



Although studies have identified a number of factors associated with internet addiction, personality traits stand out as one of the most important factors [6–13]. Research has shown that internet use is positively correlated with extraversion, conscientiousness, and agreeableness, whereas there is a negative correlation between internet use and neuroticism and openness to experience. It is argued in these studies that extrovert individuals more often feel the need to communicate with others when compared to introverted individuals and thus they more often use the internet for interactive purposes. On the other hand, introverted individuals seem to use the internet mainly because it reduces the anxiety of being rejected or ridiculed, and it allows users to conceal their identities [6,10,14–16]. Although personality traits are linked with internet use, various studies have reported conflicting findings regarding the effects of the same personality traits on internet use (Batigun & Kilic; Engelberg & Sjoberg; Floros & Siomos; Samarein et al.; Servidio; Young & Rodgers). Furthermore, a review of the literature indicates that there are a limited number of studies regarding the subject.

### Present study

The present study was motivated by conflicting findings in literature and the limited number of studies in Turkey on this subject [6]. The study was designed to examine the association between personality traits and internet addiction among adolescents.

## Methods

### Study design

This study used a cross-sectional, correlational design to examine the association between personality traits and internet addiction among adolescents.

### Setting and sample

Power analysis was conducted to determine the size of the sample. When Type I and Type II errors were set as .05 and .20 (power 80.0%), respectively, the number of participants required for the sample was estimated to be 202. This calculated number of participants needed ( $n = 202$ ) were based on internet usage hours reported in a study by Kuss et al [9]. Considering the number of students in the schools and the potential loss of participants, the plan was to incorporate two schools into the study. The number of high schools ( $n = 25$ ) located in the city where the study was conducted was obtained from the Provincial Directorate for National Education. Each school was assigned a number and two schools were randomly selected using a table of random numbers.

The study sample consisted of 328 adolescents attending two senior high schools in a provincial center in Western Turkey. The students were selected by convenience sampling and volunteered to participate.

### Ethical considerations

Ethics committee permission, institutional approval and parental consent were received for this study. Verbal consent was obtained from the participating students.

## Measures

The survey consisted of three domains assessing study participants' sociodemographic characteristics, internet addiction level, and personality traits.

### Sociodemographic Information Questionnaire

Participant background characteristics included age, gender, and grade level of the students, the age and education levels of their parents, and family financial status. It also included questions regarding internet usage, such as whether the students' homes have access to the internet, and the amount of time they spend online.

### Internet Addiction Scale

The Chinese Internet Addiction Scale was developed by Chen, Weng, Su, Wu, and Yang [17]. A score of 57 or less indicates "non-risky", while a score of 58 or more indicates "risky internet usage". The scale consists of five subscales: "compulsive usage", "withdrawal", "tolerance", "time management", and "interpersonal/health problems". The subscales are based on the DSM-IV criteria for substance abuse [8,18]. The scale was adapted for the Turkish language by Kesici and Sahin in 2010 [19]. The Cronbach's alpha coefficient of the Turkish version of the scale was .88. Five factors explain 63.8% of the total variance, with factor loadings of 0.44–0.74 (Sahin Kesici and Ismail Sahin) [19]. Permission to use the scale was obtained from the author.

### Adjective Based Personality Test (ABPT)

The ABPT was developed by Bacanli, Ilhan and Aslan [20] based on the five factor model. The ABPT consists of 40 items based on antithetical pairs of adjectives, which are rated on a 7 point Likert-like scale. Factor analysis yielded the following five factors: extraversion (e.g., "prefers to be alone/likes social get-togethers"), agreeableness (e.g., "vengeful/forgiving"), conscientiousness (e.g., "neat/disorderly"), neuroticism (e.g., "calm/agitated"), and openness to experience (e.g., "interested in art/not interested in art"). The extraversion and agreeableness subscales consist of nine items. The conscientiousness and neuroticism subscales each consists of seven items. The openness to experience subscale consists of eight items. These five factors were found to explain 52.6% of the scale's total variance. Factor loadings were 0.37–0.86 [20]. Subscale reliability coefficients are given in Table 1. Permission to use this scale was obtained from the author.

### Data collection/procedure

First, written consent was obtained from the Provincial Directorate for National Education. Then, informed consent was received

**Table 1** Subscale Reliability Coefficients.

Subscale	Original study <sup>a</sup> Cronbach's alpha	Original study <sup>a</sup> test-retest correlation	Current study Cronbach's alpha
Extraversion	.89	.85	.89
Agreeableness	.87	.86	.78
Conscientiousness	.88	.71	.80
Neuroticism	.73	.85	.74
Openness to Experience	.80	.80	.77

Note. <sup>a</sup>Bacanli et al. [20].

from the parents of the participants. Finally, the students were informed about the study and told that their participation was on a voluntary basis. The researcher explained the scales to the student volunteers before they filled out their forms. They were instructed not to write their names on the forms, so that they would feel more comfortable. Finally, the researcher distributed the forms to the literate student volunteers during one class session and collected them after they were completed.

### Data analysis

Data were analyzed using means, percentages, independent sample *t* tests and logistic regression analysis. The independent samples *t* tests were used to compare the mean scores of the addicted and nonaddicted groups of adolescents on the subscales, and logistic regression was used to analyze the relationship between personality traits and internet addiction. All analyses were performed using SPSS version 15.0 (IBM SPSS Statistics, Chicago, IL, USA).

### Results

The students, 40.5% of whom were female, had a mean age of  $16.43 \pm 1.47$  years. Almost three quarters (73.8%) of their mothers and 61.0% of their fathers were elementary school graduates. All the students who participated in the study ( $n = 328$ ) had access to the internet; 44.2% ( $n = 145$ ) had internet access at home, and 45.4% ( $n = 149$ ) of all students accessed the internet outside the home as well. While 47.3% of the students ( $n = 155$ ) reported spending less than 5 hours per week online, 15.9% ( $n = 52$ ) were found to be at risk for internet addiction. Of the 52 students at risk, 42.4% ( $n = 22$ ) thought that the amounts of time they spent online were acceptable.

The difference between the mean total ABPT scores of the students with and without the risk of internet addiction was not statistically significant (Table 2). Moreover, no significant mean differences were found between these two groups of students on the conscientiousness, neuroticism, or agreeableness subscales ( $p > .050$ ).

The mean extraversion score was  $7.08 \pm 1.46$ , for adolescents at risk for internet addiction and  $6.55 \pm 1.38$  for adolescents who were not at risk for internet addiction. The mean difference was statistically significant ( $p < .050$ ). The mean score for openness to experience among the adolescents at risk for internet addiction was  $6.19 \pm 1.15$ , while the adolescents who were not at risk had a mean score of  $5.60 \pm 1.12$ . Again, the mean difference was statistically significant ( $p < .001$ ).

Logistic regression, using the backward regression method, tested the relationship between the personality traits and risk (no risk vs. at risk for internet addiction). The final model (Table 3) presents all significant interactions and relevant main effects. In order to follow up the interactions in more detail, linear regression analyses were performed for each group (no risk and at risk) and simple effects analyses were performed. The results of the logistic regression analysis showed that only 8.6% of the risk for internet

**Table 3** Internet Addiction Risk by Personality Traits

ABPT subscales	B	Odds ratio	95% confidence interval	p
Conscientiousness	0.08	0.93	0.65–1.32	.668
Neuroticism	0.24	0.79	0.56–1.10	.159
Extraversion	0.13	0.11	0.79–1.65	.478
Openness to experience	0.58	1.79	1.08–2.96	.023
Agreeableness	0.31	0.73	0.53–1.00	.051
ABPT total	0.01	0.99	0.94–1.04	.668

Note. ABPT = Adjective Based Personality Test.

addiction was explained by personality traits. The only subscale score that was statistically significant in the analysis was openness to experience ( $p < .050$ ). Openness to experience was associated with a 1.79 fold increased risk of internet addiction. Only significant results are reported.

### Discussion

The study findings are discussed in relation to the five personality trait model. In the current study, no statistically significant difference was found in the mean subscale scores for Conscientiousness between students at risk of internet addiction and those not at risk (Table 2). Studies indicate that highly conscientious individuals generally use the internet purposefully and have lower levels of risky usage, while less conscientious people are likely to experience problems related to internet addiction [6,7,15,16,21–23]. These results may show that adolescents who show a structured behavior have a low risk of internet addiction compared to those who are disorganized. As a consequence, an unstructured environment, such as the internet, could be classified as more interesting to explore than the real social relationship. The internet has changed the qualities of the communication channel, including relative anonymity and the ability to link up easily with others who have similar interests, values, and beliefs. Yet adolescents may use internet for educational reasons and not be affected by internet addiction [9–11]. Results from other studies supported this study finding.

There were no statistically significant group differences in the mean scores on neuroticism (Table 2). Studies have revealed that individuals with the neuroticism personality trait have high rates of risky internet usage [6,7,9–11,15,21,23]. According the five trait personality model, neurotic individuals experience anger, anxiety, irritability, apprehension, depression, and feelings of insecurity/vulnerability [24]. These individuals tend to experience increased levels of stress and interpersonal conflict because of this personality trait [25]. They are unable to cope with the stress enough. This indicates that they have a higher risk of developing addictions [26,27]. However, the results of our study revealed no statistically significant differences in the mean neuroticism scores of adolescents who were at risk of internet addiction and those who were not. Nevertheless, the mean scores of the at risk group were slightly lower than that of the other group. This may be attributable to the fact that individuals with this personality trait often socialize and form friendship groups with other individuals who display similar

**Table 2** Comparison of Adjective Based Personality Test (ABPT) Subscale Scores by Internet Addiction Risk in Students.

Internet addiction risk	Conscientiousness	Neuroticism	Extraversion	Openness to experience	Agreeableness	ABPT total
No <sup>a</sup>	5.33 ± 1.39	3.36 ± 1.13	6.55 ± 1.38	5.60 ± 1.12	6.56 ± 1.49	192.77 ± 30.89
Yes <sup>a</sup>	5.45 ± 1.14	3.22 ± 1.04	7.08 ± 1.46	6.19 ± 1.15	6.57 ± 1.22	198.90 ± 31.43
T	0.53	0.79	2.31	3.34	0.05	1.15
p	.593	.427	.022	.001	.957	.248

<sup>a</sup> M ± SD



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