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– validation of a new scale**

Abstract: Love is the most widespread phenomenon at the individual, social and cultural level. Our knowledge of love comes both from our individual experiences and the social and cultural models that depict the nature of love in that particular era. There are a number of tools for measuring individual attitudes, feelings, manifestations, and behaviours relating to love. The Individual Representations of Love Scale is based on the fact that representations of love are created at the point where the individual intersects with the culture. The psychometric parameters of the Individual Representations of Love Scale were verified on a sample of 755 young people aged 18-35. Cultural resources and differentiation ability with regard to religious status, gender, and multiple partner relationship characteristics are taken into account. The results show that there are five factors of individual representations of love: 1. biological and self-centred love, 2. spiritual love, 3. physical love, commitment, searching and building, 4. strength and positive benefits of love, and 5. reverse side of love. The cultural resources of these five factors and the scale's differentiation ability are discussed.

Keywords: *love, scale validation, young people*

INTRODUCTION

Love is one of the most widespread phenomena at the individual, social and cultural level. Despite the many voices claiming that love does not lend itself to scientific investigation and that art and culture are better at depicting it, love, and especially partner relationships and romantic love, has been a lively research topic in the social sciences since the mid-twentieth century. In that time love has been conceptualised and operationalised, and measuring tools have been designed (Karandashev & Clapp, 2014; Hatfield et al. 2011). For example the biological side of love has been investigated in connection with the stress response system (Mercado & Hibel, 2017). Sociocultural research has focused on for instance the norms, scripts, prototypical stories, and ideologies that are thought to constitute the resources that people draw on when creating their own ideas and stories about love (Giddens, 1992). There has also been ample research in psychology, where there have been polemical discussions on whether love is an emotion and on its characteristics and its constituent components (Masaryk, 2012). Alongside the influential theoretical concepts (Sternberg's three-component theory, which informed his later duplex theory

of love; Sternberg, 1986, 1988), provocative concepts have also emerged such as 'love as the transformative power of being in love' or 'an encounter of myth and drive' (Lamy, 2015). It has been demonstrated that love relates to gender (Hendrick & Hendrick, 1995; Tehrani & Yamini; 2020, Gawda, 2008), age (Heintz & Ruch, 2021), religion (Levin & Kaplan, 2010), and partnership characteristics (Surra, et al. 2006; Berscheid, 1988; Sternberg, 1986, 1988; Reis, 1998; Reis, Collins, & Berscheid, 2000). Less attention has been paid to whether and how personal notions of love interconnect with the sociocultural context. A number of scholars argue that love is a socially constructed entity (Coontz & Marriage, 2005; Beall, & Sternberg, 1995; Soloski et al, 2013). Social constructions of love are shaped by the person's lived environment and experiences (Beall, & Sternberg, 1995). Other research has looked at whether love is shaped by the tensions between culturally presented models of love and the realist love that enables partnerships to function (Koontz, et al., 2017). Bauman (2003) points out that consumerist society is establishing love and romantic relationships, rendering them incapable of living up to their promise of providing long-lasting security. Love is easily consumed, and so he calls it 'liquid love'.

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The cultural context of love has also been highlighted in research into young people's individual representations of love that has identified these resources as the Western myth of romantic love, the concept of Christian love, and popularised psychological concepts of love (author).

A number of measuring tools have been developed as part of the research on love. Thirty-three alone have been created to measure passionate love and its close cousins (Hatfield, Bensman, & Rapson, 2011). Researchers engaged in a whole range of research into love and instrument development have opted for factor-analysis based approaches. As Yela (2006) states the most frequent dimensions in these studies are passion, intimacy, caring (for the partner), and attachment. Another type of study based on personal reflection, resulting from an extensive review of the literature and professional experience, showed that the fundamental dimensions were sexuality, respect, caring, and commitment (Yela, 2006). Combining these two types of analysis, Yela (2006) identified the dimensions as: caring, sexuality, passion, intimacy, respect, commitment, and attachment. He then used Sternberg's model (1986, 1988) and found an additional four components: erotic passion, romantic passion, intimacy, and commitment. A meta-analysis of love scales (Masuda, 2003) showed that there were four main theoretical approaches: Rubin's 'love' and 'liking' (Rubin, 1970), Hatfield's 'passionate Love' and 'companionate love' (Hatfield & Walter, 1978), Lee's 'eros' and 'Storge' love attitudes (Lee, 1973), and Sternberg's 'passion' and 'intimacy', 'decision/commitment' components of love (Sternberg, 1984, 1988). However, Masuda (2003) concluded that all the scales based on these theories measure two types of love. One is Erotic Love (E-Love), the love closely associated with sexual desire for the partner; and the other is Companionate Love (C-Love), the love which represents friendship-like platonic love towards the partner. E-love is conceptually purer and less ambiguous, whereas C-love is a mixture of multiple constructs (Masuda, 2003). Another meta-analytic study of 81 studies with various love scales (Graham, 2011) showed that there are three factors of love: general love, romantic obsession, and practical friendship.

Despite the numerous conceptualisations and tools for measuring love, we assume that there is still potential to investigate love in the sociocultural context of the period within which it is created. We tend to favour the thesis that love is a socially constructed entity (Coontz & Marriage, 2005; Beall, & Sternberg, 1995; Soloski et al., 2013) and that love forms within the tensions between cultural presented models of love and the realist love that enables partnerships to function (Koontz, et al., 2017). We look at love in terms of individual social representations (Von Cranach, 1995), in other words as generalised experiences of love in partner relationships that can draw on the available cultural resources. In a previous qualitative study (author) we identified individual representations of love from the array of meanings of love among young people. Based on this material we attempt to design and verify an individual representations of love scale. We verify the psychometric

qualities of the scale. Then we verify the differentiation ability of the new scale regarding young people's age, religious status, gender, and relationship status.

METHOD

Participants

The sample consisted of 755 participants aged between 18 and 35 years ($M = 25.5$, $SD = 4.63$), of whom 529 (70.1%) were women and 226 were men (29.9%). Participants' education was as follows: primary ($n = 7$, 0.9%), lower secondary ($n = 30$, 4%), upper secondary ($n = 329$, 43.6%), and tertiary ($n = 388$, 51.5%). Most respondents were religious ($n = 599$, 79.8%), the remainder of them ($n = 152$, 20.2%) were non-religious. There were 364 (48.2%) participants who lived in rural settings, while 257 (34.1%) respondents lived in towns, and 134 (17.7%) in cities. Most participants were from Western Slovakia ($n = 486$, 64.4%) or Central Slovakia ($n = 214$, 28.3%), and a small number were either from Eastern Slovakia ($n = 25$, 3.3%), or lived abroad ($n = 30$, 4.0%). The majority of participants did not have children ($n = 600$, 79.5%), the remaining respondents did have children ($n = 155$, 20.5%). The number of participants who reported being in a relationship was ($n = 548$, 72.6%), whereas 207 (27.4%) respondents were not in a relationship.

Measures and procedure

In a previous qualitative study (Lukšik & Guillaume, 2018), 38 main categories of individual representations of love were identified. These were revised down to 27 categories obtained by merging related categories, eliminating categories applying to few respondents, and determining the internal consistency using CFA (the full-wording of the items is in Table 1). These categories were then used to create a quantitative questionnaire to determine the individual representations of love. Respondents assessed how well the given item captured love on a 5-point Likert scale (from fully captures to does not capture at all).

The questionnaire also contained items relating to partner relationship characteristics, whether the respondent was in a relationship, number of relationships the respondent has had, length of longest relationship, and number of sexual relationships. The questionnaire also contained demographic questions on age, gender, and religious status.

A quantitative research methodology was employed in the form of an electronically administered questionnaire. Information about the questionnaire was distributed by students taking a methodology course at Trnava University and Nitra University in Slovakia. Participation in the research was voluntary and anonymous.

RESULTS

The analyses were conducted in jamovi and R package *psych* (Revelle, 2018). First, we attempted to identify the number of latent factors that best explain the responses to individual items of the individual items of the representa-

tions of love using three common criteria: visual inspection of the scree plot, factors with eigenvalues > 1 , and parallel analysis. Although the parallel analysis indicated five factors, there were only two factors with eigenvalues higher than one, and the scree plot likewise suggested a sharp decline after the second factor. We therefore decided to explore both a two-factor and a five-factor model to see which one best fit the data. It should be noted that both the significant Bartlett's test of sphericity, $\chi^2(171) = 3391$, $p < .001$, and Kaiser-Meyer-Olkin measure (.82) indicated fulfilment of the basic criteria for conducting an exploratory factor analysis.

First, we ran the two-factor model using exploratory factor analysis with the minimal residual method and oblimin rotation. The two-factor model showed a relatively simple pattern of factor loadings where more positive, harmonious, and idealistic descriptions of love ('love overcomes all', 'love gives life meaning'), and more physical, visceral, and negative aspects of love ('love is a basic instinct', 'love is dependency') represented two almost

orthogonal ($r = .02$) latent factors. Although the two factors cumulatively explained 28.1% of the variance in the scores, this latent structure was clearly over-simplistic, and the model was not a good fit, $\chi^2(169) = 855.0$, $p < .001$, TLI = .75, RMSEA = .07.

In comparison, the five-factor model fitted the data much better, $\chi^2(115) = 297.8$, $p < .001$, TLI = .90, RMSEA = .05. The five-factor structure showed a more meaningful pattern with items grouping into thematic clusters. However, there were two items which did not load substantially (standardised factor loadings $< .30$) on either of the factors. Therefore, we decided to exclude these two items ('love has various forms', 'love is an art') and conduct the same exploratory factor analysis with the remaining 19 items. This yielded a model with good fit, $\chi^2(86) = 212.4$, $p < .001$, TLI = .92, RMSEA = .04, where the five factors cumulatively explained 40.6% of the variance. This model was retained as the final model, both for its good fit and the theoretical meaningfulness of the resulting factors. Table 1 shows the standardised factor

Table 1 Standardised factor loadings and factor correlations for the resulting five-factor model

	F1	F2	F3	F4	F5
Love is a commitment to staying together through good and bad			.62		
Love is the physical manifestation of love			.56		
Love is building a relationship			.69		
Love is searching			.40		
Love is unconditional		.48			
God is love		.59			
Love overcomes all		.68			
Love is inner harmony				.49	
Love gives life meaning				.46	
Love is a liberating feeling				.71	
Love protects us against destruction				.43	
Love is a struggle					.57
Love is incomprehensible					.54
Love is dependency					.45
Love is introspective	.63				
Love is what sells well	.48				
Love is a natural means of reproduction	.44				
Love is a basic instinct	.43				
Love is basically self-love	.62				
<i>Factor correlations</i>					
Factor 1 ($\alpha = .72$)	1				
Factor 2 ($\alpha = .67$)	-.24	1			
Factor 3 ($\alpha = .67$)	.09	.27	1		
Factor 4 ($\alpha = .72$)	.14	.35	.38	1	
Factor 5 ($\alpha = .56$)	.39	-.06	.25	.14	1

Note. The table shows standardised factor loadings of individual items on their respective factors extracted from the exploratory factor analysis with minimum residual method and oblimin rotation. Standardised loadings under $< .30$ are suppressed. The lower part of the table shows inter-correlations among the five factor scores extracted from the exploratory factor analysis.

loadings for the retained model. As can be seen from the table, there were no substantial cross-loadings ($>.30$) between factors.

Based on the contents of items loading onto the five factors we named the factors: 1. biological love and self-centred love, 2. spiritual love, 3. physical love, commitment, searching and building, 4. strength and positive benefits of love, and 5. reverse side of love (see Table 2).

Table 2 Individual factors of love and items saturating them

factor	name	Items
1.	biological and self-centred love	Love is introspective Love is what sells well Love is a natural means of reproduction Love is a basic instinct Love is basically self-love
2.	spiritual love	Love is unconditional God is love Love overcomes all
3.	physical love, commitment, building and searching	Love is a commitment to staying together through good and bad Love is the physical manifestation of love Love is building a relationship Love is searching
4.	strength and positive benefits of love	Love is inner harmony Love gives life meaning Love is a liberating feeling Love protects us against destruction
5.	reverse side of love	Love is a struggle Love is incomprehensible Love is dependency

Then, we investigated the differentiation ability of the new scale in terms of several demographic (age, gender, religious status, and the strength of religious faith) and relationship characteristics (relationship status, number of previous relationships, longest relationship length, and the number of sexual previous sexual relationships), which were entered in two steps as predictors in hierarchical regressions predicting every love factor.

The results of the regression analysis (Table 3) show that age is a predictor of two of the extracted factors of love – *positive benefits of love* and *reverse side of love*. Here we can see that these two factors are negatively predicted by higher age. The predictors of spiritual love and positive love are mostly female gender and religious status. Strength of faith (frequency of devotion) was a stronger predictor of spiritual love than religious status, and also negatively predicted biological, self-centred love

and the reverse side of love. We did not find many notable predictors of love with regard to partner relationships. But we did find that the *positive benefits of love* was predicted by a smaller number of partnerships and the higher length of longest relationship. On the other hand, *biological and self-centred love* was predicted by a larger number of sexual relationships.

DISCUSSION

Five factors were extracted from the 21 questionnaire items articulating the various meanings of love. The factors were named as: 1. biological and self-centred love, 2. spiritual love, 3. physical love, commitment, building and searching, 4. strength and positive benefits of love, and 5. reverse side of love. The five-factor model identified via the exploratory factor analysis showed a good fit with the data. However, two of the 21 items were excluded as they had low factor saturation in the retained model. A subsequent investigation of the relationships between the five factors of love and the demographic and relationship characteristics revealed different patterns in the relationships between the various dimensions of love, particularly with the variables of gender and strength of religious faith, along with some other relationship characteristics.

After excluding some items with low factor loadings the five-factor model best explained the respondents' answers to the questionnaire. The items loading on the five factors created logical clusters of meaning and, as the factor correlations show, captured highly diverse and relatively independent manifestations of love. However, a positive correlation was identified between the factors of spiritual love, strength and positive benefits of love, commitment, searching and building. These three factors were largely independent of the remaining two dimensions of love identified – biological and self-centred love and the reverse side of love, which had an approximately medium strong mutual correlation.

The subsequent regression analysis also indicated that the five-factor model was suitable and applicable, with five dimensions of love showing different patterns of associations in relation to the demographic and relationship predictors of perceptions of love. The various dimensions of love also variously and independently predicted partner and sexual satisfaction in the respondents.

We also look at these factors in terms of the existing conceptions of love to see whether they confirm them, expand them, or bring new insights.

The first factor, *biological and self-centred love*, combines several aspects of love. Self-centred love, instinctive love, and love as a commodity are all present. The consumerist side of love can be related to Bauman's (2003) liquid love. And although not explicitly mentioned, this factor relates to a frequently mentioned component of love – sexuality or erotic love (Yela, 2006; Masuda, 2003).

The second factor, *spiritual love*, connects the spiritual aspect of love: God and faith in the strength of

Table 3 Results of hierarchical linear regression predicting five factors

Predictor	F1: biological self-centred love		F2: spiritual love		F3: physical love, commitment		F4: positive benefits of love		F5: reverse side of love	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI	β	95% CI
<i>1. Demographic information</i>										
	<i>Adj. R² = .06***</i>		<i>Adj. R² = .34***</i>		<i>Adj. R² = .00 n.s.</i>		<i>Adj. R² = .05***</i>		<i>Adj. R² = .01*</i>	
Age	.03	[-.06, .12]	.02	[-.06, .10]	.02	[-.07, .12]	-.10	[-.19, -.00]	-.10	[-.20, -.01]
Gender ^a	.04	[-.04, .13]	-.08	[-.15, -.01]	-.05	[-.14, .03]	-.11	[-.20, -.03]	.05	[-.04, .13]
Religious status	-.01	[-.11, .08]	.17	[.09, .25]	.06	[-.04, .16]	.16	[.06, .25]	.04	[-.06, .13]
Strength of faith	-.22	[-.32, -.13]	.45	[.37, .52]	-.03	[-.12, .07]	-.02	[-.11, .07]	-.10	[-.20, -.00]
<i>2. Relationship variables</i>										
	<i>Δ R² = .01 n.s.</i>		<i>Δ R² = .01 n.s.</i>		<i>Δ R² = .00 n.s.</i>		<i>Δ R² = .02**</i>		<i>Δ R² = .01 n.s.</i>	
Relationship status	-.01	[-.09, .07]	.02	[-.05, .08]	-.04	[-.12, .04]	-.02	[-.10, .06]	-.03	[-.12, .05]
No. of relationships	.03	[-.05, .10]	-.05	[-.12, .01]	-.00	[-.08, .08]	-.11	[-.19, -.03]	.07	[-.01, .15]
Longest relationship	-.05	[-.14, .04]	.03	[-.05, .10]	.01	[-.09, .10]	.11	[.02, .21]	.03	[-.06, .12]
No. of sexual relations	.09	[.01, .18]	-.04	[-.11, .03]	-.05	[-.13, .04]	.03	[-.06, .11]	.03	[-.05, .12]
<i>Full model</i>										
	<i>Adj. R² = .07***</i>		<i>Adj. R² = .35***</i>		<i>Adj. R² = .00 n.s.</i>		<i>Adj. R² = .06***</i>		<i>Adj. R² = .01 n.s.</i>	

Note. The table shows the results of five hierarchical linear regressions predicting five factors of love. For every model, the demographic factors were entered in the first step and the relationship variables in the second step. The table shows standardised regression coefficients (β) and the 95% confidence interval for each predictor in the final step of the model. ^a gender was coded as 1 = woman, 2 = man. * $p < .05$, ** $p < .01$, *** $p < .001$

love: love overcomes all. This factor is probably similar to the agape love described by Lee (1973) as selfless love, putting the other person before yourself. This factor is close to what we have previously called *transcendental love* (author), love that transcends the person and is close to God. This factor, as expected, is associated with a high level of religious faith.

The third factor is physical love, commitment, and building and searching. It combines several aspects of love. Staying together through good and bad refers to the commitment that has been passed down into everyday thinking and language from Christianity. The stress is on the dynamic, or active side of love, which is about working on the relationship, building the relationship, and may be a reference to Fromm's *learning the art of loving* (Fromm, 1956). Here we also find the physical side of love, as the dissemination of a social norm. The third factor, containing commitment and building the relationship, is similar to what Watts and Stenner (2005) identified in their Q studies and referred to as *mutual trust, recognition, and support*, although the individualist side is more distinctive in their British factor – room for the self-realisation of both partners. It is also similar to what Watts and Stenner (2013) describe in another study as *permanent commitment* but with the twist of *avoiding a 'nasty surprise'*. This factor is also similar to 'crystal love' (co-author), love that evolves, consolidates and is based on trust, communication, understanding, mutual support, and care.

The fourth factor, *strength and positive benefits of love*, contains a number of psychological and mental health aspects, such as the meaning of life, protection against destruction, and inner harmony. This factor may be related to what Watts and Stenner (2005) call the romantic myth of love, but in our factor the mystic and irrational meaning of this strong form of love is missing. Strength and the positive benefits of love is more of a socialised romantic love (Giddens, 1992) that is neither tragic nor mystic and that could be a sort of ideal but also an appropriate basis for cohabitation.

The fifth factor, *reverse side of love*, indicates the negative side of love – struggle, non-understanding and dependency. This factor, like biological and self-centred love, may be related to the demythologisation of romantic love.

The results show that the basic demographic variables have only a partial influence on the love factors identified. Age was a predictor of both the positive benefits of love and the reverse side of love. That could mean that the positive and negative meanings, or representations of love, weaken with age. We also found that female gender and religious status predicted spiritual love and the positive benefits of love. The frequency of religious devotion was an even stronger predictor of spiritual love than religious status was. It was also a negative predictor of biological, self-centred love and the reverse side of love. We did not find any notable predictors of love relating to the characteristics of partner relationships. Only that the positive benefits of love was predicted by a smaller number of partner relationships and

length of longest relationship. Conversely biological and self-centred love were predicted by a higher number of sexual relationships.

CONCLUSIONS

In total five factors of life were identified among the young people: strength and the positive benefits of love; biological and self-centred love; physical love, commitment, searching and building; the reverse side of love; and spiritual love. We consider these findings to be important in relation to this initial investigation of the new representations of love questionnaire in terms of its reliability, and content and predictive validity. However, it is important to add that the five-factor model identified in this study really needs verifying on an independent sample. It would also be a good idea to expand the analysis of the predictive value of the scale to include a wider selection of relationship characteristics.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of Slovak Academy of Science and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

AUTHOR NOTE

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Conflict of Interest

We have no known conflict of interest to disclose

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