

# Individual Differences in Reproductive Strategy are Related to Views about Recreational Drug Use in Belgium, The Netherlands, and Japan

Katinka J. P. Quintelier · Keiko Ishii ·  
Jason Weeden · Robert Kurzban ·  
Johan Braeckman

© Springer Science+Business Media New York 2013

**Abstract** Individual differences in moral views are often explained as the downstream effect of ideological commitments, such as political orientation and religiosity. Recent studies in the U.S. suggest that moral views about recreational drug use are also influenced by attitudes toward sex and that this relationship cannot be explained by ideological commitments. In this study, we investigate student samples from Belgium, The Netherlands, and Japan. We find that, in all samples, sexual attitudes are strongly related to views about recreational drug use, even after controlling for various ideological variables. We discuss our results in light of reproductive strategies as determinants of moral views.

**Keywords** Moral attitudes · Sex · Drugs · Reproductive strategy · Cross-cultural analysis

Human beings care deeply about others' behavior: In moral domains, they regularly condemn others and they express a desire that other individuals be punished for their

---

K. J. P. Quintelier (✉)  
Amsterdam Business School, University of Amsterdam  
Plantage Muidergracht 12, 1018TV Amsterdam, The Netherlands  
e-mail: katinka.quintelier@gmail.com

K. Ishii  
Department of Psychology, Kobe University, 1-1 Rokkodai-cho, Nada-ku, Kobe 657-8501, Japan

J. Weeden  
Pennsylvania Laboratory for Experimental Evolutionary Psychology, University of Pennsylvania,  
Solomon Lab, 3720 Walnut Street, Philadelphia, PA 19104, USA

R. Kurzban  
Department of Psychology, University of Pennsylvania, Solomon Lab,  
3720 Walnut Street, Philadelphia, PA 19104, USA

J. Braeckman  
Department of Philosophy and Moral Sciences, Ghent University  
Blandijnberg 2, 9000 Ghent, Belgium

activities. While certain moral issues elicit general condemnation (e.g., unprovoked harm), other issues elicit widely different opinions among individuals and cultures. The issue of recreational drug use is a case in point (Robinson and Kurzban 2007).

In this study, we ask about the sources of individual differences in moral views about recreational drug use. The most common answer to this question points to underlying differences in ideological commitments, primarily items such as political orientation and religiosity (see below, “[Ideological Theories](#)”). These factors are seen as shaping a host of moral opinions, including not only views about drugs but also the extent to which one condemns casual sex, abortion, pornography, or divorce. From this perspective, to the extent that views about drugs and attitudes toward sex are related, the inference is that this can be explained by one’s ideological commitments.

Alternatively, recent studies suggest that, in the U.S., sexual attitudes relate to moral views about recreational drug use. These studies find that this relationship is still substantial and significant when controlling for nonsexual ideological variables, such as religiosity and political orientation (Kurzban et al. 2010; Weeden et al. 2008). This suggests that ideological variables cannot explain the relationship between moral views about recreational drug use and sexual attitudes. However, these studies rely heavily on ideological dynamics in, and data from, the U.S. We therefore extend the Kurzban et al. (2010) study to other politico-religious contexts.

Here we show that in a wider range of contexts (Belgium, The Netherlands, and Japan), attitudes toward sex correlate with views about recreational drug use (“drug views”) in a way that cannot be accounted for by ideological variables. We argue that the explanation for these relationships lies in the strategic advantage for sexually restricted individuals to morally condemn recreational drug use. As a consequence, sexual attitudes and drug views are multinationally correlated, and this cannot be explained by ideological variables. In what follows, we first provide some background about ideological theories and evolved reproductive strategies.

## **Ideological Theories**

According to ideological theories, moral views are shaped by ideological commitments. Ideological commitments include centrally one’s religious and political orientations. In the U.S., religious individuals are less likely to use substances such as alcohol, cigarettes, marijuana, and crack cocaine (Allen and Lo 2010; Chitwood et al. 2008; Gryczynski and Ward 2011). Importantly, the suggested mechanism causing this relationship is that *moral views* are transferred from a social network to the focal individual, and these moral views then shape the individual’s behavior (see also Adamczyk and Palmer 2008). Similar proposals have been made to explain variation in sexual attitudes: In the U.S., increased church attendance and being a member of a more conservative denomination are related to morally conservative sexual views, arguably because religious social networks preach conservative *sexual views* (Adamczyk and Pitt 2009; Ahrold et al. 2011; Cochran and Beeghley 1991; Petersen and Donnenwerth 1997). Thus, the background assumption of these studies is that religious commitment, for example if it embeds one in a religious social network, shapes moral views about drugs and sex, which in turn shape behavior.

Others see specific moral views (measured among American survey respondents) as the downstream effect of more general political commitments (Bardes and Oldendick 2003; Erikson and Tedin 2005; Jacoby 2002; Janda et al. 2002; Sears and Levy 2003).

This view is expanded with basic personality factors explaining individual differences in politico-moral views. According to Graham et al. (2009), one's personality traits create adult ideological commitments, which in turn influence endorsement of political and moral orientations (see also Haidt and Joseph 2007). In line with this, in the U.S., personality factors such as openness and conscientiousness have been found to underlie political orientation (Carney et al. 2008).

While such links are well-established in the United States, matters are more open in Europe, including Belgium and The Netherlands. Researchers have identified some links between increased religiosity and decreased alcohol use in Europe (Wicki et al. 2010). Other researchers found a link between increased religiosity and restrictive sexual views in Belgium and The Netherlands (Hooghe et al. 2010; Kraaykamp 2002).

Matters are quite complicated when it comes to political orientation. The political landscapes in the Dutch (i.e., from The Netherlands) and in the Belgian (specifically, Flemish) multiparty system are multidimensional. Drug views and sexual views, together with religious conservatism, make up one of seven dimensions that situate the Dutch political parties (Kleinnijenhuis and Krouwel 2008; Krouwel 2012). Thus, political and religious commitments are related to specific moral opinions about drugs and sex. In Belgium (specifically, Flanders), church involvement is apparently still an important determinant of party affiliation (Abts et al. 2011). Moreover, individuals who are both involved with a church *and* ethically conservative (regarding abortion and euthanasia) are overrepresented among the electorate of one political party (Christian Democrat and Flemish [CD&V]; Abts et al. 2011). Thus, ethical/religious conservatism is related to party affiliation in Belgium (Flanders) and The Netherlands. However, what the underlying assumption is about the causal mechanism is unclear: Does the electorate's political orientation cause their specific attitudes toward sex and drugs? Thus, in general, we do not know to what extent ideological theories can be extended to Europe.

We do not know of studies clearly linking specific moral views with "religiosity" in Japan. Vaughn et al. (1995) give an overview of determinants of drug use in Japan, but they do not discuss religion as a potential determinant of drug use among the Japanese. National changes in sexual attitudes cannot plausibly be ascribed to changes in "religiosity" (Atoh 2001). To the extent that ideological theories see moral views as being transferred from a *social* network to the focal individual, such theories might not expect religious orientation to have a strong effect on views about drugs or sex in Japan. Japan, unlike the United States and Europe, is primarily Shinto-Buddhist rather than Christian. Japanese Shinto-Buddhism is not characterized by regular social gatherings (Miller 1998), where one listens to a preacher (Roemer 2007, 2010). Instead, it consists mainly of private rituals or rare public secularized events (Roemer 2007).

For political commitments, previous studies have shown that one's left/right orientation correlates with smoking behavior in Japan (Subramanian et al. 2010) but, to the best of our knowledge, there are no data about moral views and political orientation. Thus, in general, we do not know to what extent ideological theories apply to Japan.

## Evolved Reproductive Strategies

Kurzban et al. (2010) predicted that individuals endorse moral views that benefit their own reproductive strategy. Here, adopting a restrictive behavioral and moral strategy toward casual sex increases condemnation of recreational drug use. Their argument consists of three steps.

First, people differ in the extent to which they follow either a short-term, promiscuous strategy in which energy is allocated to mating effort or a long-term, monogamous strategy in which energy is allocated to parental effort. Second, people's other views will track their reproductive interests, and it is in the interest of short-term strategists to promote promiscuity in others whereas it is in the interest of more monogamously inclined people to promote restrictive attitudes toward sex and condemn promiscuity in others. Third, recreational drug use is often associated with and facilitates promiscuity. From these points it follows that individuals' attitudes toward sexual promiscuity will correlate with their views about recreational drug use, at least in contexts or cultures where recreational drug use and promiscuity are related. We will now further explain each of these three steps.

During human evolution, both short-term and long-term mating strategies could at times be adaptive for both men and women (Buss and Schmitt 1993; Gangestad and Simpson 2000). Men could increase their reproductive success by mating with as many women as possible, thereby allocating less energy to parental effort. However, paternal effort increased the survival chances or reproductive success of their offspring (Geary 1998). Therefore fathers could also increase their fitness by following a long-term strategy instead of a short-term strategy, allocating their energy to parental effort while foregoing other mating opportunities. Women could increase their fitness by enhancing the survival of their children. They would therefore prefer a partner who was likely to be an investing father. However, women also stand to benefit from mating with men with "good genes" (Little et al. 2011; Scheib 2001). There is evidence of a trade-off between good genes and parental investment in men: Men with "good genes," on average, invest less in their offspring (Alvergne et al. 2009; Booth and Dabbs 1993). Hence, "good genes" partners are less likely to be investing fathers, and women might have to choose between a short-term encounter with a "good genes" partner or a long-term relationship with an investing partner. Because the optimal strategy depends, among other things, on personal factors (such as being endowed with "good genes" indicators for men, or fertility and reproductive value for women), we can expect to find diversity in reproductive strategy within cultures.

Ample data confirm that moral views are aligned with one's strategic interests in other domains: Socioeconomic status is consistently related to political preferences for redistributive policies (e.g., Edlund and Pande 2002; Gelman et al. 2007) and race is related to preferences for policies that benefit racial minorities (Erikson and Tedin 2005). Analogously, we can expect that individuals will endorse moral views that benefit their own reproductive strategy. People in a long-term relationship, who invest time and energy in their children, benefit when others are sexually restricted, because this reduces the risk of cuckoldry, seduction, mate-poaching, or investing in

children that are not their own. They would therefore condemn *others'* short-term sexual encounters, as well as behavior that promotes others' short-term sexual encounters.

Recreational drug use is one such promiscuity-enhancing behavior. Individuals are more likely to have risky, promiscuous, or short-term sexual encounters when under the influence of recreational party drugs. This has been found in American (Lammers et al. 2000; Weeden and Sabini 2007) as well as European (Madkour et al. 2010) and Japanese (Nemoto et al. 2007; Nagata-Kobayashi et al. 2009; Takakura et al. 2001) study groups. If individuals perceive recreational drug use as conducive to sexual encounters, attitudes toward sexuality are therefore likely to track views on recreational drug use. This is the main prediction of the reproductive interests theory (cf. Weeden 2003): in Europe and Japan, as in the U.S. (Kurzban et al. 2010), sexual (moral and behavioral) attitudes will correlate with views about recreational drug use, irrespective of nonsexual ideological variables.

## This Study

The main purpose of our study is to put the *reproductive strategy theory* to additional test by investigating the relationships among views on recreational drug use and sexual variables among university students in Belgium, The Netherlands, and Japan. The questions investigated here are the following: First, in Belgium, The Netherlands, and Japan, do sexual variables correlate with views on recreational drug use? Second, if there is a relationship between sexual variables and drug views, are these correlations still significant after we control for a range of nonsexual ideological variables? Third, do the correlations between sexual variables and drug views differ between countries?

We also explore the extent to which nonsexual ideological variables are related to views on recreational drug use. Here we ask if there is a relationship between nonsexual ideological variables and drug views and if these correlations are still significant after we control for sexual variables.

We have seen that, in Japan, Belgium, and The Netherlands, it is unclear whether ideological variables relate to views on sex and drugs. Relying on ideological theories and not taking into account strategic interests, if views about sex and drugs correlate in Japan, Belgium, and The Netherlands, then one would predict that this relationship will be reduced to non-significance when controlling for regionally relevant ideological factors.

We argue that one should take reproductive strategy into account. We predict that, in line with reproductive strategy theory, in Belgium, The Netherlands and Japan, sexual attitudes will correlate with views on recreational drug use and that these relationships will still be significant and substantial after controlling for regionally relevant ideological variables.

We do not have strong expectations about the extent to which ideological variables will correlate with drug views before or after controlling for sexual variables in Japan, Belgium, and The Netherlands. In this regard, the relationships between ideological variables and drug views before and after controlling for sexual variables are exploratory.

## Methods

### Participants

We recruited first- and second-year undergraduates in Belgium (B), The Netherlands (NL), and Japan (J) to fill out the survey in class. In The Netherlands, we additionally recruited undergraduate participants via lecturers and study organizations, who made the paper surveys available for their members or advertised the URL of the electronic survey. Participation was voluntary and participants did not receive credit for their participation. We only analyzed data from students who had never been married and did not have children. We thus included 476 Belgian participants (196 men, 280 women,  $M_{\text{age}}=18.54\pm 1.95$  SD years, age range=17–46 years), 298 Dutch participants (107 men, 191 women,  $M_{\text{age}}=21.11\pm 2.751$  SD years, age range=17–35 years) and 296 Japanese participants (92 men, 204 women,  $M_{\text{age}}=19.89\pm 1.141$  SD years, age range: 18–24 years). All participants provided informed consent.

### Measures

We adapted the survey used in Kurzban et al. (2010) and asked professional translators to translate and back-translate it into Dutch for Belgium and The Netherlands; two Japanese-English bilinguals translated and back-translated the survey into Japanese for Japan. We provide the items that were created for the current study in Appendices A (Belgium and The Netherlands) and B (Japan).

Table 1 provides the means and standard deviations for all variables for the three samples. For our dependent variable, participants answered questions about their views on the morality and legality of the use of various recreational drugs (“Drug Views”—see the undergraduate sample in Kurzban et al. 2010; Cronbach’s  $\alpha_B=0.88$ ,  $\alpha_{NL}=0.89$ ,  $\alpha_J=0.86$ ). High scores indicate greater opposition to recreational drug use.

For our independent variables, we constructed 3 sexual and 12 nonsexual variables. Our nonsexual variables consisted of political and religious variables as well as personality variables because they might shape ideologies.

Participants completed the revised sociosexual orientation index (Sociosexuality—Penke and Asendorpf 2008; Cronbach’s  $\alpha_B=0.86$ ,  $\alpha_{NL}=0.87$ ,  $\alpha_J=0.86$ ). Higher scores indicate more promiscuous behavior and less opposition to promiscuity.

Participants filled out the disgust scale of Tybur et al. (2009), yielding the sexual variable “Sexual Disgust” and the nonsexual variables “Moral Disgust” and “Pathogen Disgust” (Sexual Disgust: Cronbach’s  $\alpha_B=0.78$ ,  $\alpha_{NL}=0.83$ ,  $\alpha_J=0.86$ ; Moral Disgust: Cronbach’s  $\alpha_B=0.80$ ,  $\alpha_{NL}=0.81$ ,  $\alpha_J=0.81$ ; Pathogen Disgust: Cronbach’s  $\alpha_B=0.81$ ,  $\alpha_{NL}=0.81$ ,  $\alpha_J=0.74$ ). Higher scores indicate greater feelings of disgust for a range of sexual, social, or hygienic transgressions.

We also constructed a sexual and a nonsexual political orientation variable based on agreement with a variety of regionally salient political issues. For Belgium and The Netherlands, participants indicated their agreement with issues that were

**Table 1** Means and standard deviations for all variables

	Belgium		The Netherlands		Japan	
	<i>M</i>	SD	<i>M</i>	SD	<i>M</i>	SD
Drug Views	5.01	1.23	4.07	1.28	6.26	0.99
Sociosexuality	3.44	1.49	3.73	1.53	2.17	1.24
Sexual Disgust	2.91	1.16	2.64	1.24	4.34	1.32
Sexual Politics	4.09	1.08	3.48	1.20	4.59	1.60
Nonsexual Politics	4.04	0.73	3.98	0.66	5.06	0.71
Progressivism/LR	1.89	0.97	1.15	0.35	3.90	0.79
Religiosity	0.04	0.69	0.16	0.20	0.13	0.08
Moral Disgust	3.40	1.03	3.70	0.96	4.92	0.90
Pathogen Disgust	3.07	1.15	3.01	1.08	4.14	0.98
Individualizing	3.50	0.57	3.32	0.54	3.52	0.61
Binding	2.35	0.65	2.28	0.64	2.55	0.57
Conscientiousness	4.51	1.26	4.97	1.16	3.42	1.17
Agreeableness	4.84	1.01	5.21	0.92	4.59	1.16
Openness	5.42	1.00	5.42	0.86	4.12	1.31
Extraversion	4.57	1.42	4.78	1.24	3.90	1.37
Neuroticism	3.47	1.31	4.78	1.24	4.59	1.22

prominent on the political parties' websites or appeared in "de stemtest" (Belgium)<sup>1</sup> or "stemwijzer" (The Netherlands),<sup>2</sup> two popular tests to indicate party affiliation based on 30 questions. One group of items concerned sexual issues involving prostitution, pornography, and abortion (for Belgium and The Netherlands) or online-dating (for Japan); the other group of items concerned nonsexual issues such as punishment and welfare redistribution (all samples); environmental policies, migrants, and criminality (Belgium and The Netherlands); and corruption and foreign affairs (Japan). We performed a factor analysis (alpha factoring, oblimin rotation) on the political measures for each sample. For Belgium and The Netherlands, a factor analysis revealed that four sexual variables clustered in one factor, so we calculated a Sexual Politics variable consisting of these items (Cronbach's  $\alpha_B=0.60$ ,  $\alpha_{NL}=0.65$ ). These reliabilities could not be increased by removing items. Higher scores on Sexual Politics indicate stronger agreement with restrictive sexual policies. We calculated a Nonsexual Politics variable consisting of the nonsexual variables that together had the highest reliability (Cronbach's  $\alpha_B=0.70$ ,  $\alpha_{NL}=0.71$ ). Higher scores on Nonsexual Politics indicate stronger agreement with authoritarian statements—such as harsher punishments for violent behavior—and less agreement with green or redistributive policies—such as protecting the environment, and promoting subsidized social services. These reliabilities could not be increased by removing items. For Japan, the factor analysis revealed a two-factor structure, with the item about gay rights and the

<sup>1</sup> <http://www.standaard.be/extra/verkiezingen/stemtest/> (Accessed 10 December 2011)

<sup>2</sup> <http://www.stemwijzer.nl/TweedeKamer2010/index.html> (Accessed 10 December 2011)

item about sex education belonging to the nonsexual group rather than to the sexual group. We constructed a Japanese Sexual Politics variable consisting of three sexual items that together had the highest reliability (Cronbach's  $\alpha_J=0.89$ ). Higher scores on Sexual Politics indicate stronger agreement with restrictive sexual policies. Our Japanese Nonsexual Politics variable with the highest possible reliability consisted of six nonsexual items, the item about gay rights, and the item about sex education (Cronbach's  $\alpha_J=0.59$ ). The reliability of this construct could not be increased by removing items.

Because the political variables generally did not have high reliabilities, we did an additional analysis with each individual political item in order if individual sexual political items were strongly and consistently related to views on recreational drug use. For this analysis, we left out the items about gay rights and sex education in the Belgian and Dutch sample because we could not determine whether they were sexual or nonsexual items: The content was sexual but they did not cluster with any of the other sexual or nonsexual items. For Japan, we left out the items about gay rights and buying a mobile phone for one's children.<sup>3</sup> These items had sexual content but they did not cluster with any of the other sexual or nonsexual items.

We located participants along a one-dimensional general (nonsexual) political orientation (Progressivism). As mentioned above (“[Ideological Theories](#)”), the political landscape in Belgium and The Netherlands is multidimensional. We therefore asked participants to indicate their party affiliation and we ranked the party affiliations according to their position on a general progressive/conservative factor. For The Netherlands, we used Krouwel's (2009) progressive/conservative scale. For Belgium (Flanders), we ranked the electorate according to their ethical progressivism/conservatism (Abts et al. 2011; Swyngedouw 2008) (Progressivism, on a scale of 1 to 4 with 1 = Progressive, 4 = Conservative; The Netherlands: 1 = GL [GroenLinks], D66 [Democraten 66], PvdD [Partij voor de Dieren]; 2 = SP [Socialistische Partij], PvdA [Partij van de Arbeid], VVD [Volkspartij voor Vrijheid en Democratie]; 3 = CDA [Christen-Democratisch Appèl], CU [ChristenUnie], 4 = SGP [Staatkundig Gereformeerde Partij], PVV [Partij voor de Vrijheid]; Belgium: 1 = Groen!, Open VLD [Vlaams, Liberaal, Democratisch]; 2 = sp.a [socialistische partij anders], PvdA [Partij van de Arbeid], LSP [Linkse Socialistische Partij]; 3 = NVA [Nieuw-Vlaamse Alliantie], VB [(Vlaams Belang)]; 4 = CD&V [Christen-Democratisch & Vlaams]). Progressivism correlated with nonsexual politics in the Belgian and Dutch samples (Pearson's  $r=0.354$ ,  $p<0.001$  for Belgium; Pearson's  $r=0.418$ ,  $p<0.001$  for NL). For Japanese participants, we asked where they considered themselves on a 7-point scale (1 = strongly support left-wing, 7 = strongly support right-wing) because previous work suggests that left-right (LR) position in Japan is an appropriate indicator of political orientation (Jou 2010, 2011). The LR variable did not correlate with nonsexual politics (Pearson's  $r=-0.021$ ,  $p=0.722$ ). Given the low reliability scores of Nonsexual Politics for Japan, and the fact that LR did not correlate with Nonsexual Politics, we decided to include two questions about party support in the analysis: We asked Japanese participants to what extent they supported the Democratic Party of Japan (DPJ) and the Liberal Democratic Party of Japan (LDP).

<sup>3</sup> We assumed that buying a mobile phone for one's children in Japan is associated with increased dating opportunities for these children, via matchmaking websites.

Participants responded to region-specific measures of religiosity. For Belgium and The Netherlands, these included level of religiosity, level of spirituality, frequency of private prayer, frequency of current church attendance, expected future frequency of church attendance, and how orthodox versus liberal they were concerning their religious affiliation. For Japan, these included level of religiosity, and how often they (now and in the expected future) visit a local shrine, temple, or church and participate in other religious activities. We left out level of spirituality and how often they visit the family grave and make offers to the family altar because these items lowered the reliability of the religiosity construct. For religiosity, we used the standardized item alpha (i.e., the Cronbach's alpha on the standardized items) to measure reliability because not all items were scaled the same. We accordingly calculated the religiosity variable with the standardized items. Internal consistencies of our final variables ranged from acceptable to good (standardized item  $\alpha_B=0.81$ ,  $\alpha_{NL}=0.90$ ,  $\alpha_J=0.75$ ). Higher scores indicate higher religious engagement.

Participants completed the Ten Item Personality Inventory (TIPI), a measure of the “big five” (Gosling et al. 2003), and Graham et al.'s (2009) moral foundation items. Because the alphas for each moral foundation item were often lower than 0.60, we used the individualizing foundation and binding foundation (cf. van Leeuwen and Park 2009), and we left out items that decreased the reliability of our variables. Individualizing is the mean of the harm and reciprocity subscales; Binding is the mean of the loyalty, authority, and purity subscales (Individualizing: Cronbach's  $\alpha_B=0.73$ ,  $\alpha_{NL}=0.71$ ,  $\alpha_J=0.76$ ; Binding: Cronbach's  $\alpha_B=0.82$ ,  $\alpha_{NL}=0.81$ ,  $\alpha_J=0.78$ ).

## Analyses

In order to test whether reproductive strategy is related to views on recreational drug use, in the tables in the “Results” section we list the correlations of all independent variables with the dependent variable (Drug Views), controlling for age and sex. We also list the correlations of all three sexual variables with Drug Views, controlling for all nonsexual ideological and personality variables and for age and sex. Correlations are the most appropriate measures for our purposes: At this stage, we mainly want to know if reproductive strategy correlates with Drug Views, controlling for ideological variables. Moreover, we are not interested in the unique effects of each sexual variable, controlling for the two other sexual variables (for which hierarchical regression would be the more appropriate analysis); instead, we want to know if reproductive strategy correlates with Drug Views, independent of which of the three sexual variables is used to measure reproductive strategy. Moreover, a correlation analysis makes no assumptions about causal directions, which are uncertain for the relationships between sexual variables and ideological variables—a mediation analysis would make such assumptions.

To explore the relationships between ideological variables and Drug Views, we list the correlations between each ideological variable, controlling for all three sexual variables and for age and sex. We compare these correlations with the correlations in the first set of correlations.

## Results

Table 1 (above) provides the means and standard deviations for all variables for the three samples. There was a statistically significant difference between samples in Drug Views as determined by one-way ANOVA ( $F_{2, 1070}=254.76$ ;  $p<0.001$ ). A Bonferroni post hoc test revealed that participants in The Netherlands were significantly less opposed to recreational drug use ( $M_{\text{drugs}}=4.07\pm 1.28$  SD) than Belgian participants ( $M_{\text{drugs}}=5.01\pm 1.23$  SD,  $p<0.001$ ) or Japanese participants ( $M_{\text{drugs}}=6.25\pm 0.99$  SD,  $p<0.001$ ); Belgian participants were significantly less opposed to recreational drug use than were Japanese participants ( $p<0.001$ ).

The results from the Belgian sample are shown in Table 2. In this sample, sexual variables showed the highest correlations with Drug Views, and these correlations were still significant and substantial when controlling for ideological and personality variables. Drug Views were also correlated with nonsexual variables in the Belgian sample (Progressivism, Nonsexual Politics, Religiosity, Moral Disgust, Binding, Conscientiousness). After controlling for sexual variables, Nonsexual Politics, Religiosity and Binding were still significantly related to Drug Views.

The results from the sample from The Netherlands are shown in Table 3. In this sample, the three sexual variables had three of the four highest correlations with Drug Views, and these correlations were still significant and substantial when controlling for ideological and personality variables. Drug Views were

**Table 2** Correlations ( $r$ ) between Drug Views and other items in the Belgian undergraduate sample ( $n=476$ ) controlled for age and sex

	Correlations with Drug Views	Partial correlations, controlling for nonsexual items	Partial correlations, controlling for sexual items
Sociosexuality	-0.310**	-0.227**	
Sexual Disgust	0.308**	0.188**	
Sexual Politics	0.335**	0.274**	
Nonsexual Politics	0.203**		0.142*
Progressivism	0.175*		0.132
Religiosity	0.212**		0.154*
Moral Disgust	0.205**		0.098
Pathogen Disgust	0.075		0.012
Individualizing	0.067		-0.005
Binding	0.300**		0.192**
Conscientiousness	0.193**		0.101
Agreeableness	0.082		0.016
Openness	-0.094		-0.017
Extraversion	-0.078		0.128
Neuroticism	0.003		-0.023

\* $p<0.01$ ; \*\* $p<0.001$

**Table 3** Correlations ( $r$ ) between Drug Views and other items in the Dutch undergraduate sample ( $n=299$ ) controlled for age and sex

	Correlations with Drug Views	Partial correlation, controlling for nonsexual items	Partial correlations, controlling for sexual items
Sociosexuality	-0.398**	-0.293**	
Sexual Disgust	0.338**	0.262**	
Sexual Politics	0.371**	0.184*	
Nonsexual Politics	0.252**		0.231**
Progressivism	0.314**		0.209*
Religiosity	0.291**		0.131
Moral Disgust	0.014		-0.102
Pathogen Disgust	-0.027		-0.068
Individualizing	-0.117		-0.170*
Binding	0.367**		0.178*
Conscientiousness	0.252**		0.170*
Agreeableness	0.116		0.044
Openness	-0.091		-0.072
Extraversion	-0.077		0.081
Neuroticism	0.013		0.009

\* $p < 0.01$ ; \*\* $p < 0.001$

also correlated with the nonsexual variables in this sample (Progressivism, Nonsexual Politics, Religiosity, Binding, and Conscientiousness); after controlling for sexual variables, Progressivism, Nonsexual Politics, Binding, and Conscientiousness were still significantly related to Drug Views and Individualizing became significantly correlated with Drug Views.

The results from the Japanese sample are shown in Table 4. Here, the three sexual variables had three of the four highest correlations with Drug Views, and two of the three correlations remained significant and substantial when controlling for other variables (Sexual Disgust had a  $p$ -value of 0.013). The following nonsexual variables correlated with Drug Views: Moral Disgust, Individualizing, Agreeableness, and Neuroticism. Only the correlations with Moral Disgust and Individualizing remained significant after controlling for sexual variables.

To test whether the correlations between Drug Views and sexual variables varied between countries, we compared the bivariate correlations of Drug Views with sexual variables between samples (Steel et al. 1997), including the US student sample from Kurzban et al. (2010). The chi-square values and significance levels are listed in Table 5. As predicted, the bivariate correlations between sexual variables and Drug Views did not differ significantly at the 0.01 level between countries. We did not test this for the partial correlations (Levy and Narula 1978) because in each sample we controlled for different (regionally relevant) constructs—differences in partial correlations might thus be caused by country, but also by differences in the control variables.

**Table 4** Correlations (*r*) between Drug Views and other items in the Japanese undergraduate sample (*n*=296) controlled for age and sex

	Correlations with Drug Views	Partial correlation, controlling for nonsexual items	Partial correlations, controlling for sexual items
Sociosexuality	-0.267**	-0.178*	
Sexual Disgust	0.260**	0.150	
Sexual Politics	0.356**	0.256**	
Nonsexual Politics	0.007		-0.044
Left/Right-wing	-0.122		-0.088
Religiosity	-0.076		-0.055
LDP	-0.036		-0.051
DPJ	0.036		-0.020
Moral Disgust	0.265**		0.165*
Pathogen Disgust	0.011		-0.037
Individualizing	0.231**		0.180*
Binding	0.101		0.048
Conscientiousness	0.039		-0.032
Agreeableness	0.168*		0.083
Openness	-0.079		-0.060
Extraversion	-0.114		-0.069
Neuroticism	0.173*		0.151

\* $p < 0.01$ ; \*\* $p < 0.001$

In line with Kurzban et al. (2010), we can do a less formal test to see if sexual variables are important correlates of drug views. We examined correlations between drug views and each individual political item that was taken up in the Nonsexual and Sexual Politics variables (controlling for age and sex). Consistent with our predictions, for Belgium, we found that (of these political items) the items making up Sexual Politics had four of the five strongest correlations with Drug Views, and they were still significantly correlated with Drug Views after controlling for each individual nonsexual political item. In The Netherlands, the items making up Sexual Politics had three of the four strongest correlations with Drug Views, but only two correlations were still statistically significant after controlling for the nonsexual political items. In Japan, the items making up Sexual Politics had the three strongest correlations with Drug Views. After controlling for individual nonsexual political items, they were still significant.

## Discussion

We predicted that, in line with reproductive interests, views on promiscuous sexual behavior would correlate with views on recreational drug use in Europe and Japan and would remain significant when controlling for nonsexual ideological variables. The predictions of the strategic interests theory were upheld: In all samples, the

**Table 5** Differences between bivariate correlations of sexual variables across samples. We used bivariate correlations (uncontrolled for age and sex) to match the analysis reported in Kurzban et al. (2010). We did not control for sexual/nonsexual variables because we controlled for different nonsexual variables in different samples (see text)

	Overall difference in correlations with Drug Views $\chi^2$ (df=3)	<i>p</i> -value
Sociosexuality	8.1263	0.0435
Disgust_Sexual	4.9122	0.1783
Politics_Sexual	1.2909	0.7313

relationships between Drug Views and sexual variables were substantial and significant at the 0.01 level, before and after controlling for nonsexual variables, except for Sexual Disgust in Japan after controlling for nonsexual variables, which was marginally significant at  $p=0.013$ . Moreover, the bivariate correlations between Drug Views and sexual variables did not differ significantly between samples (Table 5). (There were significant differences in Sociosexuality at the 0.05 level with  $p=0.043$ ; however, we used the 0.01 level throughout because we tested many correlations.) These results are thus in line with findings in two U.S. samples (Kurzban et al. 2010) and add to the finding that reproductive strategy also correlates with drug views across politico-religious contexts.

In contrast to these similarities, we found differences across samples in the significance of correlations between *nonsexual* variables and views on recreational drug use. In our samples, controlling for sexual variables did not reduce the correlations between drug views and nonsexual variables to the same extent as in the U.S. samples (Kurzban et al. 2010). In the U.S. samples, 20 correlations (between nonsexual variables and views on recreational drug use) were significant *before* controlling for sexual variables, and only 5 of these correlations were still statistically significant *after* controlling for sexual variables. In our samples, this fraction is 9 of 15 significant correlations,<sup>4</sup> and one variable became significantly correlated after controlling for sexual variables. Thus, nonsexual variables seem to be more important in our samples—especially in Belgium and The Netherlands—than in the U.S. samples. While this speaks for the importance of nonsexual variables, it also speaks for the importance of sexual attitudes: In contrast to the differential importance of nonsexual variables, the correlations between sexual variables and drug views occurred reliably across samples. Moreover, in each sample, controlling for sexual attitudes had an effect on the correlations between nonsexual variables and drug views. It is therefore important to take sexual attitudes into account when investigating the determinants of moral views that might relate to reproductive strategies, such as moral views about recreational drug use.

Could these results stem from issues with measurement? In the case of the Japanese sample, one might worry about the possibility of a ceiling effect for Drug Views—the maximum value is 7 and the mean is 6.27—and this might have attenuated the relationships in the Japanese sample. We should therefore be cautious

<sup>4</sup> We thank an anonymous reviewer for calling our attention to this difference.

when interpreting *nonsignificant* correlations in the Japanese sample. It might explain why we did not find many significant correlations between nonsexual variables and drug views, but it might also explain why we found no significant correlation for Sexual Disgust after controlling for nonsexual variables. Thus, the possibility of a ceiling effect does not clearly weaken or strengthen our case.

The internal consistencies of the political variables (Sexual and Nonsexual Politics) varied from good to poor. Skeptics could argue that, if we had controlled for better nonsexual political constructs, the correlations between sexual variables and Drug Views would not have been significant. However, the analysis with only the individual political items gave similar results: Most sexual items significantly correlated with Drug Views, before and after controlling for nonsexual items. This was somewhat less clear in the sample from The Netherlands. Moreover, we included other appropriate political variables to ensure that we controlled for political orientation (i.e., Progressivism, LR, support for Japanese political parties).

For Japan, one might argue that other nonsexual variables should also have been included. According to ideological theories, moral views are transferred from a social network to the focal individual. In the case of views about sex and recreational drug use (or “family values”), these values might be propagated by secular social networks such as one’s family. Indeed, as Miller (1998) suggests, family, work, and school-related social networks may function to support monogamous families and their children in Japan, just as religious social networks support monogamous families in the U.S. (Weeden et al. 2008). This is an interesting avenue for future investigations, and future studies would do well to include engagement in family, work, and school-related social networks when studying determinants of moral views in Japan.

Does all this show that reproductive strategy is a determinant of views on recreational drug use? A reproductive strategy is implemented by one’s own sexual behavior and by moral views about others’ sexual behavior. The sociosexual orientation index contains questions about one’s own sexual behavior and general views on promiscuity. Sexual Politics has questions about moral and political views on sex and Sexual Disgust has questions about emotional reactions to the sexual behavior of others. In this regard, the measures we used are a fair proxy for reproductive strategy with respect to promiscuous sexual activity. In line with other studies (Kurzban et al. 2010; Li et al. 2010; Weeden et al. 2008), it is also unlikely that other variables explain the correlation between sexual attitudes and drug views. Together these studies suggest that sexual attitudes are central to understanding a range of moral views. Though experimental studies have begun to examine the relationship between religion and reproductive strategies (e.g., Li et al. 2010; McCullough et al. 2012), more work needs to be pursued assessing the causal relationships among political, moral, and ideological variables.

**Acknowledgments** KQ conducted this study as a PhD fellow of the Fonds Wetenschappelijk Onderzoek (FWO)-Vlaanderen (Research Foundation Flanders). She would like to express her gratitude to everyone who helped her recruiting participants—in particular, Wim Ghijsen, Annemie Ploeger, Peter Derkx, and many Dutch study organizations. KI would like to thank Kunihiro Yokota for his help in collecting data. We thank Dr. Sena Koleva and the anonymous reviewers for comments on this manuscript.

**Appendix A. Survey questions for Belgium and the Netherlands (Drug Views, Religiosity, Sexual and Nonsexual Politics)**

***Drug Views***

Please read the statements below and rate your agreement with the items that follow. 1 = strongly disagree; 4 = neutral; 7 = strongly agree.

*Eric is going to a dance party and is considering taking Ecstasy, an illegal mood-altering substance.*

---

Using Ecstasy in this way is morally wrong:	1	2	3	4	5	6	7
Using Ecstasy in this way should be legally permitted:	1	2	3	4	5	6	7

---

*Megan is hanging out with friends and is considering smoking cannabis, an illegal but tolerated (“gedoogd” in Dutch) mood-altering substance.*

---

Using cannabis in this way is morally wrong:	1	2	3	4	5	6	7
Using cannabis in this way should be legally permitted:	1	2	3	4	5	6	7

---

*John is on vacation and is considering taking cocaine, an illegal mood-altering substance.*

---

Using cocaine in this way is morally wrong:	1	2	3	4	5	6	7
Using cocaine in this way should be legally permitted:	1	2	3	4	5	6	7

---

*Claudia is going out and is considering taking Speed, an illegal mood-altering substance.*

---

Using Speed in this way is morally wrong:	1	2	3	4	5	6	7
Using Speed in this way should be legally permitted:	1	2	3	4	5	6	7

---

**For the following items, please rate your agreement or disagreement.**

---

People who use recreational drugs are dirty:	1	2	3	4	5	6	7
It is ok to obtain drugs for the purpose of making you feel good:	1	2	3	4	5	6	7

---

***Religiosity***

---

	<b>How religious are you?</b> (1) Not at all religious; (4) Somewhat religious; (7) Very religious						
1	2	3	4	5	6	7	
	<b>How spiritual are you?</b> (1) Not at all spiritual; (4) Somewhat spiritual; (7) Very spiritual						
1	2	3	4	5	6	7	

---

**These days, which of the following best describes how often you attend religious services?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) More than once a week

**Which of the following best describes how often you pray in private, on your own?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) Several times a week
- (6) About once a day
- (7) Several times a day

**Thinking ahead, 10 or 15 years from now, how often do you think you will attend religious services?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) More than once a week

***Political items***

**Please indicate your level of support for the following items: (1) Strongly oppose; (4) Neutral; (7) Strongly support**

Promoting the use of the Dutch language:	1	2	3	4	5	6	7
More tax money to military defense:	1	2	3	4	5	6	7
Tougher restrictions against pornography on the Internet:	1	2	3	4	5	6	7
More police guards to prevent social disorder:	1	2	3	4	5	6	7
More binding EU rules to protect the environment:	1	2	3	4	5	6	7
Abolish the possibility of early prison release through good behavior:	1	2	3	4	5	6	7
More subsidized rental homes:	1	2	3	4	5	6	7
Increasing(B)/Decreasing(NL) the period in which abortion is legal:	1	2	3	4	5	6	7
Immigration exams for immigrants:	1	2	3	4	5	6	7
Higher unemployment benefits for the unemployed:	1	2	3	4	5	6	7
More tax money for foreign aid:	1	2	3	4	5	6	7
More attention for the value of relationships during sex education in schools:	1	2	3	4	5	6	7
Forbidding face-covering clothing:	1	2	3	4	5	6	7
To better inform and guide people with excessive debt:	1	2	3	4	5	6	7
Stricter punishments for people who use violence:	1	2	3	4	5	6	7
Homosexual couples can adopt children:	1	2	3	4	5	6	7

**Appendix B: Survey questions for Japan (Drug Views, Religiosity, Sexual and Nonsexual Politics)**

***Drug Views***

Please read the statements below and rate your agreement with the items that follow. 1 = Strongly Disagree; 4 = Neutral; = 7 Strongly Agree

*Eiji is going to a dance party and is considering taking MDMA, an illegal mood-altering substance.*

---

Using MDMA in this way is morally wrong.	1	2	3	4	5	6	7
Using MDMA in this way should be legally permitted.	1	2	3	4	5	6	7

---

*Megumi is hanging out with friends and is considering smoking marijuana, an illegal mood-altering substance.*

---

Using marijuana in this way is morally wrong.	1	2	3	4	5	6	7
Using marijuana in this way should be legally permitted.	1	2	3	4	5	6	7

---

*Takeshi is on vacation and is considering taking cocaine, an illegal mood-altering substance.*

---

Using cocaine in this way is morally wrong.	1	2	3	4	5	6	7
Using cocaine in this way should be legally permitted.	1	2	3	4	5	6	7

---

*Kumi is going out and is considering taking Speed, an illegal mood-altering substance.*

---

Using Speed in this way is morally wrong	1	2	3	4	5	6	7
Using Speed in this way should be legally permitted	1	2	3	4	5	6	7

---

**For the following items, please rate your agreement or disagreement.**

---

People who use recreational drugs are dirty.	1	2	3	4	5	6	7
It is ok to obtain drugs for the purpose of making you feel good.	1	2	3	4	5	6	7

---

***Religiosity***

---

<b>How religious are you?</b> (1) Not at all religious; (4) Somewhat religious; (7) Very religious							
1	2	3	4	5	6	7	
<b>How spiritual are you?</b> (1) Not at all spiritual; (4) Somewhat spiritual; (7) Very spiritual							
1	2	3	4	5	6	7	

---

---

**Which of the following best describes how often you offer incense at and put offerings on the family altar?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) Several times a week
- (6) About once a day
- (7) Several times a day

**Which of the following best describes how often you visit the family grave?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) Several times a week
- (6) About once a day
- (7) Several times a day

**Which of the following best describes how often you visit a local shrine/temple/church?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) Several times a week
- (6) About once a day
- (7) Several times a day

**Which of the following best describes how often you engage in religious activities except for the ones described above?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) More than once a week

**Thinking ahead, 10 or 15 years from now, how often do you think you will visit a local shrine/temple/church?**

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) More than once a week

## Thinking ahead, 10 or 15 years from now, how often do you think you will engage in other public religious activities?

- (1) Never or almost never
- (2) A few times a year
- (3) About once a month
- (4) About every week
- (5) More than once a week

### *Political items*

**Please indicate your level of support for the following items:** (1) Strongly oppose; (4) Neutral; (7) Strongly support

Tougher restrictions against pornography on the Internet:	1	2	3	4	5	6	7
Tougher restrictions against online dating sites, from which compensated dating stems:	1	2	3	4	5	6	7
Paying for sex with a prostitute should be illegal:	1	2	3	4	5	6	7
Parents should not buy a mobile phone for their elementary school children:	1	2	3	4	5	6	7
Consumption tax should increase:	1	2	3	4	5	6	7
Tougher restrictions against smoking:	1	2	3	4	5	6	7
Futenma US Marine base should relocate anywhere in Okinawa:	1	2	3	4	5	6	7
Sanctions for North Korea should be strengthened:	1	2	3	4	5	6	7
Death penalty should be abolished:	1	2	3	4	5	6	7
Politicians' corruption should be strictly punished:	1	2	3	4	5	6	7
Lifetime employment system should be ended:	1	2	3	4	5	6	7
Harsher punishment for violent criminals:	1	2	3	4	5	6	7
Higher taxes for the wealthy:	1	2	3	4	5	6	7
Expanded stem-cell research:	1	2	3	4	5	6	7
Legalized marriage between homosexuals:	1	2	3	4	5	6	7
Comprehensive sex education programs in public schools:	1	2	3	4	5	6	7

## References

- Abts, K., Swyngedouw, M., & Billiet, J. (2011). *De structurele en culturele kenmerken van het stemgedrag in Vlaanderen: analyse op basis van postelektorale verkiezingsonderzoek 2010*. Onderzoeksverslag Centrum voor Sociologisch onderzoek, CeSO/ISPO/2011-14. Leuven: Instituut voor Sociaal en Politiek opinieonderzoek.
- Adamczyk, A., & Palmer, I. (2008). Religion and initiation into marijuana use: the deterring role of religious friends. *Journal of Drug Issues*, 38(3), 717–742.
- Adamczyk, A., & Pitt, C. (2009). Shaping attitudes about homosexuality: the role of religion and cultural context. *Social Science Research*, 38(2), 338–351. doi:10.1016/j.ssresearch.2009.01.002.
- Ahrold, T. K., Farmer, M., Trapnell, P. D., & Meston, C. M. (2011). The relationship among sexual attitudes, sexual fantasy, and religiosity. *Archives of Sexual Behavior*, 40(3), 619–630. doi:10.1007/s10508-010-9621-4.
- Allen, T. M., & Lo, C. C. (2010). Religiosity, spirituality, and substance abuse. *Journal of Drug Issues*, 40(2), 433–459.

- Alvergne, A., Faurie, C., & Raymond, M. (2009). Variation in testosterone levels and male reproductive effort: insight from a polygynous human population. *Hormones and Behavior*, *56*(5), 491–497. doi:10.1016/j.yhbeh.2009.07.013.
- Atoh, M. (2001). Very low fertility in Japan and value change hypotheses. *Review of Population and Social Policy*, *10*, 1–21.
- Bardes, B. A., & Oldendick, R. (2003). *Public opinion: Measuring the American mind* (2nd ed.). Belmont: Thomson Wadsworth.
- Booth, A., & Dabbs, J. M., Jr. (1993). Testosterone and men's marriages. *Social Forces*, *72*(2), 463–477.
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological Review*, *100*(2), 204–232. doi:10.1037/0033-295x.100.2.204.
- Carney, D. R., Jost, J. T., Gosling, S. D., & Potter, J. (2008). The secret lives of liberals and conservatives: personality profiles, interaction styles, and the things the leave behind. *Political Psychology*, *29*(6), 807–840.
- Chitwood, D. D., Weiss, M. L., & Leukefeld, C. G. (2008). A systematic review of recent literature on religiosity and substance use. *Journal of Drug Issues*, *38*(3), 653–688.
- Cochran, J. K., & Beeghley, L. (1991). The influence of religion on attitudes toward nonmarital sexuality: a preliminary assessment of reference group-theory. *Journal for the Scientific Study of Religion*, *30*(1), 45–62.
- Edlund, L., & Pande, R. (2002). Why have women become left-wing? The political gender gap and the decline in marriage. *Quarterly Journal of Economics*, *117*(3), 917–961.
- Erikson, R. S., & Tedin, K. L. (2005). *American public opinion* (7th ed.). New York: Pearson Longman.
- Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: trade-offs and strategic pluralism. *The Behavioral and Brain Sciences*, *23*(4), 573–587. doi:10.1017/s0140525x0000337x.
- Geary, D. C. (1998). *Male, female: the evolution of human sex differences*. Washington: American Psychological Association.
- Gelman, A., Shor, B., Bafumi, J., & Park, D. (2007). Rich state, poor state, red state, blue state: What's the matter with Connecticut? *Quarterly Journal of Political Science*, *2*, 345–367. doi:10.1561/100.00006026.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, *37*(6), 504–528. doi:10.1016/s0092-6566(03)00046-1.
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, *96*(5), 1029–1046. doi:10.1037/a0015141.
- Gryczynski, J., & Ward, B. W. (2011). Social norms and the relationship between cigarette use and religiosity among adolescents in the United States. *Health Education & Behavior*, *38*(1), 39–48. doi:10.1177/1090198110372331.
- Haidt, J., & Joseph, C. (2007). The moral mind: How 5 sets of innate moral intuitions guide the development of many culture-specific virtues, and perhaps even modules. In P. Carruthers, S. Laurence, & S. Stich (Eds.), *The Innate Mind* (Vol. 3, pp. 367–391). New York/Oxford: Oxford University Press.
- Hooghe, M., Claes, E., Harell, A., Quintelier, E., & Dejaeghere, Y. (2010). Anti-Gay sentiment among adolescents in Belgium and Canada: a comparative investigation into the role of gender and religion. *Journal of Homosexuality*, *57*(3), 384–400. doi:10.1080/00918360903543071.
- Jacoby, W. G. (2002). Core values and political attitudes. In B. Norrander & C. Wilcox (Eds.), *Understanding public opinion* (2nd ed., pp. 177–201). Washington, DC: CQ Press.
- Janda, K., Berry, J. M., & Goldman, J. (2002). *The challenge of democracy* (7th ed.). Boston: Houghton Mifflin Company.
- Jou, W. (2010). The heuristic value of the left-right schema in East Asia. *International Political Science Review*, *31*(3), 366–394. doi:10.1177/0192512110370721.
- Jou, W. (2011). How do citizens in East Asian democracies understand left and right? *Japanese Journal of Political Science*, *12*, 33–55. doi:10.1017/s146810991000023x.
- Kleinnijenhuis, J., & Krouwel, A.P. (2008). Simulation of decision rules for party advice websites. Paper presented at the 104th annual meeting of the American Political Science Association, August 28–31, Boston.
- Kraaykamp, G. (2002). Trends and countertrends in sexual permissiveness: three decades of attitude change in the Netherlands 1965–1995. *Journal of Marriage and the Family*, *64*(1), 225–239.
- Krouwel, A.P. (2009). Mapping Portuguese voters. Dimensionality of the Portuguese issue space in comparative perspective. Presented at the Seminar on Political Science (Seminário de Ciência Política), Instituto de Ciências Sociais da Universidade de Lisboa, October 30. (draft version available at <http://www.ics.ul.pt/instituto/?ln=p&mm=1&ctmid=3&mmid=2&doc=31847566069&evid=71&mtype=4&fam=3&ag=hs>)

- Krouwel, A. P. (2012). *Party transformations in European democracies*. Albany: SUNY Press.
- Kurzban, R., Duker, A., & Weeden, J. (2010). Sex, drugs and moral goals: reproductive strategies and views about recreational drugs. *Proceedings of the Royal Society B: Biological Sciences*, 277(1699), 3501–3508. doi:10.1098/rspb.2010.0608.
- Lammers, C., Ireland, M., Resnick, M., & Blum, R. (2000). Influences on adolescents' decision to postpone onset of sexual intercourse: a survival analysis of virginity among youths aged 13 to 18 years. *Journal of Adolescent Health*, 26, 42–48. doi:10.1016/S1054-139X(99)00041-5.
- Levy, K. J., & Narula, S. C. (1978). Testing hypothesis concerning partial correlations: some methods and discussion. *International Statistics Review*, 46(2), 215–218.
- Li, Y. J., Cohen, A. B., Weeden, J., & Kenrick, D. T. (2010). Mating competitors increase religious beliefs. *Journal of Experimental Social Psychology*, 46(2), 428–431. doi:10.1016/j.jesp.2009.10.017.
- Little, A. C., Connely, J., Feinberg, D. R., Jones, B. C., & Roberts, S. C. (2011). Human preference for masculinity differs according to context in faces, bodies, voices, and smell. *Behavioral Ecology*, 22(4), 862–868. doi:10.1093/beheco/arr061.
- Madkour, A. S., Farhat, T., Halpern, C. T., Godeau, E., & Gabhainn, S. N. (2010). Early adolescent sexual initiation as a problem behavior: a comparative study of five nations. *Journal of Adolescent Health*, 47(4), 389–398. doi:10.1016/j.jadohealth.2010.02.008.
- McCullough, M. E., Carter, E. C., DeWall, C. N., & Corrales, C. M. (2012). Religious cognition down-regulates sexually selected, characteristically male behaviors in men, but not in women. *Evolution and Human Behavior*, 33(5), 562–568. doi:10.1016/j.evolhumbehav.2012.02.004.
- Miller, A. S. (1998). Why Japanese religions look different: the social role of religious organizations in Japan. *Review of Religious Research*, 39(4), 360–370.
- Nagata-Kobayashi, S., Maeno, T., Yoshizu, M., & Shimbo, T. (2009). Universal problems during residency: abuse and harassment. *Medical Education*, 43(7), 628–636. doi:10.1111/j.1365-2923.2009.03388.x.
- Nemoto, T., Iwamoto, M., Morris, A., Yokota, F., & Wada, K. (2007). Substance use and sexual behaviors among Japanese tourists, students, and temporary workers in Honolulu, Hawaii. *AIDS Education and Prevention*, 19(1), 68–81.
- 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(5), 1113–1135. doi:10.1037/0022-3514.95.5.1113.
- Petersen, L. R., & Donnerwerth, G. V. (1997). Secularization and the influence of religion on beliefs about premarital sex. *Social Forces*, 75(3), 1071–1088.
- Robinson, P. H., & Kurzban, R. (2007). Concordance and conflict in intuitions of justice. *Minnesota Law Review*, 91, 1829–1907.
- Roemer, M. K. (2007). Ritual participation and social support in a major Japanese Festival. *Journal for the Scientific Study of Religion*, 46(2), 185–200.
- Roemer, M. K. (2010). Religion and subjective well-being in Japan: do religious devotion and affiliation affect life satisfaction and happiness? *Review of Religious Research*, 51(4), 411–427.
- Scheib, J. E. (2001). Context-specific mate choice criteria: women's trade-offs in the contexts of long-term and extra-pair mateships. *Personal Relationships*, 8(4), 371–389. doi:10.1111/j.1475-6811.2001.tb00046.x.
- Sears, D. O., & Levy, S. (2003). Childhood and adult political development. In D. O. Sears, L. Huddy, & R. Jervis (Eds.), *Oxford handbook of political psychology* (pp. 60–109). Oxford: Oxford University Press.
- Steel, R. D., Torrie, J. H., & Dickey, T. A. (1997). *Principles and practice of statistics: A biomedical approach* (pp. 297–299). USA: McGraw Hill.
- Subramanian, S. V., Hamano, T., Perkins, J. M., Koyabu, A., & Fujisawa, Y. (2010). Political ideology and health in Japan: a disaggregated analysis. *Journal of Epidemiology and Community Health*, 64(9), 838–840.
- Swyngedouw, M. (2008). *Politieke kwesties en stemgedrag: een analyse op basis van het postelektorale verkiezingsonderzoek 2007. Onderzoeksverslag CeSO/GB/2008-9*. Leuven: K. U. Leuven, Centrum voor Sociologisch Onderzoek (CeSO).
- Takakura, M., Nagayama, T., Sakihara, S., & Willcox, C. (2001). Patterns of health-risk behavior among Japanese high school students. *Journal of School Health*, 71(1), 23–29.
- Tybur, J. M., Lieberman, D., & Griskevicius, V. (2009). Microbes, mating, and morality: individual differences in three functional domains of disgust. *Journal of Personality and Social Psychology*, 97(1), 103–122. doi:10.1037/a0015474.
- van Leeuwen, F., & Park, J. H. (2009). Perceptions of social dangers, moral foundations, and political orientation. *Personality and Individual Differences*, 47(3), 169–173. doi:10.1016/j.paid.2009.02.017.

- Vaughn, M. S., Huang, F. F. Y., & Ramirez, C. R. (1995). Drug abuse and anti-drug policy in Japan. *British Journal of Criminology*, *35*(4), 491–524.
- Weeden, J. (2003). *Genetic interests, life histories, and attitudes towards abortion*. Pennsylvania, US: University of Pennsylvania Press. Dissertation. URL: <http://repository.upenn.edu/dissertations/AAI3087480/>
- Weeden, J., & Sabini, J. (2007). Subjective and objective measures of attractiveness and their relation to sexual behavior and sexual attitudes in university students. *Archives of Sexual Behavior*, *36*, 79–88. doi:10.1007/s10508-006-9075-x.
- Weeden, J., Cohen, A. B., & Kenrick, D. T. (2008). Religious attendance as reproductive support. *Evolution and Human Behavior*, *29*, 327–334. doi:10.1016/j.evolhumbehav.2008.03.004.
- Wicki, M., Kuntsche, E., & Gmel, G. (2010). Drinking at European universities? A review of students' alcohol use. *Addictive Behaviors*, *35*(11), 913–924. doi:10.1016/j.addbeh.2010.06.015.

**Katinka J. P. Quintelier** received her PhD in Philosophy from Ghent University. She was a postdoctoral research at the Konrad Lorenz Institute for Evolution and Cognition Research in Altenberg, Austria, at the time this article was written, and she is now a researcher at the University of Amsterdam. Her research interests are individual differences in morality, and empirically informed normative ethics.

**Keiko Ishii** received her PhD in Human and Environmental Studies from Kyoto University. She is an associate professor at Kobe University, Japan. Her research interests are culture and cognition. One relevant publication is on cultural and individual differences in trust and reciprocity: Ishii, K., & Kurzban, R. (2008). Public goods games in Japan: Cultural and individual differences in reciprocity. *Human Nature*, *19*, 138–156.

**Jason Weeden** received his PhD in Psychology from the University of Pennsylvania after receiving a JD from the University of Texas School of Law. His research relates to mating and fertility choices, and how differences in competing reproductive lifestyles lead to differences in religiosity and in opinions on “family values” political issues.

**Robert Kurzban** received his PhD in Psychology from the University of California Santa Barbara. He is an associate professor at the University of Pennsylvania. He established The Penn Laboratory for Experimental Evolutionary Psychology (PLEEP), and conducts experimental research informed by evolutionary considerations, largely focused on evolved cognitive adaptations for social life. Other relevant publications on morality include Kurzban, R., & DeScioli, P., & Fein. (2012). Hamilton vs. Kant: Pitting adaptations for altruism against adaptations for moral judgment. *Evolution and Human Behavior*, *33* (4), 323–333; Kurzban, R., DeScioli, P., & O'Brien, E. (2007). Audience effects on moralistic punishment. *Evolution and Human Behavior*, *28*, 75–84; Robinson, P., Kurzban, R., & Jones, O. D. (2008). The origins of shared intuitions of justice. *Vanderbilt Law Review*, *60*, 1633–1688.

**Johan Braeckman** received his PhD in Philosophy from Ghent University. He is a professor of philosophy at Ghent University. His main area of interest is philosophical anthropology, a discipline that questions what it is to be human and how to situate *Homo sapiens*.