

Development of a New Instrument for Assessing Dissociation in the Net: The Van Online Dissociative Experiences Schedule (VODES)

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ABSTRACT

Objective: Most of the theoretical models of addictive behaviors of Internet use based on the social cognitive model and suggested that Internet addiction is associated with a deficit in self-monitoring and self-regulation. On the other hand, researches have consistently reported associations between addictive Internet behaviors and a tendency to dissociate in clinical and non-clinical samples. Given the accumulating evidence in the literature, dissociative experiences may be a predisposing factor in the formation and perseverance of maladaptive use of the Internet. Within this context, the present study introduces a new psychometric instrument, the Van Online Dissociative Experiences Schedule (VODES), designed to assess online dissociative experiences.

Method: Seven hundred eighteen undergraduates (71.7% were female) volunteered to participate in the study. The mean age of the sample was 20.69 (SD ± 2.14). Participants completed the Van Online Dissociative Experiences Schedule (VODES) and Chen Internet Addiction Scale (CIAS).

Results: The result of principal components analysis showed that the four-factor (Identity confusion, Escapism/Detachment, Impairment in reality monitoring/Absorption, and Losing the sense of reality) solution explained 60.34% of the variance. Confirmatory factor analysis demonstrated that the four-factor model excellently fit data, and all items of the VODES loaded strongly (0.53 to 0.86) onto the respective latent factors. Moreover, VODES had excellent internal reliability (α s= 0.93 to 0.98) and test-retest reliability (r = 0.79 to 0.90). In addition, all four dimensions of the VODES were strongly associated with the addictive use of Internet.

Conclusions: This study showed that VODES is a promising and sound measure of online dissociation.

Keywords: Internet addiction, self-regulation, social-cognitive theory, behavioral addiction, online dissociative experiences

ÖZ

İnternette Disosiyasyonun Değerlendirilebilmesi İçin Geliştirilen Yeni Bir Ölçme Aracı: Van Çevrimiçi Disosiyatif Yaşantılar Ölçeği

Amaç: İnternet bağımlılığı ile ilgili olarak geliştirilen kuramsal modeller, genellikle sosyal bilişsel modele dayanmakta ve internet bağımlılığının öz-düzenleme ve öz-denetleme eksiklikleriyle ilişkili olduğunu ileri sürmektedir. Diğer taraftan, araştırmalar klinik olan ve olmayan örnekleme interneti bağımlı şekilde kullanma davranışları ile disosiyasyona eğilimli olma arasında ilişkiler ortaya koymuştur. İlgili alan yazındaki araştırma sonuçları dikkate alındığında, disosiyatif yaşantıların problemlili internet kullanımı üzerinde belirleyici bir faktör olduğu ileri sürülebilir. Bu kapsamda bu çalışma çevrimiçi disosiyatif yaşantıları ölçmek için geliştirilen Van Çevrimiçi Disosiyatif Yaşantılar Ölçeği'nin psikometrik özelliklerini incelemeyi amaçlamaktadır.

Yöntem: Araştırmanın katılımcılarını 515'i (%71,7) kadın, 203'ü erkek (%28,3) olmak üzere, 718 üniversite öğrencisi oluşturmaktadır. Katılımcıların yaş ortalaması 20,69 ve standart sapması 2,14'tür. Araştırma verileri Van Çevrimiçi Disosiyatif Yaşantılar Ölçeği (VÇDYÖ) ve Chen İnternet Bağımlılığı Ölçeği (CİBÖ) aracılığıyla toplanmıştır.

Bulgular: Temel bileşenler analizi VÇDYÖ'nün dört faktörlü (Kimlik karmaşası, Kaçma/Ayrışma, Gerçekliği takip etmede bozulma/Absorpsiyon ve Gerçeklik duygusunu kaybetme) bir yapıdan oluştuğunu göstermiştir. Doğrulamalı faktör analizi sonuçları da, dört faktörlü modelin veriye mükemmel derece uyum gösterdiğini ve tüm maddelerin faktör yüklerinin (0,53-0,86) yeterli düzeyde olduğunu göstermiştir. Ayrıca VÇDYÖ'nün yeterli düzeyde iç-tutarlılığa (α s= 0,93 to 0,98) ve test-tekrar-test tutarlılığına (r = 0,79 to 0,90) sahip olduğu ve VÇDYÖ'nün tüm alt ölçekleri internet bağımlılığı ve çevrimiçi geçirilen süre ile anlamlı düzeyde ilişkili olduğu bulunmuştur.

Sonuç: Bu çalışma VÇDYÖ'nün çevrimiçi disosiyatif yaşantıları değerlendirmede kullanılabilecek güçlü ve yeterli düzeyde psikometrik özelliklere sahip bir ölçme aracı olduğunu göstermiştir.

Anahtar Sözcükler: İnternet bağımlılığı, öz düzenleme, davranışsal bağımlılık, sosyal-bilişsel kurum, çevrimiçi disosiyatif yaşantılar.

INTRODUCTION

Over the two decades, there has been a growing research interest on the addictive use of the Internet and its underlying mechanisms. Given the literature on behavioral addiction concerning with excessive and uncontrollable Internet use, there has been a proliferation of terms identifying the maladaptive or problematic aspects of online behaviors. Some of these terms include 'pathological Internet use',^{1,2} "problematic Internet use",^{3,4} "Internet dependence",⁵ "compulsive Internet use",^{6,7} "excessive Internet use",⁸ "deficient regulated Internet use",⁹ and "Internet addiction."¹⁰

A great deal of ongoing debate has placed emphasis on whether the use of the Internet can be addictive. Some researchers argue that Internet addiction can be a secondary condition to psychological distress or psychiatric disorders rather than a distinct morbidity.¹¹⁻¹³ In contrast, a growing body of evidence has identified pathological aspects of maladaptive Internet use that lead to functional impairment in interpersonal and work or school domains. Recent revision of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition¹⁴ included Game Playing Disorder in Section III, which needs further research for its clinical relevance and underlying mechanisms of the disorder.

Several theoretical models and frameworks of addictive use of the Internet have been outlined to understand the underlying mechanisms of development and maintenance of Internet addiction. Deficient self-regulation (DSR) approach which is drawn from the social cognitive theory of Bandura¹⁵ takes the view that problematic Internet use may periodically occur due to deficits in self-monitoring, judgment, and self-reaction which are critical components of self-control.⁹ Self-monitoring refers to the conscious attention on potential influences of one's behaviors on the self, others, and the environment. The judgmental process evaluates potential outcomes of behaviors in awareness, and the self-reactive sub-function of self-regulation processes provides psychological and behavioral rewards, including self-administered or self-evaluative rewards.¹⁵ From the perspective of the social cognitive model of Internet overuse, problematic Internet use is associated with the psychological states characterized by deficiency in self-regulation (self-monitoring, judgments, and self-reactions) which result in diminished conscious self-control over behaviors.¹⁶ In this view, insofar as the Internet-related behaviors become automatic, which is indicative of a form of diminished self-regulation, the individuals are more likely to manifest excessive, uncontrollable, and addictive use of Internet. To date, a number of proposed diagnostic criteria of Internet addiction such as loss of control in the amount of time spent online,^{17,18} unsuccessful attempts to reduce the amount of time spent online,¹⁹ withdrawal symptoms,² preoccupation with online activities,²⁰ disinhibition, loss of boundaries, timelessness,¹⁸ relapse,²¹ and aversive social, physical and emotional consequences²² are characterized by alterations in consciousness states to be regarded as markers of deficient self-regulation process.

Jacobs' general theory of addiction proposed that a tendency to manifest dissociative symptoms distinguishes between addicted and non-addicted individuals.²³⁻²⁵ Individuals more prone to experience altered states of consciousness such as trance-like states, out of body experiences, amnesia or blackouts, and altered self-perceptions exhibit a predisposition to addictive behaviors, i.e., pathological gambling. Three components of the mechanism that result in dissociative symptoms during addictive behaviors include: i) blurred reality caused by narrowed attention on a specific activity (absorption), ii) reduction of self-criticism through an internal cognitive shift (experiential avoidance), and iii) opportunity for flattering fantasy proneness about oneself which, in turn, facilitate self-relief (escapism).²⁵

In keeping with the notion asserted by Jacobs,²⁵ various lines of research have provided evidence supporting the role of dissociative phenomenon in the formation and perseverance of the addictive behaviors. A case study reported that an unemployed woman having engaged in intense online gaming more than two years up to 12h a day with several different gaming characters was hospitalized for severe complaints of intrusions of these gaming characters. She was identified as having dissociative characteristics and attained to a 12-week inpatient psychotherapy in order to integrate her perception of fragmented identities.²⁶ Based on a case report of a child with dissociative characteristics, Caretti²⁷ coined a term "Video-terminal Dissociative Trance" (VDT) referring an attempt to achieve a reorganization and coherence in fragmented self through connecting virtual realities. As an auto-hypnotic and dissociative phenomenon, building blocks of the VDT paradigm involve addiction, regression, and dissociation. Schimmenti and Caretti²⁸ provided further case reports and empirical evidence from the view of the VDT supporting the interaction between dissociative states as experiential escapism and addictive use of the Internet and its linkages to insecure attachment and interpersonal strains.

In a similar vein, those high in dissociation have greater difficulty tolerating perceptual discontinuity.^{29,30} A pioneering study with an experimental paradigm of virtual reality exposure by Aardema³¹ observed that individuals with initially high levels of dissociation reported more significant dissociation symptoms and a less sense of presence in objective reality after virtual reality exposure than did individuals with milder levels of dissociation. Given the rigorous connections between obsessive-compulsive behaviors and dissociative symptomatology identified in the previous studies,³²⁻³⁷ a number of studies suggested that addictive behaviors in the net have a compulsive nature which is strong associated with obsessive-compulsive symptoms.³⁸⁻⁴¹ Moreover, research has consistently reported strong associations between addictive Internet use and a tendency to dissociate in clinical and non-clinical samples.^{38,42-47}

As emphasized above, accumulating evidence in the literature has consistently showed that dissociative experiences seem to be a predisposing factor in the formation and perseverance of excessive, uncontrollable and maladaptive use of the Internet. Therefore, we suggest a concept of "online dissociation" referring to relative disruption in the functions of consciousness, identity, memory, and somatosensory, which are normally integrated, in response to virtual or online activities. The present study introduces a new psychometric instrument designed to assess online dissociative experiences that identify the degree of mental absorption during online activities, lapses in memory concerning with Internet experiences, depersonalization and derealization that may occur insofar as engaging virtual reality accompanied by a decrease of a sense of presence in objective reality, and discontinuation or fragmentation of a sense of real self and identity. We hypothesized that measurement of online dissociative symptoms as indexed by the Van Online Dissociative Experiences Schedule (VODES) will exhibit good psychometric properties (high internal consistency and temporal stability) and a high proportion of shared variance with addictive use of Internet as measured by the Chen Internet Addiction Scale (CIAS), strengthening the notion of online dissociation.

METHOD

Participants and Procedure

Participants were recruited from two state universities in Turkey through convenience sampling. Seven hundred eighteen undergraduates volunteered to participate in the study. The mean age of the

sample was 20.69 (SD \pm 2.14). Five hundred and fifteen respondents (71.7%) were female. Participants completed the battery set containing the Van Online Dissociative Experiences Schedule (VODES) and Chen Internet Addiction Scale (CIAS).

The present study was announced to the participants to take part in the classrooms of different majors of two state universities. Volunteered individuals were taken to a silent classroom after their lessons. Having been informed about the procedure and purpose of the study, the participants received the battery set including a socio-demographic questionnaire, the VODES and CIAS. All participants provided with written informed consent.

Data Analysis

We began with computing socio-demographic characteristics of the sample. Additional statistical analyses comprised i) item analysis by using corrected-item total analyses, ii) assessment of the construct validity of the VODES by means of explanatory factor analysis and confirmatory factor analysis, iii) criterion validity using the Pearson product moment correlation coefficients between the VODES and CIAS subscale scores, iv) student t-test in order to assess gender differences in subscale scores of the instrument, v) analysis of the scale's reliability using the Cronbach's alpha and temporal stability of the total and subscale scores between two applications with a time interval of three-week, and vi) multiple logistic regression in which subscales of the VODES were regressed onto the cutoff score on the CIAS total. Factor analytical investigation of the VODES was conducted using LISREL⁴⁸ and all other analyses were performed using Statistical Package for Social Sciences.⁴⁹

In order to provide factor invariance, using corrected-item total correlation coefficient values greater than >0.40 ,⁵⁰ 62 items were selected from an initial item pool consisting of 105 items. Selected items were undergone to factor analytic investigation of latent factor structure of the VODES. Using principal components analyses with Kaiser-Varimax rotation, which is the most widely used orthogonal method that maximizes the sum of the variance of the square loadings to obtain uncorrelated factors,⁵¹ we extracted the four subscales of the VODES using half of the sample data ($n = 359$). A confirmatory factor analysis (CFA) was performed on the 62 items of the VODES using maximum likelihood estimation method with robust standard errors (MLR) on the other half of the sample ($n=359$) in order to test the four factor latent factor structure of the instrument. The following model fit indices and acceptance ranges were used to examine the goodness of model fit of the four-factor latent structure of the VODES: Scaled χ^2/df ratio [<4], Root Mean Square Error of Approximation (RMSEA) [<0.08], 90% confidence interval of RMSEA [the upper limit <0.08], Standardized Root Mean Square Residual (SRMR) [<0.08], Comparative Fit Index (CFI) [>0.90] and Tucker-Lewis Fit Index (TLI) [>0.90].⁵²⁻⁵⁴

Instruments

The VODES and CIAS were used to gather research data. Participant's demographic information (gender, age and time spent online) was obtained via three open-ended questions.

Van Online Dissociative Experiences Schedule (VODES)

The VODES was designed to assess the degree to which an individual reveals a tendency to experience various types of dissociative symptoms during online activities. One hundred five items were written to represent potential dissociative symptoms which may be experienced during the time spent online based on theoretical considerations on pathological dissociation.^{37,55-59} 62 items remained in the final version of the instrument after item analyses and factor analytic investigations of the latent structure of the proposed construct.

Overall, the VODES was designed to assess the endorsement and severity of dissociative experiences in the net. Respondents' endorse-

ment of each symptom was assessed by asking them to rate how often they have such experiences when they are online. Each item is rated on a scale ranging from 0 (Never) to 10 (Always), in which the frequency of the experience indicated the intensity of the online dissociation.

Chen Internet Addiction Scale (CIAS)

The CIAS is a 26-item self-report questionnaire designed to assess symptoms and problems arise from the addictive use of Internet. Participants are asked to rate each item on a four-point scale. In addition to composite scores, the instrument yields scores on five dimensions of uncontrollable, problematic and undue use of Internet: Compulsive Internet use, Withdrawal symptoms, Tolerance, Interpersonal and health problems, and Time management difficulties.⁶⁰ A score greater than the cut-off point (>63) is indicative of Internet addiction.⁶¹ The Turkish version of the CIAS revealed excellent psychometric properties with a Cronbach's alpha of $\alpha=0.94$.⁶²

RESULTS

The sample was randomly split into two groups. Using the data on one sub-group, principal components analysis (PCA) with varimax rotation was run to investigate the dimensional structure of the VODES. Data on the second sub-group of participants were subjected to a CFA.

In the former subgroup ($n = 359$), the Kaiser-Meyer-Olkin measure of sampling adequacy indicated an excellent value of 0.91. Bartlett's test of sphericity indicated a chi-square value of 11288.368 ($df = 1891$, $p<0.001$), indicative of that item structure of the instrument was favorable for explanatory analysis. The four-factor solution explained 60.34% of the variance. Rotated factor loadings were higher than 0.41. Findings are presented in Table 1.

To test the four-dimensional latent structure of the VODES extracted using the PCA in the first group, Satorra-Bentler corrected maximum likelihood CFA was undertaken in the second subgroup. Structural equation modeling approach was used to evaluate the four-factor latent structure of the VODES based on the data from the second sub-sample. All CFA goodness-of-fit indices for the four-factor solution of the instrument fell within an excellent range according to the guideline,⁵² indicating that four-factor model excellently fit data. Goodness-of-fit indices for the CFA model were as follows: Satorra-Bentler χ^2 (1823) was 3942.37, Scaled χ^2/df ratio was 2.16; RMSEA was 0.057 ($p<0.01$, 90% CI = 0.055 – 0.059), TLI was 0.99, CFI was 0.99, and SRMR was 0.057. All maximum likelihood estimates were statistically significant. All items of the VODES loaded strongly (0.53 to 0.86) onto the respective latent factors (Table 1).

Univariate associations of total and subscale scores on the VODES with total and subscales of the CIAS were investigated using Pearson product-moment correlation analysis. Correlational analysis showed that aspects of online dissociation as indexed by the VODES were statistically significantly and strongly associated with dimensions of Internet addiction as measured by the CIAS. In addition, the VODES revealed excellent internal reliability (Cronbach's alpha for the overall instrument was 0.98). Findings are presented in Table 2.

Using intra-class correlation analysis, we evaluated temporal stability of scores on the VODES between two applications with three-week interval among 119 undergraduates. The VODES total (Intra $r = 0.90$ $p<0.01$), Identity confusion ($r = 0.85$, $p<0.01$), Escapism / Detachment ($r = 0.79$, $p<0.01$), Impairment in reality monitoring / Absorption ($r = 0.86$ $p<0.01$), and Losing the sense of reality ($r = 0.84$, $p<0.01$) had excellent test-retest reliability.

The mean amount of time spent online per day was 5 hours (SD \pm 3.10). The Pearson product-moment correlation coefficients of time spent online with scale scores were robust and statistically significant. We found significantly high shared variance of amount of time spent online

with the CIAS total ($r = 0.46, p < 0.01$), VODES total ($r = 0.28, p < 0.01$), Identity confusion ($r = 0.25, p < 0.01$), Escapism / Detachment ($r = 0.24, p < 0.01$), Impairment in reality monitoring / Absorption ($r = 0.31, p < 0.01$), and Losing the sense of reality ($r = 0.19, p < 0.01$).

Using student t-test, gender differences in total and subscale scores of the VODES were investigated. Results showed that gender differences in the VODES total ($t(716) = 1.423, p = 0.155$), Identity confusion ($t(716) = 1.560, p = 0.119$), Escapism / Detachment ($t(716) = 1.259, p = 0.209$), and Impairment in reality monitoring / Absorption ($t(716) = 0.683, p = 0.495$) were not statistically significant. However, male respondents reported significantly greater scores on Losing the sense of reality than did female individuals ($t(716) = 2.500, p = 0.013$). Age was mildly correlated with the VODES total ($r = 0.08, p < 0.05$), Identity confusion ($r = 0.09, p < 0.05$), and Losing the sense of reality ($r = 0.089, p < 0.05$); whereas correlation coefficients with Escapism / Detachment ($r = 0.07, p > 0.05$) and Impairment in reality monitoring / Absorption ($r = 0.07, p > 0.05$) were not statistically significant (Table 3).

To explore the multivariate relationships between online dissociation and Internet addiction, we undertook multiple logistic regression analysis. Four subscales of the VODES (Identity confusion, Escapism/Detachment, Impairment in reality monitoring/Absorption, and Losing the sense of reality) were regressed on a binary dependent variable (Internet addicts vs non-addicts) after controlling for age, gender and time spent online per day. The multivariate logistic model explained half of the unique variance of the dependent variable. Amount of time spent online (OR = 1.293 95% CI = 1.199-1.395, $p < 0.01$), Impairment in reality monitoring/Absorption (OR = 1.647 95% CI = 1.354-2.002, $p < 0.01$) and Losing the sense of reality (OR = 1.277 95% CI = 1.007-1.621, $p < 0.05$) were significant predictors of a tendency to addictive use of Internet. Results are reported in Table 4.

DISCUSSION

The main goal of this study was to develop a valid and reliable psychometric instrument in order to operationalize the online dissociation construct. To date, there has been a growing interest in relationships between dissociative symptomatology and maladaptive problematic Internet use. One of early studies in a

Table 1. Item-Total Correlations, Exploratory and Confirmatory Factor Analyses Item Loadings

	Rij	Factor 1	Factor 2	Factor 3	Factor 4	λ	R square
Item 5	0.616	0.418	0.138	0.281	0.270	0.62	0.38
Item 15	0.703	0.521	0.207	0.468	0.311	0.69	0.48
Item 17	0.677	0.538	0.292	0.257	0.234	0.71	0.50
Item 18	0.610	0.610	0.217	0.143	0.218	0.66	0.44
Item 22	0.722	0.617	0.207	0.382	0.060	0.73	0.53
Item 23	0.731	0.514	0.504	0.418	0.068	0.70	0.49
Item 24	0.722	0.537	0.371	0.444	0.154	0.74	0.55
Item 25	0.762	0.537	0.365	0.456	0.279	0.76	0.58
Item 26	0.768	0.607	0.289	0.451	0.210	0.77	0.59
Item 27	0.743	0.582	0.480	0.324	0.190	0.77	0.59
Item 29	0.618	0.565	0.165	0.295	0.075	0.66	0.44
Item 37	0.684	0.455	0.192	0.448	0.339	0.69	0.48
Item 41	0.661	0.546	0.296	0.210	0.307	0.69	0.48
Item 42	0.772	0.706	0.312	0.159	0.262	0.81	0.66
Item 43	0.654	0.492	0.371	0.221	0.410	0.67	0.45
Item 50	0.696	0.581	0.259	0.269	0.253	0.74	0.55
Item 51	0.728	0.814	0.286	0.109	0.227	0.77	0.59
Item 53	0.681	0.411	0.196	0.347	0.411	0.71	0.50
Item 54	0.705	0.533	0.289	0.337	0.357	0.73	0.53
Item 55	0.715	0.557	0.341	0.176	0.449	0.74	0.55
Item 13	0.630	0.304	0.419	0.315	0.094	0.62	0.38
Item 19	0.764	0.380	0.637	0.313	0.240	0.79	0.62
Item 20	0.751	0.359	0.649	0.257	0.295	0.76	0.58
Item 28	0.797	0.471	0.576	0.413	0.149	0.82	0.67
Item 30	0.690	0.416	0.617	0.083	0.123	0.72	0.52
Item 33	0.748	0.344	0.665	0.311	0.240	0.79	0.62
Item 34	0.747	0.431	0.686	0.252	0.287	0.78	0.61
Item 35	0.657	0.227	0.579	0.393	0.250	0.63	0.40
Item 36	0.753	0.423	0.674	0.156	0.338	0.78	0.61
Item 38	0.713	0.340	0.475	0.382	0.340	0.76	0.58
Item 39	0.697	0.314	0.447	0.376	0.177	0.70	0.49
Item 45	0.615	0.217	0.569	0.231	0.317	0.61	0.37
Item 46	0.744	0.383	0.686	0.076	0.407	0.81	0.66
Item 47	0.734	0.178	0.670	0.269	0.280	0.80	0.64
Item 48	0.677	0.090	0.640	0.224	0.314	0.72	0.52
Item 49	0.647	0.024	0.536	0.531	0.185	0.61	0.37
Item 52	0.628	0.340	0.550	0.227	0.158	0.67	0.45
Item 1	0.614	0.338	0.183	0.587	0.121	0.66	0.44
Item 2	0.607	0.100	0.220	0.638	0.259	0.70	0.49
Item 3	0.613	0.007	0.297	0.582	0.289	0.69	0.48
Item 4	0.509	0.435	0.080	0.509	0.104	0.57	0.32
Item 6	0.607	0.138	0.077	0.575	0.256	0.70	0.49
Item 7	0.592	0.207	0.189	0.637	0.057	0.69	0.48
Item 8	0.677	0.367	0.162	0.544	0.229	0.68	0.46
Item 9	0.507	0.050	0.318	0.597	0.073	0.59	0.35
Item 10	0.656	0.250	0.185	0.686	0.096	0.77	0.59
Item 11	0.689	0.405	0.062	0.620	0.219	0.76	0.58
Item 12	0.513	0.228	-0.016	0.650	0.154	0.57	0.32
Item 14	0.656	0.432	0.192	0.485	0.212	0.67	0.45
Item 16	0.725	0.347	0.431	0.586	0.197	0.70	0.49
Item 21	0.554	0.193	0.367	0.528	-0.050	0.55	0.30
Item 31	0.579	0.158	0.219	0.638	0.083	0.61	0.37
Item 32	0.636	0.127	0.504	0.553	0.087	0.65	0.42
Item 40	0.476	0.178	0.227	0.573	-0.062	0.53	0.28
Item 44	0.651	0.531	0.385	-0.041	0.540	0.77	0.59
Item 56	0.687	0.384	0.202	0.185	0.731	0.77	0.59
Item 57	0.665	0.195	0.360	0.186	0.750	0.77	0.59
Item 58	0.716	0.356	0.223	0.377	0.547	0.77	0.59
Item 59	0.639	0.205	0.259	0.120	0.821	0.77	0.59
Item 60	0.764	0.247	0.545	0.239	0.610	0.86	0.74
Item 61	0.737	0.164	0.539	0.241	0.639	0.78	0.61
Item 62	0.675	0.340	0.254	0.148	0.824	0.77	0.59
Variance explained		16.57%	16.31%	16.18%	11.28%		51.05%

Note. Rij: Corrected-item total correlations (N=718); λ = Confirmatory factor analysis estimates (n=359); Factor 1: Identity confusion; Factor 2: Escapism / Detachment; Factor 3: Impairment in reality monitoring / absorption Factor 4: Losing the sense of reality

sample of nonclinical undergraduates by De Berardis⁶³ reported a salient interaction between alexithymia, low-self esteem, impulse control problems and dissociation in relation to addictive Internet use. In a sample of 50 psychiatric outpatients, Bernardi and Pallanti³⁸ identified significant shared variance of Internet addiction with perceived family disability, obsessive-compulsive symptoms and a tendency to pathological dissociation. Canan⁴³ found that hours spent online and problematic Internet behaviors were robust correlates of dissociative experiences in a large sample of nonclinical subjects. In a more recent investigation, Internet addicts prone to dissociation were demonstrated to have more severe mental health problems compared to addicted participants with low dissociation.⁴⁶ Research has consistently pointed

diagnostic phenomenon representing a deal of shared variance with negative affect or general psychopathology.^{32,34,71}

The accumulated research evidence showed that various forms of dissociative symptomatology might exist specific to distinct types of psychiatric disorders such as post-traumatic disorder^{73,74} or obsessive-compulsive disorder.^{37,75} In this regard, mood modifying experiences during Internet use may serve for some individuals to emotional and/or mental escape reinforcing the increased maladaptive use of online activities. Temporal relief from stressful life events and psychological pain through Internet may then result in exacerbation of emotion dysregulation probably induced by functional impairment originating from counterproductive distraction strategies such as over engage-

Table 2. Pearson Product-Moment Correlation Coefficients within Scale Scores

	1	2	3	4	5	6	7	8	9	10	11
1. Van Online Dissociative Experiences Schedule	-										
2. Identity confusion	0.96 **	-									
3. Escapism / detachment	0.95 **	0.90 **	-								
4. Impairment in reality monitoring /absorption	0.91 **	0.80 **	0.79 **	-							
5. Losing the sense of reality	0.87 **	0.85 **	0.86 **	0.66 **	-						
6. Chen Internet Addiction Scale	0.67 **	0.62 **	0.61 **	0.67 **	0.52 **	-					
7. Compulsive Internet Use	0.61 **	0.56 **	0.55 **	0.61 **	0.49 **	0.91 **	-				
8. Withdrawal Symptoms	0.60 **	0.55 **	0.53 **	0.63 **	0.45 **	0.87 **	0.79 **	-			
9. Tolerance	0.56 **	0.53 **	0.49 **	0.57 **	0.43 **	0.90 **	0.79 **	0.73 **	-		
10. Interpersonal and Health Problems	0.61 **	0.57 **	0.56 **	0.61 **	0.48 **	0.91 **	0.78 **	0.69 **	0.78 **	-	
11. Time Management Difficulties	0.57 **	0.55 **	0.52 **	0.55 **	0.47 **	0.86 **	0.71 **	0.66 **	0.77 **	0.72 **	-
Mean	1.76	1.37	1.43	2.87	1.12	49.22	9.32	10.15	8.28	12.69	8.73
Standard deviation	1.63	1.64	1.65	2.00	1.68	17.17	3.79	3.91	3.04	5.03	3.45
Cronbach's alpha	0.98	0.96	0.95	0.93	0.93	0.96	0.84	0.85	0.81	0.87	0.80

Note. **:p<0.01

out robust associations between problematic Internet use and dissociation.^{26,44,47,64,65}

Suler⁶⁶ proposed a cognitive and affective process of "disinhibition effect" capturing dissociative anonymity, invisibility, asynchronicity, solipsistic introjections, dissociative imagination, and minimization authority. The concept of disinhibition suggests that online activities are not means for self-disclosure rather the process represents a shift to a cluster of effect and cognition within self-structure differing from the real self. The term "dissociation" also connotes alterations in consciousness, sensation, cognition, affect, identity, and motor functioning.^{67,68} Dissociation has long been recognized as a buffering mechanism against escalations in affective states arising in response to aversive life experiences which, in turn, shifts to a maladaptive state of detachment and compartmentalization that causes deterioration of emotion regulation.^{35,69-72} Thus, stress-induced dissociation is a trans-

ment in online behaviors as a vicious cycle.^{25,45} Greenfield¹⁸ proposed several characteristics of compelling Internet users encompassing intense intimacy, disinhibition, loss of boundaries, timelessness, and feelings of loss of control that resemble dissociative symptomatology. Additionally, the medium of Internet can fuel alterations in consciousness such as absorption, detachment and trance-like states, particularly among those more prone to dissociative experiences.^{27,28,31} Taken together, we suggested a construct of "online dissociation" referring to escalated dissociative states induced by intense immersion or engagement on Internet. Psychometric analyses of the VODES, which is designed to assess the concept of "online dissociation," demonstrated that online dissociative experiences are multifaceted, consisting of Identity confusion, Escapism/Detachment, Impairment in reality monitoring /Absorption, and Losing the sense of reality. The internal consistency of the subscales of the VODES was excellent, supporting the reliability of the construct. Moreover, moderate correlations of these subscales with the CIAS were indicative of construct validity of 'online dissociation' as measured by the VODES.

To the best of our opinion, we consider the construct of 'online dissociation' as mostly a nonpathological form of dissociative experiences that may involve escapism from milder forms of daily stresses rather than intense stressors such

Table 3. Student T-Tests between Gender Groups

	Gender				t(716)	P	Cohen's d
	Female (n = 515)		Male (n = 203)				
	Mean	SD	Mean	SD			
Van Online Dissociative Experiences Schedule	1.71	1.65	1.90	1.57	-1.423	0.155	0.12
Identity confusion	1.31	1.66	1.52	1.59	-1.560	0.119	0.13
Escapism / detachment	1.38	1.66	1.55	1.64	-1.259	0.209	0.10
Impairment in reality monitoring /absorption	2.84	2.06	2.95	1.83	-0.683	0.495	0.06
Losing the sense of reality	1.02	1.65	1.37	1.75	-2.500	0.013	0.21

Note. Significant P values are boldfaced.

as sexual trauma, and may be more likely to associate with predisposing factors such as disruption in sleep-wake cycle, cognitive failures, disruption in attentional control and errors in reality monitoring.^{32,45,76,77} Based on the current data, particularly 'Impairment in reality monitoring/Absorption' and 'Losing the sense of reality' rather than 'Identity confusion' or 'Escapism/ Detachment' seem to be significant facets of online dissociative experiences that were associated with pathological Internet use. Construction hypothesis conjectured by de Ruiter⁷⁸ posits that nonclinical dissociators are more prone to construct more vivid conscious experiences which are associated with enhanced levels of elaboration learning and reconstructive retrieval, indicative of high levels of attentional and working memory capacities. Accumulated evidence showed that non-pathological dis-

vealed excellent internal reliability, lending further evidence for the construct validity of Internet-related alterations in subjective experiences. Temporal stability of the scores on the VODES was high as well. The amount of time spent online was a significant correlate of both addictive online behaviors and online dissociative experiences. Participants who reported high scores on the dimensions of the VODES revealed maladaptive and problematic patterns of Internet use as indexed by the subscales of the CIAS, confirming our hypothesis that online dissociation plays a significant role in the pathogenesis and maintenance of addictive online behaviors. Logistic regression analysis indicated that more extended amount of time spent online, Impairment in reality monitoring /Absorption and Losing the sense of reality were significantly associated with Internet addiction. On the whole,

Table 4. Logistic Regression of Online Dissociation on Internet Addiction (CIAS > 63)

	Nagelkerke R ²	P	Odds Ratio	95% Confidence Interval
	0.498			
Age	0.556	0.962	0.845-1.095	
Gender	0.644	1.129	0.674-1.892	
Amount of time spent online (per day)	<0.001	1.293	1.199-1.395	
Identity confusion	0.220	1.200	0.897-1.605	
Escapism / Detachment	0.732	0.951	0.712-1.270	
Impairment in reality monitoring /Absorption	<0.001	1.647	1.354-2.002	
Losing the sense of reality	0.044	1.277	1.007-1.621	

Note. Significant P values are boldfaced.

sociation was positively associated with working memory scores and attentional processing scores on behavioral and neuropsychological tests.⁷⁹⁻⁸¹ In comparison to healthy controls, dissociative patients revealed more activation in the left anterior prefrontal cortex, dorsolateral prefrontal cortex and parietal cortex that are typically implicated in working memory.⁸² In addition, high dissociators under negative emotion revealed enhanced ability to divert attention to a new mental set.⁸³ Taken together, a tendency to dissociate during online activities may ease the cognitive and emotional processing to an extent among individuals from the nonclinical population; however, heightened dissociation arising from the excessive Internet use may impede with the cognitive and emotional processing capacity thereby resulting in emotional distress. Therefore, an online dissociative tendency should not in the first place be considered as a marker of a mental disorder, but might well be seen as a distinct trait that may serve attentional and emotional processing. Therefore, dissociative states may be invoked by individuals through Internet overuse to cope with cognitive and emotional difficulties.

Several limitations of the current study are worth to mention. Even though the sample was split into two subgroups, the data subjected to exploratory and confirmatory factor analyses were collected at the same time. That is, our findings should be interpreted with caution, and the latent factor structure of the construct of online dissociation measured by the VODES should be warranted through further factor analytical studies. Second, the data were cross-sectional, and all identified associations of the online dissociation with pathological use of Internet were correlational that causal interpretations cannot be drawn. Given the predisposing, precipitating and perpetuating factors for Internet addiction is proliferate, the current data did not include other potentially antecedents of addictive use of Internet. To understand the role of online dissociation in problematic Internet use, longitudinal studies after controlling for crucial risk factors for behavioral addiction should be conducted.

Online dissociative experiences, as measured by the VODES re-

scores on the VODES revealed sound and promising psychometric features in assessment of the construct of online dissociation.

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