

Other Papers

Polish Psychological Bulletin
 2017, vol. 48(2) 237–249
 DOI - 10.1515/ppb-2017-0027

Magdalena Marzec*
 Andrzej Łukasik**

Love Styles in the Context of Life History Theory

Abstract: *The evolutionary function of love is to create a strong bond between the partners with reproduction in view. In order to achieve this goal, humans use various sexual/reproductive strategies, which have evolved due to specific reproductive benefits. The use of particular strategies depends on many factors but one of the most important is early childhood experiences, on which life history theory (LHT) focuses. John Lee (1973) identified 6 basic love styles: eros, ludus, storge, pragma, agape, and mania. Our goal was to check whether love styles may be treated as sexual/reproductive strategies in the context of LHT – slow or fast strategy. In our study (N = 177) we found that people who prefer the slow reproductive strategy are inclined to show passionate, pragmatic and friendly love, and those who prefer the fast strategy, treated love as a game. A low level of environmental stress in childhood results in preferring eros, storge and agape love styles, belonging to the slow strategy, and a high one results in preferring ludus, which belongs to the fast strategy. People representing eros, storge or pragma styles have restricted sociosexual orientation so they prefer long-term relationships, whereas those with the ludus style are people with unrestricted orientation, preferring short-term relationships. Besides, storge, agape and pragma seem to determine preferring qualities connected with parental effort in one's partner, mania – with mating effort, and eros – with both kinds of effort. No correlation was found between the love style and the number of children.*

Key words: *love styles, life history theory, sexual strategies, sociosexual orientation*

Introduction

Romantic love is an emotional and motivational state without which the evolution of our species would be hard to imagine. Helen Fisher (2007) even claims that romantic love is a drive. The evolutionary function of love is to create a strong bond between the partners with reproduction in view. Romantic love is defined as the constellation of behaviors, cognitions, and emotions associated with a desire to enter or maintain a close relationship with a specific other person” (Aron & Aron, 1991). In order to achieve this goal, humans use various strategies called sexual strategies, which have evolved due to specific reproductive benefits. Gangestad and Simpson (2000, p. 575) defined sexual strategies as “integrated sets of adaptations that organize and guide an individual’s reproductive effort. They influence how individuals select mates, how much mating effort they expend, how much parental effort they expend, and so on”. This notion was introduced by Buss and Schmitt (1993) and is used

on the ground of evolutionary psychology. In biology, however, the term of reproductive strategy is rather used. Kappeler (2012) defined reproductive strategies as a “set of behavioral, morphological, and physiological adaptations that facilitate access to potential mates, improve the chances of mating and fertilization, and enhance infant survival”. As the two notions are defined in a similar way, our article uses them interchangeably.

The use of particular strategies depends on many factors but one of the most important is early childhood experiences, on which the life history theory (LHT) focuses (see e.g. Belsky, 2010; Chisholm, Quinlivan, Petersen, & Coall, 2005; Vigil, Geary, & Byrd-Craven, 2005). Early childhood experiences include both the specific features of family environment, e.g. violence (Vigil et al., 2005), the absence of the father, or the kind of attachments (Belsky, 2010), and the external one, e.g. mortality in the local population (Chisholm, 1993; Griskevicius, Delton, Robertson, & Tybur, 2011). Such experiences are signals which direct a person’s later sexual strategies.

* Police Academy in Szczytno, Faculty of Administration, Marszałka Józefa Piłsudskiego 111, 12-100 Szczytno, Poland

** Department of Psychology, University of Rzeszów, Ks. Jąłowego 24, 35-010 Rzeszów, Poland

Romantic love is not a homogenous emotion: different love styles exist. John Lee (1973) identified 6 basic love styles: eros, ludus, storge, pragma, agape, and mania. Our goal is to check whether love styles may be treated as sexual strategies, that is, they serve the same purposes as sexual strategies, organizing the reproductive effort of an individual. This approach is not new (cf. Hendrick & Hendrick, 1991; 1995), but as far as we know, there are no studies applying Lee's classification of love styles in the context of life history theory.

Life history theory

According to biological life history theory (McArthur & Wilson, 1967; Pianka, 1970; Stearns, 1992; Wilson, 1975), both species and individuals choose the reproductive strategy on the basis of the environment in which they develop. The *r*-selected strategy means preferring quantity to quality of the offspring and lower parental investment, because parents' resources (with the assumption that they do not undergo any significant changes) are limited and must be divided into a higher number of children. The *K*-selected strategy means preferring quality to quantity, because a lower number of children results in assigning them greater portions of parents' investment. The *r* strategy is also called fast life history, and *K* – slow life history (e.g. Del Giudice, 2014; Figueredo, Cabeza de Baca, & Woodley, 2013; Gladden, Sisco, & Figueredo, 2008). Humans typically apply the *K*-selected strategy, but there is some variety among individuals regarding the preference of one strategy or the other (Rushton, 1985). The selection of a particular strategy depends on ecological factors in which the organism grows: the fast strategy develops in an unstable and unpredictable (e.g. fluctuation in food availability, high mortality rates), stressful environment, and the slow strategy, in stable and predictable one. The more recent version of LHT describes the allocation of bioenergetic and material resources (e.g. calories and nutrients) among divergent components of fitness. LHT assumes that reproductive strategies of individuals able to reproduce, involve the allocation of these resources of the organism to somatic effort aimed at survival (e.g. sustaining maintenance of one's body and brain functions, in humans also acquiring knowledge, education or skills) or reproductive effort devoted to the production and support offspring as vehicles for the individual's genes to the next generations (Figueredo, Vásquez, Brumbach, Sefcek, Kirsner, & Jacobs, 2005; Figueredo et al., 2006; Griskevicius et al., 2011). Reproductive effort includes mating effort – attracting and keeping a partner (e.g. intrasexual competition, and in the case of humans, e.g. tactics of keeping the partner in the relationship or jealousy) and parental effort, when resources are used to increase the offspring's chance of survival (e.g. the quality of parental care, attachment style in human families). High mating effort represents fast life history, manifested in the tendency towards increased reproduction, early puberty and a shorter life span, whereas high somatic effort and parental effort represent slow life history, connected with

slower ontogenetic development and a longer life span (Figueredo et al., 2013). The “slow” strategy is connected with high parental expenditure and preference for long-term relationships, whereas the “fast” one, with low parental expenditure and preference for short-term relationships (see Gladden et al., 2008). People with the slow strategy demonstrate restricted sociosexual orientation, and those with the fast one, unrestricted orientation (Dunkel, Mathes, & Decker, 2010; Peterson, Geher & Kaufman, 2011). *ALHB* (*Arizona Life History Battery*) and its shorter version – Mini-K (Figueredo et al., 2006; Figueredo, 2007; Figueredo et al., 2013) are used to investigate sexual strategies in the context of LHT.

It is believed that in the period from birth to the age of 5–7, family environment provides the child with various hints which allow them to “choose” their own reproductive strategy (Belsky, Steinberg, & Draper, 1991, p. 650). Draper and Harpending (1982) made the hypothesis that the absence of the father in early childhood results in earlier puberty in girls, since it is a hint that one should not expect paternal investment in the future. The hypothesis was the basis for the formation of BSD concept (Belsky, Steinberg, Draper), which emphasizes that in early childhood family stressors such as e.g. the absence of biological father, the lack of marital harmony or work difficulties lead to the development of insecure attachment, early puberty (early menstruation), promiscuous sexual behaviors and unstable, short relationships, whereas the presence of the father has the opposite consequences (Belsky, 2010; Belsky et al.). This correlation has been proved (Ellis & Garber, 2000; see also the meta-analysis by Webster, Graber, Gesselman, Crosier, & Schember, 2014).

The current research. Love styles as reproductive strategies

John Lee (1973) identified three basic love styles: eros, ludus, and storge. Eros is passionate love with a strong sexual component connected with the partners' physical attractiveness and the demand for exclusive devotion. Ludus, in turn, is treating love as a game played with different partners, oriented at receiving pleasure through sex, the style in which the partner's growing involvement in the relationship is perceived as a threat. Finally, storge is love based on friendship, without greater emotional raptures, peaceful and quiet, in which sex plays little or no role. The combination of these three basic love styles results in identification of secondary love styles: pragma (storge + ludus), agape (eros + storge), and mania (eros + ludus). The pragmatic style is characterized by calculation: the selection of a partner depends on meeting particular, sometimes predetermined, qualities (e.g. good origin, salary, professional perspectives etc.). In other words, the potential partner is “measured” with regard to the desired attributes. Agape, in turn, is an altruistic style, characterized by disinterestedness and sacrifice for the other person without expecting any rewards. The manic style is manifested by jealousy, obsessive thinking about the partner, possessiveness and lack of trust in their faithfulness.

The typology of love styles by Lee became the starting point for constructing the *Love Attitudes Scale* (LAS, Hendrick & Hendrick 1986; see also: Hendrick & Hendrick, 2007) describing 6 love styles. Later, a short form of LAS (LAS – SF; Hendrick, Hendrick, & Dicke, 1998) comprising 24 items was created. Both tools were used in the research. Frey and Hojjat (1998), referring to the typology of sexual scripts activated in sexual situations (Mosher, 1988) found that love styles are connected with the scripts: the ludic style proved to be negatively correlated with partner engagement, in which intimacy and carnal closeness is the most important, and all the other love styles are correlated positively with this script. Different studies show (see Hendrick & Hendrick, 2007) that the ludic style is positively correlated with sexual permissiveness, and passionate love with satisfaction with relationship (just like the friendly one) and with sexual responsibility. The other study (Fricker & Moore, 2002) also indicated, that eros correlates positively with satisfaction with the relationship, whereas ludus and mania correlate negatively with it. Eros and agape correlate positively with all three components of love identified by Sternberg (1986): passion, intimacy and commitment (Hendrick & Hendrick, 1989). Eros and agape are also the only love styles negatively correlated with the occurrence of conflicts in relationships (Hendrick & Hendrick, 1989), which is significant for the duration of the relationship. Moreover consistent results were obtained indicating gender differences: Women are more storge and pragmatic (Hendrick & Hendrick, 1986, 1995; Mandal, 2012; Tsirigotis, Gruszczyński, & Tsirigotis-Wołoszczak, 2010), men are ludus (Hendrick & Hendrick, 1986, 1995; Jonason & Kavanagh, 2010; Tsirigotis i in., 2010). For other styles, the overall picture emerging from the research is inconsistent. In one of them (Hendrick & Hendrick, 1986) men and women did not differ in terms of agape, but in other, men were more agape than women (Hendrick et al., 1998; also see Jonason & Kavanagh. 2010), It was similar in relation to other styles.

To sum up, the eros love style not only has a strong sexual component connected with the partners' physical attractiveness, but is also a predictor of the durability of relationship. Agape is similar in this last respect. Ludus seems to be the style which has negative influence on durability of relationship. Women and men prefer different love styles: in the former case, it is storge, pragma, in the latter – ludus. In other words, women prefer friendly and pragmatic love, and men rather treat it as a form of entertainment. It is possible to make a hypothesis that women prefer love styles which are related to the slow strategy, and men, related to the fast strategy.

Hypotheses

We made the following hypotheses:

1. People representing the slow reproductive strategy prefer love styles such as eros, agape, storge and pragma, and people with fast reproductive strategy – ludus and mania.

2. People brought up in family environment with a low level of stress will prefer love styles belonging to the slow strategy, and those brought up in high-stress environment, love styles belonging to the fast strategy.
3. Women prefer love styles which are related to the slow strategy, and men, to the fast one.
4. The combination of love styles with life history leads to particular reproductive consequences: eros, agape, storge and pragma mean low SOI-R scores (orientation at long-term relationships), whereas ludus, and mania – otherwise (orientation at short-term relationships).
5. Eros is characterized by bioenergetic mating effort + parental effort; agape, storge and pragma – parental effort, whereas ludus and mania – mating effort.
6. People preferring love styles connected with the fast strategy have more children than people who prefer love styles connected with the slow strategy.

Method

Participants

187 persons participated in the study, but finally 177 persons (90 women and 87 men) were considered: $M_{\text{age}} = 27.89$ years, $SD = 7.04$. The scores of 5 people were removed due to significant defects in the completion of the applicable instruments. The results of 4 other people were removed after applying the Grubbs test and the scatterplot analysis, due to the fact that they differed substantially from the typical values in the sample (outliers) in age, length of relationship and number of children. Before regression analyses, an analysis of standard residuals was carried out on the data to identify any outliers, which also indicated that one participant needed to be removed. The participants were undergraduate and postgraduate students of various courses of University of Rzeszów, University of Technology and Economics in Warsaw (UTH) in Warsaw and University of Warmia and Mazury in Olsztyn. The study was conducted in groups. All the participants gave their consent to participation in the study and could discontinue it at any moment. The study was approved by UTH Research Ethics Committee.

Procedure

The participants were given a written instruction in which it was described that the aim of the study was to find out how different factors influence the development of love in relationships between people. The participants were requested to provide answers referring to their present relationship. If they were not in a relationship at the moment, they were requested to refer to the latest relationship. Then the participants received a few questionnaires to fill in. We requested to do it honestly and pointed out that the research was anonymous.

They were also asked to provide the following information: age, sex, education (secondary: 81 people, higher: 87 people, 9 people did not provide the information), duration of relationship in months ($M = 63.24$, $SD = 64.68$), and number of children ($M = 0.37$, $SD = 0.79$). Then the participants filled in a set of instruments in the order

provided below. So as to ensure a higher level of anonymity, the sets were in envelopes; the participants placed the completed questionnaires in the envelopes and sealed them. After the study, the researchers answered any questions the participants had and ensured them that the results of the study would be announced on UTH's website after being processed. Statistical analyses were carried out with the use of SPSS 21.

Materials

Mini K (Figueredo et al., 2006)

The instrument was translated into Polish by a Polish translator. Mini-K is a short form of *ALHB* (*Arizona Life History Battery*; Figueredo, 2007) comprising 20 items, used to measure the *K* factor connected with life history. Mini-K includes items referring to such notions as insight, planning and cognitive control, relations between parents, attachment style and relations with the community, etc. Mini-K does not directly diagnose the respondent's ecological environment but it allows to draw general and indirect conclusions about it. When doing the questionnaire, the respondent underlines to what extent s/he agrees with statements on a scale from -3 to +3 (-3 = *strongly disagree*, +3 = *strongly agree*). The score of each participant is the total scores of his/her responses. Higher scores indicate the slow strategy, and lower scores, the fast one. The reliability index α of Mini-K is approx. 0.7 (Figueredo et al., 2006). In our research $\alpha = .73$.

Family Environment Stability Index (FESI)

This is an original retrospective instrument used to measure the degree of environmental stress occurring before the age 7, focused on the family environment. This age limit was adopted due to the importance of that period for the development of reproductive strategies (see the section on LHT). The aim of the construction and application of this instrument was to diagnose the environment more directly than it is possible using Mini-K (correlation between FESI and Mini-K: $r_s = .338$, $p < .001$). The authors referred to the results of studies on LH proving that unfavourable family environment determines fast reproductive strategy and favourable environment, the slow one. FESI includes 11 questions concerning issues like parents' health, their alcohol consumption, emotional relations within the family and the family's financial standing, etc. (see Appendix). Questions 1 and 2 were answered by circling the right response. These questions were assigned weights (in brackets), which are added to the scores of the other items. Questions from 3 to 11 were answered by giving rates on the scale from 1 to 7, e.g. "When I was under 7 years old, the relations between my parents were: *very warm* (7), *very cold* (1)". Calculating the scores for items 3 and 4, the values should be reversed: 1 – 7, 2 – 6, 3 – 5 etc. The environmental stress index is the total score of the answers: the higher score, the lower level of environmental stress in childhood. In our research $\alpha = .70$.

Love Attitudes Scale – Short Form (LAS-SF)

(Hendrick et al., 1998)

LAS-SF was translated into Polish by a Polish translator. It includes 24 questions arranged in 6 subscales referring to 6 love styles identified by John Lee. Reliability coefficients for subscales given by the authors of LAS-SF (study III) were between .69 (mania) and .85 (agape). The participant should respond to the items in each scale by choosing one of the five answers; the extreme values are: A – *strongly agree* (value 1), F – *strongly disagree* (value 5). The scores for each subscale are achieved by calculating the means. The lower score in the subscale, the higher preference for the corresponding love style. However, for the purposes of this research, the answers were re-coded, and thus higher scores correspond to higher intensity of a given love style. In our study, Cronbach's α for the whole scale was .79, and in the subscales, from .40 (ludus) to .88 (agape); the mean for all the scales is .70. We found that question 5: "I believe that what my partner doesn't know about me won't hurt him/her" affected the value of Cronbach's α for ludus, making it low. Probably this sentence has different connotations in Polish than in English¹. Once it was removed, α for the whole scale increased up to .70. In further analyses the authors used the scores for the scale with question 5 removed.

Sociosexuality Orientation Inventory – Revised (SOI-R)

(Penke & Asendorpf, 2008)

The instrument was translated into Polish by a Polish translator. SOI-R is used to measure orientation at short-term or long-term relationships. Apart from the general score (coded here as SOI-R-Global), SOI-R makes it possible to measure one's scores in three subscales: sociosexual behavior (SOI-R-BF), sociosexual attitude (SOI-R-AF), and sociosexual desire (SOI-R-DF). The domain of sexual behavior refers to actual behavior connected with taking uncommitted sex, attitude is the evaluative aspect of tendency to uncommitted sex, moral feelings connected with it and the assessment of emotional closeness in such situations, and the desire domain means the degree of sexual drive, arousal. High scores indicate unrestricted orientation, and low – restricted orientation. The psychometric values of SOI-R are even better than those of SOI (e.g. higher reliability Cronbach's α indices). In our study, Cronbach's α was .88 for the whole questionnaire and regarding subscales: .83 for sociosexual behavior, .77 for sociosexual attitude and .89 for sociosexual desire.

Partner's Qualities (PF)

These are two scales used to measure the partner's physical attractiveness (PA) and their predispositions as a parent (PP) (see Appendix). We assumed that the degree of preference for a given quality in the participant's partner reflects the orientation of their reproductive effort. Mating effort is the rate given to the statement: "what I value in my partner is that s/he is physically attractive", and parental effort is the rate given to the statement: "what I value in

¹ Pozycja 5 w języku polskim brzmiała następująco (Item 5 in Polish was): "Uważam, że to, czego mój partner/partnerka nie wie o mnie, nie może go/jej zranić".

my partner is that s/he is (or will be) a good parent". The participant marks the importance of each of these qualities on a scale from 1 (completely unimportant) to 7 (very important). The higher rating, the greater importance of the quality (higher effort oriented at this).

Table 1 presents descriptive statistics for the variables in the studied sample.

Table 1. Variables – descriptive statistics

Variables	M	SD	Skewness	Kurtosis
Age	27.89	7.04	1.114	.341
Duration of relationship (in months)	63.24	64.86	1.764	2.921
Number of children	0.37	0.79	2.609	8.202
PA	4.82	1.57	-.576	-.195
PP	5.77	1.5	-1.484	1.864
FESI	69.58	8.9	-.781	.239
Mini-K	28.81	11.97	-.311	-.259
SOI-R- BF	7.75	5.17	1.606	2.214
SOI-R-AF	12.15	7.16	-.382	-.824
SOI-R-DF	10.84	6.58	.687	-.654
SOI-R-Global	30.73	15.84	.632	-.442
Eros	16.37	2.91	-.709	-.036
Ludus	6.71	3.23	.183	-.593
Storge	12.88	4.51	.183	-.593
Pragma	10.02	3.67	.280	-.474
Mania	12.23	3.68	-.226	-.628
Agape	14.17	4.25	-.609	-.637

Notes. FESI = Family Environment Stability Index; Mini-K = the *K* factor connected with life history indicating the type of reproductive strategy; PA = evaluation of partner's physical attractiveness, PP = evaluation of; partner's parental qualities, SOI-R-BF = sociosexual behavior, SOI-R-AF = sociosexual attitude, SOI-R-DF = sociosexual desire, SOI-R-Global = global score for SOI-R; Love styles: Eros, Ludus, Storge, Pragma, Mania, Agape.

Results

The aim of our analyses was to find the answer to the question whether love styles may be treated as reproductive strategies determined by life history. Skewness and kurtosis test (Table 1) and Kolmogorov-Smirnov's one have shown departure from the normal distribution for most variables. In particular, a strongly positively skewed distribution was reported with respect to the variables of age, duration of

the relationship, number of children, and SOI-R-BF, which indicates that the sample were mainly young people with short relationships having few children and a low level of personal experience connected with taking uncommitted sex. Given the departure from the normal distribution, non-parametric *U* tests of Mann-Whitney and Spearman's r_s as well as regression analysis with bootstrapping were used in the calculations.

Hypothesis 1

First we checked whether there is a correlation between strategies resulting from life history and love styles. The indicator of life history strategies was the score achieved in Mini-K (higher scores indicate the slow strategy, and lower scores, the fast one). Women had significantly higher scores in Mini-K than men did: mean rank, respectively 100.96, 76.63, $U = 2839$, $p < .002$. The results of Spearman's r_s correlations between Mini-K and love styles are presented in table 2. Mini-K correlates positively with eros, storge, pragma and negatively with ludus. These correlations are weak or average. So the results show that people with higher Mini-K scores, preferring slow reproductive strategy, have the tendency to passionate, friendly and pragmatic love, and people with low scores (fast strategy) are inclined to treat love as a game. Thus, hypothesis 1 was confirmed with reference to most of the love styles, except for agape and mania.

Table 2. Spearman's r_s correlations between FESI, Mini-K and love styles

Variables	Eros	Ludus	Storge	Pragma	Mania	Agape
FESI	.155*	-.191**	.159*	.035	.001	.137*
Mini-K	.362**	-.185**	.316**	.198**	-.067	.103

Notes. FESI = Family Environment Stability Index; Mini-K = the *K* factor connected with life history indicating the type of reproductive strategy.

** $p \leq .007$ (one-tailed), * $p < .04$ (one-tailed)

Hypothesis 2

Then we checked whether the level of environmental stress in childhood has an influence on love style preference. In this study environmental stress in childhood was measured using the Family Environment Stability Index (FESI). FESI includes questions concerning issues like parents' health, their alcohol consumption, emotional relations within the family and the family's financial standing, etc.: the higher score, the lower level of environmental stress in childhood. FESI correlates positively but weakly with eros, storge, agape and negatively with ludus, (tab. 2). So the family environment with a low stress level promotes passionate, friendly and self-sacrificing love, and is negatively correlated with love treated as a game. Thus, hypothesis 2 had a partial confirmation: a low level of environmental stress in childhood results in preferring eros, storge and agape love styles, belonging to the slow strategy, and a high one results in preferring ludus, which belongs to the fast strategy.

In order to measure the influence of the predictor (Mini-K) on dependent variables (love styles), we carried out a series of linear regression analyses and performed bootstrapping to assume that our model works in samples other than the one from which we collected data. The results of regression analyses are presented in table 3. The regression analyses showed that the highest percentage of variance explained with the influence of Mini-K was obtained for eros (14.7%), storge (10.17%) and ludus (4.44%). Multiple regression analysis involving the introduction of an additional predictor FESI (as the indicator of environmental stress in childhood) into the model did not give any statistically significant results, which suggests that the main determinant of love styles was the Mini-K score indicating the type of reproductive strategy (slow vs. fast).

Table 3. The results of linear regression analysis with Mini-K as a predictor and love styles as dependent variables

Variables	B	SE B	β	Significance t
Eros	.95 ^a	.017	.389	$p < .001$
Ludus	-.060 ^b	.20	-.221	$p = .003$
Storge	.126 ^c	.027	.325	$p < .001$
Pragma	.056 ^d	.023	.184	$p = .014$

Notes. Only the scores which proved to be significant are presented. Mini-K = the K factor connected with life history indicating the type of reproductive strategy.

^a $R^2 = .151$, R^2 adjusted = .147, $F(1, 175) = 31.243$, $p < .001$

^b $R^2 = .049$, R^2 adjusted = .044, $F(1, 175) = 9.005$, $p = .003$

^c $R^2 = .112$, R^2 adjusted = .107, $F(1, 175) = 22.09$, $p < .001$

^d $R^2 = .034$, R^2 adjusted = .028, $F(1, 175) = 6.142$, $p = .014$

Bootstrapping procedure with 1,000 bootstrap iterations showed that the value of B for Mini-K (BCa 95%) were in the following range: for eros CL [.67, .120], $p < .001$, ludus CL [-.098, -.023], $p < .001$, storge CL [.077, .175], $p < .001$, pragma CL [.009, .102], $p = .015$. Because zero does not fall within the boundaries of any of our bootstrap confidence intervals, we can conclude Mini-K is a genuine predictor of love styles.

Hypothesis 3

It was assumed that women prefer love styles which are related to the slow strategy, and men, related to the fast strategy. This hypothesis was not confirmed. Only one difference occurred between the sexes as regards love styles: Men have a stronger preference for the agape style than women do: mean rank, respectively 103.15, 75.32, $U = 2684$, $p < .001$.

Hypothesis 4

Then we checked whether love styles were correlated with the kind of sociosexual orientation (preference of long-term vs. short-term relationships) evaluated with SOI-R. In our sample men had higher scores than women

concerning: sociosexual behavior: mean rank 110.64, 68.08, respectively, $U = 2032$, $p < 0.001$, sociosexual attitude: 112.45, 66.63, $U = 1874.5$, $p < 0.001$, sociosexual desire: 113.93, 64.9. $U = 1746$, $p < .001$, and global SOI-R score: 117.18, 61.76, $U = 1463$, $p < .001$. Table 4 presents the results of r_s Spearman's correlations between these variables. Negative correlations of eros, storge and the general score with the subscales of SOI-R (sociosexual behavior, sociosexual attitude and sociosexual desire) were found, the same was true for pragma with sociosexual attitude and the general score. Positive correlations were also found between ludus and all the subscales and the general SOI-R score. Regarding the other love styles, a positive – but weak – correlation was only found between mania and sociosexual desire behavior. Generally, then, the results indicate that eros and storge are connected with restricted sociosexual orientation and ludus with unrestricted orientation. The former case means preference for long-term relationships, and the latter, for short-term relationships. Thus, hypothesis 4 was mainly confirmed for eros, storge and ludus, and to a limited degree for mania and pragma.

Table 4. Spearman's r_s correlations between love styles and sociosexual orientation

Love style	SOI-R-BF	SOI-R-AF	SOI-R-DF	SOI-R-Global
Eros	-.192**	-.299**	-.382**	-.354**
Ludus	.379**	.332**	.367**	.412**
Storge	-.241**	-.268**	-.279**	-.313**
Pragma	-.054	-.151*	-.092	-.136*
Mania	-.077	-.070	.185**	.029
Agape	-.075	-.061	-.091	-.075

Notes. SOI-R-BF = sociosexual behavior, SOI-R-AF = sociosexual attitude, SOI-R-DF = sociosexual desire, SOI-R-Global = global score for SOI-R

* The correlation is significant at the level of $< .04$ (one-tailed).

** The correlation is significant at the level of $< .007$ (one-tailed).

The additional analysis of correlations between love styles and SOI-R-Global (assessing global orientation at short-term or long-term relationships) with consideration of sex was also carried out (tab. 5).

Correlation analysis showed that women's passionate, friendly, pragmatic, full of sacrifices love was negatively correlated with preference for short-term relationships, and love treated as fun – positively. In men also passionate, friendly and full of sacrifices love was negatively correlated with preference for short-term relationships, and ludic – positively. So hypothesis 4 received a stronger confirmation after the consideration of the variable of sex.

We also carried out an analysis with the use of linear regression to estimate the influence of love styles on SOI-R-Global score variance and performed bootstrap-

Table 5. Spearman's r_s correlation between love styles and sociosexual orientation with consideration of sex

Love styles	SOIR – R -Global	Significance	Love styles	SOIR – R -Global	Significance
Women			Men		
Eros	-.408	$p < .001$	Eros	-.410	$p < .001$
Ludus	.305	$p = .002$	Ludus	.471	$p < .001$
Storge	-.243	$p = .01$	Storge	-.434	$p < .001$
Pragma	-.298	$p = .002$	Pragma	-.107	$p = .162$
Agape	-.214	$p = .021$	Agape	-.342	$p = .001$
Mania	.92	$p = .195$	Mania	-.094	$p = .194$

ping with 1,000 bootstrap iterations to assume that our model works in samples other than the one from which we collected data. An analysis of standard residuals was carried out, which showed that the data contained no outliers. The regression proved, however, that a much better solution is to consider Mini-K in the model apart from love styles, because both predictors together explain a greater percentage of dependent variable variance (tab. 6).

ANOVA results indicate that all models are well-matched. Bootstrapping procedure showed, however, that

zero does not fall within the boundaries of bootstrap confidence intervals only for three models (tab. 6): Mini-K and eros, Mini-K and storge, Mini-K and ludus, so we can conclude that Mini-K and these love styles are genuine predictors of sociosexual orientation. The greatest percentage of variance in SOI-R explained with the influence of love style and Mini-K was obtained for ludus (33%), eros (22%) and storge (21%). Generally (as β values indicate) in case of all investigated love styles, a greater influence of Mini-K than love styles was observed, which suggests that SOI –

Table 6. The results of multiple regression with Mini-K and love styles as predictors and the general SOI-R Global score as the dependent variable

Model	<i>B</i>	SE <i>B</i>	β	<i>t</i>	Sig.	Bootstrap Confidence Intervals 95% BCa	
						Lower Limit	Upper Limit
Eros	-1.082 ^a	.393	-.199	-2.755	$p = .006$	-1.934	-.211
Mini-K	-.485	.095	-.367	-5.081	$p < .001$	-.686	-.283
Ludus	1.864 ^b	.310	.381	6.005	$p < .001$	1.254	2.430
Mini-K	-.476	.084	-.360	-5.679	$p < .001$	-.652	-.303
Storge	-.611 ^c	.249	-.177	-2.455	$p = .015$	-1.093	-.116
Mini-K	-.511	.094	-.386	-5.446	$p < .001$	-.712	-.299
Pragma	-.203 ^d	.298	-.047	-.682	$p = .496$	-.787	.348
Mini-K	-.576	.091	-.436	-6.311	$p < .001$	-.757	-.405
Mania	-.031 ^e	.293	-.007	-.104	$p = .917$	-.568	.440
Mini-K	-.588	.090	-.455	-6.558	$p < .001$	-.755	-.422
Agape	-.136 ^f	.255	-.036	-.532	$p = .596$	-.614	.350
Mini-K	-.582	.091	-.440	-6.424	$p < .001$	-.754	-.407

Notes. Mini-K = the *K* factor connected with life history indicating the type of reproductive strategy.

^a $R^2 = .231$, R^2 adjusted = .222, $F(2, 174) = 26.109$, $p < .001$

^b $R^2 = .335$, R^2 adjusted = .327, $F(2, 174) = 43.842$, $p < .001$

^c $R^2 = .224$, R^2 adjusted = .215, $F(2, 174) = 25.136$, $p < .001$

^d $R^2 = .199$, R^2 adjusted = .190, $F(2, 174) = 21.671$, $p < .001$

^e $R^2 = .197$, R^2 adjusted = .188, $F(2, 174) = 21.388$, $p < .001$

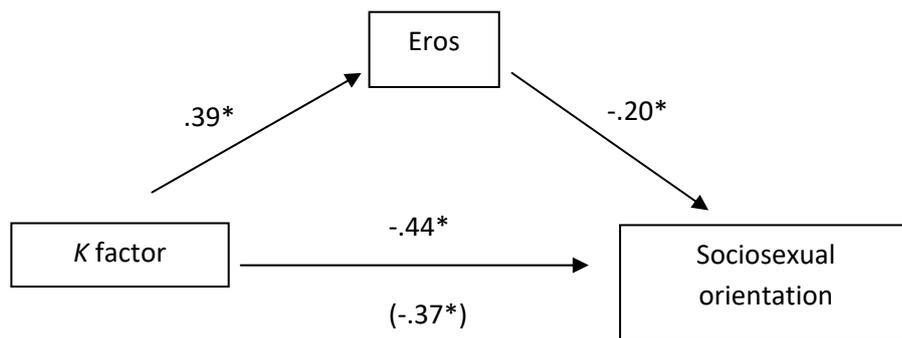
^f $R^2 = .199$, R^2 adjusted = .189, $F(2, 174) = 21.558$, $p < .001$

R scores, meaning the choice of restricted vs. unrestricted sociosexual orientation, mainly depend, not on the love style but on the K factor: people with the slow reproductive strategy rather tend to have long-term relationships, and people with the fast strategy, short-term relationships. However, in case of three models, β values were statistically significant for both Mini-K and love styles: eros, storge and ludus. Along with the bootstrapping results, it suggest the existence of mediation between the type of reproductive

strategy as a predictor of the listed styles of love as a mediator and sociosexual orientation as a dependent variable. It was therefore decided to test the mediation hypothesis by mediation analysis in three steps using regression according to the approach proposed by Baron and Kenny (1986) supplemented by Sobel test. The analysis results are shown in figures 1–3.

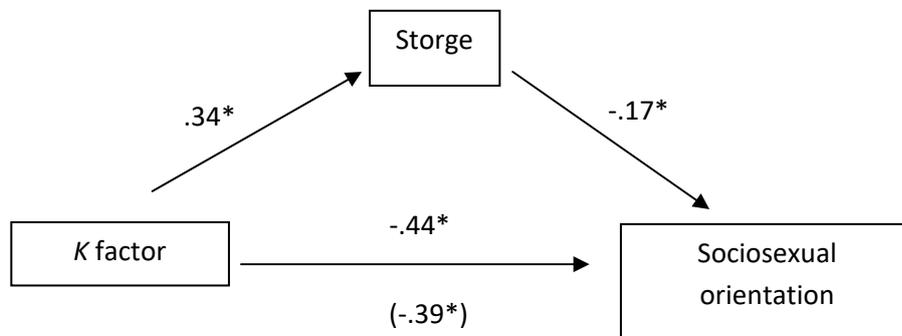
Regression model turned out to be a good fit to the data and pointed out that the slower reproductive strategy,

Figure 1. Mediation model for the influence of K- factor reproductive strategy (Mini-K result) on the sociosexual orientation (SOI-R Global result) with eros love style mediator



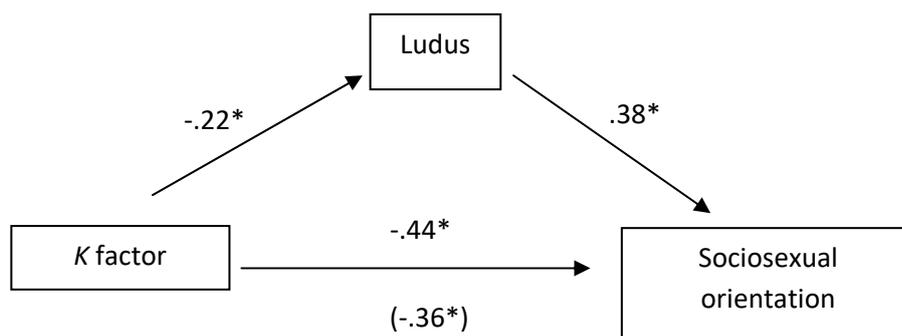
Note: * $p < .01$

Figure 2. Mediation model for the impact of K- factor reproductive strategies (Mini-K score) on sociosexual orientation (SOI-R Global result) with the storge love style mediator



Note: * $p < .05$

Figure 3. Mediation model for the impact of K- factor reproductive strategy (Mini-K score) sociosexual orientation (SOI-R Global result) with the ludus love style mediator



Note: * $p < .05$

the less focus on sociosexual non-restrictive orientation, expressed in the short-term relationship preferences ($\beta = -.44, p < .001$). The relationship between reproductive strategy and eros love style mediator also proved to be significant ($\beta = .39, p < .001$). This means that people with slow reproductive strategy prefer the type of eros love. Allowance for the simultaneous effect of a mediator and reproductive strategy for the sociosexual orientation, slightly decreased the influence of the independent variable K – factor on the dependent variable of sociosexual orientation ($\beta = -.37, p < .001$), confirming the existence of mediation. It also showed a significant effect of the eros love style mediator on the sociosexual orientation, though it was not too strong ($\beta = -.20, p = .006$): those who prefer the eros love type have less tendency to have short-term relationships. The result indicating the eros love mediation was confirmed by Sobel test ($Z = 2.44, p = .012$), but it should be noted that the effect of the mediation ($a \times b$) is small (.08).

The same analysis was carried out in relation to the storge love style (Figure 2). Directions of the described dependencies proved to be the same as in the case of eros love style mediator. The result indicating the storge type of love mediation was confirmed by Sobel test ($Z = 2.17, p = .030$), but the effect of mediation ($a \times b$) is small (.06).

In the end the analysis of mediation in relation to the ludus love style mediator was conducted (Figure 3).

Regression model turned out to be a good fit to the data and pointed out that the slower reproductive strategy, the less focus on sociosexual non-restrictive orientation expressed in the short-term relationships preferences ($\beta = -.44, p < .001$). The relationship between reproductive strategy and the ludus love style mediator also proved to be significant ($\beta = -.22, p = .003$). This means that people with slower reproductive strategies are less likely to have a tendency for the ludus type of love. Taking into account the simultaneous effect of the mediator and reproductive strategy on the sociosexual orientation decreased slightly the impact of the K – factor variable, but the impact was still significant ($\beta = -.36, p < .001$). It also showed a significant effect of the ludus love style mediator on the sociosexual orientation ($\beta = .38, p < .001$): people who prefer ludus love type have a greater tendency to enter into short-term relationships. The result indicating the ludus type of love mediation was confirmed by Sobel test ($Z = 2.68, p = .007$), but the effect of the mediation ($a \times b$) is small (.08).

Summing up, in all three cases, according to the results of the classical analysis of variance (Tab. 6), the strongest predictor of the sociosexual orientation was the reproductive strategy tested by Mini-K: the slower reproductive strategy, the less focus on entering into short-term relationships. The introduction of mediators in the form of love styles does not alter this relationship. We are dealing with partial mediation, then. In case of the mediators – eros and storge love styles – the slower reproductive strategy, the greater preference for these styles and lower non-restrictive sociosexual orientation. In case of ludus love style mediator, the correlations are the opposite:

the slower reproductive strategy, the less preference for this style of love and higher non-restrictive sociosexual orientation. The mediation effects, however, are minor.

Hypothesis 5

Our aim was also to check whether love styles correlate with a particular type of bioenergetic effort in terms of LHT, i.e. mating or parental effort, operationalized as the rate given to the statement describes the participant's partner physical attractiveness or predispositions as a parent. In the studied sample men achieved higher scores than women concerning the evaluation of partner's physical attractiveness: mean rank 104.30, 74.21, respectively, $U = 2593.5, p < .001$ Spearman's r_s correlation results between the love style and partner's qualities being the measure of bioenergetic effort are presented in table 7. These correlations are weak or average. Eros, mania correlate positively with partner's physical attractiveness, and eros, storge pragma and agape, with parental investment. Thus, as it was assumed, love styles belonging to the slow strategy are connected with preferring the qualities of a "good parent" in one's partner. Eros correlates with physical attractiveness and parental investment, just as we expected. As for mania, it belongs to the fast strategy and correlates positively with preferring physical attractiveness in the partner, as expected. As for the other love styles, we were not able to confirm the hypothesis. Another analysis was also carried out with consideration of sex: in women, there was a positive correlation between eros and parental investment ($r_s = .251, p = .009$), as well as pragma and parental investment ($r_s = .423, p < .001$). In men, pragma also correlated positively with parental investment ($r_s = .298, p = .003$, just like storge ($r_s = .273, p = .005$) and agape ($r_s = .262, p = .007$); in the case of eros there was a correlation with physical attractiveness ($r_s = .260, p = .008$), just like in case of mania ($r_s = .299, p = .002$). Generally, then, in our sample women and men who expressed various styles of love preferred the qualities of a good parent rather than physical attractiveness in their partners.

Table 7. Spearman's r_s correlations between love styles and bioenergetic effort connected with life history

Love style	PA	PP
Eros	.145*	.163*
Ludus	.041	-.054
Storge	-.027	.178*
Pragma	.036	.362**
Mania	.176*	.032
Agape	.092	.146*

Notes. PA = evaluation of partner's physical attractiveness, PP = evaluation of partner's parental qualities.

** $p \leq .009$ (one-tailed), * $p < 0.03$ (one-tailed)

Hypothesis 6

No correlation was found between the love style and the number of children. Because in the study population the number of children was very low, an additional analysis was carried out by isolating two groups in terms of a variable number of children, “no children” and “one or more children.” The results of the Mann-Whitney test, also did not show the existence of any differences in love styles between the two groups contrasted in such a way.

Discussion

The presented research allowed to confirm a part of our hypotheses. So we do not have sufficient basis for claiming that love styles are sexual strategies. Still, on the basis of the obtained data we can create a kind of global picture of correlations. People who prefer the slow reproductive strategy are inclined to passionate, pragmatic and friendly love, and those who prefer the fast strategy, to love treated as a game. A low level of environmental stress in childhood (assessed by the Family Environment Stability Index) seems to shape the loves styles we associate with the slow reproductive strategy, and a high one, the ludic love style. What is important, people representing eros, storge or pragma styles have restricted sociosexual orientation, preferring long-term relationships, and those with the ludus style are people with unrestricted orientation, preferring short-term relationships. To be more precise: negative eros, storge correlations with the subscales of SOI-R suggest that these love styles are connected with less frequent uncommitted sexual experiences, greater need for closeness before sexual engagement as well as lower sexual arousal and interest. The same is true for pragma: this style is connected with greater need for closeness before sexual engagement. Then, positive correlations between ludus and all the subscales and the general SOI-R score suggest that people who treat love as a form of game have more casual sexual experiences, lower need of emotional involvement before taking up sex and demonstrate higher sexual interest and higher level of sexual arousal. Besides, storge, pragma and agape seem to determine preferring qualities connected with parental effort in one’s partner, mania – with mating effort, and eros – with both kinds of effort. Therefore, the discussed love styles may be treated as components of reproductive strategies resulting from life history. However, they are not very strong. This is indicated by the obtained correlations (weak or average), multiple regression and mediation analysis with regression results: love styles do not individually determine reproductive strategies but are rather an addition to various factors which shape the strategies and which are measured with the *K* factor.

It was not clearly confirmed that mania belongs to the fast strategy (except for certain isolated data, e.g. positive correlation with the subscale of sociosexual desire in SOI-R or preference for the partner’s physical attractiveness). The essence of the problem seems to be that this style is actually a mixed one: just like in the research by the authors of LAS (Hendrick & Hendrick, 1986), in our research mania correlated positively with pragma ($r_s = .186$,

$p = .007$) and agape ($r_s = .213$, $p < .001$). It seems, then, that on the one hand mania has a strong sexual component with concentration on partner’s physical features, which is typical of the fast strategy, but on the other hand it has some characteristics typical of the slow strategy: inclination to pragmatism and devotion (in our study we indeed found a correlation between pragma and agape ($r_s = .172$, $p = .011$).

We did not manage to confirm the hypothesis that people with love styles connected with the fast reproductive strategy have more children than people representing love styles connected with the slow reproductive strategy. In the investigated sample, the mean age was 27.89 years old, $SD = 7.04$, so the participants were young people, students or graduates. Generally, in terms of life history theory, they are people who prefer somatic effort to reproductive effort; the mean number of children in the sample is only 0.4.

We did not manage to confirm the hypothesis that women would prefer love styles connected with the slow strategy and men, with the fast one. The only difference concerned the agape style, for which men had higher scores than women, which is in agreement with other research results (Jonason & Kavanagh, 2010; Sprecher et al., 1994). In this case we can speculate it is a specific cultural pattern being the echo of courtly love common in the Medieval Europe, in which a man makes sacrifices for his chosen one (Oatley & Jenkins, 2003). It can also be assumed that the tendency to show altruistic love – greater in men than in women – is connected with conditional (and slow) reproductive strategy, i.e. it is a response to women’s expectations. As a result of complex social and economic processes in Poland started in the 80s. of the previous century, women have achieved much greater social and economic independence and forced men to meet certain expectations, e.g. to limit their professional ambitions, greater commitment to the education of children and housekeeping, so that a woman could at the same time pursue her own educational plans and career. A relationship model in which there is a right to a parallel self-accomplishment of partners, as well as sharing care is especially evident in young women with tertiary education (Beisert, 2006). Another explanation, however, is also possible, going beyond specific cultures: generally, men’s love expressed through a willingness to sacrifice and placing the partner’s good over their own may be desired by women, because it is a very serious signal of a psychological investment in a relationship. Agapic love upgrades women building their sense of security and giving them a kind of guarantee for a stable relationship. Thus, men who are agapic are more likely to be chosen as a partner. It is worth noting that manipulation of tactics indicative of emotional involvement during mate poaching, which means striving for a partner who is already in a relationship, are judged to be more effective for men than women (Schmitt & Buss, 2001), which may indicate that men intentionally use preferences of women to men ready to sacrifice, for their own reproductive purposes.

Data replicating the findings of other studies have also been obtained. First, people with the slow strategy demonstrated restricted sociosexual orientation, preferring

long-term relationships, and those with the fast strategy, unrestricted orientation, preferring short-term relationships (cf. Dunkel et al.; Peterson et al., 2011). Second, men proved to be more sociosexually unrestricted than women (cf. Penke & Asendorpf, 2008), demonstrated stronger preference for the females' physical characteristics (cf. Sprecher et al., 1994), and achieved lower scores of the *K* factor (cf. Figueredo et al., 2005).

Limitations and future directions

There are at least three limitations of our study. Two of them refer to hypothesis 6, that people preferring love styles connected with the fast strategy have more children than people who prefer love styles connected with the slow strategy. Firstly, the limiting factor is the age of the respondents. Although the average age was approx. 28 years, and one would expect that the subjects being in their reproductive years will have children, it turned out that in the study group the average number of children was only 0.4. Low fertility rates in the study group basically made it impossible to verify hypothesis 6. Poland has witnessed a systematic increase in the age of women giving birth. According to the data from the Central Statistical Office (2015), the median age of women giving birth to a child in 2014 was 29.5 years. This means that in future studies older people should be taken into account.

Secondly, as stated earlier, somatic effort prevailed in the respondents, being expressed in acquiring education, which inhibited decisions of having a first or second child. Future research should therefore differentiate the group tested in respect of education variable.

Thirdly, the study did not include the kind of relationship (eg. marriage, informal relationship) and only focused on the duration of the relationship. Type of relationship can be an important variable influencing the choice of love style. It has been shown for example (See. Mandal, 2012) in groups of so-called traditional marriages and partnerships, that there were differences in the intensity and kind of tactics to influence the partner. Because such tactics are associated with styles of love (Mandal, 2012), we can therefore assume that the latter will also depend on the kind of relation in the relationship.

References

- Aron, A.P., & Aron, E.N. (1991). Love and sexuality. In K. McKinney & S. Sprecher (Eds.), *Sexuality in close relationship* (pp. 25–48). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Beisert, M. (2006). Przemiany współczesnej rodziny polskiej [Transformations of the contemporary Polish family]. *Rocznik Lubuski*, *32*, 19–37.
- Belsky, J. (2010). Childhood experience and the development of reproductive strategies. *Psicothema*, *22*, 28–34.
- Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, *62*, 647–670.
- Buss, D.M., & Schmitt, D.P. (1993). Sexual Strategies Theory: An evolutionary perspective on human mating. *Psychological Review*, *100*, 204–232.
- Chisholm, J.S. (1993). Death, hope, and sex: Life-history theory and the development of reproductive strategies. *Current Anthropology*, *34*, 1–24.
- Chisholm, J.S., Quinlivan, J.A., Petersen, R.W., & Coall, D.A. (2005). Early stress predicts age at menarche and first birth, adult attachment, and expected lifespan. *Human Nature*, *16*, 233–265.
- Del Giudice, M. (2014). Early stress and human behavioral development: Emerging evolutionary perspectives. *Journal of Developmental Origins of Health and Disease*, *5*, 270–280.
- Draper, P., & Harpending, H. (1982). Father absence and reproductive strategy: An evolutionary perspective. *Journal of Anthropological Research*, *38*, 255–273.
- Dunkel, C., Mathes, E., & Decker, M. (2010). Behavioral flexibility in life history strategies: The role of life expectancy. *Journal of Social, Evolutionary, and Cultural Psychology*, *4*, 51–61.
- Ellis, B.J., & Garber, J. (2000). Psychosocial antecedents of variation in girls' pubertal timing: maternal depression, stepfather presence, and marital and family stress. *Child Development*, *71*, 485–501.
- Figueredo, A.J. (2007). *The Arizona Life History Battery*. Retrieved from: <http://www.u.arizona.edu/~ajf/alhb.html>
- Figueredo, A.J., Cabeza de Baca, T., & Woodley, M.A. (2013). The measurement of human life history strategy. *Personality and Individual Differences*, *55*, 251–255.
- Figueredo, A.J., Vásquez, G., Brumbach, B.H., Sefcek, J.A., Kirsner, B.R., & Jacobs, W.J. (2005). The K-Factor: Individual differences in life history strategy. *Personality and Individual Differences*, *39*, 1349–1360.
- Figueredo, A.J., Vásquez, G., Brumbach, B.H., Schneider, S.M.R., Sefcek, J.A., Tal, I.R., Hill, D., Wenner, C.J., & Jacobs, W.J. (2006). Consilience and life history theory: From genes to brain to reproductive strategy. *Developmental Review*, *26*, 243–275.
- Fisher, H. (2007). Popęd miłości – neuronalny mechanizm doboru partnera. In R.J. Sternberg, & K. Weis (Eds.), *Nowa psychologia miłości [The new psychology of love]* (pp. 133–175). Taszów: Biblioteka Moderatora.
- Frey, K., & Hojjat, M. (1998). Are love styles related to sexual styles? *The Journal of Sex Research*, *35*, 265–271.
- Fricker, J., & Moore, S. (2002). Relationship satisfaction: the role of love styles and attachment styles. *Current Research in Social Psychology*, *7*, 182–204.
- Gangestad, S.W., & Simpson, J.A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, *23*, 573–587.
- Gladden, P.R., Sisco, M., & Figueredo, A.J. (2008). Sexual coercion and life history strategy. *Evolution and Human Behavior*, *29*, 319–326.
- Griskevicius, V., Delton, A.W., Robertson, T.E., & Tybur, J.M. (2011). Environmental contingency in life history strategies: The influence of mortality and socioeconomic status on reproductive timing. *Journal of Personality and Social Psychology*, *100*, 241–254.
- Główny Urząd Statystyczny (2015). *Dzieci w Polsce w 2014 roku. Charakterystyka demograficzna [Central Statistical Office of Poland (2015). Children in Poland in 2014. Demographic characteristics]*. Retrieved from <http://stat.gov.pl/obszary-tematyczne/ludnosc/ludnosc/dzieci-w-polsce-w-2014-roku-charakterystyka-demograficzna,20,1.html>
- Hendrick, C., & Hendrick, S.S. (1986). A theory and method of love. *Journal of Personality and Social Psychology*, *50*, 392–402.
- Hendrick, C., & Hendrick, S.S. (1989). Research on love: Does it measure up? *Journal of Personality and Social Psychology*, *56*, 784–794.
- Hendrick, C., & Hendrick, S.S. (1991). Dimensions of love: A sociobiological perspective. *Journal of Social and Clinical Psychology*, *10*, 206–230.
- Hendrick, S.S., & Hendrick, C. (1995). Gender differences and similarities in sex and love. *Personal Relationships*, *2*, 55–65.
- Hendrick, C., & Hendrick, S.S. (2007). Taksonomie miłości. In R.J. Sternberg, & K. Weis (Eds.), *Nowa psychologia miłości [The new psychology of love]* (pp. 225–255). Taszów: Biblioteka Moderatora.
- Hendrick, C., Hendrick, S.S., & Dicke, A. (1998). The love attitudes scale: Short form. *Journal of Social and Personal Relationships*, *15*, 147–159.

- Jonason, P.K., & Kavanagh, P. (2010). The dark side of love: The Dark Triad and love styles. *Personality and Individual Differences*, 49, 606–610.
- Kappeler, P.M. (2012). Male reproductive strategies. *Nature Education Knowledge*, 2, 82. Retrieved from <http://www.nature.com.zhongjivip.net/scitable/knowledge/library/male-reproductive-strategies-71224983>
- Lee, J.A. (1973). *Colours of love: An exploration of the ways of loving*. Toronto: New Press.
- Mandal, E. (2012). *Miłość, władza i manipulacja w bliskich związkach [Love, power and manipulation in close relationships]*. Warszawa: WN PWN.
- McArthur, R.H., & Wilson, E.O. (1967). *The theory of island biogeography*. Princeton, NJ: Princeton University Press.
- Mosher, D.L. (1988). Sexual path preferences inventory. In C.M. Davis, W.L. Yarber, & S.L. Davis (Eds.) *Sexuality related measures: A Compendium* (pp. 188–192). Lake Mills, JA: Graphic Publications.
- Oatley, K., & Jenkins, J.M. (2003). *Zrozumieć emocje [Understanding emotions]*. Warszawa: PWN.
- Penke, L., & Asendorpf, J.B. (2008). Beyond global sociosexual orientations: A more differentiated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of Personality and Social Psychology*, 95, 1113–1135.
- Peterson, A., Geher, G., & Kaufman, S.B. (2011). Predicting preferences for sex acts: which traits matter most, and why? *Evolutionary Psychology*, 9, 371–389.
- Pianka, E.R. (1970). On r- and K-selection. *American Naturalist*, 104, 592–596.
- Rushton, J.P. (1985). Differential K theory: The sociobiology of individual and group differences. *Personality and Individual Differences*, 6, 441–452.
- Schmitt, D.P., & Buss, D.M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing relationships. *Journal of Personality and Social Psychology*, 80, 894–917.
- Sprecher, S., Aron, A., Hatfield, E., Cortese, A., Potapova, E., & Levitskaya, A. (1994). Love: American style, Russian style, and Japanese style. *Personal Relationships*, 1, 349–369.
- Stearns, S.C. (1992). *The evolution of life histories*. Oxford: Oxford University Press.
- Sternberg, R.J. (1986). A triangular theory of love. *Psychological Review* 93, 119–135.
- Tsirigotis, K., Gruszczyński, W., & Tsirigotis-Wołoszczak, M. (2010). Płciowe (rodzajowe) zróżnicowanie typów przeżywanej miłości [Sex (gender) differentiation of love types experiencing]. *Seksuologia Polska*, 8, 26–29.
- Vigil, J.M., Geary, D.C., & Byrd-Craven, J. (2005). A life history assessment of early childhood sexual abuse in women. *Developmental Psychology*, 41, 553–561.
- Webster, G.D., Graber, J.A., Gesselman, A.N., Crosier, B.S., & Schember, T.O. (2014). A life history theory of father absence and menarche: A meta-analysis. Invited resubmission. *Evolutionary Psychology*, 12, 273–294.
- Wilson, E.O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Harvard University.

Appendix

Family Environment Stability Index

The questions below refer to issues connected with your family. We would like to know some things about your family when you were a child *under 7 years old*. For questions 1 and 2, circle the appropriate letter. For the remaining questions, rate the events they describe. Circle the appropriate number on the scale. Remember, the questions refer to the period you were *under 7 years old*.

1. When I was under 7 years, old:
 - A – Both my parents were alive (10)
 - B – My father was dead (5.5)
 - C – My mother was dead (5.5)
 - D – Both my parents were dead (1)

2. When I was under 7 years, old:
 - A – My parents were married (10)
 - B – My father divorced my mother (1)
 - C – My mother divorced my father (1)

3. When I was under 7 years old, my mother consumed alcohol

7	6	5	4	3	2	1
Very often						Very rarely

4. When I was under 7 years old, my father consumed alcohol

7	6	5	4	3	2	1
Very often						Very rarely

5. When I was under 7 years old, my father's health was

7	6	5	4	3	2	1
Very good						Very poor

6. When I was under 7 years old, my mother's health was

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very good

Very poor

7. When I was under 7 years old, the relations between my parents were

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very warm

Very cold

8. When I was under 7 years old, my mother's emotional relationship with me was

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very warm

Very cold

9. When I was under 7 years old, my father's emotional relationship with me was

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very warm

Very cold

10. When I was under 7 years old, my siblings' emotional relationship with me was (if you had no siblings, underline 0)

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

Very warm

Very cold

11. When I was under 7 years old, the economic situation in my family was

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very good

Very poor

Partner's Qualities (QF)

Below there are some statements about how important some qualities of your partner are for you. Mark your answers on the scale from 1 (completely unimportant) to 7 (very important)

1. what I value in my partner is that s/he is physically attractive.

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very
importantCompletely
unimportant

2. what I value in my partner is that s/he is (or will be) a good parent.

7	6	5	4	3	2	1
---	---	---	---	---	---	---

Very
importantCompletely
unimportant