr>
<tr>
<td>correlation</td>
<td>0.271</td>
<td>0.080</td>
</tr>
<tr>
<td><strong>Seeking for social support</strong></td>
<td>-0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>correlation</td>
<td>0.640</td>
<td>0.846</td>
</tr>
</tbody>
</table>

n=104; *p<0.05; **p<0.01

Correlation between BRS and SCS sub-dimension scores are presented in Table 4. There were positive, middle significant correlations between psychological resilience and self-confident approach, optimistic approach and a negative, middle significant correlation with helpless approach.

**Table 4.** Correlations between BRS and SCS.

<table>
<thead>
<tr>
<th></th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-confident approach</td>
<td>0.33**</td>
<td>0.001***</td>
</tr>
<tr>
<td>Optimistic approach</td>
<td>0.35**</td>
<td>0.001***</td>
</tr>
<tr>
<td>Helpless approach</td>
<td>-0.48**</td>
<td>0.001***</td>
</tr>
<tr>
<td>Submissive approach</td>
<td>0.11</td>
<td>0.281</td>
</tr>
<tr>
<td>Seeking for social support</td>
<td>-0.15</td>
<td>0.119</td>
</tr>
</tbody>
</table>

n=104; ***p<0.001

4. Discussion

The findings obtained from this study, which was carried out to examine the psychological resilience and stress coping strategies of Karate athletes according to some variables and to determine the relationship between them, are discussed and interpreted in the light of the literature in this section.

First, it can be said that the scores of the participants were relatively at a middle level. Güvendi, Türksoy, Gûçlü and Konter (2018) determined that professional wrestlers' mental endurance levels were high. Koçak, Atlı Özbaş and Gürhan (2017) found that the level of psychological resilience of physical education and sports students participating in inter-university football competitions was at middle level. In Özdemir's (2019) study on elite athletes, it was determined that the level of psychological resilience of the participants was at middle level too. On the other hand, it was determined that the participants mostly used self-confidence strategies to cope with stress, while the lowest was searching for social support strategies. In the study conducted by Ruiz-Barquín et al. (2018) in order to define the psychological profile of competitive mixed martial arts athletes, it was found that the psychological resilience levels of the participants were very high. In another study conducted by Ruiz-Barquín et al. (2018) on judo competitors, it was found that the psychological resilience levels of the participants were high. In another study conducted on judo
competitors, 38% of the participants showed high psychological resilience (García et al., 2014). This difference between the results is thought to be due to the characteristics of the samples. Further studies could overcome the limitations of this study by including performance level or similar variables.

According to our results, the perception of psychological resilience of male participants was higher than the female participants. Codonhato et al. (2018) also found differences in resilience between males and females. Some studies found that male participants’ perception of psychological resilience was higher than for females (Fountain, 2017; Karademir & Açak, 2019; Ortega et al., 2017; Özdemir, 2019; Ramirez-Granizo et al., 2020). In the studies conducted by Bingöl and Bayansalduz (2016) and Hosseini and Besharat (2010), it was found that psychological resilience does not differ by gender. On the other hand, according to the results obtained on our study, male participants’ strategies for coping with stress were higher than those of females. Similarly, in some studies male participants were found to have high levels of coping with stress (Akman, 2019; Alıncak & Abakay, 2015), Çutuk et al. (2017), Turgut (2016) and Üstün et al. (2014), on the contrary, determined that female participants had high levels of coping with stress. In the study conducted by Arsan and Koruç (2009), it was determined that gender was an effective variable regarding strategies to cope with stress, and male and female participants used different ways to cope with stress. The differences between women’s and men’s emotional structure and roles in social life may have an impact on this finding.

The results obtained from this study showed that there was a positive and low-level relationship between experience and the perception of psychological resilience. Güvendi et al. (2018) found that wrestlers with less years of sport experience had higher mental endurance levels, while Yarayan, Yıldız and Gülşen (2018) concluded that athletes with more years of sport experience had higher mental endurance. Regarding coping with stress, and according to our results, as experience increases, the sub-dimension scores of helpless approach decreases. In the study conducted by Çutuk et al. (2017), no relationship was found between experience and psychological resilience. In the study conducted by Akman (2019), it was determined that, as sports experience increased, the use of strategies to deal with stress increased too. Due to the complex nature of the sport realm, athletes constantly face many physically and psychologically stressful situations. In this context, individuals who exercise for a longer period of time may gain more competition experience and face more such stressful situations. This can be thought to have made positive contributions for them to psychologically cope with stress.

We found a positive and middle significant relationship between age and psychological resilience. Similarly, in the study conducted by Karademir and Açak (2019), it was determined that age was effective on psychological resilience and the psychological resilience levels of those who were older were higher. On the other hand, Yarayan et al. (2018) concluded that older participants had higher levels of mental endurance. Contrary to these findings, studies by Fountain (2017) and Şahin and Güçlü (2018) did not find a relationship between age and psychological resilience. In addition, the study conducted by Çutuk et al. (2017) found that psychological resilience decreased according to age. Another finding obtained from our study is that there were no relationship between age and strategies to cope with stress. Similarly, there was no significant relationship between age and stress coping strategies in Alıncak and Abakay’s (2015) study. In the study conducted by Turgut (2016), it was determined that the use of strategies to deal with stress increases with increasing age. This finding can be interpreted as the increase in life experience with the increase of age, as well as the strategies developed by people to overcome the difficulties they encounter, both increase their psychological resilience and allow them to cope more easily with stress.

A positive relationship was found between psychological resilience and style of coping with stress, specifically for the self-confidence approach and optimism approach sub-dimensions. Also, a negative correlation was found between psychological resilience and helpless approach sub-dimension. In the same line, Litwic-Kaminska (2013) found a positive relationship between participants’ psychological resilience and ways of dealing with stress. In this context, it can be said that people who consider themselves to be psychologically resilient exhibit more confident attitudes in the face of problems, do not feel helpless and think more optimistically that they will always find a way out.
5. Conclusion

This study characterized the resilience and the coping with stress style in a sample of Turkish karateka, studied them according to participants’ gender, age and experience, and analyzed their relationship. Our results add more evidence in this field which, at the moment, shows contrasting results. The fact that the sample group included in our study was relatively small can be considered its main limitation. In this context, it may contribute to the literature to include different and larger sample groups, athletes competing in different categories, and different sports modalities. In addition, designing the study in a mixed-methods approach, including qualitative research, could contribute to the interpretation of the results in more depth. In this way, it may be possible to have an idea about how people make sense of the concept of resilience, how they follow a way to improve themselves and how they reflect this to sport competition. Planning such studies could contribute to improve the athletes’ psychological and physical performance.

References


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