Sexual Content in Music and Its Relation to Sexual Attitudes and Behaviors among Consumers: A Meta-Analytic Review

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Sexual Content in Music and Its Relation to Sexual Attitudes and Behaviors among Consumers: A Meta-Analytic Review
Chrysalis L. Wright & Brittany Centeno

While previous research has documented a relation between sexual content in music and the sexual attitudes and behaviors of consumers, to date, there are no meta-analytic reviews of the literature, making our meta-analysis the first in this area. Results from 26 studies indicated that sexual content in music had a significant effect on sexual attitudes and behaviors, with both music format and genre being significant contributors. Additionally, participant ethnicity, sex, age, location, and study design were found to be significant moderators. Theoretical implications are discussed, along with suggestions for future research.

Keywords: meta-analysis; music media; sexual outcomes

It has been speculated that popular media plays a critical role in the sexual socialization of young people. Researchers have suggested that adolescents may view media as an important tool for learning about sexuality (Brown, 2008; Timmerman et al., 2008; Zhang, Miller, & Harrison, 2008). Sexual content in audio music and music videos, in particular, have been related to expectations regarding sexual activity, sex-role stereotyping, permissive sexual attitudes, sexual initiation, the timing of sexual intercourse,
early dating and sexual behaviors, sexual beliefs, sexual scripts, and increased sexual risk (Aubrey, Hopper, & Mbure, 2011; Bleakley, Hennessy, Fishbein, & Jordan, 2008, 2009; Brown et al., 2006; Coyne & Padilla-Walker, 2015; Fischer, Greitemeyer, Kastenmüller, Vogrincic, & Sauer, 2011; Martino et al., 2006; Pardun, L’Engle, & Brown, 2005; Primack, Douglas, Fine, & Dalton, 2009; Ward, Epstein, Caruthers, & Merriwether, 2011; Zhang et al., 2008). Additionally, other research has found that sexual attitudes may be predictive of future sexual behaviors (Ward et al., 2011; Wright & Brandt, 2015). This is important considering that music emerges as a preferred form of popular media during early adolescence (Roberts, Foehr, & Rideout, 2005) and continues through emerging adulthood (Behance, 2013). In fact, the most frequent consumers of audio music and music videos are adolescents (Roberts et al., 2005; van Oosten, Peter, & Valkenburg, 2015). Considering the increased rates of negative sexual health outcomes (e.g., unplanned pregnancies, sexually transmitted infections, HIV) among adolescents and emerging adults, the relationship between sexual content in music and risky sexual behaviors may be of concern (Agbo-Quaye & Robertson, 2010; Brown et al., 2006; Martino et al., 2006; Primack et al., 2009).

Bearing in mind the increasing sexualization of popular music, the relationship between music content and sexual outcomes are not surprising. The lyrics of more than one-third of popular songs contain explicit sexual content, two-thirds of which are degrading (Martino et al., 2006; Primack, Gold, Schwarz, & Dalton, 2008), and between 40% and 75% of music videos contain sexual imagery (Frisby & Aubrey, 2012; Zhang et al., 2008). The nature of music sexual content varies based on music genre, with pop music referencing sexual activity in relation to romantic relationships, rap music containing explicit sexual content, and rock music depicting sexual experimentation (Agbo-Quaye & Robertson, 2010).

It may be that younger consumers engage more with music due to their focus on identity development during this time (Lonsdale & North, 2011; Ter Bogt & Soitos, 2007; Thomas, 2016), or they may seek out sexualized media as a tool for learning information about sexual activity and intercourse (Agbo-Quaye & Robertson, 2010; Bale, 2011; Bleakley et al., 2008; Brown, 2008). Pre-existing attitudes and behaviors have been found to relate to music selection that match those characteristics, specifically sexual content in music (Bleakley et al., 2008; Kim et al., 2006). Younger consumers may also have music preferences based on demographic characteristics, such as ethnicity and biological sex (Bayles, 2005; Behance, 2013; Gaille, 2015; MusicWatch, 2015; Newman, 2009; Ross, 2006; The Numbers Guy, 2005).

Based on the uses and gratifications paradigm (Katz, Blumler, & Gurevitch, 1973; Rubin, 2009), it may be that consumers with increased dating and sexual experiences or interests seek out music that contains sexual content for reasons such as sex education, normalization and acceptance of their own behavior, strengthening friendships and peer relationships, or conforming to a sub-group or sub-culture (Bleakley et al., 2008). Repeated exposure to sexual content in music may then blur the line between reality and fantasy for consumers (Agbo-Quaye & Robertson, 2010), similar to the cultivation framework, which contends that the more people live in the media world, the more likely they are to believe that what is portrayed is real (Cohen &
Weimann, 2000; Gerbner, Gross, Morgan, & Signorielli, 1994). Additionally, musicians may create a false reality about the potential for negative consequences that are associated with risky sexual behavior (Beullens, Roe, & Van den Bulck, 2012) due to the fact that negative consequences are rarely, if ever, portrayed in music. Consumers may then be more likely to make decisions, adopt thinking processes, and behave similarly to the music content to which they are exposed (Knobloch-Westerwick, Musto, & Shaw, 2008; Kohn, 1969, 1983). In essence, then, exposure to sexual content in music is expected to alter consumers sexual attitudes, which may then influence their sexual behaviors (see Ward et al., 2011; Wright & Brandt, 2015).

**Previous Meta-Analytic Reviews**

While the relation between sexual content in audio music and/or music videos on sexual attitudes and/or behaviors of consumers has been examined, the presence of meta-analytic reviews focusing on the issue of music alone has much room to grow. Instead, the few meta-analytic reviews that have examined sexual behaviors (but not sexual attitudes) in relation to media have combined music with multiple types of media (e.g., television, movies, etc.) (Ferguson, Nielsen, & Markey, 2017; Fischer et al., 2011), making it difficult to isolate the effects of music. This is definitely a limitation of current research considering the important role of music for adolescents and emerging adults.

Fischer and colleagues (2011) reviewed 88 empirical studies with more than 80,000 participants and found an effect size of 0.29 for all forms of media and sexual risk taking. This review only included one study that isolated music (see Martino et al., 2006), providing an effect size of 0.21.

Ferguson and colleagues (2017) reviewed 22 studies with more than 22,000 participants and concluded that sexual media had a weak correlation with sexual behaviors (0.08), after controlling for other variables. All but three studies included in their review used the combined media approach. The three studies that isolated music found an effect size that ranged from 0.09 to 0.23 for sexual behaviors (defined broadly, ranging from making out to sexual intercourse).

Additionally, there has been one meta-analytic review that focused on the effects of popular music on consumers. Timmerman et al. (2008) concluded that music influenced both thoughts and attitudes via arousal and priming to reflect the content in music, with effect sizes ranging from 0.20 to 0.30. Timmerman et al. also indicated the future research opportunities to be used as a projection into media education. However, Timmerman et al. examined general outcomes rather than sexual outcomes, did not focus on adolescents and emerging adults, and looked into pornography briefly alongside music. Our current study expands that of Timmerman et al. in that we address a relevant topic related to music content, examine specific outcomes, and focus on populations that could benefit from media education in this regard (e.g., adolescents, emerging adults).
The Current Study

While the majority of previous research, utilizing various research designs, has found an association between exposure to sexual content in audio music and/or music videos on sexual attitudes and/or behaviors, there have been some studies with null results (see Sprankle & End, 2009; Sprankle, End, & Bretz, 2012). Other researchers have focused on sexual outcomes in relation to mixed media, such as reality TV, men’s magazines, pornography, and music television, and have voiced the need for further research on both nontraditional venues of sexual media and emergent mainstream medias (Wright, 2009; Wright & Tokunaga, 2015). While the combined media approach is useful and provides a glimpse of how various forms of media work together, it makes it difficult to isolate the effects of music, providing support for the need of additional research in this area. A meta-analytic review that quantitatively combines data from previous research in this area to estimate the effect size between exposure to sexual content in music and sexual outcomes, investigate potential moderators between music and sexual outcomes, and examine variations in the outcomes of previous research is well over-due.

Accordingly, we conducted a meta-analysis to provide a statistical review of findings in this area. Considering that previous research has not standardized the sexual outcomes examined, we grouped outcomes in two categories: sexual attitudes and sexual behaviors. We focused specifically on sexual content in audio music and music videos and also examined potential moderators.

Method

Literature Search Procedures and Selection of Studies

A systematic, computer-based search was conducted through MedLine, PsycINFO, and Communications and Mass Media in April and May 2017 to search for relevant articles. There were no restrictions on geography or culture in which studies were conducted. However, the time period of publication was limited from 2000 to 2017. The following search terms were used: “adolescent or youth,” “emerging adult,” “sexual attitude,” “permissive attitude,” “rape myth,” “sexual behavior,” “sexual initiation,” “risky sexual behavior,” “sexual intercourse,” “sex,” and “music.” For a study to be included it must have meet the following criteria:

1. Each study must measure the influence of audio music or music videos on an outcome related to sexual behavior. Other forms of media, including pornography, were not included in this study. It is recognizably obvious that outcome similarities exist among music videos and pornography, however music videos have yet to reach the explicit level to be labeled as such; therefore, the search for a specific isolation of one media permits they be treated separately. Both sexual attitudes and behaviors were included as outcomes.

2. Each study must present statistical outcomes or data that could be used to determine the effect size $r$. 

3. Participants in the study must be classified as adolescents (e.g., age 13–17) and/or emerging adults (e.g., 18–25). Longitudinal studies that began during adolescence and extend into emerging adulthood could be included.

4. Each study must be written or translated in English to be included in this study.

The initial search returned approximately 182 hits, the majority of which (156) did not meet the aforementioned inclusion criteria. Employing the inclusion criteria, the final search obtained 26 published articles, with total participants $n = 25,323$. Two published articles included two studies within the article (i.e., Wright & Rubin, 2017; Wright, 2013). Subsequently, each was coded separately, yielding a total of 28 studies included in analyses. Information regarding articles selected can be found in Table 1.

**Coding of Studies**

Each study was coded for outcomes related to sexual attitudes and/or sexual behavior. Sexual attitudes included such things as adversarial sexual beliefs, rape guilt, perceptions of premarital sexual permissiveness, sexual intentions, sexual behavior expectations and norms, female resistance, sex self-efficacy, and date rape acceptance. Sexual behaviors ranged from kissing to the timing of sexual initiation, condom use during intercourse, number of sexual partners, and engaging in risky sexual behaviors. The sex of each study sample was coded based on the percentage of male participants in the study. Age of participants was classified as adolescent (e.g., 13–17) or emerging adult (e.g., 18–25) based on either the age range of participants provided or the mean age of participants. Participant ethnicity was coded based on the majority of sample participants (>75%) (e.g., White, Black, Hispanic). If a study did not have 75% or more of participants identifying with one ethnicity and multiple ethnic groups were represented by the sample, participant ethnicity was coded as “mixed.” This was most often the case for studies that implemented random or convenience sampling methods. A few studies listed the ethnicity of the majority of the sample as less than 75% but did not provide additional information regarding participant ethnicity. When this was the case, the ethnicity specified in the study was used for coding purposes.

The format of music was coded as either audio or video. Music genre was also coded. Many studies examined current songs off the top charts at the time of the study, including various music genres (e.g., pop, R&B, rap, rock), which were coded as “top hits.” Other studies examined multiple music genres in their study but did not specify that songs selected were from the top charts. These studies were coded as “multiple genres” and included such genres as alternative, rap, heavy metal, classical music, and others. All of the studies included in the meta-analysis that focused on only one music genre focused on rap music (coded as “rap”) and others did not specify the music genre examined (coded as “not specified”). Each study was also coded for the research design the best described
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<td>Ybarra, Strasburger, and Mitchell (2014)</td>
<td>1808</td>
<td>0.18</td>
<td>0.02</td>
<td>50</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>A</td>
<td></td>
<td></td>
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<tr>
<td>Zhang et al. (2008)</td>
<td>266</td>
<td>0.16</td>
<td>0.06</td>
<td>42</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>V</td>
<td></td>
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</table>

Total N 25,323

Note: Age is coded as 1 = adolescents; 2 = emerging adults
Ethnicity is coded as 1 = White; 2 = Black; 3 = Hispanic; 4 = Multiple ethnic groups
Location is coded as 1 = United States; 2 = Netherlands; 3 = Australia
Format is coded as A = audio music; V = music videos
Genre is coded as R = rap; TH = top hits; M = multiple genres; NS = not specified
Design is coded as CR = cross-sectional; L = longitudinal; E = experimental
Outcome is coded as SB = sexual behavior; SA = sexual attitude
*included two studies, each coded separately for meta-analysis
the study (e.g., longitudinal, cross-sectional, experimental), the location of data collection, and publication year.

**Estimating Effect Size**

In the present analysis, controlled effect sizes (i.e., standardized regression weights) were examined. The effect size $r$ was used in this analysis both due to the inclusion of longitudinal and correlational effect sizes in the analysis and because $r$ is a straightforward effect size and easy to interpret. Additionally, considering that confounding variables may exist, Savage and Yancey (2008) argued that controlled effect sizes are the preferred inclusion for meta-analyses. While many studies reported regression weights or correlational results, the results of other studies had to be converted to $r$ prior to analysis (e.g., odds ratio, $f$, $t$, $M$, and $SD$).

Some studies reported more than one effect size that were relevant to a single underlying construct (i.e., multiple measures of sexual behavior). When this occurred, they were aggregated for a single average effect size that was included in analysis in order to maintain the assumption of independent effects, as recommended by Bor-enstein, Hedges, Higgins, and Rothstein (2009) (see Chapter 24). Additionally, a few studies reported non-significant findings. When this occurred, in line with Levine (2013), effect sizes were included in the meta-analysis. According to Levine (2013), reduced statistical power is a major cause of non-significant results, and non-significant results should be included, where provided, in meta-analyses in order to provide a stronger and more robust test than the original study due to the increased power provided by the meta-analysis. Finally, some studies examined multiple music formats (i.e., audio and videos) on both outcome measures (i.e., sexual attitudes and sexual behaviors). When this occurred, each result was entered separately in the meta-analysis.

**Analyses**

The Comprehensive Meta-Analysis (CMA) software program was used to conduct the meta-analysis. We used a random-effects model weighted by variance, more specifically the DerSimonian and Laird method (see Borenstein et al., 2009, Chapter 12) to estimate effect sizes, rather than a fixed-effects model, due to estimation limitations of fixed-effects models (Cafri, Kromrey, & Brannick, 2010; Hunter & Schmidt, 2004). Additionally, due to the nature of the predictor and outcome variables in this study, positive effects represented associations with aspects of music and sexual outcomes. Publication bias and moderator variables were assessed. Additionally, all results discussed in the following were coded such that positive effect sizes represent associations with negative outcomes.
Results for sexual behaviors and attitudes, can be found in Tables 2 and 3. The overall effect size estimate \( r \) of audio music and music videos on sexual behaviors was 0.16 \((N = 14,178, k = 20, Z = 6.72, p < 0.001, 95\% \text{ CI} [0.11, 0.20])\). The overall \( r \) of audio music and music videos on sexual attitudes was 0.25 \((N = 7,337, k = 15, Z = 4.99, p < 0.001, 95\% \text{ CI} [0.15, 0.34])\). Additionally, most studies showed a positive relationship between sexual content in music and sexual attitudes and behaviors.
The disproportionate influence of single studies on the overall effects for sexual attitudes and behaviors was examined by reconducting the meta-analysis with a different study removed each time (14 times for sexual attitudes, 19 times for sexual behaviors). The $r$ in these estimates ranged from 0.14 to 0.16 for sexual behaviors and from 0.19 to 0.27 for sexual attitudes. The fact that these estimates were not substantially different from the overall effect size (0.16 for sexual behaviors, 0.25 for sexual attitudes) indicates that no single study made a disproportionate contribution to the overall effects.

The possibility of publication bias was also examined for sexual attitudes and behaviors using a funnel plot that included study precision (1/standard error) on the $y$ axis and Fisher's Z on the $x$ axis. In this plot, larger, more precise studies

### Table 3: Meta-Analysis Results for Sexual Attitudes

<table>
<thead>
<tr>
<th></th>
<th>$k$</th>
<th>$r$</th>
<th>CI$_{LL}$</th>
<th>CI$_{UL}$</th>
<th>$z$</th>
<th>$p$</th>
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<tbody>
<tr>
<td>Overall effect</td>
<td>15</td>
<td>0.25</td>
<td>0.15</td>
<td>0.34</td>
<td>4.99</td>
<td>&lt; 0.001</td>
</tr>
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<td>Music Format</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio</td>
<td>8</td>
<td>0.20</td>
<td>0.08</td>
<td>0.31</td>
<td>3.20</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Videos</td>
<td>7</td>
<td>0.32</td>
<td>0.15</td>
<td>0.47</td>
<td>3.56</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Music Genre</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rap</td>
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<td>0.39</td>
<td>0.06</td>
<td>0.64</td>
<td>2.32</td>
<td>0.02</td>
</tr>
<tr>
<td>Top Hits</td>
<td>5</td>
<td>0.12</td>
<td>0.08</td>
<td>0.16</td>
<td>6.04</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Multiple genres</td>
<td>3</td>
<td>0.42</td>
<td>0.03</td>
<td>0.70</td>
<td>2.11</td>
<td>0.04</td>
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<tr>
<td>Not specified</td>
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<td>0.07</td>
<td>0.01</td>
<td>0.15</td>
<td>1.72</td>
<td>0.09</td>
</tr>
<tr>
<td>Participant Ethnicity</td>
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</tr>
<tr>
<td>African American</td>
<td>1</td>
<td>0.03</td>
<td>0.04</td>
<td>0.10</td>
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<tr>
<td>Hispanic</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>White</td>
<td>10</td>
<td>0.25</td>
<td>0.11</td>
<td>0.38</td>
<td>3.48</td>
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<td>Multiple Groups</td>
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<td>0.12</td>
<td>0.49</td>
<td>3.17</td>
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<td>Participant Age</td>
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<tr>
<td>Adolescent</td>
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<td>0.39</td>
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<td>Emerging Adult</td>
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<td>0.26</td>
<td>0.13</td>
<td>0.38</td>
<td>3.73</td>
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<tr>
<td>Cross-sectional</td>
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<td>0.08</td>
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</tr>
<tr>
<td>Experimental</td>
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<td>0.06</td>
<td>0.68</td>
<td>2.27</td>
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<td>0.001</td>
<td>0.20</td>
<td>1.98</td>
<td>0.05</td>
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<td>Study Location</td>
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</tr>
<tr>
<td>Australia</td>
<td>1</td>
<td>0.04</td>
<td>0.05</td>
<td>0.13</td>
<td>0.91</td>
<td>0.37</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2</td>
<td>0.07</td>
<td>0.01</td>
<td>0.13</td>
<td>2.47</td>
<td>0.01</td>
</tr>
<tr>
<td>United States</td>
<td>12</td>
<td>0.31</td>
<td>0.18</td>
<td>0.42</td>
<td>4.66</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note. $k =$ number of studies; $r =$ mean correlation coefficient; CI$_{LL}$ and CI$_{UL}$ = lower limit and upper limit of the 95% confidence interval.

Single Study Sensitivity and Publication Bias

The disproportionate influence of single studies on the overall effects for sexual attitudes and behaviors was examined by reconducting the meta-analysis with a different study removed each time (14 times for sexual attitudes, 19 times for sexual behaviors). The $r$ in these estimates ranged from 0.14 to 0.16 for sexual behaviors and from 0.19 to 0.27 for sexual attitudes. The fact that these estimates were not substantially different from the overall effect size (0.16 for sexual behaviors, 0.25 for sexual attitudes) indicates that no single study made a disproportionate contribution to the overall effects.

The possibility of publication bias was also examined for sexual attitudes and behaviors using a funnel plot that included study precision (1/standard error) on the $y$ axis and Fisher's Z on the $x$ axis. In this plot, larger, more precise studies
typically cluster closer around the mean effect than smaller, less precise studies, which tend to spread out toward the bottom of the plot (Borenstein et al., 2009). Publication bias is likely if less precise studies with smaller than average effects are missing from the bottom left of the plot. In the present case, no indication of publication bias was found for either outcome. We also used Duval and Tweedie’s (2000) trim-and-fill method to remove extreme low precision studies from the bottom right of the funnel plot and to obtain an estimate of the mean in the absence of a publication bias. Consistent with the assessment of the funnel plot, the trim-and-fill algorithm did not identify any studies to be trimmed for either outcome.

**Moderation Effects for Sexual Attitudes and Behaviors**

AQ test of homogeneity of variance indicated significant heterogeneity among correlations for sexual behaviors, $Q_w (19) = 135.22, p < 0.001$, and sexual attitudes, $Q_w (14) = 245.59, p < 0.001$. Consistent with this, the $I^2$ (Higgins & Thompson, 2002) indicated that a somewhat large percentage (85.95%) of the variation in effect sizes for sexual behaviors and sexual attitudes (94.30%) between studies was due to systematic variation, rather than random sampling error. As such, moderator variables were examined.

**Music format**

Studies were compared based on music format (i.e., audio, video). No significant moderating effects were found for sexual attitudes, $Q_B (1) = 1.41, p = 0.24$, or sexual behaviors, $Q_B (1) = 1.17, p = 0.28$.

**Music genre**

Studies were compared based on music genre (i.e., top charts, rap, multiple genres, not specified). No significant moderating effects of music genre were found for sexual behaviors, $Q_B (3) = 6.65, p = 0.08$, or sexual attitudes, $Q_B (3) = 6.66, p = 0.09$.

**Participant ethnicity**

Studies were compared based on participant ethnicity (i.e., Black, Hispanic, White, multiple ethnic groups). No significant moderating effects of ethnicity were found for sexual behaviors, $Q_B (3) = 2.27, p = 0.52$. However, significant moderating effects of ethnicity were found for sexual attitudes, $Q_B (2) = 13.66, p = 0.001$. For sexual attitudes, the smallest effect size was found in the study containing Black participants as the majority ($k = 1, r = 0.03, Z = 0.90, p = 0.37, 95\% CI [-0.04, 0.10]$). Studies with White participants had the second lowest effect ($k = 10, r = 0.25, Z = 3.48, p < 0.001, 95\% CI [0.11, 0.38]$). Studies with participants from multiple ethnic groups had the largest effect compared to the other ethnicities examined ($k = 4, r = 0.32, Z = 3.17, p = 0.002, 95\% CI [0.12, 0.49]$).
Participant age

Studies were compared based on participant age. Age was coded as adolescent (13–17 years) and emerging adult (18–25 years). There was a significant moderating effect of participant age on sexual behaviors, \( Q_B (1) = 16.47, p < 0.001 \). Results indicated that studies examining adolescents had a larger effect (\( k = 11, r = 0.22, Z = 6.82, p < 0.001, 95\% \text{ CI} [0.15, .27] \)) than those examining emerging adults (\( k = 9, r = 0.08, Z = 5.71, p < 0.001, 95\% \text{ CI} [0.05, 0.10] \)). However, there was no significant moderating effect of participant age on sexual attitudes, \( Q_B (1) = 0.03, p = 0.87 \).

Participant sex

To investigate whether participant sex moderated the size of the relation between sexual content in music and sexual attitudes and behaviors, metaregression analyses were conducted. There was no significant relation between the percentage of male participants in each study and the size of the relation for sexual behaviors, \( \beta = 0.001, Z = 1.22, p = 0.22, \tau^2 = 0.01, 95\% \text{ CI} [-0.0008, 0.003] \). However, an effect was found for sexual attitudes, \( \beta = 0.006, Z = 2.07, p = 0.04, \tau^2 = 0.10, 95\% \text{ CI} [0.0003, 0.01] \), in that as the percentage of male participants increased, so did sexual attitudes.

Location

Studies were also compared based on location (i.e., United States, Australia, Netherlands). A significant moderating effect of study location was found for sexual attitudes, \( Q_B (2) = 12.80, p = 0.002 \). Studies conducted in the United States had the largest effect (\( k = 12, r = 0.31, Z = 4.66, p < 0.001, 95\% \text{ CI} [0.18, 0.42] \)), followed by the Netherlands (\( k = 2, r = 0.07, Z = 2.47, p = 0.01, 95\% \text{ CI} [0.01, 0.13] \)), and then the study conducted in Australia (\( k = 1, r = 0.04, Z = 0.91, p = 0.37, 95\% \text{ CI} [-0.05, 0.13] \)). No significant moderating effect of study location was found for sexual behaviors, \( Q_B (2) = 4.28, p = 0.12 \).

Main and interaction effects

Two analyses of covariance (ANCOVAs) were conducted in SPSS to determine how music format and music genre were related to sexual attitude and sexual behaviors while controlling for participant age, ethnicity, location, and sex. For sexual behaviors, a main effect was found for participant age, \( F (1, 22) = 5.80, p = 0.04, \eta^2 = 0.35 \), in that across all of the studies examined here those with adolescent participants reported a greater effect (\( M = 0.22, SD = 0.12 \)) than those whose participants were emerging adults (\( M = 0.08, SD = 0.04 \)). A main effect was also found for music format, \( F (1, 22) = 8.77, p = 0.01, \eta^2 = 0.44 \), in that studies examining audio music reporter a greater effect (\( M = 0.17, SD = 0.13 \)) than studies examining music videos (\( M = 0.11, SD = 0.06 \)). An interaction effect of music format and music genre was also found for sexual behaviors, \( F (3, 22) = 4.04, p = 0.04, \eta^2 = 0.52 \), with the largest effect being found for rap audio music (\( M = 0.39, SD = 0.10 \)). For sexual attitudes, no significant main or interaction effects were found.
Study design
Studies were compared based on research design (i.e., cross-sectional, longitudinal, experimental). A significant moderating effect of study design was found for sexual behaviors, $Q_B (1) = 5.08, p = 0.02$. Longitudinal designs were found to have the largest effect for sexual behaviors ($k = 8, r = 0.21, Z = 5.46, p < 0.001, 95\% \text{ CI } [0.13, 0.28]$) followed by cross-sectional designs ($k = 12, r = 0.11, Z = 5.19, p < 0.001, 95\% \text{ CI } [0.07, 0.15]$). Experimental designs were not conducted for sexual behaviors. However, no significant moderating effects of study design were found for sexual attitudes, $Q_B (2) = 3.79, p = 0.15$.

Discussion
Interpreting the Overall Effect
The present meta-analysis found a significant positive relation between sexual content in music and sexual attitudes and behaviors. The $r$ value for the relation between sexual content in music and sexual attitudes was 0.25. For sexual behaviors, the $r$ value was 0.16. The effect size for sexual behaviors is slightly lower than that reported by previous meta-analytic reviews that included music in their review of multiple forms of media on sexual behaviors (see Ferguson et al., 2017; Fischer et al., 2011). However, it was somewhat difficult to isolate the effects of music on sexual behaviors as Fischer et al. (2011) only included one study that focused on music and Ferguson et al. (2017) included three. The current meta-analysis included a total of 26 studies examining sexual behaviors as well as sexual attitudes. The increase in the number of studies included in our meta-analysis increases the power of the test (Levine, 2013), indicating that our effect size is probably a more accurate indicator of the effects of sexual content in music on sexual behaviors. Additionally, our meta-analysis is the first to examine the effect of sexual content in music on sexual attitudes.

One way to interpret the size of the effects in the current meta-analysis is to consider them in relation to Cohen's (1988) effect size benchmarks, which proposed that $r$ values around the 0.10, 0.30, and 0.50 marks should be considered small, medium, and large, respectively. Hence, the overall effects in the present meta-analysis can be classified as small. However, the effect for sexual attitudes approached 0.30, the cutoff point to be considered a medium effect. Also, both effects were larger than 0.10, which is the minimal level for the effect to not derive from trivial effects. Given this interpretation, it is inappropriate to focus on the size of the overall relation (Borenstein et al., 2009; Hunter & Schmidt, 2004). Instead, it is more appropriate to consider the size of the effect for each music format and genre to determine if it is pertinent to consider whether policymakers should be concerned about this effect or whether it can be dismissed as inconsequential.

However, even small effects (e.g., 0.03) can have important real-world implications (McCartney & Rosenthal, 2000), indicating that the effects found in this meta-analysis are not inconsequential. Additionally, when examining the effect of audio music and music videos on the outcome variables (sexual attitudes, sexual behaviors), we see
some variation in effect size. While we did not expect to see significant moderating effects for music format (audio, videos) on sexual attitudes and behaviors, it is interesting that for sexual attitudes, sexual content in music videos (0.32) had a larger effect than audio music (0.20). The reverse was found for sexual behaviors. Sexual content in audio music (0.17) had a larger effect than music videos (0.12). This may indicate that visual content is more influential regarding sexual attitudes than auditory content but that auditory content is more influential regarding sexual behaviors than visual content. Future research would need to examine this possibility more thoroughly as well as the implications for such findings.

Considering the variations in the nature of sexual content in music based on music genre (Agbo-Quaye & Robertson, 2010), we expected to see significant moderating effects of music genre on sexual attitudes and behaviors. However, that was not the case. Interestingly, studies that focused on only one music genre focused on rap music. All other studies focused on music from the top charts, included multiple genres in their analyses, or did not specify music genre in their study. With this in mind, it was not surprising that sexual content in rap music (0.32) had the largest effect on sexual behaviors, followed by music from the top charts (0.13), music genre not specified (0.12), and multiple music genres (0.11). For sexual attitudes, however, multiple music genres (0.42) had the largest effect, followed by rap music (0.30), and music from the top charts (0.12). Focusing specifically on rap music is problematic because it appears as researcher bias regarding the music genre, music artists, and presumed consumers have influenced the research design. Rap music is not the only genre of music that has included sexual content in both audio music and music videos. Pop and rock music have been documented to do so as well (Agbo-Quaye & Robertson, 2010). While 26.8% of the studies included in the meta-analyses examined only rap music, no studies isolated other music genres for examination.

**Moderation Effects**

While it has been suggested that the relation between exposure to sexual content in media and sexual behaviors could be nothing more than a spurious gender effect (Ferguson et al., 2017), and that there are gender differences in media use and sexual outcomes (Kaestle, Halpern, & Brown, 2007; Kistler & Lee, 2010; Ter Bogt, Engels, Bogers, & Kloosterman, 2010), we did not find a moderated gender effect for sexual behaviors in this meta-analysis. We did, however, find a moderated gender effect for sexual attitudes in that sexual attitudes increased as male participants increased in the study. Perhaps this variation in findings is due to our specific focus on music content rather than multiple forms of media, as well as comparing both sexual attitudes and behaviors rather than focusing on sexual behaviors. However, considering that previous meta-analytic reviews have reported that males have more sexually permissive attitudes than females (Oliver & Hyde, 1993; Petersen & Hyde, 2010), it may be that
these results represent more of a gender effect on sexual attitudes rather than an effect related to sexual content in music.

Our findings support the moderating effect of ethnicity that has been reported in previous research examining the effects of multiple forms of media. Several studies have found a stronger effect of media on White participants compared to other ethnic groups (Brown et al., 2006; Hennessy, Bleakley, Fishbein, & Jordan, 2009). We found similar effects, but only for sexual attitudes, in that studies comparing multiple ethnic groups through random or convenience sampling reported the largest effects (0.32), followed by studies with the majority of participants being White (0.25), and then a study with the majority of participants being Black (0.03). This may partly be related to the music genre preferences of White consumers and the content contained in such music. It was previously estimated that White youth were the main consumers of rap music, with estimates ranging from 60% to 80% (Bayles, 2005; The Numbers Guy, 2005). More recent estimates, however, report that 29% of the hip-hop radio audience are White, Asian, or bi-racial (Gaille, 2015). MusicWatch (2015), on the other hand, classified consumers as either African American or not African American and reported that the majority of music consumers are not African American with estimates ranging from (83% to 91%) depending on the type of music consumption (e.g., CD purchases, music streaming, paid music subscriptions). MusicWatch also classified rap/hip-hop as in the top three preferred music genres among music consumers. Furthermore, rap music has been associated with explicit sexual content in previous research (Agbo-Quaye & Robertson, 2010) and has been the isolated focus of several studies examining the effects of sexual content in music on consumers.

We also found a moderating effect of age for the relation between sexual content in music and sexual behaviors, but not sexual attitudes, in that the effect was much stronger for adolescents (0.22) than for emerging adults (0.08). This may be due to the strong focus on identity development that emerges during adolescence (Ter Bogt & Soitos, 2007; Thomas, 2016) and then begins to stabilize during emerging adulthood (making them less vulnerable to influence) (Wångqvist, Carlsson, van der Lee, & Frisén, 2016).

We also examined potential moderating effects of study location and design (i.e., cross-sectional, longitudinal, experimental) on sexual attitudes and behaviors. Regarding location, studies conducted in the United States yielded the largest effect for sexual attitudes (0.31), but not sexual behaviors, followed by those conducted in the Netherlands (0.07), and then the study conducted in Australia (0.04). This is probably related to the fact that 78% of the studies included in the meta-analysis included a sample from the United States.

While we found no significant moderating effect of study design on sexual attitudes, there was a significant moderating effect of study design for sexual behaviors. Longitudinal designs had the largest effect (0.21) followed by cross-sectional designs (0.11). This may be because longitudinal designs are theoretically more informative and those included in our review provided evidence to support a relationship between
sexual content in music and sexual behaviors. Experimental designs were not conducted by any of the studies included to examine sexual behaviors, probably due to ethical considerations.

Conclusion

While healthcare professionals exhibit concern that exposure to sexual content in music may be related to risky sexual behaviors (Agbo-Quaye & Robertson, 2010), results of this meta-analysis indicate that sexual content in music is not the only risk factor. Moderating variables, in addition to music format and music genre, played a role in the relation between sexual content in music and sexual attitudes and behaviors, such as participant age, sex, ethnicity, and location. It may be more accurate to point out that sexual content in music combines with some of these factors to increase the risk for negative sexual health outcomes.

Considering the results of the meta-analysis, it appears as though the uses and gratifications paradigm (Katz et al., 1973; Rubin, 2009) and the cultivation framework (Cohen & Weimann, 2000; Gerbner et al., 1994) are better at explaining the sexual attitudes and behaviors of adolescents in relation to sexual content in music rather than a general relationship between sexual content in music and sexual attitudes and behaviors. For instance, it appears as though music preferences based on demographic characteristics, particularly ethnicity (Bayles, 2005; Gaille, 2015; MusicWatch, 2015; The Numbers Guy, 2005), may be related to some of the effects associated with sexual content in music and sexual attitudes. Additionally, the relationship between participant age and sexual behaviors may be related to the heavy consumption of music among adolescents (van Oosten et al., 2015; Roberts et al., 2005), possibly related to identity development (Lonsdale & North, 2011; Ter Bogt & Soitos, 2007; Thomas, 2016) or media seeking behavior related to learning information related to sexuality (Agbo-Quaye & Robertson, 2010; Bale, 2011; Bleakley et al., 2008; Brown, 2008). Furthermore, our results provide support for previous research that has found that sexual attitudes can influence sexual behaviors (Ward et al., 2011; Wright & Brandt, 2015).

Limitations and Future Research

Within the meta-analysis, there are some limits to the strength of our findings. In addition to the variations of results derived from differing research designs utilized in this field, current research in this area is rather limited, yielding 26 studies for inclusion in our review. This is partly because we limited media to music. Additionally, the majority of research in this area has focused on heterosexual relationships. Future research should consider the impact of media messages on non-heterosexual populations. The lack of standardization in terms of specific variables in previous research (e.g., sexual attitudes) can also be a limitation. While we grouped outcomes as either sexual attitudes or sexual behaviors, both
the attitudes and behaviors included in past research were not consistent across studies. Additionally, we did not correct for study artifacts (Hunter & Schmidt, 2004). As such, the true size of the relationship between exposure to sexual content in music and sexual attitudes and behaviors is higher than the observed effect sizes reported here.

Future research should consider if sexual outcomes related to sexual content in music and other forms of media are related to a third common variable, one that impacts media consumption and sexual outcomes. Additionally, future research should examine music in the socialization process more thoroughly, including aspects of parental and peer influences as they are often related to sexual behaviors (L’Engle, Brown, & Kenneavy, 2006). Furthermore, sexual messages contained in music may contradict parental messages regarding sex and intimate relationships (Epstein & Ward, 2008). Finally, risk factors associated with limited parental and peer positive socialization regarding sexuality should also be considered in future research examining the impact of music and other forms of media on sexual outcomes (Ferguson et al., 2017).

References


