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ASSESSMENT, DEVELOPMENT, AND VALIDATION

The Online Dating Intensity Scale: Exploratory Factor Analysis in a Sample of Emerging Adults

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ABSTRACT
We performed an exploratory factor analysis on the Online Dating Intensity Scale with a sample of emerging adult college students ($N = 494$). The data analyses resulted in a 1-factor, 5-item assessment that explained 60.79% of the variance.

KEYWORDS
Assessment; emerging adults; exploratory factor analysis; online dating

Emerging adults (18–29 years old) are a unique counseling population with distinct social circumstances (Siegel, 2013; Tao, 2013). One of the primary components of emerging adult development is the formation and maintenance of interpersonal and romantic relationships (Arnett, 2015; Banker, Kaestle, & Allen, 2010; McClintock, 2010; Taylor, Rappleyea, Fang, & Cannon, 2013), which take on a new level of seriousness postadolescence (Fincham & Cui, 2010). Combined with the social communication zeitgeist of today's technological era (Bargh & McKenna, 2004; Bloom & Dillman Taylor, 2015; Lepp, Li, & Barkley, 2016), researchers are compelled to explore the influence of technology on relationship development (Alam, Yeow, & Loo, 2011; Cyr, Berman, & Smith, 2015; Rappleyea, Taylor, & Fang, 2014).

Looking past potential clinical issues related to technology addiction (Roberts, Pullig, & Manolis, 2015; Smith, 2012), researchers debated for and against the use of technology and the Internet for its unique ability to allow individuals to communicate publicly or privately immediately or in delayed form (Barak, 2007). Other researchers emphasized that social communication technology (SCT) might not threaten social communities but actually strengthen relationships (Bargh & McKenna, 2004). Nonetheless, researchers criticized SCT for its ability to enable behaviors that create intimacy problems (Hertlein & Stevenson, 2010) and to promote communication without nonverbal cues (Riva, 2002), which makes for a weaker form of interaction (Best, Manktelow, & Taylor, 2014). Researchers examined emerging adults' use of SCT with a variety of constructs and reported mixed findings and encouraged future researchers to investigate specific online activities as opposed to general online use.

Online dating is one form of online activity gaining in popularity (Smith & Duggan, 2013; Stephure, Boon, MacKinnon, & Deveau, 2009); however, research related to online dating is still in its infancy. For example, McKenna, Green, and Gleason (2002) found that participants ($N = 567$) used the Internet for an average of 34 months at the time of survey, indicating that the Internet—and consequently online dating—lacked in historical and cultural relevance that is currently present. Comparing U.S. use of online dating services from 2005 ($N = 3{,}215$) to 2013 ($N = 2{,}252$), Smith and Duggan (2013) identified a 15% increase (44% to 59%) in Americans'

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/uecd.

belief that online dating is a good way to meet people. Similarly, Stephure et al. (2009) reported that college students' exposure to online dating services is increasing compared to previous studies (e.g., Donn & Sherman, 2002).

Thus far, researchers have examined the experiences of online daters (Heino, Ellison, & Gibbs, 2010; Vanderweerd, Myers, Coulter, Yalcin, & Corvin, 2016), as well as the characteristics (Blackhart, Fitzpatrick, & Williamson, 2014; Stephure et al., 2009; Timmermans & De Caluwe, 2017; Valkenburg & Peter, 2007), expectations (de Vries, 2016), goals (Alterovitz & Mendelsohn, 2013; Menkin, Robles, Wiley, & Gonzaga, 2015), and practices of those who use online dating services (Hitsch, Hortacsu, & Ariely, 2006). Although males are more likely to use online dating services, researchers suggest that individuals' use of online dating services is not related to their income level or education status (Valkenburg & Peter, 2007). In contrast, researchers concluded that online daters are similar to traditional daters, except in the sense that online daters might have lower dating anxiety (Valkenburg & Peter, 2007) and place greater emphasis on physical attractiveness of potential partners (Rosen, Cheever, Cummings, & Felt, 2008).

Researchers identified online dating as an activity that promotes the evaluation of potential partners (Sritharan, Heilpern, Wilbur, & Gawronski, 2010) and the consequential self- and other-objectification associated with evaluation (Hitsch et al., 2006). Furthermore, researchers identified that online dating promotes an element of fantasy (Arvidsson, 2006), in which online daters project an identity onto a potential partner (Ramirez, Sumner, Fleuriet, & Cole, 2015). Overall, it would appear that online dating is a unique experience of courting, which might attract individuals with preexisting differences from nononline daters, or perhaps online dating influences those who use these services.

Despite researchers' findings, research regarding online dating often includes instrumentation limitations. We conducted a thorough search of EBSCOhost (i.e., PsycINFO, PsycARTICLES), and identified a deficit of empirically validated instruments available to researchers or clinicians to measure the intensity of an individual's use of online dating services. The lack of an established, empirically supported instrument with strong psychometric properties used with consistency between studies impairs the ability to draw conclusions from research conducted (e.g., Short, Black, Smith, Wetterneck, & Wells, 2012), thus highlighting researchers' need for such an instrument.

We contacted Dr. Richard Hartshorne, Associate Professor of Educational Technology and Program Coordinator for the Instructional Design and Technology Department at the University of Central Florida (personal communication, April 26, 2015), who confirmed the limited existence of such instruments with empirically examined psychometric properties. Typically, researchers create their own instruments to measure various kinds of technology use (e.g., Cyr et al., 2015; Reich, Subrahmanyam, & Espinoza, 2012). For example, Stephure et al. (2009) used a series of forced-choice questions regarding participants' creation or response to online personal ads to measure participants' online dating activity. However, this measure might not have included participants' use of more obscure online dating services or activities, and the researchers reported that their measure might have "taxed respondents' attention spans" (p. 676). Furthermore, Blackhart et al. (2014) created an assessment called the Online Dating Inventory but reported several limitations to its viability, including the assessment of intended behaviors rather than actual behaviors related to online dating.

To practice as competent and ethical mental health professionals (American Counseling Association, 2014), counselors must be prepared to work with a variety of client populations with an array of presenting issues. The Council for Accreditation of Counseling and Related Educational Programs (CACREP, 2016) charges counselors and researchers to examine contemporary societal issues in the counseling field. To meet the needs of clients who use online dating services, a need exists for the creation of a tool to measure an individual's intensity of his or her use of online dating services. Therefore, with the goal of promoting use of an empirically

supported instrument to measure use of online dating services, rather than using a researcher-created instrument with unexamined psychometric properties, we modified an existing instrument designed to measure the intensity of Facebook use among emerging adults (i.e., the Facebook Intensity Scale [FBI]; Ellison, Steinfield, & Lampe, 2007) to create an instrument called the Online Dating Intensity Scale (ODI).

We elected to modify the FBI for the purposes of our study because we believed its intended measurement of the intensity of an individual's use of Facebook paralleled our intention to measure the intensity of emerging adults' use of online dating services more closely than other existing assessment instruments. Furthermore, the FBI demonstrated strong psychometric properties with similar populations (e.g., Ellison et al., 2007; Lampe, Wohn, Vitak, Ellison, & Wash, 2011; Lou, Yan, Nickerson, & McMorris, 2012; Orr et al., 2009; Sherrell, 2014; Valenzuela, Park, & Kee, 2009), and experts in the field of technology encouraged our modification of the FBI to measure the intensity of individuals' use of online dating (R. Hartshorne, personal communication, April 26, 2015). Thus, this article explores whether the ODI has practical uses for counselors and researchers.

Online Dating

Online dating is a vehicle for relationship initiation that then progresses to face-to-face relationships (Sprecher, 2009). Some researchers theorized that online dating might be a tool to form relationships specifically for individuals with high anxiety, but researchers found evidence to contest this theory (Stevens & Morris, 2007; Valkenburg & Peter, 2007). Rather, individuals from emerging adulthood through older adulthood use online dating services to establish relationships (Alam et al., 2011; Alterovitz & Mendelsohn, 2011; McWilliams & Barrett, 2014). However, researchers criticized online dating as a medium for social interaction and communication because its use bypasses essential face-to-face experiences that researchers argue are necessary for relationship development (e.g., nonverbal cues, physical proximity, physical attraction; Riva, 2002); yet, online relationships and online dating are widespread and prevalent in U.S. society across demographic variables (Smith & Duggan, 2013).

The Pew Research Center (Smith & Duggan, 2013) conducted a survey in the spring of 2013 with a sample of U.S. adults age 18 or older ($N = 2{,}252$) and reported on the current state of online dating. Researchers reported that 11% of Internet users (9% of adults) have personally used an online dating Web site (e.g., Match.com, eHarmony, OkCupid) and 7% of cell phone application users (3% of adults, 5% of 18–24 year olds, $n = 243$) have used a dating application on their cell phone, resulting in 11% of all U.S. adults having used at least one of the two methods of online dating. Smith and Duggan (2013) noted that 38% of single Americans have used online dating to find a partner and 66% of online daters have gone on a date with a person met through a dating Web site or application. The prevalence of online dating has increased throughout the last decade so that 42% of Americans know an online dater, and 29% of Americans know someone who has found a spouse or long-term partner through online dating.

Despite Americans' use of online dating services, it is also worth noting that 32% of Americans believe online dating keeps people from settling down (Smith & Duggan, 2013). Further, 54% of online daters encountered profiles that misrepresent the online dater, and 28% of online daters reported having been made uncomfortable or felt harassed by another online dater (42% of females, 17% of males). Even though online dating is prevalent and used among individuals in the United States, research on online dating is still burgeoning.

In its short existence, research efforts have generally focused on the use of deception in online dating (Hall, Park, Song, & Cody, 2010)—such as misrepresentation of photographs and profiles—and the evaluation of authenticity of the user and that information (Lo, Hsieh, & Chiu, 2013). Similarly, researchers identified that online daters might change their self-reported

personality characteristics and appearance when they anticipate meeting a potential date, and that online dating specifically "may exacerbate people's tendency to engage in deceptive self-presentation" (Guadagno, Okdie, & Kruse, 2012, p. 647). Some researchers reported on risks identified by online daters (e.g., deceitfulness [false identities], sexual risks [pregnancy, sexually transmitted infections], emotional risks [online bullying], and physical risks [sexual violence]; Couch, Liamputtong, & Pitts, 2012). Overall, researchers conducted an extensive exploration of the characteristics of online daters, the motivation to use online dating services, and some of the experiences of online dating, but few studies have used empirically supported and validated instruments to measure online dating service use as opposed to categorizing individuals as online daters or not. Consequently, there exists a need for an instrument that can provide valid and reliable scores of use of online dating services.

Development of the Online Dating Intensity Scale

The FBI (Ellison et al., 2007) is a one-factor, self-report instrument consisting of nine items on a 5-point Likert-type scale ranging from *strongly disagree* to *strongly agree*, with a neutral *not applicable* option. The FBI was designed "to obtain a better measure of Facebook usage than frequency or duration indices" (Ellison et al., 2007, p. 1150). Further, the authors designed it "to measure the extent to which the participant was actively engaged in Facebook activities … to tap the extent to which the participant was emotionally connected to Facebook and the extent to which Facebook was integrated into her daily activities" (Ellison et al., 2007, p. 1150). Similarly, with modifications to the FBI, we hoped the ODI would measure the extent to which an individual was actively engaged in online dating activities, emotionally connected to online dating, and the extent to which online dating was integrated into a person's everyday life.

Researchers used the FBI in a series of studies with undergraduate college students with internal consistency scores ranging from $\alpha = .83$ ($N = 286$; Ellison et al., 2007) to $\alpha = .89$ ($N = 2{,}603$; Valenzuela et al., 2009), with other studies reporting internal consistencies of $\alpha = .84$ ($N = 103$; Orr et al., 2009), $\alpha = .85$ (53.37% of the variance accounted for, $N = 222$; Lou et al., 2012), and $\alpha = .86$ ($N = 373$; Lampe et al., 2011). However, few authors reported the amount of variance accounted for in these studies, creating a challenge to adequately evaluate the validity of the data in these studies.

Other researchers modified use of the FBI by altering the words of items or reducing the number of items and still achieved strong internal consistency ($N = 246$; $\alpha = .92$; Park & Lee, 2014). Sherrell (2014) performed a confirmatory factor analysis (CFA) on the FBI with the factor structure established by Ellison et al. (2007) and identified poor factor loadings with her sample of 717 undergraduate college students (e.g., below .70; Kline, 2011); however, she did not report the specific factor loadings, thus making it difficult to evaluate Sherrell's decision to stray from the factor structure intended by Ellison and colleagues. Sherrell (2014) also performed an exploratory factor analysis (EFA) with a sample of undergraduate college students ($N = 717$), resulting in a two-factor solution: (a) emotional connectedness ($\alpha = .89$, 47.04% of the variance explained), and (b) friends ($\alpha = .77$, 14.71% of the variance explained) that explained 61.75% of the variance.

Overall, researchers demonstrated success with using the FBI. Therefore, to measure the intensity of use of online dating services as a construct, we followed classical test theory to modify the FBI for use in this study (see Crocker & Algina, 2006; Devellis, 2012; Dimitrov, 2012), which resulted in the creation of the ODI. The following research questions guided this investigation:

1. What is the factor structure of the ODI with a sample of emerging adult college students?
2. What is the internal consistency reliability of the ODI with a sample of emerging adult college students?

3. What is the relationship between emerging adults' intensity of online dating service use and their scores of social desirability?
4. What is the relationship between emerging adults' use of online dating services (as measured by the ODI) and their reported demographic variables (e.g., age, gender, race, ethnicity, sexual orientation)?

Method

Participants

We identified emerging adults who presently use or have previously used online dating services as the identified population of interest in this investigation. We analyzed an existing data set from a larger study with emerging adult college students. The data set examined included a convenience sample of emerging adult undergraduate or master's-level college students between the ages of 18 and 29 enrolled at a college or university in the United States regardless of gender, race or ethnicity, or any other demographic variable.

We distributed 800 instrument packets to potential participants for face-to-face data collection and invited 105 potential participants to participate online through personal contacts. Additionally, 10,157 students had access to participate in the study through an online recruitment system hosted by the psychology department at a large Southeastern university. When considering response rates, it is necessary to note that the online recruitment system limited responses to 999 potential participants. Overall, we acquired 1,713 data packets of both online daters and nononline daters. A subsample of participants ($n = 505$) used online dating services. After cleaning the data, we included a final sample of 494 participants for this investigation ($n = 253$, recruited online; $n = 241$, recruited face-to-face).

Most participants were undergraduate students ($n = 407$, 82.7%) compared to master's-level students ($n = 80$, 16.2%). One hundred and thirty-five participants reported that they were freshmen (27.3%), compared to participants who reported that they were sophomores ($n = 107$, 21.7%), juniors ($n = 86$, 17.4%) or seniors ($n = 79$, 16.0%). One hundred and thirty-five participants reported that they currently used online dating services (27.3%), compared to participants who used online dating services in the past year ($n = 239$, 48.4%), or who used online dating services more than a year ago ($n = 114$, 23.1%). Additional information related to participants' demographic information as well as the specific online dating sites used by participants are presented in Table 1 (e.g., age, gender, race).

Procedure

Prior to any data collection, we received approval from the University of Central Florida's Institutional Review Board (IRB), as well as approval from the IRBs of some additional universities where data collection occurred and IRB approval was requested. Data collection followed two forms: (a) Web-based survey, and (b) face-to-face administration. We followed Dillman, Smyth, and Christian's (2009) tailored design method, a survey method designed to increase participant motivation to respond by establishing trust, increasing perceived benefits of participation, and decreasing the perceived cost of participation. To establish trust with potential participants, we pursued endorsement for this research project through involved universities and faculty members. Through informed consent, we assured potential participants that their information would be treated confidentially and their anonymity would be protected. To decrease potential participants' perceptions of cost, we made the survey convenient and accessible, avoided the use of technical language, and minimized solicitation of personal or private information (Dillman et al., 2009).

We received approval from the author of the FBI (N. B. Ellison, personal communication, July 10, 2015) and imported the data collection instruments (e.g., general demographic questionnaire,

Table 1. Participants' Demographic Characteristics.

Characteristic	*n*	Total %
Age		
18–19	231	46.8
20–21	105	21.2
22–23	80	16.2
24–25	32	6.5
26–27	22	4.4
28–29	20	4.0
Gender		
Female	317	64.2
Male	166	33.6
Other	9	1.8
Racial background		
White (non-Hispanic)	378	76.5
African American/African/Black	46	9.3
Biracial/multiracial	35	7.1
Asian/Asian American	16	3.2
Other	17	3.4
Ethnic background		
Non-Hispanic	402	81.4
Hispanic	83	16.8
Sexual orientation		
Heterosexual	415	84.0
Gay/lesbian	32	6.5
Bisexual	32	6.5
Other	11	2.2
Relationship status		
Single	270	54.7
In a relationship	133	26.9
Dating	46	9.3
Cohabiting	21	4.3
Married/partnered	11	2.2
Engaged	4	0.8
Other	9	1.8
Online dating sites used[a]		
Tinder	403	81.6
OkCupid	76	15.4
PlentyofFish	57	11.5
Match.com	25	5.1
Grindr	23	4.7
Badoo	17	3.4
eHarmony	16	3.2
Zoosk	15	3.0
Coffee Meets Bagel	13	2.6
Christian Mingle	8	1.6
Hinge	8	1.6
JDate	5	1.0
Date Hook Up	3	0.6
Down	3	0.6
How About We	3	0.6
LoveFlutter	0	0.0
Other	47	9.5

Note. $N = 494$.
[a]Some participants used multiple dating sites.

ODI) into Qualtrics (www.qualtrics.com) for online survey distribution. To reduce measurement error, we distributed physical data collection packets and the online survey link to colleagues ($n = 10$) prior to data collection to confirm the legibility and parsimony of the measurement instruments and the demographic forms (Dillman et al., 2009). We implemented identified concerns to the survey regarding this feedback (e.g., readability, instruction) to make modifications to the ODI.

We assigned a number to completed data packets and entered the data into the Statistical Package for Social Science (IBM Corp., 2013) software package for Windows (Version 22.0). We

did not collect identifying information (e.g., name, student ID). Thus, having used both online Web-based survey and face-to-face administration, we applied rigorous data collection procedures to ensure heterogeneity in the sample and geographic representation.

Data Screening

Prior to data analysis, we examined the data set for incomplete responses. We determined data to be missing completely at random (MCAR) and ignorable (e.g., $< 5\%$; Kline, 2011; Osborne, 2012). Thus, we used listwise deletion to remove missing cases and to promote consistency within the data set (Osborne, 2012; Warner, 2013). Next, we examined the data set for outliers (e.g., participants' standardized z scores that were greater than $+4$ or less than -4; Hair, Black, Babin, Anderson, & Tatham, 2010). We identified 32 item responses that appeared extreme (e.g., ± 4 *SD*). However, rather than removing extreme responses, we considered Osborne's (2012) statement: "As a researcher casts a wider net and the dataset becomes larger, the more the sample resembles the population from which it was drawn, and thus the likelihood of legitimate extreme values, becomes greater" (pp. 148–149). Therefore, after examining the extreme responses, we deemed the presence of outliers in the sample to be legitimate values that should not be removed. In total, our final sample size of 494 participants exceeded a recommended sample size of 300 (Comrey & Lee, 1992) and an item-to-participant ratio greater than 10:1 (Dimitrov, 2012); thus, we deemed our sample as adequate to conduct EFA. Further, we employed histograms, Q-Q plots, and boxplots to assess for data nonnormality and determined that our data were nonnormally distributed. Consequently, we used principal axis factoring (PAF) with oblimin rotation and Kaiser normalization to examine the factor structure of the ODI with these data (Costello & Osborne, 2005).

Data Instrumentation

General Demographic Questionnaire

We included a general demographic questionnaire to collect participant data related to various demographic variables (e.g., age, gender, and ethnicity). Additionally, the general demographic questionnaire included items related to the quantity of online dating services used by an individual and asked participants to identify which online dating services they used. The general demographics questionnaire listed 16 possible services that were a combination of the most popular online dating services (e.g., eHarmony, OkCupid) and telephone applications (e.g., Tinder, Grindr) as of June and July 2015 (Corpuz, 2015; eBiz, 2015).

ODI

To measure the intensity of an individual's use of online dating services, we modified the FBI (Ellison et al., 2007) in several significant ways. First, we altered references from Facebook and changed them to references to online dating services. We only retained three items related to attitudes about online dating, as Ellison (personal communication, July 10, 2015) suggested placing an emphasis on the measure of specific activities. Therefore, we altered items to measure specific activities of online daters in quantity, frequency, and duration. The modifications to the FBI resulted in a 10-item instrument on a 5-point Likert-type scale. Total scores are obtained by calculating a participant's mean score, where higher values represent greater intensity of online dating use. We anticipated a two-factor solution (e.g., attitudes, intensity; see Figure 1) for the ODI with these data.

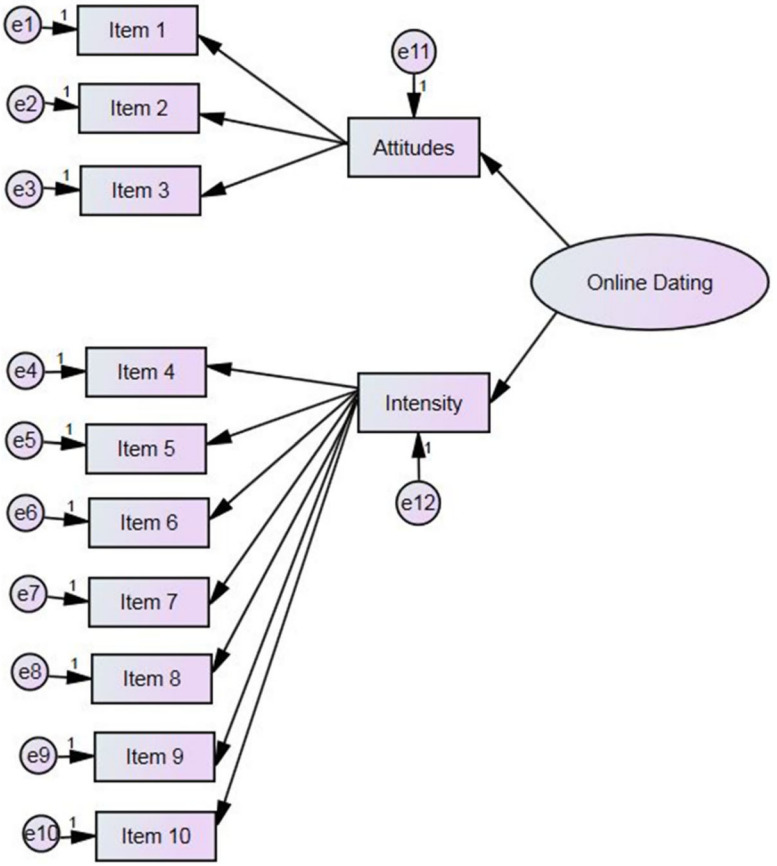

Figure 1. Anticipated measurement model of the Online Dating Intensity Scale (ODI).

Marlowe–Crowne Social Desirability Scale–*Short Form A*

We employed the Marlowe–Crowne Social Desirability Scale–Short Form A (MCSDS–FA; Reynolds, 1982) to measure social desirability in our participant response set. The MCSDS (Crowne & Marlowe, 1960) is widely recognized and used to measure social desirability in research investigations (Barger, 2002). However, we elected to use Reynolds's (1982) short form because of its brevity and strong relationship to the original MCSDS.

Results

After completing the initial data screening process, we identified a Kaiser–Meyer–Olkin (KMO) value of .819 (Kaiser, 1970, 1974), which is adequate for conducting EFA, and Bartlett's test of sphericity was significant ($p < .001$; Bartlett, 1954). Thus, these data met the assumptions necessary to conduct EFA. In the spirit of following best practices, we conducted parallel analysis (Henson & Roberts, 2006; Horn, 1965), in which eigenvalues extracted from the data set are compared with 100 randomly generated correlation matrices. Parallel analysis is used to establish appropriate eigenvalues for factor retention for the unique data set and to avoid overextraction (Patil, Singh, Mishra, & Donavan, 2008). To conduct parallel analysis with these data, we used a Web site (Patil, Singh, Mishra, & Donavan, 2007) with SAS-based code written by O'Connor (2000; see http://smishra.faculty.ku.edu/parallelengine.htm).

Initially, we identified factor loadings greater than .32 (Hair et al., 2010; Tabachnick & Fidell, 2013), and the scree plot provided evidence for a one-, two-, or three-factor solution (Costello & Osborne, 2005). However, we observed problematic cross-loading (e.g., < .2) on four items across two factors each (Hair et al., 2010; Henson & Roberts, 2006) and low communality values (e.g., less than .40; Costello & Osborne, 2005) on multiple items ($n = 3$). Therefore, we independently examined and evaluated the individual contribution of specific items with low communality, which resulted in the removal of Items 7, 4, 10, 9, and 8 (Costello & Osborne, 2005). Because the items appeared to measure similar aspects of an individual's use of online dating, we deemed removal of these items to be best practice without jeopardizing the integrity of the assessment (Costello & Osborne, 2005). Accordingly, we conducted EFA on the modified five-item scale.

Considering variables in the data set and sample size for the modified five-item instrument, we determined that an eigenvalue of at least 1.12 was necessary to retain one factor, and an eigenvalue of at least 1.05 would be necessary to retain an additional factor (O'Connor, 2000). With respect to these criteria, we reviewed the table of total variance explained (see Table 2) and identified one eigenvalue meeting criteria to retain a single factor (3.04). Similarly, the scree plot revealed a significant decline and plateau after the first factor, supporting the existence of a one-factor solution (see Figure 2).

The one-factor structure included five items with very good to excellent factor loadings with these data ranging from .65 to .84 (Tabachnick & Fidell, 2013; see Table 3). Regarding the one-factor structure, researchers consider "5 or more strongly loading items (.50 or better) are desirable and indicate a solid factor" (Costello & Osborne, 2005, p. 5), lending support for the use of a one-factor solution. Furthermore, the one-factor solution accounted for 60.79% of the variance, which exceeded the 60% threshold recommended by Hair et al. (2010). The factor appeared to measure the degree to which an individual regularly uses online dating services (e.g., "Using online dating services is part of my everyday activity"); thus, the factor was consistent with the theoretical intention of the instrument to measure an individual's intensity of use of online dating services. Overall, we determined the one-factor solution to be theoretically viable, parsimonious, and psychometrically sound with these data.

Internal Consistency Reliability

We examined the internal consistency reliability of the ODI with a sample of emerging adult college students. The initial model revealed adequate internal consistency among the ODI items ($\alpha = .815$; Leech, Onwuegbuzie, & O'Conner, 2011; Streiner, 2003). Similarly, the modified five-item instrument with one factor also demonstrated adequate internal consistency reliability ($\alpha = .83$). Therefore, we deemed the modified ODI model to have appropriate levels of reliability with these data.

Social Desirability

We examined the relationship between participants' social desirability and their responses on the ODI. We conducted bivariate correlations between the modified ODI and the MCSDS–FA. We failed to identify a statistically significant relationship between participants' scores ($r = -.01$, $p = .80$). Therefore, we determined that participants' responses on the ODI were not influenced by social desirability.

Exploratory Relationships

We conducted Spearman rank order correlations to identify statistically significant relationships between participants' demographic variables and their use of online dating services as measured

Table 2. Total Variance Explained.

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.040	60.794	60.794	2.568	51.355	51.355
2	.842	16.849	77.643			
3	.526	10.517	88.160			
4	.314	6.279	94.439			
5	.278	5.561	100.000			

Note. Extraction method: Principal axis factoring.

by the modified ODI. Spearman rank order correlations are preferred over Pearson's product--moment correlations when examining nonparametric variables (Kline, 2011). Due to the large size of the sample in this investigation, we set significance at $p < .001$ (Cohen, 1994). We failed to identify statistically significant relationships ($p > .001$) between participants' ODI scores and their reported demographic variables (e.g., age, gender, race, ethnicity, and sexual orientation).

Discussion

We explored the factor structure and internal consistency reliability of the ODI with a sample of emerging adult college students. Our analyses resulted in a five-item instrument with a one-factor solution that demonstrated strong internal consistency reliability, high factor loadings, and accounted for over 60% of the variance. Although the psychometric properties of the ODI had not previously been examined, our analyses differed from previous research conducted with the FBI, from which the ODI was modified. Our one-factor structure contrasted Sherrell's (2014) two-factor structure, but it did align with Ellison et al.'s (2007) original instrument, which contained a one-factor structure and similarly measured intensity of use of an SCT activity (e.g., Facebook). However, it is worth noting that our modifications resulted in a five-item instrument as opposed to Ellison et al.'s (2007) nine-item instrument. Furthermore, our analyses revealed that social desirability was not a factor in participants' response on the ODI, and there were no identified relationships between participants' use of online dating services and their demographic variables. As such, with principal axis factoring and oblimin rotation with Kaiser normalization, our preliminary analyses support the use of the ODI as a measure that yields reliable scores of the intensity of an individual's use of online dating services with emerging adult college students, although further research is deemed necessary to confirm this finding.

Implications for the Counseling Profession

Our data supported a one-factor solution for the ODI with implications for mental health counselors and marriage and family therapists. With growing concern about the potentially addictive nature of our technology and how we use it (Roberts et al., 2015; Smith, 2012), the ability to measure the intensity of our technology use—specifically online dating in this instance—is an essential clinical tool. We encourage clinicians who work with clients with tendencies toward addiction to use the ODI to measure their clients' use of online dating to quantify a baseline level of the intensity of their online dating use. Clinicians can then continue to use the ODI as an instrument to measure a client's improvement toward reducing the intensity of their online dating activity.

Beyond addictive behaviors associated with technology use, researchers have identified online activities as potential vehicles for individuals to practice infidelity (Hertlein & Stevenson, 2010; Martins et al., 2016), which becomes more dynamic as emerging adults move from dating to committed relationships (Banker et al., 2010; Taylor et al., 2013). As such, for clinicians who are

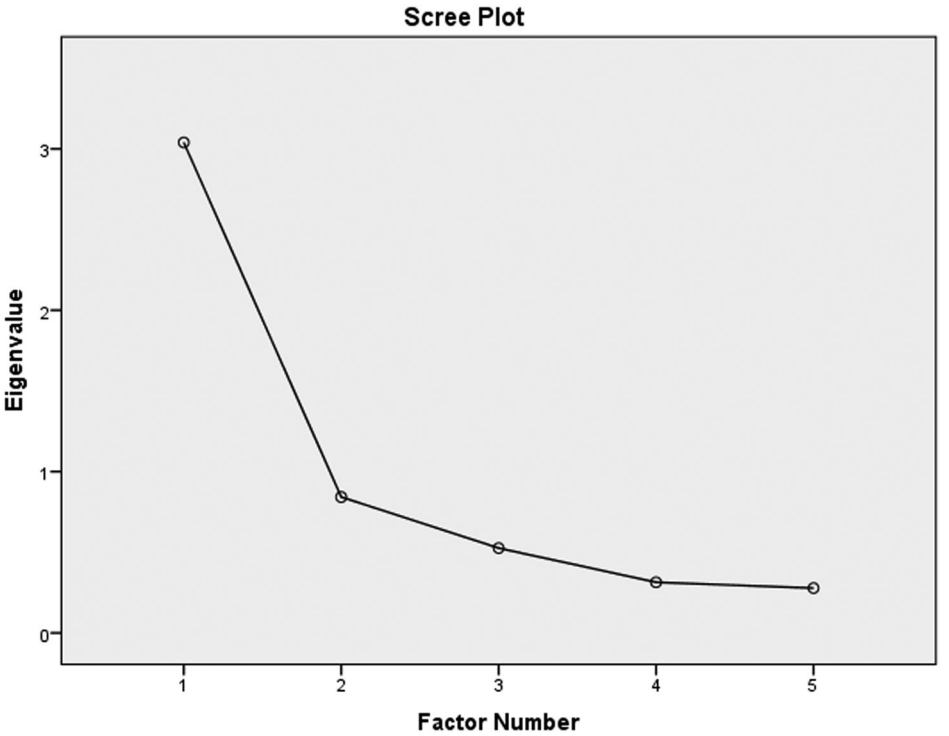

Figure 2. Eigenvalues from five-item Online Dating Intensity Scale (ODI) factor analysis.

Table 3. Factor Loadings for a One-Factor Solution.

Item	Description	Factor 1
ODI 2	I feel out of touch when I haven't logged into my online dating account(s) for a week.	.838
ODI 1	Using online dating services is part of my everyday activity.	.704
ODI 6	On average, estimate how much time do you spend per day using online dating services (e.g., browsing, messaging, editing your profile)?	.702
ODI 5	On average, how many times per day do you log on to your online dating service?	.677
ODI 3	I would miss online dating if I had to suddenly stop using online dating services.	.648

Note. ODI = Online Data Intensity Scale. Extraction method: Principal axis factoring.

working with clients who are presenting with issues related to their infidelity, the ODI might serve as a valuable instrument to measure a client's potential reduction in their online dating practice. Furthermore, as online practices continue to evolve with the development of new technologies, the ODI might be a starting point for clinicians to measure the intensity of a client's use of more nuanced online dating activities (e.g., virtual reality; see Wiederhold, 2016). Overall, the instrument might be a viable tool to measure progress over the course of therapy or as a pre–post measure of efficacy of an intervention for clients who wish to decrease their use of online dating or who find themselves having difficulty removing themselves from online dating services despite their commitment to a monogamous romantic relationship. We believe that the five-item assessment is efficient, demonstrates adequate psychometric properties with emerging adult college students, and that it might be a viable instrument to use with other populations (e.g., adolescents, adults) due to its brevity and readability.

Limitations

A primary limitation of this study is the self-report nature of the instrument. Although we attempted to account for social desirability by distributing the MCSDS–FA, self-report instruments are vulnerable to bias (Gall, Gall, & Borg, 2006). Additionally, it is possible that our data were influenced by a floor or basement effect (Hogan, 2015), in which our items failed to discriminate levels of low-intensity use of online dating services due to wide intervals between responses to ODI items.

Furthermore, it is necessary to note that there was an unequal distribution of age groups of emerging adults in this study, as younger emerging adults (e.g., 18–21 years old) had greater representation than older emerging adults (e.g., 26–29 years old). Overall, our sample was generally homogeneous (e.g., non-Hispanic, White, heterosexual). As such, our results might not be generalizable to all emerging adult college students. Similarly, participants from this study were recruited through multiple universities ($n = 8$), but the majority of the participants were recruited from schools located in the southeastern United States ($n = 6$), which also might limit the generalizability of our findings. Considering the diversity of online dating services used by our sample, it is also necessary to note that the majority of participants used Tinder as their preferred online dating service at the exclusion of other dating services; thus, we encourage our findings to be interpreted with caution.

Recommendations for Future Research

The current generation of emerging adults is unique in that they are the first cohort to have grown up in a technological age with regular use of online technology, and perhaps by studying emerging adults, we can make inferences about future generations (Best et al., 2014). Therefore, we recommend future researchers confirm the factor structure of the ODI with emerging adults by conducting CFA and address the limitations of this study by including more equal emerging adult age representation in their sample. We also encourage future researchers to evaluate potential strengths and limitations of using alternative intervals for potential responses to items on the ODI to account for the potential basement or floor effect that might have occurred with these data. We recommend future researchers explore the psychometric properties of the ODI with samples that include greater diversity in gender, race, ethnicity, and sexual orientation. Similarly, we suggest future researchers examine the factor structure and psychometric properties of the ODI with alternate populations (e.g., adolescents, adults).

Currently, few studies report either the intensity of use of online dating services or the specific markers used to measure online dating service use. As such, it is difficult to establish convergent or discriminant validity of the ODI. We recommend that future researchers distribute the ODI in addition to other measures or markers of online dating use (e.g., interviews via qualitative investigation, additional instruments).

We recommend researchers consider using the ODI in conjunction with other measures to examine the influence of online dating in relation to participants' various characteristics or practiced behaviors. The majority of research regarding online dating has examined experiences, characteristics, and differences between online daters, and few studies have examined online dating with other constructs of interest (e.g., empathy, objectification, relationship quality). We also believe it is warranted to explore potential relationships between participants' responses on the ODI and scales that measure addiction or patterns of obsessive behavior. Overall, we believe the ODI is a valuable and efficient one-factor instrument for measuring individuals' intensity of use of online dating services.

In summary, we explored the factor structure and internal consistency reliability of the ODI with a sample of emerging adult college students. Our results provide preliminary support for the

ODI and suggest a one-factor structure with adequate internal consistency reliability, high factor loadings, and substantial variance accounted for with these data. Our participants' responses were not influenced by social desirability. Overall, we believe the instrument can be used as a valuable tool in clinical practice as well as in future research investigations.

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