

A cross-national pattern of strategic differentiation and integration of sexual strategy indicators

Heitor B. F. Fernandes

Introduction

Sexual strategies theory (SST) proposes that individuals have different strategies for achieving reproductive success and that these strategies lead to differences in sexual attitudes, desire and behaviour (Buss & Schmitt, 1993). Sexual strategy traits are also an intrinsic component of life history (LH) studies across taxa (Figueredo, Cabeza de Baca, & Woodley, 2013; van Schaik & Isler, 2012).

Building on the principle that LH strategies configure a continuum that varies from fast to slow (also called the *K* factor, which is a latent general factor representing slow LH; Figueredo et al., 2013), recent advances have demonstrated that the correlations amongst LH traits are stronger among individuals (and groups) of faster life history (characterized by rapid ontogenetic development, early reproduction, and high mating effort) than amongst those with slower life histories (characterized by more parental effort, community building, higher longevity, and better health; Ellis et al., 2009; Pianka, 1970). This phenomenon has been termed strategic differentiation-integration effort (SD-IE), and consistently replicated at the individual differences (Figueredo, Woodley, Brown, & Ross, 2013) and group differences levels (Fernandes & Woodley, 2013; Woodley & Fernandes, 2013).

SD-IE among humans has been tested with many latent and outcome variables in the LH field. However, possible SD-IE effects have not yet been explored among sexual strategy indicators, several of which are the focus of much scientific interest in human psychology, such as attachment styles, sociosexual orientation, negative emotions experienced in sexual relationships, and correlates of sexual strategies such as mate value.

Aim and predictions

We intend to test the SD-IE hypothesis among indicators of sexual strategies. We predict that effects supportive of SD-IE will be recovered for all mating strategy indicators, with more pronounced SD-IE effects on variables that have a high *K*-loading.

Method

Participants:

American sample

318 ethnically diverse students from two public Midwestern universities. Females were 65.7%. Male participant's mean age was 19.4 years ($SD = 1.6$), and female participants' was 19.8 ($SD = 2.1$).

Brazilian sample

544 individuals (66.9% females) from all five regions. Male participants' mean age was 23.6 ($SD = 3.0$), and female participants' was 23.2 ($SD = 2.9$);

Multi-national sample

112 from multiple countries composed the third sample: 26.5% were from Canada, 24.8% from the United Kingdom, 22.1% from other European countries, 16.8% from various Asian, African, and Latin American countries (excluding Brazil), and 9.7% from Australia. Females were 77.9%, and their mean age was 26.2 ($SD = 9.8$), while males' mean age was 31.1 ($SD = 10.1$).

Measures:

We selected five variables that are associated with both SST and LHT:

- Promiscuous behavioural tendencies - *The Sociosexual Orientation Inventory-Revised*.
- and (iii) *The Experiences in Close Relationships Scale-Short Form* - attachment styles. This comprises two factors: anxious and avoidant attachment.
- (iv), (v) and (vi) Frequency of negative emotions experienced after sexual intercourse - Negative Post-coital Emotions inventory. This contains three factors of NPEs: Need for bonding, Avoidance, and Reputation maintenance.
- (vii) *The Mate Value Inventory* - perceived personal mate value. This is a one-factor proxy for genetic quality or genetic fitness.

Additionally, we employed the *Mini-K Life History Strategy Short Form* as a measure of slow LH strategy.

Statistics:

A unit-weighted LH factor was used as the basis for analyses. Variables with a negative correlation with the Mini-K were reversed before analyses. As in all our three samples attachment anxiety was consistently not correlated with the Mini-K ($r < .10$, $p > .05$), as was the Need for bonding NPEs factor they were not included in the factor.

We used the continuous parameter estimation model (CPEM; Gorsuch, 2005) to test for evidence of SD-IE among sexual strategy traits. We controlled for the CPE of the skew of the residuals. Thus, to measure SD-IE for each variable, we regressed (a) the Slow LH factor scores and (b) the CPEs of skew of the residuals for that variable against the Slow LH factor*indicator cross-products.

References:

- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological review*, 100, 204-232.
- Cardillo, M. (2002). Body size and latitudinal gradients in regional diversity of New World birds. *Global Ecology and Biogeography*, 11, 59-65.
- Fernandes, H. B. F., & Woodley, M. A. (2013). Strategic differentiation and integration among the 50 states of the USA. *Personality and Individual Differences*.
- 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.

Results and discussion

Table 1 indicates that all six selected sexual strategy and life history variables have moderate to high factor loadings on the Slow LH factor across the three samples. We computed coefficients of comparability (CC) among the three samples to assess the similarity of their Slow LH factors. There was an extremely high level of comparability ($CC = .99$; $P < .05$) in all three pairs.

Life history indicator	US sample factor loading	Brazilian sample factor loading	Multi-national sample factor loading
Mini-K	.63	.63	.63
Sociosexual behaviour	.54	.54	.52
Avoidant attachment	.71	.60	.68
Avoidance NPEs	.71	.69	.73
Reputation NPEs	.67	.62	.66
Mate value	.58	.64	.59

Table 1

Factor pattern for the Life History factor produced by unit-weighted factor analysis.

Note: NPEs corresponds to negative post-coital emotions. Scores for all variables except the Mini-K and mate value were reversed before analysis, to represent slow life history.

Table 2 demonstrates that statistically significant SD-IE-supportive effects were recovered for all variables across all samples.

	American sample	Brazilian sample	Multi-national sample
K Super factor indicator	$\beta(K)-\beta(zs-zf)^3$	$\beta(K)-\beta(zs-zf)^3$	$\beta(K)-\beta(zs-zf)^3$
z(LHfactor)*z(Mini-K)	-.213*	-.190*	-.384*
F(H₀)	F(2,316)=10.903*	F(2,446)=8.237*	F(2,110)=19.108*
z(LHfactor)*z(SociosexBehaviour)	-.115*	-.219*	-.408*
F(H₀)	F(2,316)=5.689*	F(2,446)=20.909*	F(2,110)=18.589*
z(LHfactor)*z(AvoidantAttachm)	-.246*	-.202*	-.410*
F(H₀)	F(2,316)=15.815*	F(2,446)=8.285*	F(2,110)=10.485*
z(LHfactor)*z(AvoidantNPEs)	-.476*	-.308*	-.524*
F(H₀)	F(2,316)=45.818*	F(2,446)=29.381*	F(2,110)=27.597*
z(LHfactor)*z(ReputationNPEs)	-.393*	-.381*	-.465*
F(H₀)	F(2,316)=36.420*	F(2,446)=60.411*	F(2,110)=18.467*
z(LHfactor)*z(MateValue)	-.163*	-.226*	-.355*
F(H₀)	F(2,316)=5.985*	F(2,446)=16.035*	F(2,110)=23.821*
z(LHfactor)*z(AnxiousAttachm)	-.399*	-.160*	-.300*
F(H₀)	F(2,316)=30.402*	F(2,446)=3.539*	F(2,110)=13.754*
z(LHfactor)*z(NeedforBondNPEs)	-.335*	-.374*	-.159*
F(H₀)	F(2,316)=127.557*	F(2,446)=215.206*	F(2,110)=183.451*

Table 2

Testing for SD-IE by predicting the correlations between the Life History factor and its sub-scales.

Note: $\beta(K)-\beta(zs-zf)^3$ corresponds to the SD-IE effects controlled for skew of the residuals, $F(H_0)$ corresponds to the F-statistic, and $p(H_0)$ corresponds to the significance level.

Testing the correlation between *K*-loadings and SD-IE effect magnitudes, in the American sample, a significant Spearman's rank-order correlation of $\rho = .90$ ($p < .05$, $N = 6$) was found. In the Brazilian sample, $\rho = .42$ ($p > .05$, $N = 6$), and in the multi-national sample, $\rho = .77$ ($p > .05$, $N = 6$). The odds of producing three consistent positive vector correlations of magnitude .42 or higher are only 2.4%; by this principle of inductive generalization, there is corroboration for the prediction that SD-IE effect magnitudes would be moderated by the *K*-loading of the sexual strategy traits and correlates.

The average magnitude for the SD-IEs effect was -.29 in the American sample, -.25 in the Brazilian sample, and -.37 in the multi-national sample. These are comparable to previous SD-IE effect magnitudes (Figueredo et al., 2013).

The results suggest that among subjects from various continents, slow human life histories at the individual differences level are more differentiated amongst themselves than faster life histories as it pertains to sexual strategies too. Interestingly, even sexual strategy indicators that consistently do not correlate with life history in our samples also presented weaker relationships with other sexual strategy traits at higher levels of *K* in all three samples, which demonstrates the pervasiveness of SD-IE.

This study has implications to the field of human sexual strategies, as these appear to be more polymorphic among high-*K* individuals. In other words, it is plausible that a complex of specific and highly-specialized sexual strategies exist among slow life histories. On the other hand, fast life histories may be behaviourally flexible, that is, contingently switch between phenotypes in response to environmental changes. In this sense they appear to be generalists as it pertains to sexual strategies, as with other components of life history in humans (Fernandes & Woodley; Figueredo et al., 2013; Woodley & Fernandes, 2013; Woodley et al., 2013), and as tentatively demonstrated in other animal taxa (Cardillo, 2002).

- Figueredo, A. J., Woodley, M. A., Brown, S. D., & Ross, K. C. (2013). Multiple successful tests of the strategic differentiation-integration effort (SD-IE) hypothesis. *Journal of Social, Evolutionary, and Cultural Psychology*.
- Gorsuch, R. L. (2005). Continuous parameter estimation model: Expanding the standard statistical paradigm. *Journal of the Science Faculty of Chiang Mai University*, 32(11-27), 21.
- Van Schaik, C. P., & Isler, K. (2012). Life-history evolution. In J. C. Mitani, J. Call, P. M. Kappeler, R. Palombit, & J. B. Silk (Eds.), *The evolution of primate societies* (pp. 220-244). Chicago: University of Chicago Press.
- Woodley, M. A., & Fernandes, H. B. F. (2013). Strategic and cognitive differentiation-integration effort in a study of 76 countries. *Personality and Individual Differences*.