



Development and Bi-Cultural Validation of the New Sexual Satisfaction Scale

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Abstract: The development and bi-cultural validation of the New Sexual Satisfaction Scale (NSSS), a 20 item multi-dimensional composite measure of sexual satisfaction is presented. The development of the scale was based on a 5-dimension conceptual model that emphasized the importance of multiple domains of sexual behavior including sexual sensations, sexual awareness/focus, sexual exchange, emotional closeness, and sexual activity. Scale construction and validation were carried out using seven independent samples with over 2000 participants aged 18-55 in Croatia and the United States (U.S.). Primary data collection was completed using online survey tools. Analyses did not confirm the proposed conceptual framework, but suggested a two-dimensional structure focusing on self (“ego-centered”) and the other (“partner and sexual activity centered” factor) domains, each containing items representing all five conceptual dimensions. Scale reliability ($\alpha=20$) was satisfactory for all samples and construct validity was confirmed in both cultures. The NSSS was also found to have acceptable one-month stability. It is suggested that the NSSS may be a useful tool for assessing sexual satisfaction regardless of person’s gender, sexual orientation, and relationship status.

Key words: sexual satisfaction, psychometric analysis, validity, reliability, gender, and culture.

Introduction

In the era of *pure relationships* and morally permissive individualism (Giddens, 1993; Halman, 1996), sexual satisfaction has become an essential element of individual well-being. Abundant empirical evidence attests to this, especially within the sex therapy literature (Heiman & LoPiccolo, 1988; Zilbergeld, 1992) as well as research into relationship/marital

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3 quality and stability (Byers, 2005; Byers, Demmons, & Lawrance, 1998; Christopher &
4 Sprecher, 2000; Young, Young, & Luquis, 2000). A number of studies have reported
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6 associations between sexual satisfaction and gender (Carpenter, Nathanson, & Kim, 2009;
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8 Štulhofer, Zelenbrz, Landripet, Kuti, Gregurović, & Tiljak, 2004), age (Carpenter et al., 2009;
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10 Young et al., 2000), income (Christopher & Sprecher, 2000), and religiosity (Young et al.,
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12 2000), as well as with various sexual and non-sexual aspects of relationships (Bancroft,
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14 Loftus, & Long, 2003; Byers, 2005; Henderson-King & Veroff, 1994; Pedersen & Blekesaune,
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16 2003; Young et al., 2000). Sexual satisfaction has been found to be positively correlated with
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18 frequency of sexual activity (Hurlbert & Apt, 1994; Štulhofer, Gregurović, & Štulhofer, 2003;
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20 Young & Luquis, 1998), frequency and consistency of orgasm (Darling, Davidson, &
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22 Jennings, 1991; Darling, Davidson, & Cox, 1991; Hurlbert & Apt, 1994; Pinney, Gerrard, &
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24 Denney, 1987), as well as level of intimacy (Byers & Demmons, 1999; Moret, Glaser, Page,
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26 & Bergeron, 1998) and partner communication (Gossmann, Juliene, Mathieu, & Chartrand,
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28 2003; Štulhofer et al., 2004). Sexual satisfaction also appears to be affected by a variety of
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30 both micro-level and macro-level phenomena - from anxiety and avoidance (Butzer &
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32 Campbell, 2008), to female assertiveness (Whitley & Poulsen, 1975), as well as broader
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34 cultural factors (Ah Song, Bergen, & Schumm, 1995; Carpenter et al., 2009).
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44 In the fields of sexual medicine and sexual psychotherapy, assessment of sexual
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46 satisfaction is used as one of the standard indicators of sexual health disturbances. Thus, items
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48 measuring overall sexual satisfaction and contentment are often included in composite
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50 measures of sexual dysfunction (cf. Taylor, Rosen, & Leiblum, 1994; Rosen, Cappelleri,
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52 Smith, Lipsky, & Pena, 1999).
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58 *An Overview of Sexual Satisfaction Measurement Tools*
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3 In large national studies of sexual behavior, sexual satisfaction is often assessed with either
4 one-item (“How satisfied you are with your sex life?”) or two-item indicators (physical and
5 emotional satisfaction with primary sexual relationship) (Barrientos & Paez, 2006; Laumann,
6 Gagnon, Michael, & Michaels, 1994; Lewin, Fugl-Meyer, Helmius, Lalos, & Mansson, 2000;
7 Liu, 2003; Štulhofer et al., 2003; 2004; Rosser, Metz, Bockting, & Buroker, 1997), primarily
8 for practical reasons. However, a variety of more complex, multi-item measures have also
9 been developed and used to assess sexual satisfaction. Early examples of measures that
10 represent this type of approach include the Whitley Inventory of Sexual Satisfaction (Whitley
11 & Poulsen, 1975), Index of Sexual Satisfaction, developed by Hudson and associates
12 (Hudson, Harrison, & Croscup, 1981; Hurlbert, & Apt, 1994; Moret et al., 1998), and the
13 Pinney Sexual Satisfaction Inventory (Pinney et al., 1987), which was specifically designed to
14 measure female sexual satisfaction.

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32 The last two decades, have seen a dramatic increase in attention paid to sexual health
33 issues (e.g. pharmacological innovations) which has intensified the demand for more valid
34 and reliable measures of sexual satisfaction (Arrington, Cofrancesco, & Wu, 2004). Several
35 new measures have been proposed, such as Young’s Sexual Satisfaction Scale (Young &
36 Luquis, 1998; Young et al., 2000), composed of 11 items adapted from the Derogatis Sexual
37 Functioning Inventory (Davis, Yarber, Bauserman, Schreer, & Davis, 1998: 269-271), and
38 two shorter, 5-item measures – the satisfaction dimension of the Multidimensional Sexuality
39 Questionnaire (Snell, 1993) and the Global Measure of Sexual Satisfaction (Byers &
40 MacNeil, 2006). While Snell’s scale consists of highly homogenous statements regarding
41 general sexual satisfaction, the Global Measure offers an interesting approach based on a
42 multi-dimensional answer to a single question assessing sexual satisfaction with one’s partner
43 (the question is followed by five 7-point bipolar scales: good/bad, pleasant/unpleasant,
44 positive/negative, satisfying/unsatisfying, valuable/worthless).

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3 A more specific measure that focuses on sexual satisfaction in committed relationships
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5 is the Interpersonal Exchange Model of Sexual Satisfaction (IEMSS; Byers, 2005; Byers &
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7 Demmons, 1999; Byers & MacNeil, 2006; Demmons & Lawrance, 1998). The instrument is
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9 explicitly based on exchange theory (Sprecher, 1998) and developed to explain sexual
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11 satisfaction based on a dyadic background. The IEMSS has four dimensions (Lawrance &
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13 Byers, 2005): (a) the balance between sexual costs and benefits (rewards), (b) the balance
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15 between expected and experienced sexual costs and benefits, (c) perceived equality of
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17 partners in sharing sexual costs and benefits, and (d) relationship satisfaction. The measure is
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19 intended for assessing sexual satisfaction in close relationships.
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25 Another approach has included instruments such as the Golombok-Rust Inventory of
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27 Sexual Satisfaction (GRISS), that do not measure sexual satisfaction per se, but rather the lack
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29 of it (Rust & Golombok, 1986). The recently developed the Sexual Satisfaction Scale for
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31 Women (SSS-W), is an attempt to assess both sexual satisfaction and distress (Meston &
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33 Trapnell, 2005). Although the authors started from a two-dimensional theoretical model
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35 (based on the relevant research literature), which distinguishes between personal sexual
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37 satisfaction and the assessment of one's partner's and relationship-related satisfaction, the
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39 final 30-item scale has five subscales (satisfaction, communication, compatibility, personal
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41 distress, and relationship related distress).
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46 As mentioned, the existing composite measures may be limited in their application by
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48 their focus on a specific group (women), status (being in a committed relationship) or
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50 extended phenomena (satisfaction vs. distress/dysfunction). In addition, most sexual
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52 satisfaction measures lack cross-cultural validation and systematic testing in non-heterosexual
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54 populations. Our aim was to develop a composite measure of sexual satisfaction with clear
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56 conceptual underpinnings that would not be limited to a particular class of individuals, by
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58 orientation, gender, or cultural background. As sexual satisfaction is a universal human
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3 experience, development of a new scale with wide applicability may facilitate comparisons
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5 across a wide variety of groups and cultures. The following sections present the conceptual
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7 foundation, development, and empirical validation of a new 20-item composite measure.
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10 11 12 *Theoretical Background of a New Measure*

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14 The conceptualization of the New Sexual Satisfaction Scale is largely based on the counseling
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16 and therapeutic literature in the field of sexual health (Bancroft 1983; Ellison, 2001; Hawton,
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18 1986; Heiman & LoPiccolo, 1988; Klein, 2002; Schnarch, 1991; Zilbergeld, 1992). The first
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20 step in development of this instrument was to review psychotherapeutic guidelines and
21
22 rationales for common interventions in working with sexually complaining, dysfunctional,
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24 distressed, and dissatisfied individuals, which resulted in the development of three conceptual
25
26 “lenses” (inspired by John Bancroft’s “three windows” approach; cf. Bancroft, Loftus, &
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28 Long, 2003) from which different aspects of sexual satisfaction could be approached in a
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30 systematic fashion. The first, personal lens refers to individual characteristics and habits
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32 including perception of sexual stimuli, the ability to focus on sexual stimuli and feelings, and
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34 other relevant physiological and psychological reactions. The second lens is interpersonal, and
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36 it takes into consideration the emotional exchange between sexual partners. The third lens
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38 catalogues an individual’s sexual experiences and focuses on characteristics of sexual
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40 activities, their frequency, variety, and intensity.
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48 In the second step, the three lenses were used to derive the main dimensions of sexual
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50 satisfaction from the literature. Focusing on the potential determinants or components of
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52 sexual health and, consequently, sexual satisfaction, five dimensions were identified: (1)
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54 sexual sensations (first lens), (2) sexual presence/awareness (first lens), (3) sexual exchange
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56 (second lens), (4) emotional connection/closeness (second lens), and (5) sexual activity (third
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3 lens). Figure 1 provides a brief overview of the derived dimensions and the related core
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5 categories.
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FIGURE 1 ABOUT HERE

The first of the dimensions, sexual sensations, denotes the realm of sexual pleasure (or its absence). Pleasurable sexual sensations are the foundation of sexual “trance” and, as such, the prime motivation behind the repetition of sexual contacts. It is a simple virtuous circle (Hurlbert & Apt, 1994; Carpenter et al., 2009; Štulhofer et al., 2003): pleasure brings more sex and more sex brings more pleasure. Clinically, the importance of sexual presence/awareness (Bancroft, 1983; Hawton, 1986; Heiman & LoPiccolo, 1988) or the ability to focus on erotic and sexual sensations is essential for sexual sensations to be (felt as intensely) pleasurable. Deficits in sexual awareness could occur as a consequence of excessive self-monitoring during sex (Zilbergeld, 1992) and can also be seen in the high distractibility observed in some anorgasmic women (Heiman & LoPiccolo, 1988). The sexual exchange dimension emphasizes the importance of reciprocity in sexual contacts. Radical discrepancies between giving and receiving of sexual attention and pleasuring can impact one’s sexual contentment negatively, particularly if such inequality is perceived as chronic (Byers, Demmons, & Lawrance, 1998; Lawrance & Byers, 1995; Sprecher, 1998).

Emotional connection/closeness has also been associated with sexual satisfaction and contentment, both clinically and anecdotally. It has been argued that a strong emotional bond and intimacy can generate long-term sexual interest (Ellison, 2001; Schnarch, 1991). Among women, one of the mechanisms behind sexual satisfaction could be the association between emotional closeness and trust on the one hand and sexual letting go, important for orgasmic efficacy, on the other hand (Heiman, & LoPiccolo, 1988). As suggested by several recent

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3 studies, emotional contact and intimacy may also be important for male sexual satisfaction
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5 (Byers, 2005; Carpenter et al., 2009; Štulhofer et al., 2004). The final dimension underscores
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7 the importance of frequency, duration, variety, and intensity of sexual activities for sexual
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9 satisfaction among both women and men (cf. Young et al., 1998; Štulhofer et al., 2004).
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12 13 14 15 **Method**

16 17 *Participants*

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19 The analyses are based on seven independent samples, five of which were surveyed in Croatia
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21 and two in the U.S. Of the seven, three were student samples (two collected in Croatia and
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23 one in the U.S), two were community samples (a Croatian and the U.S. one), one sample was
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25 clinical (sexual psychotherapy clients), and the final one consisted of non-heterosexual
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27 Croatian men and women.
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31 In Croatia, the student sample consisted of 544 sexually active students attending
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33 various universities (age range 18-25; $M=21.3$, $SD=1.66$), while the community sample
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35 included 729 adults (age range 30-55, $M=34.1$, $SD=6.64$). Both samples were obtained using
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37 on-line questionnaires. Women constituted a majority in both samples: 66% of the student
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39 sample and 64% in the community sample. Another student sample, consisting of 219
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41 students of the University of Zagreb ($M=20.7$, $SD=2.14$), of which 53% were women, was
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43 surveyed twice, one month apart, using the standard paper-and-pen format.
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48 Two other samples were surveyed in Croatia. The first consisted of 360 non-
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50 heterosexual individuals, of which less than one third (28.3%) were women, who were
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52 contacted and surveyed on-line. The average age in this sample was 26.1 ($SD=6.67$). The
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54 other sample included 54 individuals (22 women and 32 men) who were participating in sex
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56 therapy for either individual or relational sexual problems, and were diagnosed according to
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58 criteria found in the *Diagnostic and Statistical Manual, Fourth Edition [DSM-IV]* of the
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3 American Psychiatric Association (APA, 2000) by a number of Croatian sex counselors and
4 therapists. The average age in this sample was 34.6 years ($SD = 7.96$).
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8 Two samples were surveyed in the U.S., both using online questionnaires. The first
9 was a sample of sexually active students, aged 18-26 ($n=356$; $M=20.4$, $SD=1.93$), from a
10 medium sized regional southern university. Women constituted over two thirds (70.6%) of the
11 sample. Women were also predominant (65.1%) in the community sample, which included
12 212 participants with the average age of 40.7 years ($SD=8.72$).
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19 In student samples only, participants who reported that they never had sexual
20 intercourse were excluded from analyses.
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27 TABLE 1 ABOUT HERE!
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32 *Procedures*

33 Five of the seven samples were surveyed via the Internet. The standard paper and pen format
34 was used in two Croatian samples, the second student sample (the test-retest one) and the
35 clinical sample. Online questionnaires were constructed and administered using a commercial
36 site (dedicated to online survey research) tools. To protect privacy, permanent recording of
37 participant's IP number was disabled during data collection. In Croatia, participation in the
38 study was sought primarily through social networks (student networks were used for the
39 student sample). A generic message describing the study and containing two links to the
40 online questionnaire was sent to consenting students enrolled in a large human sexuality class
41 (taught by the first author). The recipient was asked to follow the link and fill in the
42 questionnaire, as well as to forward the message to their partners, friends, and acquaintances
43 aged 18-25 years. A similar chain referral procedure was used in the community samples,
44 with a target age range set between 30 and 55.
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3 Participants in the U.S. student sample were solicited from undergraduate courses
4 across disciplines at the beginning of the spring semester 2008. After obtaining permission
5 from the lecturer, a graduate assistant visited the class, briefly introduced the survey, and
6 distributed a handout that directed potential participants to a survey website. Students were
7 also advised that they could forward information about the survey to other students at the
8 university aged 18 or older.
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11 To obtain a sample of non-heterosexual individuals, banners containing basic
12 information about the study were posted on several Croatian gay and lesbian Web sites. A
13 generic message, similar to the one used for the student and community samples, was posted
14 on forums frequently used by gay and lesbian populations and sent through a network of gay
15 and lesbian activists. Slight alterations were made to some items in the brief questionnaire
16 form to make them appropriate for non-heterosexual participants. A question asking for
17 sexual partners' sex was added to verify membership in the target population. The online
18 surveying procedure was identical to the method previously described.
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21 The test-retest properties of the scale were assessed using a second Croatian student
22 sample that was tested twice with a one month interval between testing's. At both times, a
23 brief questionnaire was administered in the classroom to student groups of varying size (20-
24 50). In large classes, students were divided into smaller groups and surveyed sequentially to
25 maintain confidentiality. Test and re-test questionnaires were matched using individual codes
26 devised by participants.
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29 The clinical sample of individuals with personal and/or couple-related sexual
30 difficulties was tested in the offices of a dozen sex counselors and therapists who are
31 members of the Croatian Association for Sexual Therapy (Arbanas, Knez, Barolin, &
32 Štulhofer, 2007). The inclusion criterion was the persistent or recurrent distressful presence of
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3 one or more sexual disorders related to sexual desire, sexual arousal, orgasm, or sexual pain
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5 (APA, 2000).
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8 No incentives were offered for participation in this study. All procedures were
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10 approved by the Department of Sociology, Faculty of Humanities and Social Sciences of the
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12 University of Zagreb and the Texas A&M University at Corpus Christi ethical review boards.
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14 All individuals were asked to complete or electronically acknowledge their informed consent
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16 at the beginning of survey. Data collection was completed between November 2007 and
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18 March 2008.
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23 24 *Measures*

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26 The final stage of scale development was the generation of an initial pool of 35 items by the
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28 first author using the proposed 5-dimensional conceptual framework (see Appendix A).
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31 Whenever possible, each dimension was operationalized with approximately the same number
32
33 of items. Once completed, the list was discussed and revised with several international sex
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35 researchers and a group of doctoral students. Each item and its five point Likert-type scale
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37 responses were originally formulated in Croatian and then jointly translated into English by
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39 the first and the third author.
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43 Except for the new sexual satisfaction scale, all other instruments were pre-tested in
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45 2006 and 2007 as a part of a study on pornography and sexual socialization (Štulhofer, Buško,
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47 & Landripet, 2008). In the current study, they were included as part of a longer questionnaire
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49 (217 variables) used for surveying the Croatian and the U.S. student sample. In all other
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51 samples, including the second Croatian student sample, a brief version of the questionnaire
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53 was used, consisting of 35 sexual satisfaction items and a few sociodemographic questions
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55 (including one on sexual activity in the preceding month). The English versions of the
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3 questionnaires were translated from Croatian by the first author and then edited by the third
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5 author, keeping as close as possible to the Croatian original.
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8 A single item indicator was used as a global measure of *sexual satisfaction* ("All in all,
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10 how satisfied are you with your sex life at the moment?"). Responses were indicated on a 7-
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12 point scale, ranging from 1=extremely satisfied to 7=extremely dissatisfied, and reverse
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14 scored so that higher scores reflected higher satisfaction with one's sex life.
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17 To assess *general life satisfaction* the following standard question was used: "All
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19 things considered, how satisfied are you with your life as a whole these days?" Answers were
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21 recorded on a 7-point scale (1=extremely satisfied, 7=extremely dissatisfied). The scores were
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23 recoded, so that higher scores indicate higher satisfaction with one's life.
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27 *The degree of intimacy* in current relationship – or, if currently not in a relationship, in
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29 the most recent one – was assessed by five items based on the Miller Social Intimacy Scale
30
31 (Miller & Lefcourt, 1982). All items were anchored on a 5-point scale ranging from "almost
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33 never" to "almost always", with higher composite scores denoting higher levels of intimacy.
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35 The scale proved to have acceptable internal consistency (Cronbach's $\alpha = .77$).
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39 *Partner communication about sex* was assessed with seven questions regarding
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41 communication with one's partner about personal and partner's sexual history, personal and
42
43 partner's sexual preferences, pornography, etc. The scale ($\alpha = .79$) was a simple linear
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45 combination of the seven items and had 0-7 theoretical range of scores, where a larger score
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47 indicated more partner communication.
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51 *Sexual boredom* was assessed using a 5-item scale ($\alpha = .85$) obtained by shortening the
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53 Sexual Boredom Scale (Watt & Ewing, 1996) after it was pre-tested in another study
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55 involving Croatian students in 2006. Responses were recorded on a 5-point scale (from
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57 1=completely disagree to 5=completely agree). Larger scores reflected being more easily and
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59 rapidly bored with repetitive sexual experiences.
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3 *Self-reported sexual difficulties* were assessed with six (yes/no) questions inquiring
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6 about difficulties with sexual desire, sexual arousal, orgasm and sexual pain domains during
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8 the preceding two or more months (Laumann, Nicolosi, Glasser, Paik, Gingell, Moreira, &
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10 Wang., 2005). Any reported difficulty was coded 1 and its absence 0.
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12 13 14 15 **Results**

16 17 *Factor Structure and Descriptives*

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19 Using data from the two initial Croatian samples (student and community adult), principal
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21 component analysis (PCA) was carried out on the initial pool of 35 Likert-type items. Six
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23 components with eigenvalues >1 were extracted and rotated to oblique position. However,
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25 two of the components were found to be narrow in meaning, each loading no more than two
26
27 items, and were only marginally related to the rest of the structure. While the first was
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29 composed of two items focusing on situational aspects of sexuality (time and space needed for
30
31 sexual activities), the second one consisted of two items tapping into the importance of
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33 protection from unwanted pregnancy and sexually transmitted infections. These four items,
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35 plus an additional one that was judged ambivalent in content, were omitted from subsequent
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37 analyses.
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44 PCA was repeated on the remaining 30 items using four data sets (two Croatian and
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46 two U.S. samples). Depending on the sample, 4-6 components with eigenvalues >1 were
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48 extracted, accounting for 66-73% of the total item variance. In all the samples, the
49
50 eigenvalues for the first two components were above 13 and 2, respectively, with the
51
52 remaining ones being just slightly above 1. The obtained 4, 5- or 6-factor solutions differed
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54 across samples and were difficult to interpret. Based on the observed eigenvalues and scree
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56 test results, and given the similarity of the factor structures obtained on different datasets, a 2-
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58 factor solution was retained and rotated by direct oblimin method with Kaiser normalization.
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3 Although the procedure resulted in a somewhat reduced proportion (54-58%) of the explained
4 total item variance, the obtained solution enabled clear and consistent interpretation across
5 samples. Table 2 shows the pattern matrices, with factor loadings (>.40) and component
6 intercorrelations in two student and two community samples from Croatia and the U.S. The
7 larger size of the Croatian samples allowed for separate analyses by gender, using the same
8 procedure described earlier. The analysis (not shown here) produced highly similar pattern
9 matrices to those reported in Table 2 (Štulhofer & Buško, 2008).
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22 TABLE 2 ABOUT HERE!
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27 In the obtained factor structure two components were identified: one composed of
28 items denoting personal erotic/sexual experience and sensations, and another composed of
29 items focusing on partner's erotic/sexual reactions, together with frequency and variety of
30 sexual activities. As presented in Table 2, factor correlations ranged from .52 to .61,
31 suggesting a broader common foundation. The selection of items per component was
32 performed according to standard criteria of simple structure, factor loadings, and content
33 overlap (redundancy). Respecting both statistical and content related characteristics, 20 items
34 (ten per component) were retained from the initial set of 30. Based on the interpretation of the
35 two components, the following subscales were created: *the Ego-centered subscale*, which
36 measures sexual satisfaction generated by personal experiences/sensations, and *the*
37 *Partner/sexual activity centered subscale*, which measures sexual satisfaction derived from
38 one's partner's sexual behavior/reactions and the diversity and/or frequency of sexual
39 activities (see Appendix B). Together, these two subscales formed *the New Sexual*
40 *Satisfaction Scale (NSSS)*.
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3 Table 3 summarizes basic descriptive data on sexual satisfaction scale scores in five
4 independent samples. In both the Croatian and the US samples, the NSSS scores ranged
5 between 20 and 100, covering the full range of scores. The NSSS and its subscales displayed
6 a characteristic asymmetric distribution with the mean scores leaning toward more
7 satisfaction, as confirmed by obtained asymmetry values, ranging from -.52 to -1.2 in the
8 Croatian samples and from -.39 to -.59 in the U.S. samples. A comparison of scale and
9 subscale means across the samples pointed to systematic differences in levels of sexual
10 satisfaction. Contrary to our expectations, there were no differences between participants in
11 student and community samples, in either Croatia, or the US. However, individuals surveyed
12 in Croatia consistently reported higher levels of sexual satisfaction than the U.S. participants.
13 Significant differences were found on all three scales (composite and subscales; $F=13.09$,
14 $p<.001$; $F=22.02$, $p<.001$; $F=21.39$; $p<.001$, respectively) and Bonferroni multiple comparison
15 tests confirmed country-specific levels of sexual satisfaction. In regard to gender differences,
16 Croatian men reported higher scores than women on the ego-centered subscale ($t=-4.74$,
17 $df=972.46$, $p<.001$), while in both countries women scored higher than men on the partner-
18 centered subscales ($t_{Croatia}=5.63$, $df=1220$, $p<.001$ and $t_{US}=4.83$, $df=255.50$, $p<.001$).

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41 Non-heterosexual women and heterosexual men consistently reported higher sexual
42 satisfaction than non-heterosexual men ($t=-2.77$, $df=324$, $p<.01$ and $t=-3.37$, $df=431.34$,
43 $p<.01$, respectively).

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TABLE 3 ABOUT HERE!

Reliability: Internal Consistency and Stability

Table 3 also contains Cronbach alpha coefficients for the NSSS in five independent samples. Taking into account the potential effects of gender specific sexual socialization, this analysis

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3 was carried out separately for women and men. Internal consistency in two student, two
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5 community samples, and a sample of Croatian non-heterosexual adults was high for the full
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7 scale ($\alpha=.94-.96$), both subscales ($\alpha=.91-.93$ and $.90-.94$, respectively), and the short version
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9 ($\alpha=.90-.93$). No substantial differences related to either gender or sexual orientation were
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11 observed. The coefficients were similar in the group of participants currently in a relationship
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13 and those who were single ($\alpha=.87-.96$; Croatian students dataset). This remained the case even
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15 after separate analyses were done for men and women.
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20 Test-retest reliability of the NSSS was shown to be satisfactory in a sample of
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22 Croatian students over a 4-week period (Table 4). Stability coefficients ranged from 0.72 to
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24 0.84, with somewhat stronger associations reported among women.
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29 TABLE 4 ABOUT HERE!
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33 34 *Validity*

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36 Zero-order correlations between the NSSS scores and the measures of constructs associated
37
38 with sexual satisfaction were analyzed (Table 5). The NSSS was shown to be significantly,
39
40 and positively, associated with a global measure of life satisfaction. Negative correlations
41
42 with sexual boredom scores and positive correlations with relationship intimacy, partner
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44 communication about sex, and relationship status were also found to be significant among
45
46 men and women in both the Croatian and the U.S. student samples.
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51 In support of convergent validity, associations between a global (single item) measure
52
53 of sexual satisfaction and the NSSS scores were moderately high in both samples ($r=.44-.67$).
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55 Correlations between the NSSS and global sexual satisfaction were systematically lower in
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57 the U.S. sample.
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TABLE 5 ABOUT HERE!

Further analyses included testing the differences in NSSS scores between samples of Croatian students with and without self-reported sexual difficulties as well as between participants in the clinical (sex therapy clients) and non-clinical sample (Table 6) As expected, both comparisons found that participants without sexual difficulties (self-reported or diagnosed) reported significantly higher sexual satisfaction. In the case of clinically diagnosed sexual difficulties, the values of Cohen's *d*, as a standardized measure of group differences, suggested that the observed differences were large in size (Cohen, 1988). As shown in Table 6, mean score differences between the clinical and community samples were larger than 1 standard deviation in all cases. Also, the overlap between distributions of the full NSSS scores in these two samples was 32 percent.

A discriminant analysis was performed as an additional estimate of the diagnostic validity of the instrument, and was used to predict the actual group membership of the individuals belonging to clinical and non-clinical samples based on NSSS scores. With the prior probability of group membership set to be equal, analyses that used the NSSS as discriminant function scores produced 80.3% of overall correctly classified cases (a gain of 30.3% over guessing by chance).

TABLE 6 ABOUT HERE!

Discussion

This paper presents the development and bi-cultural validation of the New Sexual Satisfaction Scale (NSSS); a new 20-item multi-dimensional measure of sexual satisfaction. The validation procedure was carried out on an initial set of items describing proposed facets of

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2
3 sexual satisfaction. Exploratory factor analyses did not confirm the hypothesized 5-
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5 dimensional structure. The results supported a two dimensional factor structure with items
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7 from all five conceptual dimensions contained within both factors (cf. Figure 1). The first
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9 factor primarily focused on personal experiences and sensations, while the second factor
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11 reflected partner's behaviors and sexual activity in general. The analyses, performed on a
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13 number of independent samples with participants of different characteristics (gender, age,
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15 sexual orientation, sexual health issues), produced consistent findings.
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20 The obtained 2-factor solution obviously departs from the initial conceptual structure.
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22 General sexual satisfaction, as demonstrated by the present findings, appears to be relatively
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24 homogenous concept rather than an amalgam of a number of independent components. This
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26 conclusion is supported by a solid association found between the two components and
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28 strengthened by the fact that it arose from a manifest diversity of the sexual satisfaction
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30 domains generated by our conceptualization. However, the possibility that this finding is at
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32 least partly related to the selection of items defining the proposed domains cannot be ruled
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34 out. Although an effort was made to generate a variety of manifold items to cover all relevant
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36 aspects of sexual satisfaction, it is possible that some important domains remained
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38 underrepresented.
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44 However, the obtained two-factor solution was not entirely surprising. To some extent
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46 this could be related to the fact that a number of conceptually relevant categories were
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48 represented by "paired" items in the initial pool. One item would focus on personal
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50 satisfaction with a given category (e.g. sexual desire), while the other would ask about
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52 satisfaction with the respective experience of one's partner. A recent empirical study
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54 emphasized similar dimensions in a theoretical framework related to female sexual
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56 satisfaction and distress. More specifically, Meston and Trapnell (2005) argued that the
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58 personal and relational dimensions should be distinguished when analyzing female sexual
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3 satisfaction and distress. Although their relational dimension differs somewhat from our
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5 partner and sexual activity focused domain, the theoretical concept that Meston and Trapnell
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7 started from displays similarities with our findings.
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10 Stability coefficients and differences in sexual satisfaction between two measurements
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12 found in a sample of Croatian students should be viewed within the context of participants'
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14 relative sexual inexperience. The largest, and the sole significant difference was found, only
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16 among women, on the partner and activity-focused subscale. Since women reported less
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18 sexual experience than men – as reflected in fewer sexual partners (lifetime) and sexual acts
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20 tried – the finding seems to support the assumption of potentially high marginal value of any
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22 new sexual episode among sexually less experienced individuals.
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27 As expected, participants with self-reported and diagnosed sexual difficulties reported
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29 significantly lower levels of sexual satisfaction than controls. The distinction between the
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31 subjective and a more objective assessment of sexual difficulties was reflected in effect size
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33 of differences in sexual satisfaction between participants with and without difficulties in
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35 sexual functioning. The comparison using a clinical and control sample of Croatian adults
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37 resulted in substantially higher effect sizes than the comparison involving students. This
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39 finding corresponds not only with the way sexual difficulties were assessment, but also with a
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41 clinical observation that young, and relatively sexually inexperienced individuals may confuse
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43 their (or their partner's) lack of experience with sexually dysfunctional response.
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48 It should be noted that in the student comparison (individuals with and without self-
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50 reported sexual difficulty), a larger difference in scores was found in the ego-focused
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52 subscale. This was expected, since participants were asked about their own sexual problems.
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54 In the case of clinical sample of Croatian adults, comprised mostly of couples, sexual
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56 problem(s) were, regardless of their personal origin, also a property of the couple. This was
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58 reflected in almost identical effect sizes for the differences between the clinical and control
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3 sample on both subscales. Clearly, more evidence is needed to assess the clinical usefulness
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5 of the NSSS. While awaiting more systematic analyses (the scale is currently being tested in a
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7 sample of couples receiving assisted reproduction treatment), the preliminary findings of this
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9 study suggest that the NSSS has potential as a clinical assessment instrument.
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12 13 14 15 *Study Limitations*

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17 Online surveying provides some benefits (e.g. improved anonymity and confidentiality) over
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19 traditional forms of data collection, but decreases control over conditions during participation
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21 and may increase misrepresentation, missing data, and self-selection bias. As sexually more
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23 experienced and permissive individuals are usually overrepresented in sex research
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25 (Wiederman, 1999), it could be that the average levels of sexual satisfaction were
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27 overestimated in this study. However, this problem was not obvious since a comparison of the
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29 mean NSSS scores among Croatian students who were surveyed online and those who filled
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31 out standard paper-and-pencil questionnaire did not reveal any significant differences.
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38 39 **Conclusions**

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41 The development and bi-cultural validation of a new composite measure of sexual satisfaction
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43 was presented. Initial assessment of its psychometric properties suggests several potential
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45 uses in sex research, clinical studies, and research on the quality of life. Although the NSSS
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47 needs more detailed and systematic validation in clinical settings, the findings presented in
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49 this paper suggest that the new scale may be used in the assessment of client's perception of
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51 the discrepancy between their personal and their partner's sexual reactions and their
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53 contribution to overall sexual satisfaction. Considering the fact that the New Sexual
54
55 Satisfaction Scale was developed using a number of independent samples from two cultures,
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3 which included women and men of different ages, relationship status, and sexual orientation,
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5 the proposed instrument may have some advantages over comparable measures.
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Figure 1 – Conceptual framework of sexual satisfaction: Basic dimensions and related categories*

<i>SEXUAL SATISFACTION</i>	
Individual Lens	<p>1. <i>Sexual sensations</i> (6)</p> <ul style="list-style-type: none"> - quality of touch/feel - quality of sexual arousal (1) - frequency of arousal - quality of orgasm (2) - frequency of orgasm (9) <p>2. <i>Sexual presence/awareness</i> (15)</p> <ul style="list-style-type: none"> - feeling of letting oneself go (3) - being focused (4) - sexual reaction toward partner (5)
Interpersonal Lens	<p>3. <i>Sexual exchange</i> (14)</p> <ul style="list-style-type: none"> - receiving pleasure (16) - giving pleasure (10) - partner's sexual availability (18) - partner's sexual initiative (13) - partner's sexual creativity (17) - balance between giving and receiving (11) <p>4. <i>Emotional connection/closeness</i> (8)</p> <ul style="list-style-type: none"> - trust - emotional opening up (7) - partner's emotional surrender (12) - emotional closeness in sex - sex is contributing to the emotional bond
Repertorial Lens	<p>5. <i>Sexual activity</i></p> <ul style="list-style-type: none"> - variety (19) - frequency (20) - intensity (passion) - duration - sexual experimentation

*Bracketed numbers denote item(s) from the New Sexual Satisfaction Scale (see Appendix B) which were derived from the related category; when attached to a dimension, bracketed numbers refer to items derived from more than one category of the respective dimension

Table 1 – An overview of the seven samples used in the study

<i>Sample no</i>	<i>Country of origin</i>	<i>Sample size</i>	<i>Population</i>	<i>Age range</i>	<i>Percentage of female participants</i>	<i>Data collection method</i>	<i>Data collection period</i>
1	Croatia	544	College students	18-25	66	Online survey	November-December 2007
2	Croatia	729	Adults	30-55	64	Online survey	January 2008
3	Croatia	219	College students	18-35	53	Classroom based survey (self-administered)	March 2008 (test) and May 2008 (retest)
4	Croatia	360	Non-heterosexual individuals	18-58	28	Online survey	March-April 2008
5	Croatia	54	Clinical: sex therapy clients	21-53	41	Sex therapist's office survey (self-administered)	January-May 2008
6	The U.S.	356	College students	18-26	71	Online survey	January-February 2008
7	The U.S.	212	Adults	21-71	65	Online survey	February-March 2008

Table 2 – Factor pattern matrices of sexual satisfaction items in Croatian (CRO) and the U.S. (US) samples

Items	Student samples				Community samples			
	CRO (n=544)		US (n=356)		CRO (n=729)		US (n=212)	
	A ^a	B ^a	A	B	A	B	A	B
I1	.44			-.42	.48			.57
I2	.82		.73		.81			.86
I3	.88		.82		.76			.76
I4	.86		.83		.86			.82
I5	.81		.84		.83			.90
I9	.49		.66		.62			.65
I10		.47	.42	-.41		-.54		.44
I11		.48		-.54		-.65		.60
I12		.91		-.88		-.96		.94
I13		.72		-.64		-.62		.55
I14		.84		-.89		-.84		.68
I15		.74		-.65		-.82		.66
I16		.94		-.96		-.96		.95
I17		.72		-.80		-.72		.85
I18		.96		-.82		-.95		.88
I19		.53		-.50	.45	-.45		.49
I20		.56				-.40		
I22		.51		-.45		-.52		.74
I23		.47				-.50		.67
I24	.72		.83		.77		.77	
I25	.43		.55		.46		.43	
I26		.45	.49		.56		.46	.42
I27	.61		.57		.78		.74	
I28	.59		.64		.70		.71	
I29	.46		.53			-.42	.43	
I30		.59		-.67		-.69		.72
I31		.60		-.58		-.50		.62
I32	.80		.72		.66		.62	
I33	.41	.40	.45		.58		.46	
I34	.60		.62		.70		.59	
<i>r</i>		.57		-.61		-.56		.52

^aValues < .40 were suppressed; A= Ego-centered factor; B = Partner & activity-centered factor; r = correlation between the components

Table 3 – Mean values and reliability of the New Sexual Satisfaction Scale in Croatian (CRO) and the U.S. (US) samples

	Subscale A (k = 10)			Subscale B (k = 10)			Full scale (k = 20)			
	<i>M</i>	<i>SD</i>	Cronbach's α	<i>M</i>	<i>SD</i>	Cronbach's α	<i>M</i>	<i>SD</i>	Cronbach's α	
CRO student sample										
all (n = 544)	39.97	7.61	.91	40.17	7.67	.92	80.21	13.97	.94	
women (n = 359)	39.28	7.87	.91	41.16	7.28	.91	80.57	13.88	.94	
men (n = 185)	41.32	6.90	.92	38.17	8.05	.93	79.48	14.16	.95	
CRO community sample										
all (n = 729)	39.71	7.34	.92	38.97	8.62	.94	78.90	14.40	.95	
women (n = 471)	39.02	7.69	.92	39.87	8.66	.94	79.14	14.98	.95	
men (n = 258)	41.02	6.46	.91	37.32	8.31	.93	78.45	13.28	.94	
CRO non-heterosexual sample										
all (n = 360)	38.57	8.64	.92	36.85	9.41	.94	75.34	16.93	.95	
women (n = 102)	39.75	8.63	.92	39.47	8.93	.94	79.29	16.20	.95	
men (n = 258)	38.08	8.61	.92	35.77	9.41	.93	73.67	16.99	.95	
US student sample										
all (n = 356)	37.38	8.14	.91	36.59	8.44	.92	74.07	15.36	.95	
women (n = 246)	37.46	8.03	.91	37.67	7.87	.91	75.30	14.65	.94	
men (n = 110)	37.15	8.49	.93	33.78	9.23	.94	70.25	16.79	.96	
US community sample										
all (n = 212)	37.41	7.85	.93	35.79	9.05	.92	72.96	15.22	.94	
women (n = 138)	37.25	8.23	.93	37.67	7.95	.90	74.52	14.73	.94	
men (n = 74)	37.69	7.19	.92	32.32	9.93	.94	70.15	15.78	.95	

Table 4 – One-month stability of the New Sexual Satisfaction Scale in a sample of Croatian students

	Women (<i>n</i> =116)			Men (<i>n</i> =103)			All (<i>n</i> =219)		
	M_1^a (<i>SD</i>)	M_2^b (<i>SD</i>)	<i>r</i>	M_1^a (<i>SD</i>)	M_2^b (<i>SD</i>)	<i>r</i>	M_1^a (<i>SD</i>)	M_2^b (<i>SD</i>)	<i>r</i>
Subscale A	38.99 (6.60)	39.87 (7.03)	.84*	40.26 (8.23)	41.40 (7.33)	.72*	39.59 (7.43)	40.59 (7.20)	.78*
Subscale B	41.72 (6.15)	41.71 (7.18)	.73*	38.10 (9.38)	37.98 (8.23)	.73*	40.02 (8.02)	39.95 (8.20)	.74*
Full scale	80.66 (11.84)	81.71 (13.43)	.81*	78.34 (16.70)	79.33 (15.22)	.74*	79.57 (14.35)	80.60 (14.31)	.76*

^a M_1 = 1st measurement mean value, ^b M_2 = 2nd measurement mean value; **p* <.001

Table 5 – Correlations between the New Sexual Satisfaction Scale and related measures in Croatian (CRO) and the U.S. (US) student samples

	Subscale A (k = 10)		Subscale B (k = 10)		Full scale (k = 20)	
	CRO	US	CRO	US	CRO	US
	<i>r</i> (<i>n</i>)					
Life satisfaction	.28*** (531)	.21*** (290)	.24*** (527)	.25*** (290)	.28*** (523)	.25*** (284)
Sexual boredom	-.49*** (522)	-.37*** (285)	-.44*** (519)	-.35*** (285)	-.51*** (515)	-.39*** (279)
Intimacy	.41*** (525)	.43*** (288)	.41*** (521)	.43*** (288)	.44*** (517)	.47*** (282)
Partner communication about sex	.19*** (531)	.16** (290)	.18*** (537)	.15* (290)	.20*** (523)	.18** (284)
Currently in a relationship	.25*** (531)	.21*** (290)	.32*** (527)	.16** (290)	.30*** (523)	.20** (284)
Satisfaction with one's sex life	.63*** (531)	.44*** (271)	.61*** (527)	.54*** (271)	.67*** (523)	.53*** (265)

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 6 – Differences in sexual satisfaction between Croatian students with and without self-reported sexual difficulties, and between adults in a clinical and non-clinical sample

	Subscale A	Subscale B	Full scale
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Students with self-reported sexual difficulties (<i>n</i> =265)	37,28 (7.90)	38,72 (8,07)	76,18 (14,52)
Students with no self-reported sexual difficulties (<i>n</i> =279)	42,48 (6,39)	41,56 (7,00)	84,01 (12,30)
<i>t</i>	-8,30*	-4,32*	-6,64*
<i>df</i>	492,56	506,67	(496,77)
Cohen's <i>d</i>	-0,72	-0,38	-0,58
Clinical sample (<i>n</i> =54)	30.39 (8.87)	29.96 (8.24)	59.84 (12.95)
Community sample (<i>n</i> =729)	39.71 (7.34)	38.97 (8.62)	78.90 (14.40)
<i>t</i>	-7.33*	-7.74*	-8.64*
<i>df</i>	55.17	740	709
Cohen's <i>d</i>	-1.14	-1.07	-1.39

**p* < .001

Appendix A – Initial 35 items and the corresponding conceptual dimensions

	Conceptual dimension
I1 Emotional closeness I feel during sexual contact	4
I2 The intensity of my sexual arousal	1
I3 The quality of my orgasms	1
I4 My letting go during sex and surrendering to sexual pleasure	2
I5 My focus/concentration during sexual activity	2
I6 How my moods affect my sex life	*
I7 The degree of protection from sexually transmitted infections	*
I8 The degree of protection from unwanted pregnancy	*
I9 The way I sexually react to my partner(s)	2
I10 The balance between what I give and receive in sexual activities	3
I11 My partner's emotional opening up during sexual activity	4
I12 My partner's initiation of sexual activity	3
I13 My partner's ability to orgasm	3
I14 My partner's surrender to sexual pleasure (letting himself/herself go)	2
I15 The way my partner takes care of my sexual needs	3
I16 My partner's level of sexual desire	5
I17 My partner's sexual creativity	3
I18 My partner's sexual availability	3
I19 Emotional bond I feel to my partner(s) in sexual contact	4
I20 The level of trust I have in my partner(s) during sexual activity	4
I21 Setting(s)/place(s) where I have sex	*
I22 The variety of my sexual activities	5
I23 Sexual experimentation (trying out new things)	5
I24 My body's sexual functioning	1
I25 My body's sex appeal	2
I26 Eroticism and sensuality of partner's touch	1
I27 My emotional opening up during sexual activity	4
I28 My mood after sexual activity	4
I29 The duration of sexual intercourse	5
I30 The frequency of sexual activity	5
I31 The frequency of erotic/sensual touching	5
I32 The frequency of my orgasms	1
I33 The pleasure I provide to my partner	3
I34 My sexual skills	3
I35 The amount of time that I have for sexual activity	*

*Items unrelated to five conceptual dimensions, but presumed important from the individual lens perspective

Appendix B – The New Sexual Satisfaction Scale items

	Subcale A (Ego- focused)	Subscale B (Partner and activity- focused)
<i>Thinking about your sex life during the last six months. please rate your satisfaction with the following aspects:^a</i>		
(1) The intensity of my sexual arousal	X	
(2) The quality of my orgasms	X	
(3) My “letting go” and surrender to sexual pleasure during sex	X	
(4) My focus/concentration during sexual activity	X	
(5) The way I sexually react to my partner	X	
(6) My body’s sexual functioning	X	
(7) My emotional opening up in sex	X	
(8) My mood after sexual activity	X	
(9) The frequency of my orgasms	X	
(10) The pleasure I provide to my partner	X	
(11) The balance between what I give and receive in sex		X
(12) My partner’s emotional opening up during sex		X
(13) My partner’s initiation of sexual activity		X
(14) My partner’s ability to orgasm		X
(15) My partner's surrender to sexual pleasure (“letting go”)		X
(16) The way my partner takes care of my sexual needs		X
(17) My partner’s sexual creativity		X
(18) My partner’s sexual availability		X
(19) The variety of my sexual activities		X
(20) The frequency of my sexual activity		X

^aResponses are anchored on the following scale: 1 = not at all satisfied. 2 = a little satisfied. 3 = moderately satisfied. 4 = very satisfied. 5 = extremely satisfied