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Sexuality Education in the Digital Era: Intrinsic and Extrinsic Predictors of Online Sexual Information Seeking Among Youth

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This study aimed to identify demographic, intrinsic and extrinsic predictors of youth's online sexual information seeking. We used survey data from a large, representative sample of youth (12–24 years) in the Netherlands (N = 20,500). We focused on online sexual information seeking in general, and on two specific types of online sources: interactive user-generated content (UGC) and professional sexuality education content. Findings suggested that LGB youth and youth with more sexual knowledge were more likely to consult sexual information online, both via UGC and via professional websites about sex. Professional content specifically reaches female youth more than male youth, and is more likely to be consulted by youth with more sexual experience and sexual problems. Further, being male, having low sexual esteem and high sexual curiosity were linked to a higher use of interactive UGC. Finally, only communication with friends about sex, but not with parents or partners, nor the amount and appreciation of school-based sexuality education received, was related to a higher use of online sexual information seeking, notably expert sources of sexual information.

Next to parents, school, and friends, online media provide an important source of information for youth to learn about sex (Bleakley, Hennessy, Fishbein, & Jordan, 2009; Borzekowski & Vaughn, 2001; Hoff, Greene, & Davis, 2003; Simon & Daneback, 2013). Youth often turn to online media because it is quick, easily accessible and provides the opportunity to look for information anonymously (Doornwaard et al., 2017; Kanuga & Rosenfeld, 2004; Mitchell, Ybarra, Korchmaros, & Kosciw, 2014). Moreover, online media provide the opportunity to access a variety of different sources of information, different opinions and other youth's experiences (Attwood, Barker, Boynton, & Hancock, 2015; Kanuga & Rosenfeld, 2004). Youth can even actively participate in online sexual information by responding to content of others and by creating content themselves (Attwood et al., 2015).

Online sexual information can, therefore, be a valuable source to youth, but it also poses certain drawbacks. For one, the abundance of information available online makes it difficult to distinguish unreliable from reliable sources of information (Kanuga & Rosenfeld, 2004). Online content providing information about sex that is created by people themselves (as opposed to that created by professionals), so-called 'user-generated content' (UGC), is often inconsistent with scientific evidence or clinical practice (Chou, Prestin, Lyons, & Wen, 2013). Also, even reliable sources of information may be misinterpreted, especially if it is presented in a manner that is not age-appropriate or tailored to one's literacy skills (Doornwaard et al., 2017). Moreover, because online media can be accessed without parental guidance, there is a risk of viewing sexual content that is developmentally inappropriate (e.g., porn) and a risk of child exploitation, such as grooming (Kanuga & Rosenfeld, 2004). Given the benefits and risks of online media for sexual information seeking, it is essential to a) increase our understanding of characteristics of youth who are more likely to turn to online media to learn about sex, and b) to know what type of sources of sexual information they consult online.

For more than a decade, scholars have investigated predictors of sexual information seeking. For instance, a body of

literature suggests that youth's sexual information seeking, in particular using mass media, is predicted by insufficient sources of sexual information in their social environment (e.g., parents and school; McKee, 2012). Such research also suggests that, in addition to these *extrinsic* factors, *intrinsic* factors may play an important role in youth's sexual information seeking. Youth's sexual behavior, attitudes, and self-concept may predict the likelihood of their turning to the media for information about sex (e.g., Shafer, Bobkowski, & Brown, 2013; Steele, 1999; Steele & Brown, 1995). However, research on how these extrinsic and intrinsic factors predict youth's sexual information seeking using *online* media, and in particular professional sexuality education websites and user-generated online content, is lacking.

In the present study, we used survey data from a large, representative sample of adolescents and emerging adults (12–24 years) in the Netherlands to examine predictors of whether or not youth turn online for sexual information. We investigated intrinsic predictors, on the one hand, (i.e., sexual orientation, sexual curiosity and knowledge, sexual experience, sexual pleasure and esteem, positive and negative experiences with and feelings towards sex) and extrinsic predictors (i.e., communication with friends, parents and partners, and the amount and appreciation of sexuality education at school), on the other. We focus on three measures of online sexual information seeking, which include online sexual information seeking in general, and two specific types of online sources: consulting online interactive user-generated content, such as forums, blogs and vlogs, and visiting professional content such as sexuality education websites. Knowing which factors relate to which type of online sexual information seeking will help in developing –professionally produced – online sexual information sources that appeal to youth.

Online Sexual Self-Socialization

It has been argued that youth actively use media as a tool for *self-socialization*, that is, to learn about the appropriate behaviors, values and roles in their society (Arnett, 1995; Silverblatt, 2004). Concerning *sexual* socialization, self-socialization theory posits that adolescents can choose the content that matches their individual preferences and personalities from a wide variety of sources and messages when socializing themselves via the media, in contrast to the more narrow and passive sexual socialization employed by schools and institutions (Arnett, 1995; Silverblatt, 2004). This notion of the deliberate choice for media content as a result of individual preferences is in line with the Uses and Gratifications theory (UGT, Katz, Blumler, & Gurevitch, 1974). UGT posits that people seek out particular media content to satisfy their needs, which can have both psychological (e.g., intrinsic factors such as personality, cognitions, and affect) and social (e.g., extrinsic factors such as one's social environment and cultural background) origins (Katz et al., 1974).

Despite an abundance of research on the role of mass media in general in the sexual self-socialization of youth (Bleakley

et al., 2009; Brown & Bobkowski, 2011; Ferguson, Nielsen, & Markey, 2017; Shafer et al., 2013; Ward, 2003; Wright, 2009), there is little knowledge on adolescents' use of *online* sexual information for sexuality education in particular (Bleakley, Hennessy, & Fishbein, 2011). The few studies conducted on this topic focused mostly on identifying demographic factors that link to online sexual information seeking (e.g., age, gender, education level; Bleakley et al., 2009; Borzekowski & Vaughn, 2001; Cotten & Gupta, 2004). For example, concerning age, youth are more likely to search for sexual information online as they get older (Bleakley et al., 2009). Also, higher educated people are more likely to use online media as a source for sexual information than lower educated people, who are more likely to consult offline sources, such as relatives, friends or health-care professionals (Cotten & Gupta, 2004). The role of gender is unclear: while two studies found that girls are more likely to use online sources for sexual information (Bleakley et al., 2009; Hoff et al., 2003), one study found that boys and girls are equally likely to search online for information concerning health issues, including sexual information (Borzekowski & Vaughn, 2001).

With the exception of sexual orientation (Charest, Kleinplatz, & Lund, 2016; Mitchell et al., 2014), other variables that relate to youth's intrinsic needs and motivations, such as sexual curiosity, need for sexual information (for instance about sexual problems) and sexual (self-) views, have not yet been investigated in relation to online sexual information seeking. Moreover, it has also been suggested that youth turn online for sexuality education when the messages that they receive from offline sources (i.e., parents and schools) are not tailored to their personal needs and preferences (Attwood et al., 2015; Doornwaard et al., 2017; McKee, 2012), but empirical research on the role of such extrinsic factors is scarce and mostly qualitative in nature (McKee, 2012). As a result, we do not know to what extent online sexual information seeking is predicted by intrinsic factors and/or extrinsic factors. The aim of the present quantitative study was, therefore, to jointly investigate the role of intrinsic factors and extrinsic factors in explaining youth's online sexual information seeking.

Intrinsic Predictors of Online Sexual Information Seeking

Previous research that focused on sexual self-socialization using (offline) mass media have suggested a link with factors related to sexual experience and identity. During adolescence, sexual self-concepts, such as sexual openness, sexual self-esteem, and (decreased) sexual anxiety, start to develop and play an important role in one's sexual behavior (e.g., Buzwell & Rosenthal, 1996; Hensel, Fortenberry, O'Sullivan, & Orr, 2011; O'Sullivan, Meyer-Bahlburg, & McKeague, 2006; Zimmer-Gembeck, Ducat, & Boislard-Pepin, 2011). As suggested by previous research (e.g., the Media Practice Model, Brown, 2000; Shafer et al., 2013; Steele, 1999; Steele & Brown, 1995), such sexual self-concepts predict adolescents'

selection of sexual content in the media. Moreover, (early) sexual experience and curiosity are associated with an increase in the use of media to learn about sex among adolescents (e.g., Bleakley, Hennessy, Fishbein, & Jordan, 2008; Brown, Halpern, & L'Engle, 2005; Kim et al., 2006).

In terms of searching for sexual information *online*, most studies have focused on selective exposure to sexually explicit internet material (i.e., pornography). Such research has shown that sexual self-concepts, sexual experience, sexual curiosity, and perceptions of sex, can predict the frequency of looking at sexually explicit material online (e.g., Doornwaard, van Den Eijnden, Overbeek, & Ter Bogt, 2014; Paul, 2009; Peter & Valkenburg, 2008, 2009; Vandenbosch & Peter, 2016). However, we know little about how sexual self-concepts and sexual experience may be related to youth's searching for sexual information in other online sources, such as professional sex education websites or user-generated content.

The few studies that have investigated youth's intrinsic predictors of online sexual information seeking have mostly focused on sexual orientation. While sexual orientation is often considered as a demographic factor, when it comes to searching sexual information online it may serve as a particularly relevant and unique intrinsic predictor, which is in some ways similar to sexual self-concept and sexual experience as a predictor of online sexual information seeking. Studies showed that LGB youth are more likely to acquire sexual information online compared to heterosexual individuals (Charest et al., 2016; Mitchell et al., 2014). This is potentially due to the anonymity of online media, which is important to LGB youth due to fear of stigmatization (Craig & McInroy, 2014; Mitchell et al., 2014) and the predominately heteronormative focus of offline sexual information sources (Craig & McInroy, 2014).

Against the backdrop of previous findings on online sexual information seeking by LGB youth, and the lack of research on other intrinsic predictors of such information seeking, the present study aimed to answer the research question: to what extent do (sexual) intrinsic factors (e.g., factors related to sexual orientation, self-concepts, experiences and feelings) predict youth's online sexual information seeking, and to what extent does this differ by user-generated or professional content?

Extrinsic Predictors of Online Sexual Information Seeking

In addition to intrinsic factors predicting online sexual information seeking, youth may be more or less motivated to turn to the internet for sexual information because of external influences from their environment (i.e., *offline* sources of sexual information). The most important offline sources for sexual information are parents, friends, and school (Bleakley et al., 2009; Borzekowski & Vaughn, 2001; Hoff et al., 2003). Youths generally consult multiple sources to learn about different types of information concerning sex. To gain biological information about sex, youths often consult 'authority sources', such as parents and schools. In contrast, youths often consult friends and online sources to learn about sexual activities and the emotional side of sex (McKee, 2012).

On the one hand, there may be a positive influence from the social environment on youth's online sexual information seeking. For example, one study found that youth who used friends as a source for sexual information, often also used media as a source for such information (Bleakley et al., 2009). In another study, it was found that sexual information seeking was predicted by perceived normative pressure (i.e., the perception that other youth look for sexual information in the media and that other youth think one should look for this type of information; Bleakley et al., 2011). Relatedly, studies have shown that talking about sexually explicit content with peers is related to more frequent exposure to such content among males (Weber, Quiring, & Daschmann, 2012), but communication with parents is not (Peter & Valkenburg, 2006; Wolak, Mitchell, & Finkelhor, 2007). This is in line with one of the assumptions of the Media Practice Model (Steele & Brown, 1995), namely that friends and peers are important in the selection and effects of sexual media through generating, sharing, and interpreting such media.

On the other hand, it is suggested that youth turn to online sources when offline sources fail to provide the information that youth are looking for (McKee, 2012). Some youth report that parents often provide short and preventative messages linked to risk of pregnancy and contraception, without developing ideas of love, relationships, feelings, desire or sexual impulses (Macintyre, Montero Vega, & Sagbakken, 2015). Thus, when their parents fail to meet their needs when it comes to providing sexual information, youth may be more likely to turn to online sources. Similarly, when youth are dissatisfied with the sexuality education they receive from school, they may also be more likely to search for information online. This implies a negative influence of extrinsic factors (i.e., offline sexual information sources) on youth's online sexual information seeking. However, it has yet to be empirically examined how different offline sources relate to online sexual information seeking, which we therefore investigated in this study by posing the following research question: to what extent do extrinsic factors (e.g., consulting offline sources such as parents, peers, and school) predict youth's online sexual information seeking, and to what extent does this differ by user-generated or professional content?

Method

Sample and Procedure

Data for this study were collected as part of 'Sex under the age of 25′, a large representative population study on sexual health among youth aged 12–24 in the Netherlands (De Graaf, van den Borne, Nikkelen, Twisk, & Meijer, 2017). In addition, fifteen municipal health regions (MHR) recruited extra respondents, from schools as well as municipal population registers, to have sufficient statistical

power to perform analyses on the subsample of respondents living in their own municipal health region. Respondents were recruited by two means.

First, secondary school students (12–16 years old) were recruited from randomly selected schools, geographically spread across the Netherlands. Of the 148 randomly selected schools, 60 instantly agreed to participate. For schools that did not agree to participate, a similar school (in terms of size, level [vocational, general or pre-university] and religious denomination) was approached. Participating schools were asked to administer the digital survey in a set number of classes within different class years to end up with a sample of students reflective of the general population of secondary school students aged 12–16. In total, 4,927 secondary school students, spread over 106 schools and 291 classes, participated in the study.

Second, respondents aged 17–24 years were recruited via a sample from the municipal population registers drawn by Statistics Netherlands. Of the 17,368 youth that were invited to fill out the online survey, 4,464 (25.7%) responded. The recruitment of extra respondents by the MHR resulted in an additional 12,423 respondents aged 12 to 24.

Of the total sample of 21,814 respondents, 6% (N = 1,314) was excluded because the respondent reported that h/she did not answer all questions honestly, the respondent turned out to be a non-native speaker, the survey was filled out by a parent, or because inspection of the data showed two or more inconsistencies. As such, the final sample included 20,500 respondents.

Measures

Outcome Variables. Three dichotomous outcome variables were examined. The first outcome variable, 'general online sexual information seeking' was measured by asking respondents to indicate, in addition to other sources, whether they look for information online (i.e., on websites, social media or apps) when they want to know something about sex (0 = no, 1 = yes). The second outcome variable, 'consulting interactive user-generated content' (UGC) was measured by asking respondents to indicate, in addition to other sources, whether they would consult people online (e.g., via a chat, forum, blog, or vlog) in case they had a problem concerning sex (0 = no, 1 = yes). The third outcome variable measured whether or not respondents had ever visited one of eight Dutch professional websites about sex. Per website, respondents checked whether they had ever visited it or not. A dichotomous score was then created indicating whether or not at least one of the listed websites had been visited (0 = no, 1 = yes).

Demographic Predictors. Sample demographics are displayed in Table 1. *Age* was measured in years. *Sex* referred to respondents' birth sex (0 = *male*, 1 = *female*). *Educational level* was measured as respondents' current level of education if they were still in school and highest level of education finished when respondents were currently

Table 1. *Sample demographics (N = 20,500)[a]*

	%	M (SD)
Age		20.59 (2.70)
Urbanicity		3.53 (1.30)
Sex		
Male	48.1	
Female	51.9	
Education		
Low	8.6	
Middle	37.3	
High	54.0	
Religiosity		
Not religious	76.3	
Religious	23.7	
Relationship		
No	40.1	
Yes	59.9	

[a]N represents unweighted N. Percentages represent weighted percentages.

not in school. Education level was then recoded into three categories (0 = *low*, 1 = *middle*, 2 = *high*). A low education level refers to primary education and pre-vocational secondary education, a middle education level refers to vocational secondary education, senior general secondary education and pre-university education, and a high education level refers to higher professional education and university education. To measure *religiosity*, we asked respondents how important religion was to them (0 = *not important*, 1 = *a bit important*, 2 = *very important*). The last two categories were collapsed to create a dichotomous variable (0 = *not religious*, 1 = *religious*). We measured *urbanicity* using respondents postal codes, which were then recoded into five categories representing degree of urbanization (1 = *very low*, 5 = *very high*). *Relationship status* referred to whether or not respondents were currently in a relationship or married (0 = *not in a relationship*, 1 = *in a relationship*).

Intrinsic Predictors. We measured several factors related to sexual development and health that are indicative of intrinsic motivations to search for sexual information online. Three measures (sexual orientation, knowledge about sex, and sexual experience) were filled out by all respondents. Six measures (sexual pleasure, sexual curiosity, sexual self-esteem, sexual problems, sex guilt, and positive feelings towards sex) directly related to sexual activities and were therefore only filled out by sexually active respondents, here defined as respondents who ever had sex. In this study, 'sex' referred to oral sex, intercourse (penis in vagina) and anal sex. In the case of sex between two females, manual sex and the use of sex toys were also included in the definition of sex.

Intrinsic Factors, Total Sample. To measure *sexual orientation*, we asked respondents whether they felt attracted to persons of their own or the other sex (1 =

exclusively attracted to other sex, 2 = *mostly attracted to other sex*, 3 = *attracted to both males and females*, 4 = *mostly attracted to own sex*, 5 = *exclusively attracted to own sex*, 6 = *neither*, 7 = *I don't know*). This variable was dichotomized: respondents who exclusively or mostly felt attracted to the other sex were recoded as heterosexual; respondents who felt attracted to both sexes, or who exclusively or mostly felt attracted to their own sex, were recoded as LGB. In our sample, 3.8% of respondents identified as LGB, which is comparable to other research among the general Dutch population (Kuyper, 2016).

To measure *knowledge about sex*, respondents answered eight knowledge questions about sex, STDs, and contraceptives (1 = *correct*, 2 = *incorrect*, 3 = *I don't know*). Sample items are "girls always bleed during their first sexual intercourse" and "if you wash yourself thoroughly after sex, you are less likely to get an STD". Correct answers were recoded to 1 and incorrect answers to −1. When respondents did not know the answer, it was recoded to 0. A total score was then created by summing the recoded items ($\alpha = .69$).

To measure *sexual experience*, participants had to indicate for seven types of sexual experiences (french kissing, masturbating [i.e., without a partner, thus solo-sex], feeling and petting, manual sex, oral sex, intercourse and anal sex), whether they had ever done this (0 = *no*, 1 = *yes*). Exploratory factor analysis indicated a one-factor solution (Eigenvalue = 4.66, variance explained = 66.5%). A weighted sum score was created by multiplying the score for each experience with its factor loading and then summing these weighted scores ($\alpha = .91$) (cf. DiStefano, Zhu, & Mîndrilă, 2009).

Intrinsic Factors, Sexually Active Sample. *Sexual curiosity* was measured using the statement *"I want to try out all sorts of things in sex"* (1 = *totally disagree*, 5 = *totally agree*).

To measure *sexual pleasure and sexual self-esteem*, we presented sexually active respondents with six statements about their feelings and behavior during sex with their last sexual partner (e.g., 'I felt aroused' and 'I felt insecure about the way I looked), answered on a 5-point scale (1 = *never*, 2 = *sometimes*, 3 = *regularly*, 4 = *often*, 5 = *always*). Factor analysis revealed two factors. The first, consisting of four items, reflected sexual pleasure (Eigenvalue = 2.27, variance explained = 37.9%, $\alpha = .71$). The second, consisting of two items, reflected sexual self-esteem (Eigenvalue = 1.51, variance explained = 25.2%, $\alpha = .71$). Negatively worded items were recoded such that higher scores indicate higher sexual pleasure and self-esteem. Average scale scores were then created for both scales.

For 10 types of *sexual problems* (e.g., "pain during sex", "not able to have an orgasm") we asked whether sexually active respondents experienced this in the past year for 3 months or longer. A sum score was created indicating the number of sexual problems one experienced.

Positive feelings towards sex and sexual guilt were measured with nine items about participants' feelings towards sex in general. Sample items include "I am ashamed when I have

sexual feelings" and "I know what I like concerning sex". Items were answered on a 5-point Likert scale (1 = *completely agree*, 5 = *completely disagree*). Factor analysis revealed two factors. The first, consisting of four items, reflected positive feelings towards sex (Eigenvalue = 3.37, variance explained = 37.5%, $\alpha = .75$). The second, consisting of five items, reflected sexual guilt (Eigenvalue = 1.55, variance explained = 17.2%, $\alpha = .72$). Two scales were created by averaging the items, with higher scores indicating more positive feelings and more sexual guilt.

Extrinsic Predictors. We measured six social factors that were indicative of extrinsic factors, three of which (communication with friends, amount of school-based sexuality education and appreciation of school-based sexuality education) was measured among all respondents. One factor (communication with parents), was only deemed relevant for adolescent respondents and were therefore only measured in the subsample of 12–17-year-olds. One measure (communication with last sexual partner) was only measured among sexually active respondents.

Extrinsic Factors, Total Sample. To measure *communication with friends*, respondents filled out eight items about how often they talked about sex-related subjects with their close friends (e.g., "how to make sex more fun', "how to prevent pregnancy" and "sex on television or online"). Items were answered on a 5-point scale (1 = *never*, 2 = *sometimes*, 3 = *regularly*, 4 = *often*, 5 = *very often*). Exploratory factor analysis indicated a one-factor solution (Eigenvalue = 4.33, variance explained = 54.1%). Items were averaged such that higher scores indicate more communication with friends ($\alpha = .88$).

The *amount of school-based sexuality education* was measured by asking respondents how much information they had received about nine sex-related subjects in school (e.g., "STDs, HIV, and aids", "pregnancy, having children, and abortion" and "sex against your will"). Items were answered on a four-point scale (1 = *none*, 2 = *little*, 3 = *sufficient*, 4 = *a lot*). Items were averaged, with higher scores representing higher level of sexuality education received ($\alpha = .91$). Subsequently, we asked respondents to grade the sexuality education they received in school on a scale from 1 to 10 as a measure of *appreciation of school-based sexuality education*.

Extrinsic Factors, Adolescent Sample. Among adolescents, the same eight items to measure communication with friends were also used to measure *communication with parents*. Exploratory factor analysis indicated a one-factor solution (Eigenvalue = 4.15, variance explained = 46.1%). Again, items were averaged such that higher scores indicate more communication with parents ($\alpha = .84$).

Extrinsic Factors, Sexually Active Sample. We asked sexually active respondents how often they had talked about particular sex-related subjects with their last sexual partner

(e.g., "things I don't want to do in sex" and "my previous sexual experiences"). Items were answered on a 5-point scale (1 = *never*, 2 = *sometimes*, 3 = *regularly*, 4 = *often*, 5 = *very often*). Exploratory factor analysis indicated a one-factor solution (Eigenvalue = 3.79, variance explained = 63.2%). An average score was calculated, with higher scores indicating more *communication with their last sexual partner* (α = .88).

Statistical Analyses

We used complex samples logistic regression to analyze the relative contribution of the predictor variables to each of the three outcome variables. We applied complex samples to account for the complex design of our sample due to the oversampling of respondents in certain municipal health regions in the Netherlands and to correct for selective null-response on a range of demographic variables (e.g., age, gender, ethnicity). On these particular variables, this procedure made the sample nationally representative. For each outcome variable, we tested three models: one including all predictors for the total sample, one including all predictors for the adolescent sample (aged 12–17) and one including all predictors for the sexually active sample. We controlled for the general measure of online sexual information seeking when predicting the two outcome variables related to content (i.e., interactive UGC and professional websites). Given the large sample size and the resulting increased risk of findings being due to chance, we decided to only consider associations with a significance level of $p < .001$ as statistically significant.

Results

Descriptive statistics are displayed in Table 2, and logistic regression results are displayed in Table 3.

Overall Model Results

For the first outcome measure, general online sexual information seeking, analyses showed significant overall models for the predictors of the total sample, Wald F (13, 18,986) = 117.04, p < .001, McFadden pseudo R^2 =.25, adolescent sample, Wald F (14, 6,168) = 32.95, p < .001, McFadden pseudo R^2 = .16, and sexually active sample, Wald F (20, 11,920) = 17.46, p < .001, McFadden pseudo R^2= .11. Also, for the second outcome measure, consulting interactive user-generated content, analyses showed significant overall models for the predictors of the total sample, Wald F (13, 18,986) = 13.94, p < .001, McFadden pseudo R^2 =.04, adolescent sample, Wald F (14, 6,168) = 9.68 p < .001, McFadden pseudo R^2 =.11, and sexually active sample, Wald F (20, 11,920) = 4.76, p < .001, McFadden pseudo R^2 =.04. Finally, for the third outcome variable, visitation of professional websites about sex, again we found significant

Table 2. *Descriptive statistics of outcomes and intrinsic and extrinsic predictors*

	Sample	Total N	% yes	M (SD)
Outcome variables				
General online sexual information seeking	General	20,500	64.1	
Consulting interactive UGC	General	20,500	6.8	
Visitation of professional websites	General	20,500	25.9	
Intrinsic predictors				
Sexual orientation (heterosexual)	General	20,500	96.2	
Knowledge about sex	General	20,500		5.00 (2.81)
Sexual experience	General	20,500		3.50 (2.68)
Sexual curiosity	Sexually active	11,788		3.64 (1.02)
Sexual pleasure	Sexually active	11,788		3.98 (0.80)
Sexual self-esteem	Sexually active	11,788		4.00 (1.08)
Sexual problems	Sexually active	11,788		1.41 (1.64)
Sexual guilt	Sexually active	11,788		1.60 (0.64)
Positive feelings	Sexually active	11,788		3.99 (0.61)
Extrinsic predictors				
Communication friends	General	20,500		1.94 (0.77)
Sexuality education	General	20,500		2.13 (0.70)
Appreciation of SexEd	General	20,500		5.88 (1.84)
Communication parents	Adolescent	5,738		1.50 (0.51)
Communication last partner	Sexually active	11,788		2.60 (1.01)

overall models for the predictors of the total sample, Wald F (13, 18,986) = 77.33, p < .001, McFadden pseudo R^2 =.15, adolescent sample, Wald F(14, 6,168) = 25.61, p < .001, McFadden pseudo R^2 =.16, and sexually active sample, Wald F(20, 11,920) = 11.35, p < .001, McFadden pseudo R^2 =.05.

Demographic Predictors

Of the demographic variables, sex was related to general online sexual information seeking as well as consulting UGC and visiting professional websites. Males were more likely than females to seek sexual information online in general (OR = 0.64, $p < .001$) as well as to visit interactive UGC (OR = 0.70, $p < .001$). In contrast, females were more likely to visit professional websites (OR = 1.40, $p < .001$). Age and education level were significantly related to general online sexual information seeking only. As respondents were older and higher educated, they were more likely to search for sexual information online than younger (OR = 1.17, $p < .001$) and lower educated respondents (OR = 1.79 for middle vs. low and 3.07 for high vs. low, p's < .001). Relationship status was related to consulting interactive UGC only. Respondents who were not in a relationship were more likely to consult interactive

Table 3. *Logistic regressions with demographic predictors of online sexual information seeking*

	General online sexual information seeking		Consulting interactive UGC		Visitation of professional websites	
	OR	CI	OR	CI	OR	CI
Demographics (N = 20,500)						
Age	1.17*	1.14–1.20	1.05	1.01–1.10	0.98	0.95–1.01
Sex[1]	0.64*	0.57–0.73	0.70*	0.58–0.85	1.40*	1.21–1.62
Education: middle	1.79*	1.52–2.11	1.83	1.26–2.66	1.18	0.88–1.59
Education: high	3.07*	2.48–3.80	1.95	1.27–2.99	1.45	1.07–1.95
Religiosity[2]	0.94	0.82–1.08	0.81	0.63–1.02	1.17	1.00–1.38
Urbanicity	1.03	0.98–1.08	1.01	0.93–1.09	1.07	1.01–1.12
Relationship status[3]	0.92	0.79–1.08	0.58*	0.47–0.72	1.02	0.88–1.19
Intrinsic predictors						
General sample (N = 20,500)						
Sexual orientation[4]	2.14*	1.42–3.21	1.85*	1.32–2.59	2.15*	1.65–2.81
Knowledge about sex	1.11*	1.08–1.14	1.12*	1.06–1.18	1.14*	1.10–1.18
Sexual experience	1.14*	1.10–1.19	0.98	0.92–1.04	1.24*	1.19–1.29
Sexually active sample (N = 11,788)						
Sexual curiosity	1.16	1.04–1.28	1.34*	1.17–1.53	1.13	1.04–1.22
Sexual pleasure	1.00	0.88–1.13	0.93	0.78–1.10	1.12	1.02–1.24
Sexual self-esteem	0.91	0.83–0.99	0.84*	0.77–0.93	0.96	0.90–1.02
Sexual problems	1.18*	1.11–1.25	1.11	1.04–1.18	1.12*	1.07–1.15
Sexual guilt	1.01	0.85–1.20	0.99	0.81–1.20	0.96	0.85–1.09
Positive feelings	1.04	0.88–1.23	0.88	0.69–1.12	0.91	0.78–1.05
Extrinsic predictors						
General sample (N = 20,500)						
Communication friends	1.23*	1.12–1.35	1.06	0.93–1.21	1.25*	1.15–1.35
Sexuality education	0.93	0.80–1.08	1.16	0.93–1.45	1.23	1.07–1.41
Appreciation of SexEd	1.01	0.97–1.06	0.96	0.89–1.03	0.99	0.95–1.03
Adolescent sample (N = 5,738)						
Communication parents	0.72	0.58–0.90	0.85	0.56–1.29	1.07	0.85–1.34
Sexually active sample (N = 11,788)						
Communication last partner	1.11	1.00–1.24	1.11	0.98–1.26	1.04	0.96–1.12

[1] 0 = boy, 1 = girl; [2] 0 = not religious, 1 = religious; [3] 0 = no relationship, 1 = in a relationship; [4] 0 = hetero, 1 = LGB. *p < .001.

UGC (*OR* = 0.58, *p* < .001). Religiosity and urbanicity were not related to the three outcome measures.

Intrinsic Predictors

Of the intrinsic predictors that were measured in the total sample, sexual orientation (*OR's* = 1.85 to 2.15, *p* < .001) and knowledge about sex (*OR's* = 1.11 to 1.14, *p* < .001) were consistently positively related to the three outcome measures. Sexual experience was positively related to general online sexual information seeking (*OR* = 1.14, *p* < .001) and visiting professional sexual education websites (*OR* = 1.24, *p* < .001), but not to consulting interactive UGC. Higher sexual curiosity (*OR* = 1.34, *p* < .001) and lower sexual self-esteem (*OR* = 0.84, *p* < .001) were related to a higher likelihood of consulting interactive UGC about sexual problems, but not to the other measures of online sexual information seeking. Concerning the additional predictors for the sexually active sample, experiencing sexual problems was positively related to general online sexual information seeking (*OR* = 1.18, *p* < .001) and visiting professional sexual education websites (*OR* = 1.12, *p* < .001), but not to consulting interactive UGC. The remaining

variables, sexual pleasure, positive feelings towards sex and sexual guilt were not significantly related to any of the three outcome measures.

Extrinsic Predictors

Of the extrinsic predictors, communication with friends was positively related to general online sexual information seeking and visiting of professional websites: as respondents talked more about sex with their friends, they were more likely to search online for information about sex (*OR*=1.23, *p*<.001) and more likely to have visited professional websites about sex (*OR*=1.25, *p*<.001). There was no relationship between communication with friends and consulting interactive UGC. None of the other extrinsic factors (i.e., communication with parents and last sexual partner, receiving sexual education in school and appreciation thereof) were related to any of the outcome measures.

Discussion

This study aimed to identify demographic, intrinsic and extrinsic predictors of online sexual information seeking. We

focused on general online sexual information seeking as well as two specific types of online sexual information seeking: consulting interactive user-generated content (UGC) and professional websites about sex. Our findings provide insight into which youth are more likely to search online for sexual information, and more importantly, that intrinsic and extrinsic predictors differentially determine whether adolescents consult interactive UGC or professional education websites. This study is, therefore, one of the first to focus on this important distinction between sources in young people's online sexual information seeking.

The Differential Role of Intrinsic and Extrinsic Factors in Online Sexual Information Seeking

In line with both self-socialization literature (Arnett, 1995; Silverblatt, 2004) and the Uses and Gratifications perspective (Katz et al., 1974), this study showed that whether young people choose to search for sexual information online, and the type of sexual information seeking that young people engage in, depend on specific characteristics of people as well as factors in their social environment. Certain characteristics of people, such as a higher sexual knowledge, and having a non-heterosexual orientation, were consistently and positively related to all types of sexual information seeking online, which dovetails with previous findings (Bleakley et al., 2009; Charest et al., 2016; Cotten & Gupta, 2004; Mitchell et al., 2014). However, other characteristics were related to online sexual information seeking in more idiosyncratic ways. For instance, previous research has found that females were more likely to search for sexual information online than males (Bleakley et al., 2009; Borzekowski & Vaughn, 2001; Hoff et al., 2003). The present study extends such findings by showing that this may only be the case for visiting professional sexual education websites. Males, in turn, were more likely to consult UGC. Moreover, males searched more for sexual information online in general in our study, which could entail other sources of sexual information such as pornography. In fact, pornography use has repeatedly been found to be higher for males (Peter & Valkenburg, 2016).

Previously, scholars had argued that online sources, and in particular social media and interactive UGC, are often preferred by adolescents because of the possibility to discuss personal experiences and issues (e.g., Macintyre et al., 2015; McKee, 2012). Our findings suggest that this may be somewhat more nuanced. Our findings show that obtaining sexual information through social media (e.g., interactive UGC) is mostly related to young people's sense of their sexual openness and self-views (i.e., sexual curiosity and sexual self-esteem). Sexually experienced youth and youth with sexual problems, on the other hand, were more likely to visit professional sexual education websites specifically, but these factors did not have an association with consulting UGC. This suggests that as young people gain sexual experience and – perhaps as a result of this experience – encounter

more sexual problems, they mostly have a need for expert information about sex, but not necessarily a higher need to share such issues through interactive UGC.

Similar to youth with more sexual experience and problems, a higher likelihood of searching for sexual information online in general, and visiting sexual education websites, was found for youth that talked more about sex with their friends. This fits with previous findings that when youth want to learn about sex, they consult multiple different sources, namely authority sources to learn about the biological side of sex and informal sources to learn about the emotional side of sex (McKee, 2012). In fact, the large majority of adolescents who indicate using media as a source for sexual information, also report friends as a source (Bleakley et al., 2009). It may be possible that such findings for communication with friends are confounded by the experiencing of sexual problems: youth that experience more problems may both be more likely to talk to their friends, as well as consult expert sources of sex online, in order to solve such problems. However, in our model we controlled for the intrinsic factors when looking at the relationships for the extrinsic factors and vice-versa, ruling out such confounding relationships.

While the associations with communication with friends were rather robust, this was not the case for communication with parents and sexual education in schools. From a UGT perspective, these findings suggest that in terms of the social origins of online sexual information needs, peers play a more significant role than authority figures such as parents and schools. Interestingly, there was no relationship between communication with friends, partners or parents, and consulting interactive UGC: interactive UGC does not seem to replace nor complement communication with off-line sources, which attests to the conclusion that online sexual information seeking via interactive UGC and offline sources of sexual information may satisfy different needs. That is, our findings suggest that interactive UGC seems to mostly satisfy a need for (further) exploring one's sexual self, and does not have much to do with the amount of sexual information and communication that one already receives from offline sources. The latter, in the case of communication with friends, seems to mostly drive the search for sexual information by online expert sources.

Practical Implications and Suggestions for Future Research

The previous findings indicate that professional websites about sex particularly reach female youth, suggesting that efforts are needed to attract male youth. Moreover, given youth's need for consulting others via online interactive UGC when they identify as LGB, or experience low sexual self-esteem and high sexual curiosity, it is important to create platforms where these youth obtain the appropriate information. Youth that are willing to try different sexual experiences and youth that feel insecure about their sexual selves, may be particularly vulnerable to the influence of

risky sexual information. For instance, they may be more easily encouraged to try out risky sexual behavior to satisfy their sexual curiosity and to feel better about themselves sexually. More research is needed to consolidate these assumptions, but it may be conducive for sexual educators to pay attention to these possibilities. Moreover, professional sexuality educators are advised to incorporate interactive UGC in their educational material to attract such youth to the correct information about sex. For instance, professional websites could be linked to interactive platforms where peer vloggers and bloggers address these youth in a personal way, in order to tailor to the needs of such youth.

Our study did not investigate underlying reasons or mechanisms for online sexual information seeking, but the associations with intrinsic and extrinsic factors that were found do hint at some mechanisms that future research may focus on. For instance, the higher likelihood of consulting interactive UGC among youth that identify as LGB, have no romantic partner, or experience low sexual self-esteem, suggests that they turn to interactive UGC to be able to hear and share personal experiences and find support in a way that they may not be able to do elsewhere. For instance, due to fear of stigmatization, LGB youth may prefer to find such information in an anonymous setting and therefore turn online. Previous research has shown that important reasons for emerging adults to use social media are gaining a sense of belongingness, disclosing one's own thoughts or feelings and providing emotional response to others (Ifinedo, 2016; Jung, Pawlowski, & Kim, 2017; Quan-Haase & Young, 2010). Similarly, it may be that adolescents and emerging adults find particular intrinsic needs (i.e., social belongingness) satisfied through online sexual information seeking via interactive UGC channels.

At the same time, youth with sexual problems seemed to mostly gain professional information about sex online, which indicates that these youth have a need for making sure that they obtain correct information in order to solve such problems. Relatedly, it needs to be noted that more correct sexual knowledge was positively associated with online sexual information seeking via interactive UGC as well as visiting sexual education websites. This suggests that concerns of UGC spreading false information, or that youth are unable to correctly interpret the information provided by UGC, may not be warranted. However, future research needs to further explore what type of sexual information is shared exactly through interactive UGC, and how this is interpreted and processed by youth, before such conclusions can be drawn with certainty.

Finally, the finding that talking to friends about sex makes it more likely that youth consult professional websites about sex could be explained by different mechanisms. On the one hand, it could mean that youth refer each other to expert sources about sexual information. On the other hand, it could also be that talking about sex with friends creates confusion about sexual topics, which youth then try to solve

by looking up expert information online. Future research is needed to gain more insights into the exact motivations that explain the relationship between talking to friends about sex and online sexual information seeking.

Limitations

Some limitations of this study warrant attention. First, due to the cross-sectional, exploratory nature of this paper, questions about causality remain. Some of the factors that we found to be related to online sexual information seeking could be either predictive of or result from online sexual information seeking. An example is sexual self-esteem. Although one might argue that youths with lower sexual self-esteem have a higher need for anonymous sexual information and therefore consult interactive UGC to hear and share other's experiences, one can also argue that when youth hear a lot of experiences from others, they may start doubting their own sexual experiences, thereby lowering their sexual self-esteem. Similarly, sexual knowledge is also likely to be an outcome of online sexual information seeking. Future longitudinal research is therefore needed to test such causal models.

Second, concerning the offline sources that we investigated, (i.e., parents, friends and sexual partners) we only examined quantity of communication, not quality. Moreover, the means for the frequency of communication about sex with parents or friends were rather low, meaning that overall, young people only sometimes talked about sex with people in their offline social environment. This may explain the lack of robustly significant relationships between communication with parents and online sexual information seeking. Looking at the quality of communication when young people *do* talk about sex, rather than mere frequency, may lead to more variability in responses and therefore more meaningful findings, especially as the quality of communication about sex with parents and teachers has been said to play an important role in young people's satisfaction with such communication (e.g., Macintyre et al., 2015; McKee, 2012). It should be noted, though, that the rather robust findings for communication with friends, despite the low frequency of such communication, attest to the important role such communication plays in young people's online sexual information seeking. That said, more research is needed into how satisfied youth are with the conversations they have about sex with their parents, friends, and partner and how this relates to online searching for sexual information.

Third, our measure of online sexual information seeking only tells us whether someone looks online for information about sex, but not how often he/she does so. We asked participants "what do you do when you want to receive information about sex?", after which they had the option to click on the item 'search online (i.e., on websites, social media or apps)'. The phrasing of this question hints at participants' more general behavior in such cases, which suggests that we are tapping into a recurring type of online sexual information seeking rather than a one-time

occurrence. In addition, continuous measures of exposure to online sexual content are often skewed, given the high number of participants that indicate they (almost) never look for such information online. In the current sample, this is reflected in the majority of our sample never having visited a professional sexual education website (75%) and never having consulted interactive UGC with questions about sex (93.2%). As a result, a binary measure of online sexual information seeking was deemed more suitable as a dependent variable in the analyses, and has been used in previous research investigating similar outcomes (e.g., Bleakley et al., 2011). That said, we do encourage future research to look at the variety of online sexual information seeking, in terms of frequency and number of online sources, to obtain more insights in this behavior.

A final limitation concerns the measure of UGC, which focused on consulting people online through interactive UGC when experiencing sexual problems. However, youth can also use UGC in a less interactive manner, such as by only looking at vlogs or reading blogs or fora. Only 6.8% of respondents in our sample reported that they consulted people online through interactive UGC. We thereby missed the youth who passively used UGC, or who consulted UGC without experiencing sexual problems, which are probably more than 6.8% of youth.

Conclusion

This study was one of the first to empirically study both intrinsic and extrinsic predictors of adolescents' and emerging adults' online sexual information seeking, and to distinguish between professionally produced and user-generated sources of online sexual information. Our findings suggest that youth have both intrinsic and extrinsic needs to search for sexual information online, which may exist in parallel, and may be differently related to different sources of online sexual information. More specifically, searching for expert sources of sexual information seems to be driven mostly by extrinsic needs related to communication about sex with friends or intrinsic needs related to sexual experience and problems, while consulting user-generated sexual information online seems to result from needs related to one's sexual curiosity and self-esteem. Despite the exploratory nature of this study, these findings have increased our – still limited – understanding of which adolescents turn to which online sources for information about sex and can inspire future research and interventions. In doing so, it can inspire a shift in perspective of both researchers and practitioners to focus more on young people's uses and gratifications in consulting online sources of sexual information.

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