Personality and Individual Differences 71 (2014) 51–55

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Partner satisfaction, as opposed to condom use, predicts symptoms of depression amongst women: A failure to replicate Gallup et al. (2002)

Pavol Prokop *

Department of Biology, Faculty of Education, Trnava University, Priemyselná 4, 918 43 Trnava, Slovakia
Institute of Zoology, Slovak Academy of Sciences, Dúbravská cesta 9, 845 06 Bratislava, Slovakia

ARTICLE INFO

Article history:
Received 24 June 2014
Received in revised form 20 July 2014
Accepted 21 July 2014

Keywords:
Depression
Ejaculate
Human
Replication
Sexual selection

ABSTRACT

Gallup et al. (2002) argued that women who never use condoms or less frequently receive more ejaculates which contain antidepressants such as prostaglandins, testosterone or oestrogen which enters the woman's bloodstream several hours after intercourse. Although their study received considerable media attention, there was no attempt to replicate their findings. There is additionally a lack of theoretical assumptions which may explain the evolution of antidepressants in human male ejaculates. The original study of Gallup et al. (2002) with 261 Slovak women was replicated and found extremely inconsistent results in a comparison with their original research. In contrast to condom use, partner satisfaction was found to be a unique predictor of women's symptoms of depression. Since no scientific theory may be built on a single research project, this study calls for replications of the original research.

1. Introduction

In their controversial paper which received considerable attention, predominantly in the popular press, Gallup, Burch, and Platek (2002) reported a greater prevalence of symptoms of depression and suicide attempts among women who used condoms compared with those who either used condoms rarely or not at all. They argued that ejaculate compounds, such as prostaglandins, testosterone or oestrogen (see Burch & Gallup, 2006 and Gallup, Burch, & Petricone, 2012 among others for a review) which pass through the vaginal epithelial tissue to the peripheral circulation, may antagonize symptoms of depression in order to promote further sexual activity. Indeed, a number of ejaculate compounds can be measured in the woman's bloodstream within several hours after administration (Benziger & Edelson, 1983 and Sandberg, Ingelman-Sundberg, Ryden, & Joelsson, 1968).

The primary function of the seminal fluids is to facilitate female receptivity to pregnancy in terms of increasing the likelihood of pregnancy after insemination by a given male (Robertson, 2005). Males and females, however, differ in their reproductive potential (Bateman, 1948) and the conflict over optimal reproduction has led to adaptations wherein one sex manipulates the reproductive interests of the other sex (Arnqvist & Rowe, 2005). Male seminal fluids, may, for example, inhibit female sexual receptivity and/or reduce the female lifespan, facilitate sperm storage or modulate oviposition (Chapman, Liddle, Kalb, Wolfner, & Partridge, 1995; Gillott, 2003; Perry, Sirot, & Wigby, 2013). All these manipulations influencing female fitness are ultimately selected as a means to secure the paternity of a given male (Arnqvist & Rowe, 2005; Chapman et al., 1995).

Men are, similarly as the males of other animals, at risk of cuckoldry (Platek & Shackelford, 2006), since 1–30% of children are fathered by extra-pair copulation (reviewed by Platek & Porter, 2012). A reduced number of symptoms of depression as a result of ejaculate compound manipulation with female mood (Gallup et al., 2002) may, on the one hand, positively enhance the willingness to engage in additional sexual intercourse, and, may ultimately, increase male reproductive success. On the other hand, there is no reason to believe that a woman should be willing to receive additional ejaculate from the *same* man. Furthermore, there are more reasonable alternatives which may serve to explain Gallup et al. (2002) findings. Perhaps partner satisfaction (Whitton & Whisman, 2010), rather than ejaculates *per se*, may be responsible for the variation in female symptoms of depression, although this variable was not investigated in the original Gallup et al. (2002) study.

In summary, previous research was conducted primarily amongst college student women in the USA. The ignoring of

* Address: Department of Biology, Faculty of Education, Trnava University, Priemyselná 4, 918 43 Trnava, Slovakia. Tel./fax: +421 33 55 14618.
E-mail address: pavol.prokop@savba.sk

http://dx.doi.org/10.1016/j.paid.2014.07.024
0191-8869/

replicate studies and tests of biological generalizations, actually greatly hinders our ability to fully understand this evolutionary phenomenon (Kelly, 2006) and maximize the decline effect (Schooler, 2011). As far as I am aware, no study has attempted to replicate the research of Gallup et al. (2002). Furthermore, any reasonable explanation as to why antidepressants could evolve in human men ejaculates were not found, but partner satisfaction seems to be a more relevant predictor of symptoms of depression.

2. Methods

2.1. Participants

Volunteer women were recruited personally at two universities in Slovakia ($N = 184$). Additional participants were contacted through social networks and asked to kindly participate in the research using the snowball-sampling technique (Goodman, 1961), meaning that existing participants were asked to recruit further individuals from among their acquaintances. This allowed for collection of data from more diverse samples explicitly recommended by other researchers (e.g. McKibbin et al., 2009). A total of 261 responses from heterosexual women between the age of 18–70 were received ($M = 23.4$, $SD = 6.89$, range: 18–70). Approximately half of the participants (47.5%) were young women between 18 and 30 years of age. Sample sizes vary, because in a few instances items were left blank.

2.2. Research instruments

The questionnaire consisted of basic demographic questions focused on age, employment (student–non-student), sexual orientation, partnership status and relationship duration. The following questions were focused on certain aspects of sexual behavior, in particular the frequency of vaginal (How many times did you engage in vaginal sexual intercourse?) and non-vaginal (How many times did an ejaculate enter your body via non-vaginal intercourse, e.g. through fellatio or anal sex?) sexual activity over the last week and last month, condom use (1 = never, 5 = always, see Table 1 for more details), use of hormonal contraceptive pills (yes or no) and the number of days since their last vaginal sexual encounter. Symptoms of depression were measured with the Beck Depression Inventory (Cronbach alpha = 0.86) (Beck, 1961), identical with Gallup et al. (2002). Partner satisfaction (Cronbach alpha = 0.86) was examined on a 7-item scale according to Roberts et al. (2012) where participants rated satisfaction with their partners on a 7-point scale (1 = completely dissatisfied, 7 = extremely satisfied, example item: How satisfied are you with your partner's physical attractiveness?). The reliability of the partner satisfaction scale was also alpha = 0.86.

The translation of questionnaires from English to Slovak proceeds as follows: A bilingual speaker translated the English questionnaire into Slovak. A second bilingual speaker who was also expert in this field translated the English version independently from the first one. Then the two bilingual speakers consensually resolved the few resulting discrepancies between the original English questionnaire and the translated Slovak version.

Table 1
Female condom use and scores with the Beck Depression Inventory.

Condom use	BDI scores		*N*
	M	*SD*	
Never	8.5	6.61	106
Rarely	10.21	6.84	37
Sometimes	8.83	5.68	23
Usually	11.52	8.99	23
Always	8.27	6.34	45
No intercourse	10.74	7.91	27

3. Results

The majority of the participants (180/261, 69%) reported being in a romantic relationship. A total of 172 and 204 participants reported having at least one vaginal sexual intercourse over the last week ($M = 3.27$, $SD = 2.93$, range: 1–20) and over the last month ($M = 12.15$, $SD = 13.43$, range: 1–100), respectively. An additional 20 participants reported having had vaginal sexual intercourse earlier than 1 month ago. After controlling for the effect of age (ANCOVA, $F(1,254) = 2.28$, $p = .13$), the depression scores on the Beck Depression Inventory (BDI) did not vary as a function of condom use (ANCOVA, $F(5,254) = 1.10$, $p = .35$, Table 1). When involving only participants who were sexually active at least once over the last month, the results remained almost identical. Partner satisfaction does seems to be not influenced by condom use (ANCOVA, $F(5,173) = 1.09$, $p = .37$), although condom use tended to decrease with increasing age ($F(1,173 = 5.51$, $p = .02$).

There was no significant correlation between BDI scores and the length of time (in days) since engaging in sexual intercourse ($r = .10$, $p = .13$, $N = 234$). After controlling for the effect of age and the frequency of condom use, the statistical significance decreased (partial $r = .09$, $p = 0.18$, $N = 234$). All correlations between BDI scores and the length of time since engaging in sexual intercourse carried out separately with respect to frequency of condom use yielded non-significant results.

After controlling for the effect of age ($F(1,166) = 0.49$, $p = .48$ and $F(1,198) = 0.02$, $p = .88$), the incidence of sexual intercourse amongst sexually active women was not a function of condom use when considering sexual activity over the last week (ANCOVA, $F(4,166) = 0.75$, $p = .56$) or over the last month (ANCOVA, $F(4,198) = 1.77$, $p = .14$). The incidence of sexual intercourse was inversely correlated with the frequency of condom use both over the last week (Spearman $r = -0.19$, $p = .006$, $N = 208$) and over the last month (Spearman r = −.22, $p = .001$, $N = 204$).

In order to determine whether being in a relationship might affect depression scores, respondents were subdivided into two groups: those who were currently in a relationship with a member of the opposite sex ($N = 180$) and those who were not ($N = 81$). After controlling for the effect of age ($F(1,258) = 2.69$, $p = .10$), the BDI scores between females who were in a relationship ($M = 8.76$, $SD = 6.62$) and those that were not ($M = 10.27$, $SD = 7.50$) were not significantly different ($F(1,258) = 1.87$, $p = .17$). There was also no correlation between relationship duration and symptoms of depression ($r = -.03$, $p = .69$, $N = 179$). Partner satisfaction revealed, however, a negative correlation with symptoms of depression ($r = -.39$, $p < 0.001$, $N = 180$) suggesting that women who were more satisfied with their partners had less symptoms of depression. The frequency of sexual intercourse over the last month and over the last week tended to decrease as the duration of the relationship increased ($r = -.13$ and $-.09$, $p = .08$ and .19, $N = 175$ and 179, respectively). Partner satisfaction tended to positively correlate with the number of sexual intercourses over the last month and over the last week ($r = 0.13$ and 0.15, $p = .08$ and .06, $N = 176$ and 180, respectively).

A multiple regression analysis of the BDI score (dependent variable), with condom use, days since last intercourse, frequency of intercourse over the last month, and the duration of the relationship and relationship satisfaction as predictors was significant ($R^2 = 0.18$, $F(6,161) = 5.76$, $p < .001$, $N = 168$). As indicated in Table 2, relationship satisfaction, rather than condom use, was

the only significant predictor of symptoms of depression. Women with high relationship satisfaction scores had less symptoms of depression than others. Almost identical results emerged when the number of sexual intercourses over the last week was replaced with the number of intercourses over the last month. Inclusion of the use of contraceptive pills into the model ($\beta = 0.09$, $p = .26$) did not change the results of the analyses (See Table 2).

In order to test the potential effects of received ejaculates on symptoms of depression, we analyzed scores from other sexual activities (fellatio, anal sex) from the last month and the last week. These additional sexual practices over the last week and over the last month were reported by 35 ($M = 2.06$, $SD = 1.73$, range: 1–8) and 39 women ($M = 6.51$, $SD = 9.49$, range: 1–45), respectively. A comparison of symptoms of depression among sexually active women who received at least one ejaculate apart from vaginal intercourse with those who did not receive an extra ejaculate over the last week ($M = 9.74$, $SD = 9.15$, $N = 35$ and $M = 9.15$, $SD = 6.54$, $N = 173$, respectively) and over the last month ($M = 10.13$, $SD = 9.32$, $N = 39$ and $M = 9.07$, $SD = 6.43$, $N = 169$) failed to show any significant difference ($t = 0.87$ and 1.33, $df = 206$, $p = .38$ and .18, respectively). Moreover, considering only women who received extra ejaculates over the last week ($N = 35$) and over the last month ($N = 39$), no correlation between the number of ejaculates and symptoms of depression was found (Spearman $r = -.21$ and .02, and $p = .24$ and .89, respectively).

In conclusion, females were asked if they had ever attempted suicide. Overall, suicidal attempts were rare (19/261, 7.2%). There were no apparent differences in suicidal attempts with respect to condom use (never: 8.49%, rarely: 5.40%, sometimes: 8.70%, usually: 8.70, always: 6.66, no intercourse: 3.70%). The results remained almost identical even when sexually inactive women were removed from the analysis. Multiple logistic regression with suicidal attempts as a dependent variable and with condom use, days since last intercourse, frequency of intercourse over the last month, and the duration of the relationship and relationship satisfaction and BDI score as predictors revealed that only the BDI score and relationship duration (Wald $\chi^2 = 8.41$ and 3.89, $df = 1$, $p = .004$ and .049, respectively) were associated with suicidal attempts (other $p > 0.12$). Those who reported having longer relationships and higher BDI scores were more likely to have attempted suicide.

Finally, considering the potential criticism that these data are not based on college students as in the Gallup et al. (2002) study, all the analyses listed above were rerun with a sample of 183 university women of an age of 18–28 years. All the results are fully comparable with those presented with a full sample of students (see the Electronic Supplementary Material).

4. Discussion

The original study of Gallup et al. (2002) could be viewed as an example of sexual conflict between men and women in terms of manipulation of female mood by compounds in male ejaculates (Gorelik & Shackelford, 2011). Although a great deal of research has indicated that manipulative substances in ejaculates indeed exist (Arnqvist & Rowe, 2005; Chapman et al., 1995; Gillott, 2003; Perry et al., 2013), these manipulations were ultimately selected to enhance paternity certainty at the expense of female fitness. There seems to be little or no evolutionary pressures for selection of antidepressants in human ejaculates, since they would be unlikely to increase paternity certainty amongst men. Instead, one would expect that possible antidepressants would favor polyandry, since this would enhance the reception of the high number of antidepressants, rather than inhibited sexual receptivity as would be expected according to the sexual conflict theory (Arnqvist & Rowe, 2005). Moreover, if ejaculates obtain antidepressants, one would expect that they would be beneficial particularly in the case of unwilling sexual intercourse in order to neutralize the negative effects of circumvent mate choice. When considering posttraumatic stress disorders and depression (or even suicidal attempts) of raped women (Baugher, Elhai, Monroe, & Gray, 2010; Thornhill & Palmer, 2000; Zinzow et al., 2012), it is unlikely that any selective pressures would favor the evolution of antidepressants in human ejaculates which would manipulate female mood.

Gallup et al. (2002) measured relationship duration as a proxy of relationship satisfaction and this would, at least partly, confound the result of their study. Although these two variables negatively correlated (this study, $r = -.25$, $p = .001$, $N = 179$, data not shown), the correlation between them is modest, at best. An explicit measurement of relationship satisfaction, as a meaningful predictor of symptoms of depression (Whitton & Whisman, 2010) yielded to statistically stronger results which are different from those of Gallup et al. (2002).

Gallup et al. (2002, 2012) also speculated that antidepressants from ejaculates would act, if they enter a woman's bloodstream through nonreproductive sites of entry, such as fellatio or anal sex. I took this possibility into account, but, once again, no associations between non-vaginal ejaculate acceptance and symptoms of depression were found.

The only consistency between the present research and those of Gallup et al. (2002) is that there is an inverse relationship between condom use and the frequency of sexual intercourse and no significant correlation between relationship duration on BDI scores. Importantly, however, the size of the correlations was very small that they account for only about 2% of the observed variance. Rather than using antidepressive compounds as a possible explanation for this phenomenon, there are certain viable alternatives. For example, Higgins, Hoffman, Graham, and Sanders (2008), Crosby, Milhausen, Yarber, Sanders, and Graham (2008) and Brody (2010) found that male condoms were strongly associated with decreased pleasure amongst women. This would suggest that lower pleasure from sexual intercourse with condoms would suppress women's willingness to engage in sexual intercourse. There may be some personality differences between condom users and non-users in women who have a preference for using condoms (Costa & Brody, 2008). This may be associated with sexual motiva-

Table 2
Multiple regression analysis of BDI scores.

	β	SE of β	B	SE of B	$t(161)$	p
Intercept			46.78	3.65	12.82	<.001
Relationship length	−0.10	0.10	−0.01	0.01	−0.94	.35
No. intercourses last month	−0.14	0.08	−0.06	0.04	−1.85	.07
Days since last intercourse	0.10	0.07	0.07	0.06	1.27	.21
Condom use	−0.07	0.07	−0.31	0.31	−0.99	.32
Relationship satisfaction	−0.34	0.07	−2.25	0.48	−4.67	<.001
Age	−0.11	0.10	−0.11	0.10	−1.10	.27

tions or men using condoms may be more afraid of unwanted pregnancies or disease transmission. Furthermore, condoms may be used to prevent sexually transmitted diseases (Tybur, Bryan, Magnan, & Hooper, 2011) that may indicate a relationship with missing trust or a suboptimal partner. Both these reasons add to dissatisfaction, frequency of sexual intercourse and thus to depressive tendencies. For example, Flood (2003) showed that males abandon condoms in relationships in which the female partner trust. On the other hand, low readiness for fatherhood (Smith, Fenwick, Skinner, Merriman, & Hallett, 2011) that needs not to reflect covert desires of women also influences the use of condoms by males. The question of condom use and frequency of sexual intercourse clearly requires further attention.

The higher incidence of sexual intercourse among women that do not use condoms reported in this paper as well as by Gallup et al. (2002) may be a reflection of a self-medicating effect. That is, women being exposed to semen on a regular basis may use sexual intercourse to modulate their mood, and as such become more closely attached to and bonded with their partner. This in turn would promote a higher probability of impregnation and greater reproductive success by males whose semen contained antidepressant properties. Modulated mood would be expressed by the greater partner satisfaction, but there was no association between frequency of condom use and partner satisfaction. Alternatively, exposure to semen may sometimes cause allergic reaction termed seminal plasma hypersensitivity (SPH). Gallup and Reynolds (2014) hypothesize that occurrence of SPH may activate evolved mechanisms that process information about the other person's health, fertility, and genetic compatibility. This possibility cannot be supported without additional data.

Gallup et al. (2002) found that the BDI scores between females who were in a relationship and those that were not were not significantly different. Additional analysis on a subsample of university students in this paper showed that single women tended to report more symptoms of depression than those who were involved in a romantic relationship. Furthermore, university students who reported using hormonal contraceptives were less depressed than those who did not use hormonal contraceptives. Because using hormonal contraceptives is associated with involvement in a romantic relationship (see Electronic Supplementary Material), it seems that the absence of a male partner increases the incidence of symptoms of depressions rather than hormonal contraceptives *per se*. It may be that at least some of the single women could be deceived in their previous romantic relationships that could cause increased symptoms of depressions. Indeed, deceived individuals reported symptoms after the disclosure comparable to those of posttraumatic anxiety (Gordon, Baucom, & Snyder, 2004).

In conclusion, this study failed to provide any support for the antidepression function of ejaculates proposed by Gallup et al. (2002). Our recent knowledge concerning the evolution of seminal fluids in the context of sexual conflict, lacks similar examples which would provide any support for this controversial hypothesis. Depression symptoms seem to be a function of partner satisfaction, and condom users reported having lower frequencies of sexual intercourse. This study is a call for critical evaluation and a replication of controversial research which are sometimes accepted as "facts" without further critical evaluation.

Acknowledgement

David Livingstone improved the English of the manuscript. Three anonymous referees provided helpful comments on an earlier draft. This study has been approved by the institutional review board at Trnava University licence no. 012/14.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.paid.2014.07.024.

References

Arnqvist, G., & Rowe, L. (2005). *Sexual conflict*. Princeton: Princeton University Press.
Bateman, A. J. (1948). Intra-sexual selection in Drosophila. *Heredity, 2*, 349–368.
Baugher, S. N., Elhai, J. D., Monroe, J. R., & Gray, M. J. (2010). Rape myth acceptance, sexual trauma history, and posttraumatic stress disorder. *Journal of Interpersonal Violence, 25*, 2036–2053.
Beck, A. T. (1961). A systematic investigation of depression. *Comprehensive Psychiatry, 2*, 163–170.
Benziger, D. P., & Edelson, J. (1983). Absorption from the vagina. *Drug Metabolism Reviews, 14*, 137–168.
Brody, S. (2010). The relative health benefits of different sexual activities. *Journal of Sexual Medicine, 7*, 1336–1361.
Burch, R. L., & Gallup, G. G. (2006). The psychobiology of human semen. In S. M. Platek & T. K. Shackelford (Eds.), *Female infidelity and paternal uncertainty* (pp. 141–172). New York, USA: Cambridge University Press.
Chapman, T., Liddle, L. F., Kalb, J. M., Wolfner, M. F., & Partridge, L. (1995). Cost of mating in *Drosophila melanogaster* females is mediated by male accessory gland products. *Nature, 373*, 241–244.
Costa, R. M., & Brody, S. (2008). Condom use for penile-vaginal intercourse is associated with immature psychological defense mechanisms. *Journal of Sexual Medicine, 5*, 2522–2532. http://dx.doi.org/10.1111/j.1743-6109.2008.00987.x.
Crosby, R., Milhausen, R., Yarber, W. L., Sanders, S. A., & Graham, C. A. (2008). Condom 'turn offs' among adults: an exploratory study. *International Journal of STD & AIDS, 19*(9), 590–594. http://dx.doi.org/10.1258/ijsa.2008.008120.
Flood, M. (2003). Lust, trust and latex: Why young heterosexual men do not use condoms. *Culture Health & Sexuality, 5*(4), 353–369.
Gallup, G. G., Burch, R. L., & Platek, S. M. (2002). Does semen have antidepressant properties? *Archives of Sexual Behavior, 31*, 289–293.
Gallup, G. G., Burch, R. L., & Petricone, L. R. (2012). Sexual conflict, infidelity and vaginal/semen chemistry. In T. K. Shackelford & A. T. Goetz (Eds.), *Oxford handbook of sexual conflict in humans* (pp. 217–232). New York: Oxford University Press.
Gallup, G. G., Jr., & Reynolds, C. J. (2014). Evolutionary medicine: Semen sampling and seminal plasma hypersensitivity. *Evolutionary Psychology, 12*, 245–250.
Gillott, C. (2003). Male accessory gland secretions: Modulators of female reproductive physiology and behavior. *Annual Review of Entomology, 48*, 163–184.
Goodman, L. A. (1961). Snowball sampling. *Annals of Mathematical Statistics, 32*, 148–170.
Gordon, K. C., Baucom, D. H., & Snyder, D. K. (2004). An integrative intervention for promoting recovery from extramarital affairs. *Journal of Marital and Family Therapy, 30*, 1–12.
Gorelik, G., & Shackelford, T. K. (2011). Human sexual conflict from molecules to culture. *Evolutionary Psychology, 9*, 564–587.
Higgins, J. A., Hoffman, S., Graham, C. A., & Sanders, S. A. (2008). Relationships between condoms, hormonal methods, and sexual pleasure and satisfaction: An exploratory analysis from the women's well-being and sexuality study. *Sexual Health, 5*, 321–330. http://dx.doi.org/10.1071/SH08021.
Kelly, C. D. (2006). Replicating empirical research in behavioral ecology: How and why it should be done but rarely ever is. *Quarterly Review of Biology, 81*, 221–236.
McKibbin, W. F., Shackelford, T. K., Goetz, A. T., Bates, V. M., Starratt, V. G., & Miner, E. J. (2009). Development and initial psychometric assessment of the rape avoidance inventory. *Personality and Individual Differences, 49*, 336–340.
Perry, J. C., Sirot, L., & Wigby, S. (2013). The seminal symphony: How to compose an ejaculate. *Trends in Ecology & Evolution, 28*, 414–422.
Platek, S. M., & Porter, J. R. (2012). Sexual conflict and paternal resemblance: Insight from evolutionary cognitive neuroscience. In T. K. Shackelford & A. T. Goetz (Eds.), *Oxford handbook of sexual conflict in humans* (pp. 295–301). New York: Oxford University Press.
Platek, S. M., & Shackelford, T. K. (Eds.). (2006). *Female infidelity and paternal uncertainty: Evolutionary perspectives on male anti-cuckoldry tactics*. New York, USA: Cambridge University Press. 258 pp.
Roberts, S. C., Klapilová, K., Little, A. C., Burriss, R. P., Jones, B. C., DeBruine, L. M., et al. (2012). Relationship satisfaction and outcome in women who meet their partner while using oral contraception. *Proceedings of the Royal Society of London B, 279*, 1430–1436. http://dx.doi.org/10.1098/rspb.2011.1647.
Robertson, S. A. (2005). Seminal plasma and male factor signalling in the female reproductive tract. *Cell Tissue Research, 322*, 43–52.
Sandberg, F., Ingelman-Sundberg, A., Ryden, G., & Joelsson, I. (1968). The absorption of tritium labeled prostaglandin E1 from the vagina of non-pregnant women. *Acta Obstetricia et Gynecologica Scandinavica, 47*, 22–26.
Schooler, J. W. (2011). Unpublished results hide the decline effect. *Nature, 470*, 437.
Smith, J. L., Fenwick, J., Skinner, R., Merriman, G., & Hallett, J. (2011). Young males' perspectives on pregnancy, fatherhood and condom use: Where does responsibility for birth control lie? *Sexual & Reproductive Healthcare, 2*(1), 37–42. http://dx.doi.org/10.1016/j.srhc.2010.10.002.

Thornhill, R., & Palmer, C. P. (2000). *A natural history of rape*. Cambridge, MA: The MIT Press. 272 pp.

Tybur, J. M., Bryan, A. D., Magnan, R. E., & Hooper, A. E. (2011). Smells like safe sex: Olfactory pathogen primes increase intentions to use condoms. *Psychological Science, 22*, 478–480. http://dx.doi.org/10.1177/0956797611400096.

Whitton, S. W., & Whisman, M. A. (2010). Relationship satisfaction instability and depression. *Journal of Family Psychology, 24*, 791–794. http://dx.doi.org/10.1037/a0021734.

Zinzow, H. M., Resnick, H. S., McCauley, J. L., Amstadter, A. B., Ruggiero, K. J., & Kilpatrick, D. G. (2012). Prevalence and risk of psychiatric disorders as a function of variant rape histories: Results from a national survey of women. *Social Psychiatry and Psychiatric Epidemiology, 47*, 893–902.