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When will I feel love? The effects of culture, personality, and gender on the psychological tendency to love

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ABSTRACT

Convenience samples from 48 nations completed a self-report measure of love called the "Emotional Investment" scale (EI; Schmitt, D. P., & Buss, D. M. (2000). Sexual dimensions of person description: Beyond or subsumed by the Big Five? *Journal of Research in Personality, 34*, 141–177). The seven-item EI scale possessed moderate to extensive internal reliability across all nations. Within most nations, higher levels of EI were associated with higher levels of Extraversion and Agreeableness but were unassociated with Neuroticism, providing evidence of the conceptual equivalence of love across cultures. As predicted by evolutionary theories of attachment, higher levels of ecological stress were associated with lower levels of EI within and across nations. Emotionally investing tendencies were also associated with fertility and sexual promiscuity levels, though these nation-level links were not always consistent with evolutionary perspectives. As expected by Parental Investment Theory, women reported higher levels of EI than men in nearly every culture, though the predicted sex difference was not observed in Bolivia, Indonesia, or Malaysia. Contrary to social role theories, greater sociopolitical gender equality across cultures was associated with larger sex differences in EI. Discussion focuses on limitations and alternative explanations of the current findings.

1. Introduction

For psychologists guided by evolutionary theories of human mating, the experience of love is principally important because of its reproductive and fitness-enhancing consequences (Buss, 1988; Fisher, 2004; Lampert, 1997). Love can rivet our attention to a single mate, instigate the process of romantic flirtation, lead to systematic patterns of courtship behavior, and on occasion culminate in marriage (Eibl-Eibesfeldt, 1989; Hazan & Shaver, 1987; Moore, 1995; Tennov, 1979). Love helps parents bond in healthy ways with newborn offspring, leads to informative adolescent infatuations before more serious romantic pursuits, and serves as a social glue for functional interchanges of support amongst family and friends (Fletcher & Stenswick, 2003; Hrdy, 1999; Kirkpatrick & Shaver, 1992; McAndrew, 2002; Shaver & Hazan, 1988).

Although socially-constructed contexts are clearly essential to the experience of love (Medora, Larson, & Hortacsu, 2002), consistent patterns of love across cultures seem to support evolutionary perspectives (Fisher, 1992). For example, romantic love is universal across nearly all forms of human culture (Hatfield & Rapson, 2002; Jankowiak & Fischer, 1998; Sprecher, Aron, & Hatfield, 1994), and function-specific forms of love appear to have distinct biological substrates (Diamond, 2004; Fisher, 2000, 2004; Insel & Young, 1997). Within the context of love's apparent universality, important individual differences exist in the intensity and prevalence with which love is emotionally experienced (Dion & Dion, 1988; Landis & O'Shea, 2000; Lee, 1973; Murstein, 1988). Among the more influential factors that contribute to individual differences in love experiences are personality traits, cultural ecologies, and biological sex.

1.1. Personality traits and love

Love and many Emotional Investment aspects of romantic relationships appear to have ties to core features of human personality (Asendorpf, 1998; Dion & Dion, 1988; Shaver & Brennan, 1992; White, Hendrick, & Hendrick, 2004). The Big Five model provides a popular heuristic of the core features of personality traits (Digman, 1997; John, 1990). Locating individual difference variables such as love within the Big Five helps to functionally relate Emotional Investment as a psychological construct to other individual difference dimensions (Buss, 1996), as well as hint to the genetics,

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neurology, and physiology underlying love (Costa & McCrae, 1992; Fisher, 2000). Among the five dimensions of the Big Five, two stand out as most closely related to individual differences in love—Extraversion and Agreeableness (Caralis & Haslam, 2004; Davies, 1996; Heaven, Da Silva, Carey, & Holen, 2004; Wiggins, 1979).

In a lexical study of love and personality, Schmitt and Buss (2000) explored a series of love-related adjectives found in the English language and identified a general dimension of love they dubbed "Emotional Investment." The Emotional Investment scale seemed to capture many of the core features of love—including aspects of passion, intimacy, and commitment (Sternberg, 1988)—and was comprised of the adjectives *Loving, Lovable, Romantic, Affectionate, Cuddlesome, Compassionate*, and *Passionate*. In various samples of American college students, Schmitt and Buss (2000) found that self-ratings on the Emotional Investment scale had psychometrically sound internal reliability ($\alpha = .87$), temporal reliability over 4 weeks, $r(49) = 0.86$, $p < .001$, convergent validity with Sternberg's three dimensions of love (e.g., intimate love, $r(301) = 0.57$, $p < .001$), and displayed discriminant validity by not correlating with social desirability or relationship satisfaction (for more details, see Schmitt & Buss, 2000).

In terms of personality, Schmitt and Buss found the generally expected links with Extraversion and Agreeableness. Among men, Emotional Investment correlated with Extraversion, $r(129) = 0.26$, $p < .01$, and Agreeableness, $r(129) = 0.50$, $p < .001$, and among women Emotional Investment correlated with Extraversion, $r(178) = 0.24$, $p < .001$, and Agreeableness, $r(178) = 0.59$, $p < .001$. No other Big Five dimensions correlated with the Emotional Investment scale in either sex. Given this correlational profile, it seems that love in terms of Schmitt and Buss' (2000) Emotional Investment dimension may be a mix of Extraversion and Agreeableness, with about twice as much Agreeableness as Extraversion (see also Digman, 1997). These findings support the view that love is related to serotonergic (Agreeableness-related) and dopaminergic (Extraversion-related) brain circuitry (Fisher, 2004), and perhaps to related heritable personality substrates (Cherkas, Oelsner, Mak, Valdes, & Spector, 2004; Luo, Kranzler, Zuo, Wang, & Gelernter, 2007; though see Waller & Shaver, 1994).

Special links of Extraversion and Agreeableness with love and relationship outcomes have been documented by other researchers (Asendorpf, 1998; Schmitt, 2002; White et al., 2004). Specific subtypes of love sometimes correlate differentially with Extraversion and Agreeableness (Wan, Luk, & Lai, 2000). Fehr and Broughton (2001), for example, found passionate love is closely related to dominance or Extraversion, whereas companionate love is closely related to nurturance or Agreeableness. Nevertheless, individual differences in the general tendency to emotionally invest in relationships (i.e., variations along the general Emotional Investment dimension) appear fundamentally related to Extraversion and Agreeableness, residing somewhere in between these two dimensions and forming one of the two basic axes of the interpersonal circle (see Gurtman & Pincus, 2003; Wiggins, 1979).

1.2. Cultural ecologies and love

In addition to love's differential links with personality traits, Emotional Investment emerges in different ways and in varying degrees across cultures (Dion & Dion, 1996; Hendrick & Hendrick, 2003; Inman & Sandhu, 2002; Rodríguez, Montgomery, & Peláez, 2003; Wan et al., 2000). The rules and permissions regarding when, with whom, and how we may fall in love are potent examples of the influence of culture (Hatfield & Rapson, 1996; Neto et al., 2000). Culture can moderate how love feels, what we think about when we are deeply in love, and which love behaviors are most appropriate or pleasing in our love lives (Landis & O'Shea, 2000; Sternberg, 1998). Love appears, at least to some degree, to be socially constructed and reflect the time and place within which it occurs.

Within the multi-cultures of the United States, for example, there are differences in the Emotional Investment experiences of certain ethnic groups. Chinese Americans tend to express higher levels of passionate love than European Americans, whereas Pacific Islanders tend to express more companionate love than European Americans (Doherty, Hatfield, Thompson, & Choo, 1994). On the other hand, Gao (2001) found that passionate love is sometimes more intense among European Americans than Chinese Americans. Across nations, Sprecher and her colleagues (1994) found the percentage of people reporting that they are "in love" right now was highest among Russians (67%), lowest among Japanese (52%), with Americans in the middle (58%). When assessed in terms of whether one would marry without love, many people in Pakistan (50%) and India (49%) would do so, whereas very few in Japan (2%) or the United States (4%) would do so (Levine, Sato, & Hashimoto, 1995). Although the collectivism–individualism dimension might explain some of these cross-cultural findings (Dion & Dion, 1996; Hofstede, 2001; Triandis, 2001), the relationships between collectivism and measures of love experiences have proven inconsistent (Sprecher et al., 1994). In contrast, evolutionary perspectives have proven quite useful in explaining cultural universals and variations of love, particularly in terms of Emotional Investments (Bowlby, 1988; de Munck, 1998; Jankowiak & Fischer, 1992; Rosenblatt, 1967).

According to the evolutionary model of Belsky, Steinberg, and Draper (1991); (i.e., the "*BSD Model*"), early socialization adaptively channels children down one of two reproductive pathways. Children culturally exposed to high levels of stress—such as insensitive/inconsistent parenting, harsh physical environments, high pathogen exposures, and economic hardship—tend to grow up expressing lower levels of Emotional Investment (see also Rohner & Britner, 2002). This low level of Emotional Investment is viewed as a facet of dismissing attachment and is associated with early puberty, more prolific reproduction, and short-term mating strategies in adulthood (Chisholm, 1999; Kirkpatrick, 1998; Schmitt, 2005a). Overall, lower levels of Emotional Investment, insecure dismissing attachments, and short-term mating are thought to constitute a more adaptive reproductive strategy within high stress cultural ecologies.

Children from cultures with lower stress—such as those with ample healthcare, education, and resources—develop more emotionally investing tendencies or experience higher levels of love (Gangestad & Simpson, 2000; Rohner & Britner, 2002). This more loving emotionality is thought to be rooted in secure parent–child attachment and is linked in adulthood to delayed puberty, lower fertility, and long-term or monogamous mating strategies. In each case, the different expressions of Emotional Investment are thought to be functional within their local ecologies of reproduction (Belsky, 1997; Chisholm, 1999). Feelings of love and high Emotional Investment are adaptive in low stress ecologies and long-term mating cultural contexts, whereas low levels of love and more distant emotional attachments are adaptive in high stress ecologies and short-term mating contexts (Schmitt, Alcalay, Allik et al., 2004).

1.3. Biological sex and love

Additional evidence suggests that the tendency for people to experience love, or not, is somewhat related to biological sex (Dion & Dion, 1973; Durik et al., 2006; Fehr & Broughton, 2001; Hendrick, Hendrick, Foote, & Slapion-Foote, 1984; Sprecher & Toro-Morn, 2002). For example, women are more likely to experience love and attraction for a man when he is intelligent, charming, and socially dominant over other men (Graziano, Jensen-Campbell, Todd, & Finch, 1997; Kenrick, Neuberg, Zierk, & Krones, 1994), whereas

men are more likely to experience love and attraction for a woman when she is especially physically attractive (i.e., displays cues to youth and high fertility; see Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004; Lucas, Wendorf, & Imamoglu, 2004; Schmitt & Buss, 1996). Women are more likely to think about love in terms of emotional commitment and security, whereas men are more likely to think of love in terms of sexual commitment and the physical pleasure of intercourse (Buss, 2000; Cimbalo & Novell, 1993; Hazan & Shaver, 1987). Women tend to experience more of the "emotional symptoms" of love (e.g., feeling giddy, tingling spine, and euphoria), whereas men tend to report falling in love more quickly than women (Brantley, Knox, & Zusman, 2002; Kanin, Davidson, & Scheck, 1970). Finally, women tend to require feeling love before consenting to sexual intercourse (Schmitt, 2005b; Simpson & Gangestad, 1991), whereas men are more likely to consent to sex without feeling love, such as with a complete stranger (Clark & Hatfield, 1989; Voracek, Hofhansl, & Fisher, 2005).

In the lexical exploration of love-related adjectives described earlier, Schmitt and Buss (2000) found that women reported moderately higher levels of "Emotional Investment" than men ($d = -0.66$; see also, Schmitt, 2006), which may reflect the intimacy-laden aspects of love that comprise the Emotional Investment scale (e.g., self-ratings of the words "Romantic" and "Compassionate"). On a scale of more sexualized descriptors called Erotophilic Disposition (with adjectives such as "Lustful" and "Kinky"), men reported higher scores than women, $d = 0.43$ (Schmitt & Buss, 2000). Findings from other studies would seem to confirm the view that women score higher on love-related scales that are rooted in emotional closeness and intimacy. Hendrick and Hendrick (1986) measured self-ratings of "being in love right now" and found American women (64%) reported significantly higher levels of love than American men (46%). Sprecher et al. (1994) replicated this finding and documented that significantly more women than men reported currently being "in love" across many different and diverse cultures, with Russian women (73%) reporting 12% points higher than Russian men (61%), American women (63%) reporting 10% points higher than American men (53%), and Japanese women (63%) reporting 21% points higher than Japanese men (41%).

Why does this seemingly pervasive sex difference in the tendency to love emerge, at least in terms of love as Emotional Investment? According to Parental Investment Theory (Trivers, 1972), the relative proportion of parental investment—the time and energy devoted to individual offspring—varies across the males and females of different species. In some species, males provide more parental investment than females (e.g., the Mormon cricket). In other species, females possess the heavy investing parental burdens (e.g., most mammals; Clutton-Brock, 1991). Trivers (1972) noted that sex differences in parental investment burdens are systematically linked to sexual selection in ways that potentially relate to love. Within a given species, the sex investing more in parenting tends to have a more long-term or love-oriented mating strategy, whereas the lesser-investing sex tends to have a short-term or sex-oriented mating strategy (see also Andersson, 1994). The processes of sexual selection also result in the heavy-investing sex being smaller, less aggressive, less risk-taking, earlier to mature, later to die, and generally more discriminating when choosing to invest in a mating partner (Alexander & Noonan, 1979).

Among humans, many males invest heavily as parents, dedicating direct resources and general prestige to their children (Pasternak, Ember, & Ember, 1997; Rohner & Britner, 2002). Nevertheless, human males invest much less than females in active parenting effort across all known cultures (Low, 1989; Munroe & Munroe, 1997; Quinn, 1977). In addition, men face much lower levels of obligatory or "minimum" investment in offspring than women do. That is, men are not obligated to invest as much as women in order to produce viable progeny (Symons, 1979). Women are obligated to incur the costs of internal fertilization, placentation, and gestation. The minimum obligations of men are considerably less—requiring only the contribution of sperm. Furthermore, all female mammals, including ancestral women, carried the requisite burdens of lactation. Lactation can last several years in human foraging environments, years during which it is significantly harder for women, but not men, to produce additional offspring (Kelly, 1995).

When viewed from the evolutionary perspective of Parental Investment Theory (Trivers, 1972), this asymmetry in obligate parental investment burdens should result in the lesser-investing sex (i.e., men) displaying lower levels of love or Emotional Investment in potential reproductive partners and their offspring. In general support of Parental Investment Theory applying to humans, numerous studies have shown men exhibit greater physical size and competitive aggression (Archer & Lloyd, 2002; Harvey & Reynolds, 1994; Hyde, 1986), riskier life history strategies (Daly & Wilson, 1988), relatively delayed maturation (Geary, 1998), and earlier death than women across all known cultures (Alexander & Noonan, 1979). Many of these sex differences appear culturally universal among pre-adolescents (Freedman & DeBoer, 1979; Low, 1989). In addition, men's mate preferences are, as predicted by Parental Investment Theory, almost always less "choosy" or discriminating than women's, especially in the short-term mating contexts of having sex without love (Buss & Schmitt, 1993; Kenrick, Sadalla, Groth, & Trost, 1990; Regan, 1998; Regan & Berscheid, 1997; Simpson & Gangestad, 1991). Based on Parental Investment Theory, men are clearly the lesser-investing sex of our species and should be inclined toward lower Emotional Investment in relationships and any offspring that ensue (see also Baron-Cohen, 2003; Csatho & Bereczkei, 2003; Geary, 1998; Mealey, 2000).

1.4. Cultural ecologies, biological sex, and love

An important caveat to Parental Investment Theory is that other evolutionary theories expect the degree of difference between men and women to vary across different ecological contexts. According to the BSD Model (Belsky et al., 1991), when the local ecology is particularly stressful women are designed to shift away from their primary long-term mating strategy with its accompanying high levels of Emotional Investment and instead develop a more short-term mating strategy with lower levels of Emotional Investment (see also Chisholm, 1999; Gangestad, Haselton, & Buss, 2006; Schmitt, Alcalay, Allensworth et al., 2003). Men may also be driven toward short-term mating and low investment in high stress reproductive environments, but the effect appears to be more pronounced in women (Draper & Harpending, 1982; Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). This is likely due to men having evolved to preferentially follow a low investment reproductive strategy to begin with (Schmitt, 2005b; Simpson & Gangestad, 1991), at least when doing so was unlikely to have strong negative consequences on survival (Schmitt, Alcalay, Allik et al., 2004). Thus, women's culturally-contingent movement toward lower Emotional Investment in high stress reproductive environments may be more conspicuous or severe than men's shift, resulting in smaller Emotional Investment sex differences in high stress environments.

In contrast, Social Structural Theory posits that men and women have not evolved different mating psychologies (Eagly & Wood, 1999; Wood & Eagly, 2002). Instead, men and women evolved different physical abilities (e.g., women's nursing abilities and men's hunting abilities) that often give rise to sex roles, and these roles are what proximately cause men and women to psychologically differ in the realm of mating and love. From this perspective, when men and women occupy similar roles (e.g., in cultures with high

gender equality), men and women should tend not to differ (or differ much less) in psychological qualities, including Emotional Investment tendencies.

Evolutionary and social role theories do not necessarily make simple and diametrically opposed predictions. It could be the case that sex differences in Emotional Investment are due to evolved sex differences in mating/parenting psychology and are universal to some degree (supporting Parental Investment Theory), but the exact size of the sex difference is accentuated or attenuated depending on additional evolutionary-sensitive features of culture (e.g., ecological stress could lead everyone to lower Emotional Investment levels, but the effects of stress could be larger among women causing an overall attenuation of sex differences; see Schmitt, Alcalay, Allensworth et al., 2003). If the size of sex differences in Emotional Investment were consistently close to zero without a compelling evolutionary rationale to explain cultural variations (in effect, showing no difference with only small random variation across samples), this would be an empirical disconfirmation of Parental Investment Theory. If sex differences in Emotional Investment were highly variable across cultures, and cultures of higher sociopolitical gender equality exhibited negligible or even reversed sex differences, this would strongly support Social Structural Theory. On the other hand, if sex differences in Emotional Investment were universal, or very close to universal, and the size of sex differences in Emotional Investment were not related, as predicted, to indices of gender equality across cultures, this would represent an empirical disconfirmation of Social Structural Theory. In the current study, sex differences in Emotional Investment were examined across 48 nations and were related to cultural indices of ecological stress and gender equality.

1.5. Objectives of the present study

The present research study had five basic objectives. First, we evaluated whether the Emotional Investment scale, originally derived from English adjective ratings in North American samples (Schmitt & Buss, 2000), replicated as a reliable scale across 48 nations. Second, we sought to examine the validity of the Emotional Investment scale across cultures by relating it to conceptually relevant personality traits across 48 nations. Third, we tested an evolutionary theory (i.e., the BSD Model; Belsky et al., 1991) concerning the degree to which Emotional Investment should be prevalent within and across cultures, and how levels of Emotional Investment should relate to indexes of ecological stress, romantic attachment, and reproductive factors. Fourth, we examined whether sex differences in Emotional Investment previously observed among North American samples (Schmitt & Buss, 2000) were universally evident across a more diverse set of cultures. Fifth, we evaluated different psychological theories (the BSD Model versus Social Structural Theory; Eagly & Wood, 1999) concerning cross-cultural differences in the degree to which men and women differed in Emotional Investment.

2. Method

2.1. Sampling and procedures

The research reported in this paper is a result of the international sexuality description project (ISDP; Schmitt, Alcalay, Allensworth et al., 2003), a collaborative effort of over 100 social, behavioral, and biological scientists. Fifty-six nations comprised the full span of ISDP cultures (for details, see Schmitt, Alcalay, Allensworth et al., 2003; Schmitt, Alcalay, Allik et al., 2002). A total of 15,234 participants from 48 nations of the ISDP (see Table 1) completed all the measures related to the present investigation, including the "Sexy Seven Measure" of human sexuality described below (Schmitt & Buss, 2000).

Table 1
Sample sizes, ages, and languages of administration across 48 nations of the international sexuality description project.

Nation	Men	Women	Total	Age	Language
Argentina	110	136	246	22.59	Spanish
Australia	200	288	488	21.36	English
Austria	204	260	464	26.54	German
Bangladesh	83	62	145	21.73	Bangla
Belgium	163	346	509	18.75	Flemish
Bolivia	79	76	155	21.95	Spanish
Botswana	97	116	213	21.59	English
Brazil	42	53	95	23.44	Portuguese
Canada	345	625	970	22.28	English/French
Croatia	113	109	222	20.80	Croatian
Cyprus	21	34	55	21.15	Greek
Czech Republic	104	122	226	25.28	Czech
Estonia	69	101	170	22.54	Estonian
Ethiopia	120	62	182	31.01	English[a]
Fiji	68	71	139	23.48	English[a]
Finland	32	88	120	37.34	Finnish
Germany	279	479	758	28.00	German
Greece	47	181	228	23.23	Greek
Hong Kong	96	99	195	20.36	English[a]
Indonesia	43	38	81	28.11	Indonesian
Israel	147	173	320	26.28	Hebrew
Italy	92	108	200	23.48	Italian
Japan	149	100	249	19.67	Japanese
Latvia	87	100	187	19.61	Latvian
Lebanon	114	124	238	19.71	English
Lithuania	47	47	94	21.32	Lithuanian
Malaysia	42	73	115	23.32	Malay
Malta	116	147	263	20.95	English
Mexico	102	108	210	24.23	Spanish
Morocco	67	58	125	20.15	English[a]
Netherlands	105	119	224	21.40	Dutch
New Zealand	112	157	269	20.03	English
Peru	99	97	196	21.99	Spanish
Philippines	120	153	273	19.55	English[a]
Poland	286	511	797	23.49	Polish
Portugal	110	141	251	21.24	Portuguese
Romania	116	121	237	19.91	Romanian
Serbia	100	99	199	21.78	Serbian
Slovakia	80	90	170	20.91	Slovak
Slovenia	73	103	176	22.16	Slovenian
South Korea	195	295	490	20.44	Korean
Switzerland	85	128	213	23.63	German
Taiwan	116	93	209	21.38	Mandarin
Tanzania	59	15	74	28.08	English[a]
Turkey	201	200	401	24.68	Turkish
United Kingdom	132	329	461	22.70	English
United States	988	1769	2757	21.35	English
Zimbabwe	85	90	175	20.37	English
Worldwide	6340	8894	15,234	22.51	28 Languages

[a] English survey included annotations with explanations of difficult words and phrases.

All collaborators were asked to administer the 9-page ISDP survey to at least 100 men and 100 women. All participants were provided with a brief description of the study, including the following written instructions: "This questionnaire is entirely voluntary. All your responses will be kept confidential and your personal identity will remain anonymous. No identifying information is requested on this survey, nor will any such information be added later to this survey. If any of the questions make you uncomfortable, feel free not to answer them. You are free to withdraw from this study at any time for any reason. This series of questionnaires should take about 20 min to complete. Thank you for your participation." The full instructional set provided by each collaborator varied and was adapted to fit the specific culture and type of sample. Details on incentives and cover stories used across samples are available from the first author.

Participants in most samples were recruited as volunteers, some received course credit for participation, and others received a small monetary reward for participation. All samples were administered the self-report survey anonymously, with most surveys returned via sealed envelope or the usage of a drop-box. Return rates for college student samples were relatively high (around 95%). Return rates for community samples were around 50%. Further details on the sampling procedures within each nation are provided elsewhere (Schmitt, Alcalay, Allensworth et al., 2003) and are available from the first author.

2.2. Measures

2.2.1. Translation procedures

Researchers from nations where English was not the primary language conducted a translation/back-translation procedure and administered the ISDP measures in their native language. This typically involved the primary collaborator translating the measures into the native language of the participants and then having a second bilingual person back-translate the measures into English. Differences between the original English and the back-translation were discussed, and mutual agreements were made as to the most appropriate translation. In general, this is regarded as more of an "etic" approach to cross-cultural psychology (Church, 2001). This procedure attempts to balance the competing needs of making the translation meaningful and naturally readable to the native participants, while preserving the integrity of the original measure and its constructs (Brislin, 1980).

As seen in Table 1, this process resulted in the survey being translated into 28 different languages. Samples from Ethiopia, Hong Kong, Morocco, and the Philippines were administered the survey in English, but certain terms and phrases were annotated to clarify what were thought to be confusing words for the participants. The translation of the ISDP survey into the Flemish dialect of Dutch used only a translation procedure, as this involved minor word variant changes from the original Dutch. Pilot studies were conducted at several testing sites to clarify translation and comprehension concerns.

2.2.2. Demographic measure

Each sample was first presented with a demographic measure entitled "Confidential Personal Information." This measure included questions about sex (male, female), age, Sexual Orientation (heterosexual, homosexual, bisexual), current relationship status (e.g., married, cohabiting, dating one person exclusively, not currently involved with anyone), and socioeconomic status (lower, lower-middle, middle, upper-middle, and upper).

2.2.3. Personality traits

All samples were administered the Big Five Inventory (BFI) of personality traits (Benet-Martínez & John, 1998). The 44-item English BFI was constructed to allow quick and efficient assessment of five personality dimensions—Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (Benet-Martínez & John, 1998). Example items from the BFI include: "I see myself as someone who is outgoing, sociable" (i.e., Extraversion), "I see myself as someone who is helpful and unselfish with others" (i.e., Agreeableness), "I see myself as someone who is a reliable worker"(i.e., Conscientiousness), "I see myself as someone who worries a lot" (i.e., Neuroticism), and "I see myself as someone who is curious about many different things" (i.e., Openness). Self-report ratings for each item were made on a scale from 1 (Disagree Strongly) to 5 (Agree Strongly). This self-report measure was used because of its ease of administration, its brevity, and its usefulness for cross-language and cross-cultural research (Benet-Martínez & John, 1998). In addition, it has been shown to provide personality profiles similar to related measures across cultures (Schmitt et al., 2007), including the consistent documentation of gender differences in personality across cultures (Schmitt, Realo, Voracek, & Allik, 2008).

2.2.4. Romantic attachment measure

All samples were administered a four-typology measure of adult romantic attachment called the Relationship Questionnaire (Bartholomew & Horowitz, 1991; Schmitt, Alcalay, Allensworth et al., 2004). This measure has one Secure attachment item: "It is easy for me to become emotionally close to others. I am comfortable depending on others and having others depend on me. I do not worry about being alone or having others not accept me." Participants use a 7-point Likert-type scale to rate the Secure item, ranging from 1 "does not describe me" to 7 "very accurately describes me," with 4 as the midpoint of the scale. The Relationship Questionnaire has three items that measure insecure romantic attachment styles. The first is the Dismissing romantic attachment item, "I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me." The Preoccupied romantic attachment item reads, "I want to be completely emotionally intimate with others, but I find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others do not value me as much as I value them." Finally, the Fearful romantic attachment item is, "I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will get hurt if I allow myself to get too close to others." Although the Relationship Questionnaire is not the most recent or advanced measure of romantic attachment, it is relatively brief and is the only measure, among classic measures of attachment, to have documented independence from self-deceptive biases (Leak & Parsons, 2001).

2.2.5. Self-esteem measure

All participants were asked to complete a measure of global self-esteem, Rosenberg's Self-Esteem Scale (Rosenberg, 1965). This scale contains ten counter-balanced 4-point items ranging from Strongly Agree to Strongly Disagree. The Self-Esteem Scale is coded so that higher scores indicate higher levels of global self-esteem. This measure has been validated across several cultures (e.g., Pullmann & Allik, 2000; Schmitt & Allik, 2005).

2.2.6. Sexy Seven Measure

All samples were administered a measure of the "Sexy Seven" sexuality attributes (Schmitt & Buss, 2000). The Sexy Seven Measure asks participants to rate themselves compared to others they know (using a nine-point scale from 1 = Extremely Inaccurate to 9 = Extremely Accurate) on a list of 67 sexually-connotative adjectives. The Sexy Seven scales that are scored from these self-ratings include Sexual Attractiveness (including facets of beauty and seduction), Relationship Exclusivity (whether one is promiscuous and adulterous), Gender Orientation (masculinity and femininity), Sexual Restraint (abstinence and prudishness), Erotophilic Disposition (obscenity, indecency, and lust), Emotional Investment (love and romance), and Sexual Orientation (homosexuality and heterosexuality). The Emotional Investment scale included the specific adjectives *Loving, Lovable, Romantic, Affectionate, Cuddlesome, Compassionate*, and *Passionate* as translated from English into 27 additional languages. The overall mean-level average of these seven adjectives constituted the Emotional Investment scale used in this study as a broad-based dimensional indicator of "love" (Schmitt, 2005b, 2006; Schmitt & Buss, 2000).

2.2.7. Archival measures

Several archival data sets were used to evaluate theories concerning the pattern of Emotional Investment across cultures. Five measures were used as nation-level indicators of cultural stress (to test the BSD Model; Belsky et al., 1991). Two were indicative of low cultural stress: The human development index (i.e., the degree to which people achieve basic human capabilities, including health, longevity, education, and a decent standard of living; United Nations Development Programme, 2001) and gross domestic product per capita (GDP; United Nations Development Programme, 2001). Three were indicative of high cultural stress: Infant Mortality (United Nations Statistics Division, 2001), Childhood Malnutrition (United Nations Development Programme, 2001), and Pathogen Stress (Gangestad & Buss, 1993).

Evolutionary theories concerning Emotional Investment were further tested using archival datasets including national levels of romantic attachment styles (Schmitt, Alcalay, Allensworth et al., 2004), self-esteem (Schmitt & Allik, 2005), and self-worth (Diener & Diener, 1995). Also used to test evolutionary theories were national indicators fertility rate (United Nations Development Programme, 2001), divorce rate (United Nations Development Programme, 2001), sociosexuality (Schmitt, 2005b), short-term mating interests (Schmitt, Alcalay, Allik et al., 2002), and mate poaching (Schmitt, Alcalay, Allik et al., 2004).

Social Structural Theory (Eagly & Wood, 1999) was evaluated using archival measures of the gender development index (i.e., the degree to which men and women differ in the achievement of health, longevity, education, and a decent standard of living; United Nations Development Programme, 2001), the gender empowerment measure (i.e., sociopolitical gender equality; United Nations Development Programme, 2001), and a direct survey measure of progressive sex-role ideology (Williams & Best, 1990). Finally, cultural values dimensions were obtained for 42 nations from Hofstede (2001), one of which, Cultural Masculinity, was relevant for testing Social Structural Theory.

3. Results and discussion

3.1. Measuring Emotional Investment across cultures

3.1.1. Reliability of the Emotional Investment scale

The internal reliability of the Emotional Investment scale was moderate to high across most ISDP nations (see Table 2). In only one nation, Tanzania ($\alpha = 0.59$), did Cronbach's alpha fall below the minimal threshold of 0.60 for a personality scale (Robinson, Shaver, & Wrightsman, 1991). In all but six nations, the internal reliability was above 0.70, a level considered "extensive" (Robinson et al., 1991). The internal reliability of the Emotional Investment scale was highest in the United States ($\alpha = 0.87$), perhaps because that nation is where the precise meanings of the Sexy Seven Measure's love-related adjectives were the clearest (i.e., this is where the Sexy Seven adjectives were emically culled, rated, and factorially organized; Schmitt & Buss, 2000).

3.1.2. Validity of the Emotional Investment scale

Within each of the ISDP cultures, higher levels of love—as measured by the Emotional Investment scale—were expected to be associated with higher levels of Extraversion and Agreeableness as measured by the BFI (Heaven et al., 2004; Wiggins, 1979). This was largely the case with all reported correlations falling in the positive direction (see Table 2). In only two nations, Indonesia and Malaysia, did neither Extraversion nor Agreeableness reach statistical significance in correlating with Emotional Investment. Relatively small sample sizes in these nations may have led to inadequate power in detecting these expected associations. In Indonesia, the link between love and Agreeableness was somewhat stronger, $r(79) = 0.13$, whereas in Malaysia the link between love and Extraversion was slightly higher, $r(113) = 0.12$. In most cases (60%), positive correlations were stronger between Emotional Investment and Agreeableness than between Emotional Investment and Extraversion. However, these differences were usually not statistically significant using Fisher's r–z transformation, indicating that Emotional Investment as measured by the Sexy Seven Measure can only be said to fall somewhere in between Extraversion and Agreeableness (see Wiggins, 1979).

Love was generally found to be unassociated with Neuroticism, with only spotty positive or negative correlations observed across cultures (see Table 2). These results suggest the Emotional Investment scale possessed discriminant validity across most nations. Overall, the ISDP findings provided evidence that love in terms of the general Sexy Seven dimension of "Emotional Investment" has a reasonable degree of conceptual equivalence across cultures.

3.2. Predicting levels of Emotional Investment across cultures

Table 3 displays the mean levels and standard deviations of Emotional Investment across 48 nations of the ISDP. National levels of Emotional Investment (after controlling for sex of participant) ranged from relatively low levels in Tanzania ($M = 5.44$), Hong Kong ($M = 5.54$), and Japan ($M = 5.60$), to relatively high levels in the United States ($M = 7.53$), Slovenia ($M = 7.47$), and Cyprus ($M = 7.38$). Overall, there was a significant effect of nation on Emotional Investment, $F(47, 15{,}186 = 61.87$, $p < .001)$.

There was a trend for East Asian cultures to score lower than others on Emotional Investment. For example, encoding each nation as representative of North America ($N = 1435$ men, 2502 women), South America ($N = 330$ men, 362 women), Western Europe ($N = 1000$ men, 1749 women), Eastern Europe ($N = 1075$ men, 1403 women), Southern Europe ($N = 386$ men, 611 women), the Middle East ($N = 462$ men, 497 women), Africa ($N = 428$ men, 341 women), Oceania ($N = 380$ men, 516 women), South/Southeast Asia ($N = 288$ men, 326 women), or East Asia ($N = 556$ men, 587 women; for details on these groupings see Schmitt, Alcalay, Allik et al., 2002, 2004), resulted in a significant main effect of world region on Emotional Investment, $F(9, 15{,}214) = 193.65$, $p < .001$. According to Tukey's *HSD* post-hoc tests, East Asia had significantly lower levels of Emotional Investment than all other world regions, whereas North America had significantly higher levels than all other regions (see Fig. 1).

3.2.1. Evaluating the BSD Model—Emotional Investment and cultural stress

Across nations, the evolutionary BSD Model (Belsky, 1997; Belsky et al., 1991) predicted higher levels of Emotional Investment should be associated with indicators of lower cultural stress—such as ample healthcare, education, and resources—as well as with secure forms of romantic attachment, lower fertility, and more long-term oriented mating strategies (see also Chisholm, 1999; Schmitt, 2005a). Conversely, higher cultural stress, insecure dismissing attachments, and more unrestricted forms of mating should be associated with lower levels of Emotional Investment.

The United Nations tracks the degree to which nations have adequate healthcare, education, and resources and quantifies this cultural variability in the form of the human development index (HDI; United Nations Development Programme, 2001). HDI scores were available for 46 of the ISDP nations (scores were not available for Taiwan or Serbia). As seen in Table 4, national Emotional Investment levels were positively correlated with the national HDI scores, $r(44) = .31$, $p < .05$. This linkage was present among both men and women, supporting the evolutionary BSD Model of Belsky et al. (1991). When looking at the direct level of gross domestic

Table 2
Psychometric properties of Emotional Investment across 48 nations of the international sexuality description project.

Nation	Internal reliability	Convergent validity		Discriminant validity
	Alpha	Extraversion	Agreeableness	Neuroticism
Argentina	.72	.32***	.28***	−.03
Australia	.84	.34***	.32***	−.04
Austria	.78	.24***	.22***	−.07
Bangladesh	.74	.20**	.11	−.14*
Belgium	.81	.28***	.35***	−.02
Bolivia	.64	.16*	.19**	.06
Botswana	.75	.18**	.08	−.03
Brazil	.72	.28**	.40***	−.23*
Canada	.87	.27***	.34***	−.02
Croatia	.79	.28***	.27***	.01
Cyprus	.82	.25*	.38**	−.21
Czech Republic	.73	.18**	.18**	.00
Estonia	.76	.07	.26***	.17*
Ethiopia	.67	.09	.19**	.05
Fiji	.78	.26***	.21**	−.04
Finland	.78	.20**	.26***	−.05
Germany	.80	.22***	.21***	−.08*
Greece	.81	.31***	.26***	−.02
Hong Kong	.71	.19**	.21**	.12*
Indonesia	.74	.04	.13	−.27**
Israel	.68	.18***	.33***	.03
Italy	.81	.11*	.27***	.09
Japan	.78	.20***	.21***	−.04
Latvia	.79	.22***	.26***	.11
Lebanon	.84	.22***	.32***	.09
Lithuania	.75	.09	.21**	.00
Malaysia	.75	.12	.07	.01
Malta	.85	.12*	.22***	−.03
Mexico	.74	.25***	.29***	−.15*
Morocco	.79	.18*	.21**	−.09
Netherlands	.77	.27***	.23***	−.09
New Zealand	.85	.29***	.35***	−.07
Peru	.72	.10	.29***	.16*
Philippines	.82	.25***	.21***	−.04
Poland	.80	.04	.23***	.04
Portugal	.85	.15**	.33***	−.08
Romania	.74	.18**	.23***	−.12*
Serbia	.68	.17**	.27***	−.02
Slovakia	.72	.28***	.29***	−.12
Slovenia	.84	.12	.15*	−.16*
South Korea	.73	.25***	.30***	−.01
Switzerland	.64	.17**	.12*	−.07
Taiwan	.75	.22***	.14*	−.05
Tanzania	.59	.27**	.15	−.21*
Turkey	.68	.11*	.32**	.02
United Kingdom	.85	.25***	.22***	−.04
United States	.87	.26***	.32***	−.06***
Zimbabwe	.74	.22**	.09	.01
Worldwide	.81	.22***	.29***	−.06***

Note: Correlations represent partial correlations controlling for gender.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

product (GDP), the links did not reach statistical significance, but all were in the predicted direction with higher Emotional Investment associated with higher GDP. Conversely, high national levels of stress—as indicated by Infant Mortality rates, Childhood Malnutrition rates, and the Pathogen Stress experienced in local environments—were also linked, as predicted, to lower levels of Emotional Investment (see Table 4).

We also evaluated the more direct effects of socioeconomic status on Emotional Investment levels across individuals. The BSD Model predicts higher socioeconomic status should be associated across individuals with higher levels on the Emotional Investment scale. Socioeconomic status was self-reported by individuals using the categories upper, upper-middle, middle, lower-middle, or lower class (some nations did not assess socioeconomic status as it was seen as not conceptually relevant to their culture). The main effect of socioeconomic status category on Emotional Investment was significant, $F(4, 14{,}282) = 17.04$, $p < .001$. As expected from the BSD Model, Emotional Investment was higher among those who reported upper ($M = 7.07$, $SD = 1.32$, $N = 416$) or upper-middle socioeconomic class ($M = 7.13$, $SD = 1.24$, $N = 3966$), with decreasing levels of Emotional Investment observed across middle ($M = 7.00$, $SD = 1.20$, $N = 7661$), lower-middle ($M = 6.86$, $SD = 1.26$, $N = 1882$), and lower classes ($M = 6.65$, $SD = 1.43$, $N = 367$). According to Tukey's *HSD*s, only the contrasts between upper and upper-middle classes, and upper and middle classes, were not significantly different from one another.

3.2.2. Evaluating the BSD Model—Emotional Investment and romantic attachment

Belsky et al. (1991) hypothesized that the link between social stress and loving Emotional Investment is rooted in the psychology of secure attachment (see also Chisholm, 1999; Rohner & Britner,

Table 3
Levels of Emotional Investment across 48 nations of the international sexuality description project.

Nation	National		Men		Women		Sex difference	
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*	*d*
Argentina	7.33	1.05	7.09	1.10	7.51	0.96	−3.25***	−0.41
Australia	7.28	0.99	6.95	0.97	7.52	0.94	−6.45***	−0.57
Austria	7.29	0.97	7.04	1.01	7.46	0.90	−4.64***	−0.43
Bangladesh	7.30	0.97	7.07	0.99	7.46	0.91	−2.48**	−0.41
Belgium	6.76	1.15	6.50	1.21	6.94	1.10	−4.09***	−0.38
Bolivia	6.75	1.10	6.71	1.10	6.71	1.11	0.00	0.00
Botswana	6.93	1.38	6.57	1.43	7.21	1.27	−3.43***	−0.46
Brazil	7.31	0.89	7.17	0.86	7.39	0.91	−1.19	−0.24
Canada	7.28	1.08	7.02	1.17	7.46	0.99	−6.20***	−0.41
Croatia	7.14	1.13	6.77	1.18	7.45	0.96	−4.69***	−0.60
Cyprus	7.38	0.99	7.04	1.21	7.62	0.77	−2.20*	−0.59
Czech Republic	6.77	0.95	6.62	0.92	6.86	0.96	−1.92*	−0.26
Estonia	6.83	1.03	6.59	0.98	7.00	1.04	−2.63**	−0.40
Ethiopia	6.07	1.35	5.83	1.39	6.24	1.24	−1.95*	−0.30
Fiji	6.69	1.25	6.54	1.25	6.78	1.25	−1.13	−0.17
Finland	7.10	0.89	7.02	1.00	7.22	0.85	−1.09	−0.22
Germany	7.12	0.94	6.82	1.00	7.32	0.86	−7.33***	−0.53
Greece	7.13	1.02	7.11	1.05	7.24	1.02	−0.80	−0.13
Hong Kong	5.54	1.05	5.15	0.98	5.86	1.00	−5.04***	−0.68
Indonesia	5.98	1.16	6.11	1.05	5.73	1.26	1.46	0.32
Israel	7.11	1.05	6.81	1.10	7.33	0.94	−4.52***	−0.49
Italy	6.71	1.36	6.52	1.38	6.84	1.34	−1.71*	−0.24
Japan	5.60	1.34	5.45	1.36	5.65	1.31	−1.15	−0.15
Latvia	6.78	1.02	6.42	1.03	7.05	0.92	−4.37***	−0.61
Lebanon	7.03	1.31	6.82	1.35	7.17	1.26	−2.07*	−0.27
Lithuania	6.83	1.04	6.55	0.95	7.03	1.08	−2.30**	−0.46
Malaysia	6.46	1.27	6.67	1.29	6.36	1.26	1.27	0.24
Malta	7.29	1.24	7.02	1.30	7.48	1.15	−3.01**	−0.37
Mexico	6.41	1.81	6.22	1.48	6.53	2.07	−1.24	−0.17
Morocco	6.34	1.51	5.96	1.21	6.67	1.72	−2.71**	−0.47
Netherlands	6.90	0.93	6.73	0.97	7.01	0.87	−2.26**	−0.30
New Zealand	7.18	0.99	7.01	0.99	7.30	0.98	−2.37**	−0.29
Peru	6.98	1.29	6.65	1.28	7.25	1.23	−3.31***	−0.46
Philippines	7.26	1.09	7.07	1.02	7.38	1.12	−2.37**	−0.29
Poland	6.96	1.46	6.83	1.51	7.07	1.43	−2.22**	−0.16
Portugal	7.28	0.99	7.17	0.98	7.35	1.00	−1.43	−0.18
Romania	7.04	1.15	6.77	1.21	7.24	1.04	−3.19***	−0.41
Serbia	6.94	0.99	6.53	1.01	7.29	0.80	−5.89***	−0.77
Slovakia	7.10	0.99	6.67	1.02	7.43	0.82	−5.40***	−0.77
Slovenia	7.47	1.05	7.02	1.17	7.79	0.82	−5.12***	−0.73
South Korea	5.90	1.07	5.86	1.09	5.94	1.06	−0.86	−0.08
Switzerland	6.49	1.12	5.92	0.70	6.88	1.19	−6.74***	−0.86
Taiwan	6.39	0.96	6.28	1.01	6.41	0.90	−0.99	−0.14
Tanzania	5.44	1.34	5.21	1.34	5.58	1.33	−0.95	−0.27
Turkey	6.85	1.01	6.72	1.03	6.92	0.98	−2.00*	−0.20
United Kingdom	7.09	1.12	6.74	1.16	7.30	1.06	−4.79***	−0.50
United States	7.53	1.09	7.29	1.09	7.70	1.07	−9.55***	−0.38
Zimbabwe	7.12	1.23	6.94	1.14	7.23	1.31	−1.58	−0.24
Worldwide	7.02	1.23	6.73	1.24	7.22	1.19	−24.30***	−0.39

National scores are based on marginal means after controlling for sex of participant.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

2002; Shaver & Hazan, 1988). In support of this perspective, higher levels of Emotional Investment at the national level were positively related to secure attachment, $r(46) = 0.35$, $p < .01$, negatively related to preoccupied attachment, $r(46) = -0.46$, $p < .001$, and negatively related to fearful attachment among women, $r(46) = -0.27$, $p < .05$. Indeed, among the eight nations with the lowest Emotional Investment levels (i.e., Taiwan, Morocco, Ethiopia, Indonesia, South Korea, Japan, Hong Kong, and Tanzania) all eight were above-average in national levels of Preoccupied romantic attachment (see Fig. 2). Dismissing attachment was expected to relate negatively to Emotional Investment. However, these negative correlations failed to reach statistical significance.

Romantic attachments were more directly related to Emotional Investment by looking at the associations of the RQ scales and the Emotional Investment scale across all 10 world regions of the ISDP (see Table 5). Within most regions, those individuals with higher secure attachment ratings tended to report higher levels of Emotional Investment, whereas those individuals with higher dismissing attachment ratings tended to report lower levels of Emotional Investment. Overall, these within-region patterns suggest more emotionally investing personalities are strongly associated with a positive Model of Other (or low attachment avoidance; Heaven et al., 2004).

Emotional Investment was also associated with national levels of self-esteem, in terms of both Rosenberg's measure of self-esteem as administered in the ISDP (Schmitt & Allik, 2005; see Fig. 3) and Diener and Diener's (1995) cross-cultural assessment of self-worth (see Table 4). Self-esteem was more directly related to Emotional Investment by looking at the associations of the RSES and the Emotional Investment scale across all 10 world regions of

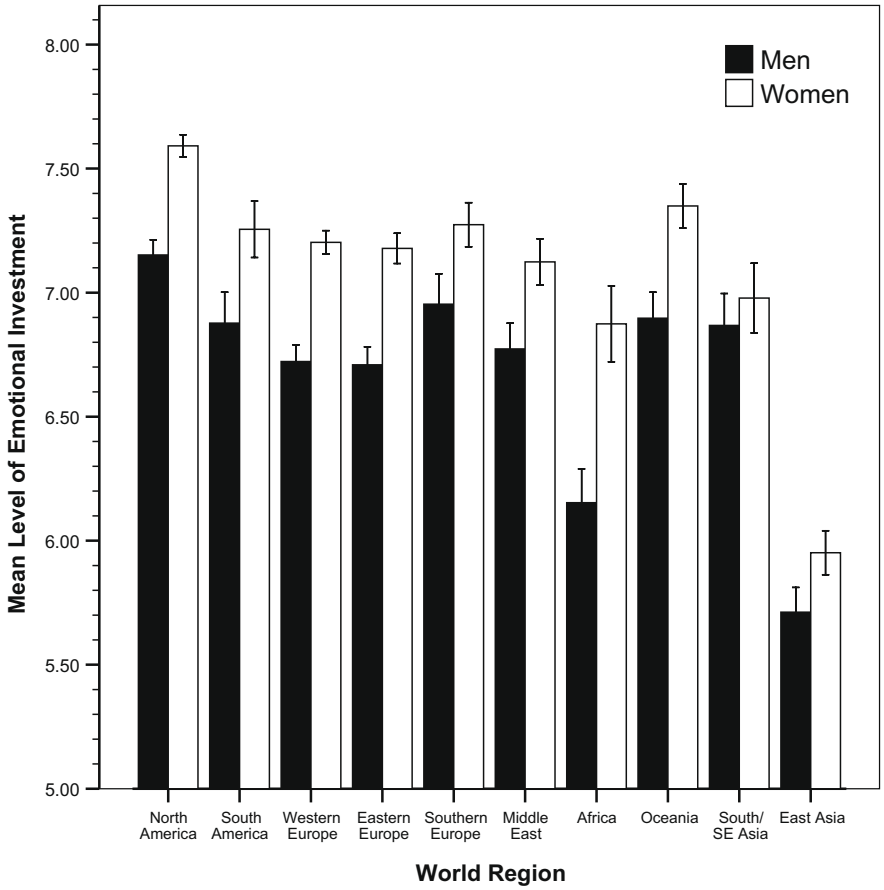

Fig. 1. Mean levels (with 95% confidence intervals) of Emotional Investment for men and women across the 10 world regions of the international sexuality description project.

the ISDP (see Table 5). Within each region, those individuals with higher self-esteem tended to report higher levels of Emotional Investment. These findings replicate those of Dion and Dion (1975) and provide a further indication that securely attached individuals (i.e., those with high self-esteem or a positive model of self; Bartholomew & Horowitz, 1991) have more emotionally investing personalities.

3.2.3. Evaluating the BSD Model—Emotional Investment and mating strategies

The BSD Model views the development of insecure dismissing attachment and low Emotional Investment levels as part of an adaptive reproductive strategy that includes high fertility, early puberty, and short-term mating. The current nation-level results did not support all aspects of this theory. Lower nation-level Emotional Investment levels among women were related, as expected, to higher fertility levels, $r(44) = -0.25$, $p < .05$. However, national levels of Emotional Investment were positively correlated with divorce rate, $r(22) = 0.52$, $p < .01$, unrestricted sociosexuality, $r(41) = 0.49$, $p < .001$, short-term mating interests, $r(41) = 0.44$, $p < .01$, and the tendency to engage in short-term mate poaching, $r(40) = 0.55$, $p < .001$ (i.e., stealing someone else's partner for a short-term sexual affair; see Fig. 4). It appeared that when short-term mating was more common at the national level, Emotional Investment was more commonly reported at the national level as well.

Mating strategies were more directly related to Emotional Investment by looking at the associations of sociosexuality, short-term mating interests, and short-term mate poaching with the Emotional Investment scale across all 10 world regions of the ISDP (see Table 5). Across some regions, individuals with more short-term oriented mating strategies expressed the predicted lower levels of Emotional Investment. For example, individuals from North America who reported more unrestricted sociosexuality reported lower levels of Emotional Investment, $r(3707) = -0.03$, $p < .05$. Similar results were observed within the world regions of South America, Eastern Europe, and Oceania. However, unrestricted sociosexual strategists from South/Southeast Asia and East Asia reported higher levels of Emotional Investment, contradicting the BSD Model. Moreover, individuals from Africa who were interested in short-term mating, $r(487) = 0.09$, $p < .05$, and who engaged in short-term mate poaching, $r(756) = 0.08$, $p < .05$, reported significantly higher levels of Emotional Investment. Overall, there was weak only support for the BSD Model predicting links between mating strategies and Emotional Investment levels.

3.3. Sex differences in Emotional Investment across cultures

Parental Investment Theory (Trivers, 1972) predicts that men will tend to exhibit lower levels of Emotional Investment than women across cultures. In terms of nation-specific magnitudes of effect (d; see Table 3), in 11 nations men were much lower than women on Emotional Investment with a sex difference "moderate to large" in magnitude (i.e., d of -0.50 or lower), in 26 nations men were somewhat lower than women on Emotional Investment with a sex difference "small to moderate" in size (d between -0.20 and -0.49), and in eight nations men were lower than women on Emotional Investment but this was only a "minimal" sex difference (d between -0.01 and -0.19). In three nations, men were either equal to or higher than women in Emotional Investment. In Bolivia, men and women were identical in their average levels of Emotional

Table 4
Levels of Emotional Investment related to sociocultural factors across nations of the international sexuality description project.

Sociocultural factors	*n*	Emotional Investment			
		National	Men	Women	Sex difference (*d*)
Cultural stress					
Low stress					
Human development index United Nations Development Programme (2001)	46	.31*	.29*	.32*	−.21
Gross domestic product United Nations Development Programme (2001)	46	.18	.12	.22	−.30*
High stress					
Infant Mortality United Nations Statistics Division (2001)	47	−.27*	−.25*	−.28*	.21
Childhood Malnutrition United Nations Population Division (2001)	21	−.37*	−.32	−.39*	.23
Pathogen Stress Gangestad and Buss (1993)	48	−.22	−.17	−.24*	.23*
Romantic attachment Schmitt, Alcalay, Allensworth et al. (2004)					
Secure attachment	48	.35**	.33**	.35**	−.13
Dismissive attachment	48	−.09	−.04	−.12	.21
Preoccupied attachment	48	−.46***	−.39**	−.51***	.35**
Fearful attachment	48	−.22	−.17	−.27*	.28*
Self-esteem					
RSES Schmitt and Allik (2005)	48	.54***	.52***	.53***	−.14
Self-worth Diener and Diener (1995)	18	.43*	.40*	.44*	−.19
Reproductive factors					
Fertility rate United Nations Development Programme (2001)	46	−.23	−.19	−.25*	.28*
Divorce rate United Nations Development Programme (2001)	24	.52**	.46*	.54**	−.29
Sociosexuality Schmitt (2005b)	43	.49***	.43**	.52***	−.29*
Short-term mating interests Schmitt (2005a)	43	.44**	.36**	.47***	−.33*
Mate poaching Schmitt, Alcalay, Allik et al. (2004)	42	.55***	.50***	.57***	−.20
Gender equality					
Gender development index UNDP (2001)	45	.31*	.29*	.32*	−.22
Gender empowerment measure UNDP (2001)	33	.35*	.26	.37*	−.31*
Sex-role ideology Williams and Best (1990)	9	.47	.41	.50	−.48
Cultural values Hofstede (2001)					
Individualism (versus Collectivism)	42	.31*	.25*	.32*	−.23
Power distance	42	−.18	−.14	−.19	.16
Uncertainty avoidance	42	.13	.14	.12	.04
Masculinity	42	−.14	−.20	−.11	−.13

UNDP = United Nations Development Programme; UNSD = United Nations Statistics Division; UNPD = United Nations Population Division; RSES = Rosenberg Self-Esteem Scale.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Investment ($d = 0.00$). In Indonesia ($d = 0.32$) and Malaysia ($d = 0.24$), men scored higher than women (though not significantly so). It is interesting that these two neighboring countries exhibit the same unexpected trend for men to have higher levels of Emotional Investment than women. In Indonesia, the reversed sex difference was primarily due to Indonesian women ($M = 5.73$) scoring much lower than the worldwide average for women ($M = 7.22$). Indonesian men ($M = 6.11$) were also below the worldwide average for men ($M = 6.73$), but not as low as Indonesian women. In Malaysia, the reversed sex difference was due to a combination of Malaysian men ($M = 6.67$) scoring about average for men and Malaysian women ($M = 6.36$) scoring below average women. Perhaps there is something restricting women's reporting of "Romantic" and "Loving" in these two cultures. It is worth noting that these two nations were also the only nations that did not exhibit a significant correlation of Emotional Investment with either Extraversion or Agreeableness. It is possible that in the languages of these two countries (Indonesian and Malay, respectively) ratings of the translated love-related adjectives of the Emotional Investment scale were not equivalent to those of the original English. In any event, the robust sex differences across nearly all of the nations of the ISDP represent a basic confirmation of Parental Investment Theory.

As seen in Table 3, statistically significant sex differences in Emotional Investment were nearly universal across the ISDP. Across 34 of the 48 nations, sex differences reached the level of statistical significance. Some of the instances of the sex difference failing to reach significance were due to relatively small sample sizes, with the magnitude of the sex difference still reaching the −0.20 level of *d*. For example, with statistical power set at 0.80 and statistical significance at 0.05, in order to ensure a sex difference of $d = -0.20$ would be found statistically significant, a sample of over 300 men and 300 women would have been necessary—a sample size present in only Canada and the United States.

In order to more properly gauge the universality of statistically significant sex differences with adequate power, we focused on the level of the 10 world regions of the ISDP (see Fig. 1). After encoding each nation as representative of North America, South America, Western Europe, Eastern Europe, Southern Europe, the Middle East, Africa, Oceania, South/Southeast Asia, or East Asia (for details on these groupings see Schmitt, Alcalay, Allik et al., 2002, 2004), we found a significant main effect of sex on Emotional Investment, $F(1, 15{,}214) = 312.96$, $p < .001$, with women scoring significantly higher than men across all world regions—North America, $t(3935) = -11.51$, $p < .001$, $d = -0.38$, South America, $t(690) = -4.42$, $p < .001$, $d = -0.33$, Western Europe, $t(2747) = -11.79$, $p < .001$, $d = -0.46$, Eastern Europe, $t(2476) = -9.79$, $p < .001$, $d = -0.39$, Southern Europe, $t(995) = -4.25$, $p < .001$, $d = -0.27$, the Middle East, $t(957) = -4.95$, $p < .001$, $d = -0.32$, Africa, $t(767) = -6.93$, $p < .001$, $d = -0.49$, Oceania, $t(894) = -6.49$, $p < .001$, $d = -0.43$, and East Asia, $t(1141) = -3.53$, $p < .001$, $d = -0.21$—except South/Southeast Asia, $t(612) = -1.13$, *ns*, $d = -0.09$ (see Fig. 1). Thus, we found sex interacted somewhat with world region in predicting Emotional Investment, $F(9, 15{,}214) = 4.20$, $p < .001$. We turn next to the issue of predicting the degree of sex differences in Emotional Investment across cultures.

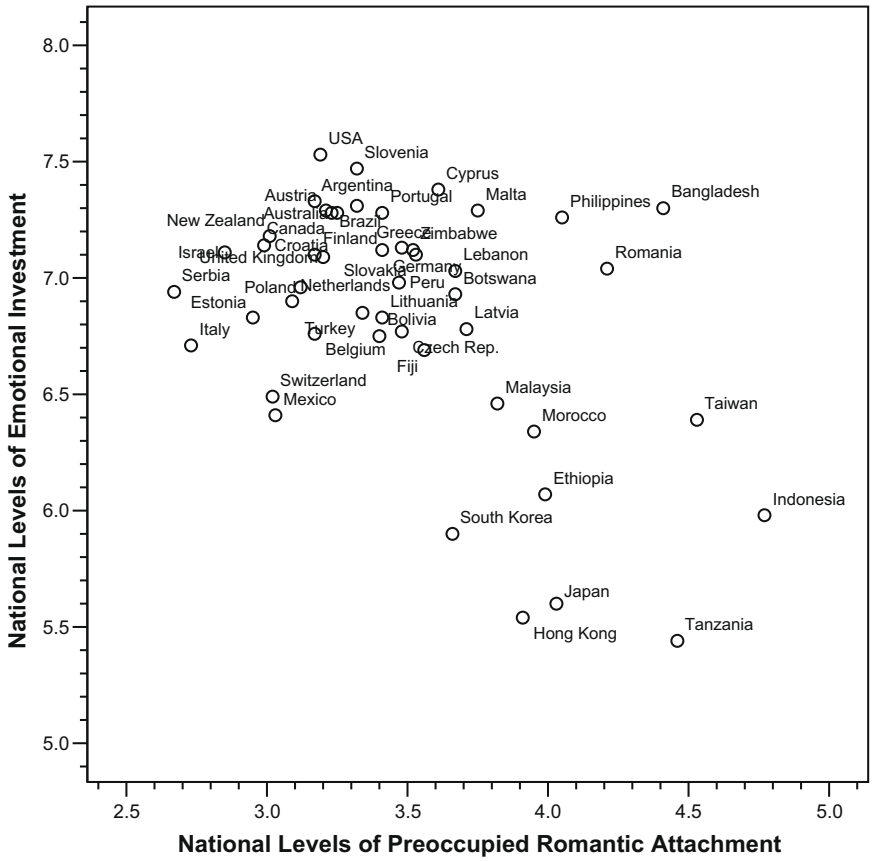

Fig. 2. Preoccupied romantic attachment related to Emotional Investment across the nations of the international sexuality description project, $r(46) = -0.46$, $p < .001$.

3.4. Variation in the degree of sex difference in Emotional Investment across cultures

3.4.1. The BSD Model predicts smaller sex differences in high stress cultures

As expected in cultures with high stress (e.g., Bolivia, Indonesia, and Malaysia), levels of Emotional Investment were significantly lower, especially among women (see Belsky et al., 1991; Schmitt, Alcalay, Allensworth et al., 2003). For example, high levels of Pathogen Stress were correlated with low levels of Emotional Investment among women, $r(48) = -.24$, $p < .05$, but were not significantly correlated with men's Emotional Investment, $r(48) = -.17$, with the result that sex differences in Emotional Investment were closer to zero in high Pathogen Stress cultures, $r(48) = .23$, $p < .05$. This basic pattern of results occurred across many indicators of stress, with higher cultural stress being linked to smaller sex differences in Emotional Investment, and lower stress (e.g., high human development) being linked to larger sex differences in Emotional Investment (see Table 4).

3.4.2. Social structural theory predicts smaller sex differences in progressive cultures

An additional theory for why some nations had smaller sex differences than others is Social Structural Theory (Eagly & Wood,

Table 5
Emotional Investment related to romantic attachment, self-esteem, and reproductive factors (controlling for sex and nation) within the 10 world regions of the international sexuality description project.

World regions	Romantic attachment				Self-esteem	Reproductive factors		
	S	D	P	F	RSES	SOI	STMI	MP
North America	.24***	−.16***	.08***	−.14***	.20***	−.03*	−.03*	−.01
South America	.16***	−.14***	.06*	−.05	.13***	−.07*	−.02	−.01
Western Europe	.17***	−.19***	.03*	−.14***	.21***	−.03	−.02	.04*
Eastern Europe	.14***	−.20***	.04*	−.14***	.12***	−.15***	−.08***	−.02
Southern Europe	.07**	−.14***	.08**	−.08**	.14***	−.04	−.05	−.05
Middle East	.19***	−.08**	.13***	−.05*	.11***	.02	−.05	−.01
Africa	.05	−.03	.00	−.08*	.23***	−.02	.09*	.08*
Oceania	.26***	−.18***	.07*	−.19***	.27***	−.06*	−.06*	−.01
South/Southeast Asia	.09**	−.09**	.01	−.08*	.16***	.17***	−.02	.13***
East Asia	.09**	−.02	.02	−.06*	.31***	.05*	.04	−.03

Note: S = secure attachment, D = dismissing attachment, P = preoccupied attachment, F = fearful attachment, RSES = Rosenberg Self-Esteem Scale, SOI = sociosexuality, STMI = short-term mating interests, MP = mate poaching.

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

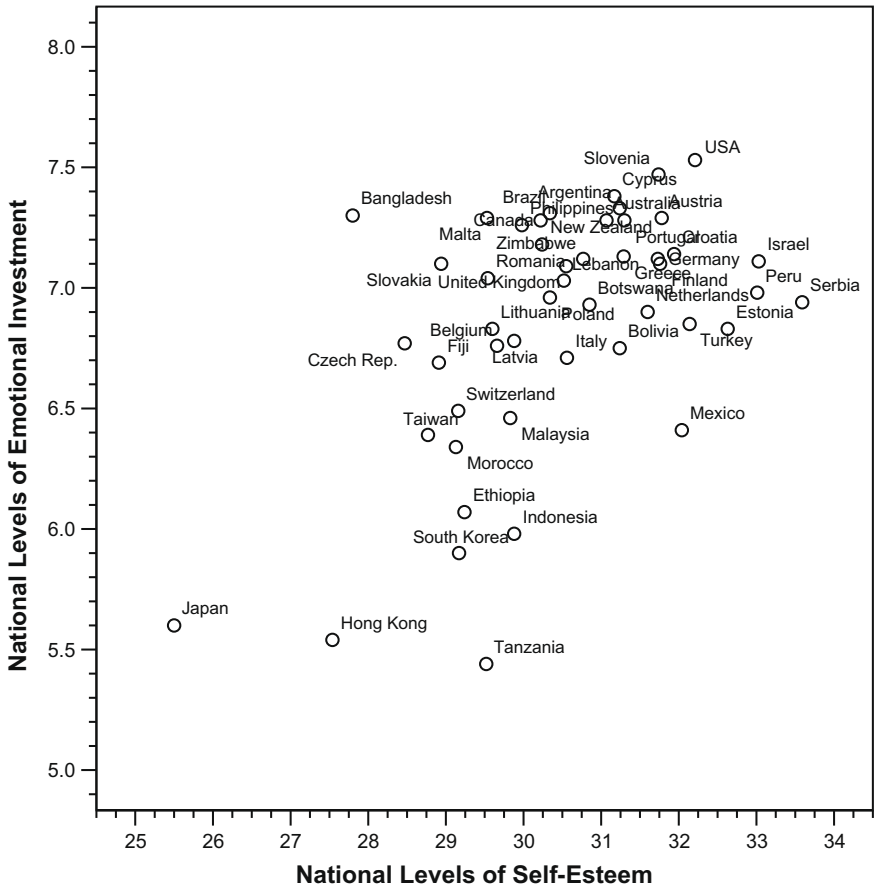

Fig. 3. Self-esteem related to Emotional Investment across the nations of the international sexuality description project, $r(46) = 0.54$, $p < .001$.

1999). This theory suggests that when a nation moves toward greater gender equality, sex differences in variables such as Emotional Investment will be eliminated, or at the very least strongly attenuated (Wood & Eagly, 2002). Of particular interest would be to determine whether such shifts are due to a lowering of Emotional Investment among women, an increase of Emotional Investment among men, or both—something not predicted a priori by Social Structural Theory.

The United Nations Statistics Division provides two key indicators of gender-related equality. The first is the gender development index (GDI), which is similar to the HDI but penalizes a nation if human development indicators are not made equally available to men and women. The second is the gender empowerment measure (GEM), which quantifies the overall degree of gender equality in three domains: economic participation and decision-making, political participation and decision-making, and power over economic resources. In both cases, national indexes of greater gender equality were positively associated with national levels of Emotional Investment (see Table 4). Increases in gender equality, it seemed, lead to increases in Emotional Investment at the national level.

Contrary to social structural expectations, sex differences in Emotional Investment were *larger* in nations with high gender equality (e.g., Switzerland, Australia, and Germany) and were *smaller* in nations with low gender equality (e.g., Turkey, South Korea, and Bolivia). Indeed, Switzerland is among the top 10 nations in terms of the GEM but had the largest sex difference in Emotional Investment across the nations of the ISDP ($d = -0.86$; see Fig. 5). These same trends were observed among the few nations where direct measures of sex-role ideology were measured by Williams and Best (1990). Higher scores on sex-role ideology (i.e., more modern or progressive gender equality beliefs) are marginally associated with higher Emotional Investment among men and women, and are linked with more negative or more extreme sex differences in Emotional Investment, $r(7) = -0.48$, $p < .10$ (see Table 4). What appears to be happening is that greater gender equality is associated with higher Emotional Investment among both men and women, but the accentuating effects of gender equality on Emotional Investment are greater among women, leading to larger levels of the naturally-occurring sex difference in Emotional Investment.

These findings run directly counter to Social Structural Theory (Eagly & Wood, 1999; Wood & Eagly, 2002), which assumes that "when men and women occupy the same specific social role, sex differences would tend to erode" (Eagly & Wood, 1999, p. 413). Instead, according to the ISDP dataset, more similar gender role experiences and equal levels of exposure to power and resources are associated with larger sex differences. Other cross-cultural studies (e.g., Costa, Terracciano, & McCrae, 2001; Williams & Best, 1990) have shown that more gender equality is associated with larger sex differences in self-perceptions (cf. Schmitt, 2005b). For example, in a large study of personality traits across 26 cultures, it was noted that "the social role model would have hypothesized that gender differences would be attenuated in progressive countries, when in fact they were magnified" (Costa et al., 2001, p. 329). One speculation offered by researchers is that in cultures where men and women are more socially differentiated, they fail to compare themselves across sex when completing self-report surveys. In cultures where men and women are free to inhabit different social roles, people may be more likely to compare themselves to both genders, and sex differences are thereby more

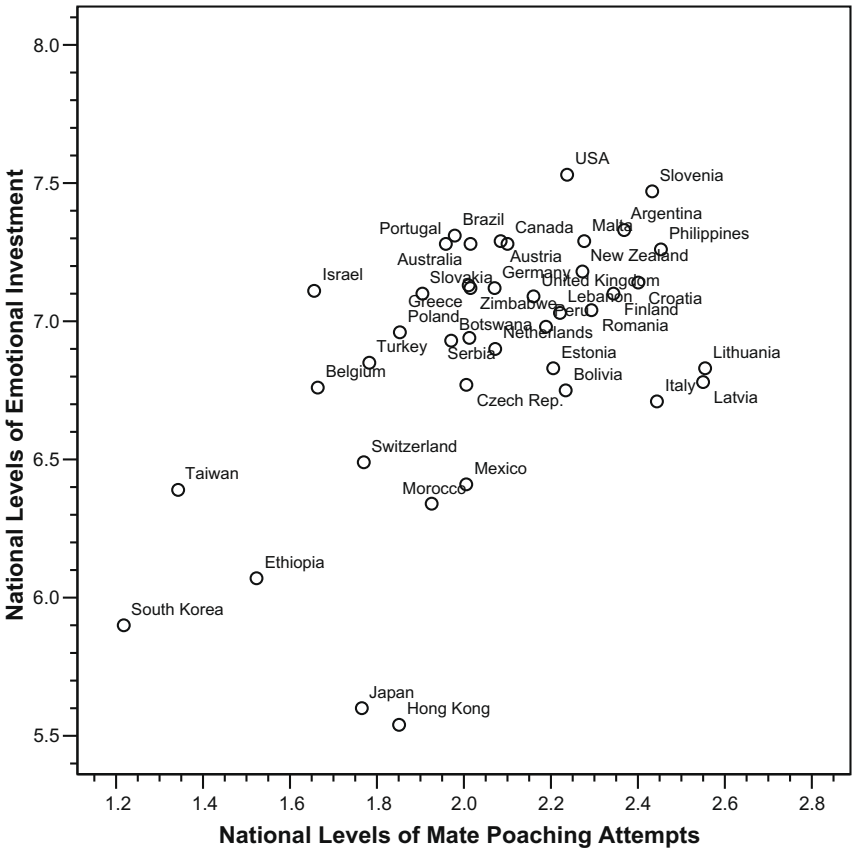

Fig. 4. Mate poaching related to Emotional Investment across the nations of the international sexuality description project, $r(40) = 0.55$, $p < .001$.

likely to surface. In any case, these findings represent an empirical disconfirmation of Social Structural Theory.

3.4.3. Demographic factors related to sex differences in Emotional Investment

We examined whether additional demographic factors had an influence on the degree to which men and women differed in Emotional Investment. We divided individuals across all samples into three non-overlapping age categories: 18–25 ($N = 9723$), 26–35 ($N = 1292$), and 36 and older ($N = 620$). We also divided individuals across all samples into five non-overlapping relationship statuses: Married ($N = 1013$), Living with Someone ($N = 669$), Dating One Person ($N = 5069$), Currently Single ($N = 4222$), and Never Had Sex ($N = 662$). These particular groupings of age and relationship status allowed us to evaluate with sufficient sample sizes the combined interactive effects of age and relationship status on Emotional Investment and on the degree to which men and women differed in Emotional Investment.

Overall, age category had no main effect on Emotional Investment levels, $F(2, 10{,}617) = 0.49$, with women being significantly higher in Emotional Investment across all ages. The effect of age category did significantly interact with sex, $F(2, 10{,}617) = 3.18$, $p < .05$, with Tukey's *HSD* suggesting sex differences were smaller in the 26–35 age category ($d = -0.22$) relative to those who were younger ($d = -0.51$) or older ($d = -0.59$). Relationship status had a significant main effect on Emotional Investment levels, $F(4, 10{,}617) = 4.29$, $p < .01$, with Tukey's *HSD* suggesting Emotional Investment significantly peaks when Dating One Person ($M = 7.29$, $SD = 1.13$); is somewhat lower among those who are Living with Someone ($M = 7.13$, $SD = 1.14$), Married ($M = 6.89$, $SD = 1.35$), or Currently Single ($M = 6.88$, $SD = 1.20$); and is significantly lower than that among those who have Never Had Sex ($M = 6.53$, $SD = 1.39$). Importantly, relationship status did not interact with sex, $F(4, 10{,}617) = 2.04$, suggesting that sex differences in Emotional Investment persist across relationship statuses. Finally, the 3-way interaction of age, relationship status, and sex on Emotional Investment levels was not significant, $F(8, 10{,}617) = 0.67$.

4. Conclusions

As part of the ISDP, convenience samples from 48 nations completed a self-report survey that included a simple adjectival measure of love called the "Emotional Investment" scale (Schmitt & Buss, 2000). This measure included seven love-related items, and possessed moderate to extensive internal reliability across all nations. Within most nations, high levels of Emotional Investment were associated with high levels of Extraversion and Agreeableness but were generally not associated with Neuroticism, providing evidence of the conceptual equivalence of love across cultures.

Cross-cultural variation in love confirmed the evolutionary theory that high levels of ecological stress—especially insensitive/inconsistent parenting, harsh physical environments, and economic hardship—lead children to form insecure attachment styles that culminate in low levels of Emotional Investment during adulthood (Belsky et al., 1991). People from cultures with lower stress—such as those with ample healthcare, education, and resources—tend to develop secure romantic attachment styles, have high self-esteem, and possess more emotionally investing romantic personalities (Schmitt, Alcalay, Allensworth et al., 2004). Emotional Investment tendencies were associated with fertility and promis-

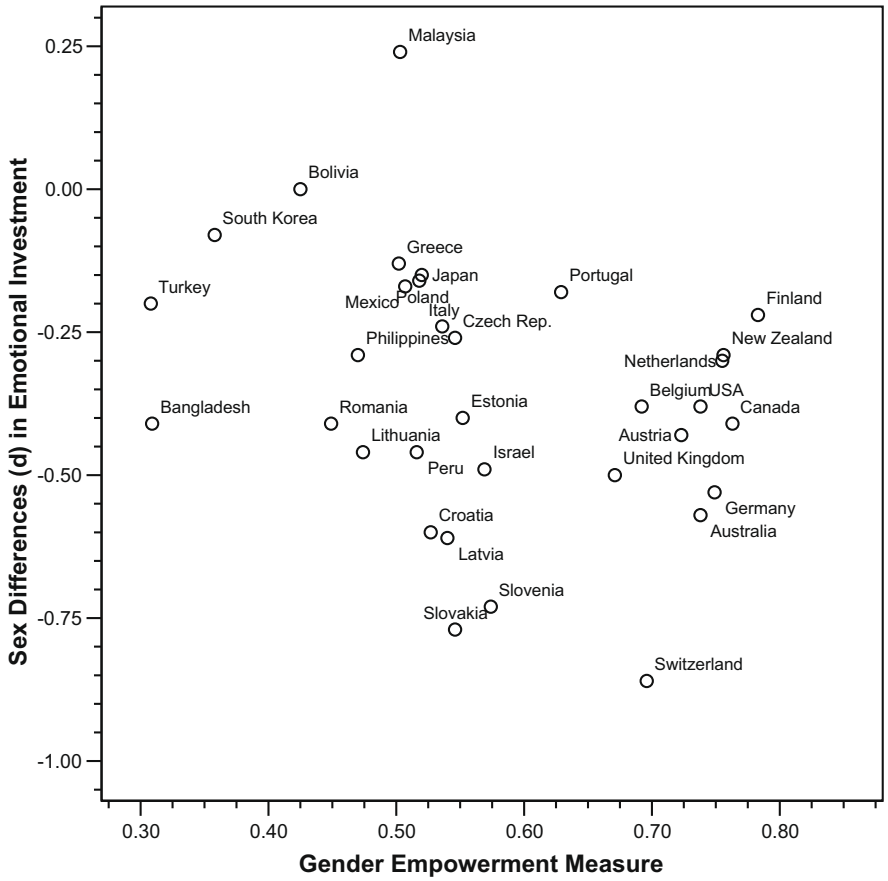

Fig. 5. Gender empowerment measure related to sex differences in Emotional Investment across the nations of the international sexuality description project, $r(33) = -0.31$, $p < .05$.

cuous sexual attitudes and behaviors, though these links were not always consistent with the BSD Model (Belsky et al., 1991) of the evolution of love.

Other factors are likely involved in the cross-cultural patterns of Emotional Investment observed across the ISDP. For example, levels of Emotional Investment were positively correlated with national levels of individualism, $r(40) = .31$, $p < .05$. However, the direction of this relationship ran counter to the expectation that love in terms of Emotional Investment would be expressed more in collectivist cultures (cf. Dion & Dion, 1996). In addition, love as Emotional Investment was unrelated to Hofstede's (2001) other dimensions of culture.

The courtship-related socialization practices across different cultures may have influenced the current findings (Medora et al., 2002). In South Korea, it is only lately that young adults have had to work on their Emotional Investment skills within the context of dating relationships during their college years. Until recently, marriages in several nations of the ISDP tended to be arranged. Thus, in western societies there is more freedom of choice with regard to love. In more traditional societies, however, familial obligations and sociocultural expectations dictate a person's love attitudes and expectations, and there is less freedom of choice in the domain of Emotional Investment and mating (see Hatfield & Rapson, 1996, 2002; Pasternak et al., 1997). Such influences may account for some of the national variations in Emotional Investment across the ISDP.

Although these nation-level love findings seem informative, several limitations of the ISDP must be considered. First, the translations of ISDP survey were not all conducted by professional translators, leaving open the question of translation quality. Second, even if the love items of the Emotional Investment scale have translation and conceptual equivalence, that does not guarantee that all items have full metric equivalence across cultures (van de Vijver & Leung, 2000). Third, evidence suggests that people from different cultures possess varying degrees of response biases, including the acquiescence bias, the negative item bias, and socially desirable responding (Schmitt & Allik, 2005). Thus, the present findings must be considered tentative until future work is conducted that takes these issues more fully into account. The consistent intracultural reliability and correlations between love and personality, as well as the international correlations among love and cultural indicators, provide some reassurance that similar constructs are being measured across languages and nations. Within this limited context, the present findings represent an advance in our empirical understanding of sex, personality, and cultures of love.

In conclusion, the present research accomplished five basic objectives. First, we documented that the Emotional Investment scale, originally derived from English adjective ratings in North American samples (Schmitt & Buss, 2000), replicates as a reliable scale across dozens of nations. Second, we found the Emotional Investment scale relates conceptually to relevant personality traits across cultures. Third, we tested an evolutionary theory (i.e., the BSD Model; Belsky et al., 1991) concerning the degree to which Emotional Investment should be relatively high versus low across cultures, finding that Emotional Investment relates in predictable ways to indexes of ecological stress and romantic attachment, but not to all the expected reproductive factors. Fourth, we found sex differences in Emotional Investment were nearly universal across a more diverse set of cultures than has heretofore been ex-

plored. Finally, we contrasted two theories concerning cross-cultural differences in the degree to which men and women differed in Emotional Investment. The BSD Model was largely supported, with higher cultural stress seeming to lower women's Emotional Investment levels down nearer to men's relatively low levels (hence, smaller sex differences exist in high stress cultures). Social Structural Theory was directly refuted, a similar result to a host of other research findings (e.g., Costa et al., 2001; Schmitt, Alcalay, Allensworth et al., 2003; Schmitt, Alcalay, Allik et al., 2004; Schmitt & Allik, 2005). Sex differences in Emotional Investment are larger in more gender egalitarian cultures—a finding that converges on the counter-intuitive idea that as men and women are provided more social and political freedom, their personality and romantic psychologies conspicuously diverge.

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