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Does Adolescent Media Use Predict Sexual Stereotypes in Adolescence and Emerging Adulthood? Associations with Music Television and Online Pornography Exposure

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ABSTRACT

Entertainment media consumed by adolescents have been criticized for their stereotyped depictions of sexual relationships. This longitudinal study among 182 boys and 218 girls from Belgium tests reciprocal relationships between adolescents' acceptance of gendered sexual roles and their exposure to music television and online pornography over three waves. The study innovates by including a fourth wave, approximately five years after Wave 3, when the participants had reached emerging adulthood, allowing to study long-term associations across the two developmental stages. Results first showed that adolescents who watched more music television than their same-aged peers reported a stronger acceptance of rape myths in emerging adulthood. Second, the link between adolescents' music television viewing and acceptance of rape myths in emerging adulthood was an indirect relationship through adolescents' acceptance of gendered sexual roles during adolescence. Third, adolescents' exposure to online pornography relative to their same-aged peers did not predict their acceptance of gendered sexual roles or rape myths in emerging adulthood. Fourth, gender and age differences could not be investigated due to model fit problems and are suggested to be examined in future research. Implications of the long-term consequences of adolescents' media use are discussed.

Keywords: gender roles, rape myths, music television, online pornography, adolescence

INTRODUCTION

The beliefs that men are obsessed with sex, whereas women are portrayed as sex objects are typical examples of traditional gendered sexual roles (Diamond & Savin-Williams, 2009; Wright, 2009). During adolescence, gender roles intensify and adolescents learn how to respond to others in sexual activities (Arnett, 2013). Although adolescent boys and girls differ in their emerging gender understandings, research has formulated concerns about how the process of gender intensification may be affected by media contents' narrow interpretation of sexual gender roles (Kim et al., 2007). Research has suggested that adolescents with more traditional gender roles more frequently select media promoting these biased views, but also that more frequent exposure to such media content leads to stronger endorsement of such roles (Peter & Valkenburg, 2009; Zillmann & Bryant, 1985). Scholars have in particular warned for two media types that are popular among adolescents and in which gendered sexual roles are often portrayed: music television and online pornography (Aubrey & Frisby, 2011; Ferris, Smith, Greenberg, & Smith, 2007; Klaassen & Peter, 2015). Additionally, exposure to sexual media content, such as music television and online pornography, and an endorsement of gendered sexual roles are known to predict rape myth acceptance (Hald, Malamuth, & Yuen, 2010; Suarez & Gadalla, 2010). Such myths are especially hazardous in emerging adulthood as sexual aggression is known to be a frequently occurring problem in this age group (Thompson, Swartout, & Koss, 2013).

Prior research has been unable to test whether adolescents' media use and acceptance of gendered sexual roles can develop into an acceptance of rape myths in emerging adulthood. To study such long-term associations over the two developmental stages, a four-wave panel study was conducted, which consisted of three waves with six-month intervals during adolescence and a fourth wave, five years later, in emerging adulthood.

Adolescents, Media Use, and Gendered Sexual Roles

Adolescence is the time in which most young people first gain interest in and experience with romantic relationships and sex (Arnett, 2013; Symons, Van Houtte, & Vermeersch, 2013). Often, adolescents follow gendered roles in these romantic and sexual relationships. Although gender stereotypes can take on different forms for people with different sexual orientations (Blashill & Powlishta, 2009; Pirlott & Neuberg, 2014), in the current study, gendered sexual roles will refer to sexual stereotypes of heterosexual relationships (Kim et al., 2007). According to these heterosexual gender roles, boys are preoccupied with sex and do not require emotional closeness, whereas girls are expected to be more passive, but are also seen as sex objects (Diamond & Savin-Williams, 2009; Wright, 2009). Such gendered sexual roles are commonly portrayed in mediatized depictions of heterosexual relationships and sex (Wright, 2009).

Wright (2011, 2013) has developed a script acquisition, activation, application model ($_3$AM) which aims to understand how exposure to gendered sexual roles in media content can impact young viewers' cognitive scripts about relationships and sex. The model is based on previous script perspectives, most notably Huesmann's (1988) information processing model, that explain how, first, media exposure can lead to the acquisition of cognitive scripts, then, these scripts can be activated in people's minds through subsequent media exposure, and, finally, how active cognitive scripts can be applied, and thus affect people's behavior (Huesmann, 1988; Wright, 2011). In the $_3$AM, this script perspective is applied to the literature on media effects (e.g., Bandura, 2009) and sexual scripts (e.g., Gagnon & Simon, 1973) in order to formulate hypotheses about the relationship between sexual media exposure and sexual attitudes and behaviors, and the conditions and content characteristics that impact this relationship (Wright, 2011). One of the content characteristics that influences the acquisition of sexual scripts is sexual explicitness (Wright, 2011). More explicit sexual

content is expected to increase arousal, which, in turn, would increase attention to the content and thus facilitate the acquisition of scripts (Wright, 2011). Within the current literature, two types of media have been suggested to frequently show sexual content which promotes gendered roles and to relate to gendered sexual roles: music television and pornography. Both media are popular among adolescents, but are characterized by different degrees of explicitness.

Much of music television's air time is taken up by two types of content that frequently display gendered sexual roles; reality shows about dating and sex, and music videos (Aubrey & Frisby, 2011; Ferris et al., 2007). In a Dutch adolescent sample, music videos were one of the most popular types of television content (ter Bogt, Engels, Bogers, & Kloosterman, 2010). Content analyses have shown that music videos and reality dating shows frequently convey the message that women are sex objects and that men are sex-driven (Aubrey & Frisby, 2011; Bond & Drogos, 2014; Ferris et al., 2007; Wallis, 2011; Wright, 2009). Following the tenets of the $_3$AM, music television may be especially likely to influence gender role attitudes since the acquisition of scripts is facilitated by the realism (reality shows) and attractiveness (music videos) of media models (Wright, 2011). Online pornography comprises pictures and videos that show explicit portrayals of sexual acts (Vannier, Currie, & O'Sullivan, 2014). Although different studies report mixed findings with regard to the frequency of pornography use among adolescents, the general consensus is that a substantive number of adolescents (especially boys) watch online pornography (Peter & Valkenburg, 2016). In popular online pornography videos, women are more likely to be objectified than men, sexual pleasure is more likely to be gained by men than women, and men are more likely to be depicted in a dominant position (Gorman, Monk-Turner, & Fish, 2010; Klaassen & Peter, 2015; Vannier et al., 2014).

A cross-sectional study among Dutch adolescent boys and girls found that a preference for music television predicted a stronger agreement that men are sex-driven and women can be seen as sex objects (ter Bogt et al., 2010). The same study showed that adolescent boys' exposure to online pornography predicted their agreement with these gendered roles. Longitudinal support for the association between adolescents' exposure to the content of music television or online pornography and gendered sexual roles has also been found (Peter & Valkenburg, 2009; van Oosten, Peter, & Valkenburg, 2015). However, some longitudinal studies were unable to confirm these relationships (Peter & Valkenburg, 2011; Vandenbosch & Eggermont, 2011). Overall, multiple studies have found associations between adolescents' exposure to the contents of music television or online pornography and the acceptance of gendered sexual roles, but several null findings highlight the need for more research. The current study will re-examine this relationship. The first hypothesis reads:

> Hypothesis 1: Music television and online pornography exposure positively predict the acceptance of gendered sexual roles during adolescence.

Media Selection Hypothesis

Although most research focuses on the outcomes of media use, these outcomes may also be able to predict an individual's media use (Zillmann & Bryant, 1985). Selective exposure refers to individuals' tendency to select content that matches their prior beliefs and attitudes (Zillmann & Bryant, 1985). If such selective exposure processes occur, exposure to music television or online pornography and the acceptance of gendered sexual roles may be reciprocally related. In terms of the $_3$AM, selective exposure to media content that portrays the (gendered) sexual scripts that have already been acquired may activate and further strengthen these scripts in the minds of the media users (Wright, 2011).

A longitudinal study has found that a stronger acceptance of the notion that women are sex objects predicted more exposure to online pornography among male but not female

adolescents (Peter & Valkenburg, 2009). However, other longitudinal studies have not been able to find support for such media selection processes (Peter & Valkenburg, 2011; van Oosten et al., 2015). To gain more insight in selective exposure processes, the current study examined whether reciprocal relationships occur between exposure to music television or pornography, and the acceptance of gendered sexual roles:

> Hypothesis 2: The acceptance of gendered sexual roles positively predicts music television and online pornography exposure during adolescence.

Emerging Adulthood and Gendered Sexual Roles

Emerging adults experience more freedom and possibilities than adolescents (Arnett, 2013). Although most emerging adults value committed relationships, many do not feel ready for this engagement (Shulman & Connolly, 2015) and casual sex is relatively common at this time (Lyons, Manning, Longmore, & Giordano, 2015). Both in committed and uncommitted relationships, gendered sexual roles can be problematic as they are related to lower sexual satisfaction and potentially offensive sexualized behavior, such as making sexual comments and unwanted sexual touching (Jewell & Brown, 2013; Sanchez, Fetterolf, & Rudman, 2012). Emerging adults have been exposed to gendered sexual roles in the media for many years (Carroll et al., 2008; Seabrook et al., 2016). The $_3$AM suggests that repeated exposure to similar messages can strengthen the related cognitive scripts in long-term memory (Huesmann, 1988; Wright, 2011). Thus, exposure to gendered sexual roles in media content during adolescence may have a long-term influence on the acceptance of these roles. Studies that examine a long-term impact of mediatized gendered sexual roles on emerging adults' acceptance of these roles are lacking.

As the $_3$AM (Wright, 2011) suggests that cumulative media exposure may strengthen the acceptance of gendered scripts, these strengthened attitudes might also lead to further selective exposure to consistent media content (Zillmann & Bryant, 1985). As such, the

reciprocal relationships between media use and the acceptance of gendered sexual roles may also occur as individuals develop from adolescence to emerging adulthood. Furthermore, scholarly insights regarding the inconsistent results on the relationship between media exposure and the acceptance of gendered sexual roles, and vice versa, may be increased when studying these relationships across different developmental periods, i.e., during adolescence and emerging adulthood. Moreover, these associations may differ depending on the time frame over which such processes occur and thus whether they occur across shorter and longer time intervals. As such, the following hypotheses will be tested over a five-year interval between two developmental periods with attention for different time intervals:

Hypothesis 3: Music television and online pornography exposure in adolescence positively predict the acceptance of gendered sexual roles in emerging adulthood.

Hypothesis 4: The acceptance of gendered sexual roles in adolescence positively predicts music television and online pornography exposure in emerging adulthood.

Rape Myth Acceptance in Emerging Adulthood

Prior research has found that an acceptance of gendered sexual roles is linked to rape myth acceptance (Grubb & Turner, 2012; Suarez & Gadalla, 2010). Rape myths are stereotypes that trivialize the seriousness of rape and the harm for rape victims (Burt, 1980). A meta-analysis concluded that rape myth acceptance is related to sexually aggressive behavior towards women (Suarez & Gadalla, 2010). This is especially relevant for emerging adults since sexual aggression has been described as a significant problem associated to this age group (Thompson et al., 2013). Moreover, emerging adults are more sexually active than adolescents, including more casual sex, which increases the likelihood of encountering sexual aggression (Clodfelter, Turner, Hartman, & Kuhns, 2010; Lyons et al., 2015).

Rape myth acceptance can be seen as a more extreme continuation of gendered sexual roles (Burt, 1980; Grubb & Turner, 2012). As such, gendered attitudes developed during

adolescence might further manifest themselves as rape myths when individuals mature and sexual relationships become a more salient aspect of their own lives. Since both media use and the acceptance of gendered sexual roles have previously been found to predict rape myth acceptance (Hald et al., 2010; Suarez & Gadalla, 2010), the current study tested whether the hypothesized reciprocal relationships between exposure to music channels or online pornography and gendered sexual roles during adolescence may further develop into a stronger acceptance of rape myths in emerging adulthood. As such, long-term direct relationships will be examined, as well as indirect relationships between media use and rape myth acceptance through the acceptance of gendered sexual roles:

Hypothesis 5: Music television and online pornography exposure in adolescence positively predict rape myth acceptance in emerging adulthood.

Hypothesis 6: The acceptance of gendered sexual roles in adolescence positively predicts rape myth acceptance in emerging adulthood.

Hypothesis 7: Music television and online pornography exposure in adolescence indirectly and positively predict rape myth acceptance in emerging adulthood

A model that encompasses all the hypothesized relationships is shown in Fig. 1.

Moderating Roles of Gender and Age

This study examined whether gender differences exist in the hypothesized model. Previous studies have been mixed as associations between exposure to the contents of music television or online pornography and the acceptance of gendered sexual roles have been found among both boys and girls, or among boys only (Peter & Valkenburg, 2009; ter Bogt et al., 2010). Second, age differences will be tested as the age range in the current sample is relatively large (12-18 in Wave 1). Sexual media content may have a different impact among older or younger adolescents as the older may already have more sexual experience at the onset of the study (Arnett, 2013). Moreover, susceptibility to media effects depends on a

person's developmental stage due to differences in cognitive abilities and interests (Valkenburg & Peter, 2013). As such, the current study tested whether the hypothesized model differs between boys and girls, and between the younger and older half of the sample.

METHOD

Particpants[1]

The current longitudinal study consisted of four waves. The first three waves were conducted among a sample of adolescents and took place in their secondary schools, with six-month intervals. At baseline, 1513 adolescents completed the paper and pencil survey. The sampling procedure of the initial three-wave study has been described in more detail in previous articles (Vandenbosch & Eggermont, 2014).

Approximately five years after the third wave of the initial panel study, a fourth wave was conducted among the same participants, who had then reached emerging adulthood. As this follow-up was not yet planned during the time of the initial panel study, contact information of the participants was not directly available. With the help of the 12 schools that participated in the initial three-wave study, contact information was gathered for 1220 participants from the initial study. However, a substantial part of this information was incorrect as many participants had changed residence since they graduated from secondary school. A combination of contact methods, including letters, e-mails, and telephone calls, was used depending on which contact information was available. First, paper-and-pencil surveys were mailed to all participants for whom postal addresses were available. Second, a reminder letter was mailed. A total of 269 participants filled out the survey and mailed it back using prepaid envelopes that were provided. Third, in an effort to increase response, emails with a link to an online version of the survey were sent to participants of the original study who had not responded to the letter or whose postal address was not available. If an email address was

[1] The current paper uses data that were part of a larger study project that examines the use of sexual media content and sexual development from adolescence to emerging adulthood. More information about the study project can be obtained by sending an email to the first author.

not available but a telephone number was, the researchers called the participants to inform them about the study and request their participation. If they agreed to participate, an email address was asked and the link to the questionnaire was sent. If the researchers' phone call was unanswered, two additional attempts were made to contact the participant by phone. In total, 400 participants of the initial panel study filled out the questionnaire in the fourth wave (W4). Based on the participants' gender, date of birth, and school, a code was created which allowed the researchers to match their answers to the same participants' answers in the previous waves, while handling the data anonymously.

The current sample consisted of 182 men and 218 women between the ages of 18 and 24 (M = 21.17, SD = 1.52). A total of 33 participants were not born in Belgium or had (grand)parents who were born in a different country. Of the 400 participants, 17 did not identify as heterosexual. Additionally, 74.2% of participants had a higher education (either finished or enrolled as a student at the time of the study). Participants were also asked about their parents' educational level in W1. Almost one in three did not know their father's (31.3%) or mother's (27.0%) educational level. Among those who were able to answer the question, 2.2% of fathers and 2.7% of mothers did not finish secondary education, 40.4% of fathers and 30.5% of mothers finished secondary education but had no higher education, and 57.5% of fathers and 66.8% of mothers had enjoyed a higher education.

As the attrition in the current follow-up study was substantial, a multivariate logistic regression analysis was conducted in order to test whether the participants who participated in the follow-up (W4) differed from those who did not based on a wide variety of variables measured in W1. Participants' gender, age, ethnic background, sexual orientation, education, parents' education, communication quality with parents and peers, television consumption, and the study's central measures (music television, SEIM use, gendered sexual roles) were tested as predictors of their probability of participating in the follow-up, $\chi^2(16) = 65.75$, $p <$

.001, Nagelkerke R^2 = .11. Specifically, participants of Belgium origin were more likely to participate than those with an immigrant background, B = 0.57, SE = 0.29, p = .047. Those who were pursuing a more theoretical, B = 1.26, SE = 0.34, p < .001, or practice-oriented education, B = 0.86, SE = 0.36, p = .02, in W1 were more likely to participate than participants who were pursuing a vocational education. Finally, those whose fathers did not have a secondary or higher diploma were less likely to participate in W4 than participants whose fathers were more educated, B = -1.20, SE = 0.56, p = .03. The other background variables and the study's key measures did not predict participants' probability of participating in the follow-up study.

Measures

Control variables

Participants' gender (1 = *male*; 2 = *female*) was included in the analyses as a control variable. Ethnic background was measured in W1 by asking participants about their and their (grand)parents' country of birth (1 = participant *and grandparents born in* Belgium; 2 = participant *or grandparents born in another country*). As attachment and communication with parents have been shown to play a role in adolescents' sexual media use and sexual socialization, participants' communication quality with their parents (W1) was also added as a control variable (Overbeek, van de Bongardt, & Baams, 2018; Vandenbosch & Eggermont, 2012). A subscale of the Inventory of Parent Attachment (Armsden & Greenberg, 1987) was used, consisting of nine items including "My parents notice when I worry about something" and "My parents understand me." Participants indicated their agreement with these items using a 5-point scale ranging from *I completely disagree* (= 1) to *I completely agree* (= 5) (principal components analysis; explained variance = 53.13%, α = .89). Scores across the nine items were averaged to create a measure for communication quality with parents.

Participants' overall television viewing (in each wave) was also included as a control variable. On separate time lines for each day of the week, participants indicated when they usually watched television. In each wave, the mean was calculated for the number of hours that was indicated on each of the seven time lines, creating a measure for average daily television viewing.

Exposure to music television

Participants' exposure to music television was assessed during the first three waves by asking how often they watched each of the three music channels that were broadcasting in Belgium at the time. A 7-point scale ranging from *never* (= 1) to *(almost) every day* (= 7) was used. Exposure was calculated by averaging the scores for the three channels (principal components analysis; range explained variance for W1-W3 = 77.88-84.87%, range α for W1-W3 = .86-.91). At the time of W4, only one of the three music television channels (MTV) was still broadcasting. Hence, only participants' frequency of watching this channel was asked using the same scale as in the previous waves.

Exposure to online pornography

On a 7-point scale, participants indicated at each wave how often they visited four types of pornographic content on the internet (Peter & Valkenburg, 2006b), i.e., pictures with clearly exposed genitals, videos with clearly exposed genitals, pictures in which people are having sex, and videos in which people are having sex. The response options ranged from *never* (= 1) to *several times a day* (= 7). The responses for the four types of content were averaged at each wave to create a measure of exposure to pornography (principal components analysis; range explained variance for W1-W4 = 72.91-82.57%, range α for W1-W4 = .87-.93).

Acceptance of gendered sexual roles

In line with prior research (Vandenbosch & Eggermont, 2014), acceptance of gendered sexual roles was measured using a scale based on items from the Stereotypes about Male Sexuality Scale (Snell, 1998) and the Hyperfemininity Scale (Murnen & Byrne, 1991). Using a 5-point scale ranging from *I totally disagree* (= 1) to *I totally agree* (= 5), participants rated their agreement with 28 statements about the roles in sexual relationships for males (e.g., "Boys are always in the mood for sex") and females (e.g., "If a girl wishes to attract a boy, she is advised to use her appearance or her body"). In the first three waves, the statements referred to "boys" and "girls" whereas the words "men" and "women" were used in the fourth wave. Based on the results of a principal component analysis in W1, 14 of the 28 items that loaded on a single factor were selected (explained variance: 19.18%). Among these 14 items, nine originated from the Stereotypes about Male Sexuality Scale and five from the Hyperfemininity Scale. This 14-item scale loaded on one factor and displayed good reliability in each wave; range of explained variance for W1-W4: 27.03-31.99%, range of α for W1-W4: .78-.83. In order to decrease the likelihood of correlated residuals and thus increase the fit of the eventual SEM model, parceling was used (Little, Cunningham, Shahar, & Widaman, 2002). In each wave, two parcels of four items and two parcels of three items were created. Following Little's (2013) suggestions, parcels were balanced by including items with high and low item-scale correlations in each parcel and the composition of the parcels was the same in each wave.

Rape myth acceptance

Following prior research (Aubrey, Hopper, & Mbure, 2011; Kistler & Lee, 2009), a selection of items from Burt's (1980) Rape Myth Acceptance Scale was used. Using a 5-point scale ranging from *I totally disagree* (= 1) to *I totally agree* (= 5), participants in W4 assessed six statements including "In the majority of rapes, the victim has a bad reputation" and

"When women go around wearing short skirts and tight tops, they are just asking for trouble" (principal components analysis; explained variance = 43.06%, α = .71).

Moderators

Gender and age were used as moderators. In order to include age as a dichotomous moderator, two age groups were created based on the participants' age in W4. The first group included all participants from 18 to 21 years old (49.50% of the sample) and the second group included participants aged 22 to 24.

Analysis

Descriptive statistics and zero-order correlations were calculated using SPSS. To minimize effects of age due to the relatively large age range (12-18 in W1), all items of the media variables and the Rape Myth Acceptance scale and the parcels for gendered sexual roles were centered around the age group's mean. Three age groups were created based on the participants' birth year (1996-1998, 1994-1995, and 1992-1993). Next, each participant's score on a certain item was subtracted from the mean score of their age group for that item. These mean centered items and parcels were used to set up the SEM model in Mplus. In other words, the measures in the models represent a participant's level for this measure relative to the mean of their age group.

First, tests were conducted to ensure that the measurements for the latent variables were invariant across the different waves. Second, the full, structural model was set up. Music television, online pornography, gendered sexual roles, and rape myth acceptance were entered as latent variables. Only music television in W4 was entered as a manifest variable since this measure encompassed only one instead of three music channels. Predictive paths were modeled from the latent variables for music television and online pornography to gendered sexual roles in the subsequent waves and vice versa. Additionally, predictive paths were modeled from the media variables and gendered sexual roles in W3 to rape myth

acceptance in W4 (see Fig. 1). In each wave, covariances were estimated between the residual variances of the media variables, gendered sexual roles, and rape myth acceptance (only in W4). The control variables (i.e., gender, ethnicity, and communication quality with parents) were included in the model by estimating predictive paths from the control variables to the music television, online pornography, gendered sexual roles, and rape myth acceptance variables. The analyses controlled for overall TV viewing by modeling predictive paths from TV viewing in each wave to gendered sexual roles, music television, and pornography in the subsequent wave, and also to rape myth acceptance in W4.

The fit of the measurement models and the hypothesized model was assessed by checking that CFI $\geq .90$, RMSEA $\leq .08$, and $\chi^2/df \leq 5$ (Schumacker & Lomax, 2004; Wang & Wang, 2012). In order to calculate indirect paths and to validate the significance of the direct paths, bootstrapping (95% bias-corrected bootstrapped confidence intervals; 1000 bootstrapped samples) was used. As not all participants participated in each of the four waves, full information maximum likelihood was used in Mplus to deal with missing data (Muthén & Muthén, 2017).

RESULTS

Descriptive statistics and zero-order correlations for communication quality with parents, overall TV viewing, exposure to music television, online pornography use, acceptance of gendered sexual roles, and rape myth acceptance are shown separately for male and female participants in Table 1.

Invariance Testing

Before analyzing the hypothesized model, tests were conducted to assess whether the three latent constructs were invariant across the four waves. In order to do this, the fit of an unconstrained model with freely estimated saturations was compared to the fit of a constrained model in which the factor loadings and item intercepts were fixed to be equal in

each wave. Longitudinal invariance was tested in three separate models; one for each of the study's latent constructs.

For the measure of gendered sexual roles, the fit of the unconstrained model, $\chi^2(94) = 309.83$, $p < .001$, CFI = .93, RMSEA = .08, significantly differed from that of the unconstrained model, $\chi^2(112) = 339.31$, $p < .001$, CFI = .92, RMSEA = .07, based on the chi-square difference, $\Delta\chi^2(18) = 29.48$, $p = .04$. However, CFI fit statistics differed by less than .01 between the two models (ΔCFI = .004). As such, there was insufficient evidence to reject the hypothesis of longitudinal invariance for this measure (Cheung & Rensvold, 2002). For the measure of exposure to music television, the unconstrained model, $\chi^2(21) = 179.40$, $p < .001$, CFI = .95, RMSEA = .14, did not differ significantly from the constrained model, $\chi^2(29) = 180.28$, $p < .001$, CFI = .95, RMSEA = .12, $\Delta\chi^2(8) = 0.88$, $p = .99$, ΔCFI = .002. Also, for the measure of exposure to online pornography, the unconstrained model, $\chi^2(94) = 483.67$, $p < .001$, CFI = .94, RMSEA = .10, did not differ significantly from the constrained model, $\chi^2(112) = 499.38$, $p < .001$, CFI = .94, RMSEA = .09, $\Delta\chi^2(18) = 15.71$, $p = .61$, ΔCFI = .001. As such, there was evidence to suggest that each of the measures were invariant across the four waves. The constraints on the factor loadings and intercepts are thus also included in the final, hypothesized model.

Testing the Hypothesized Model

The hypothesized model initially did not show an adequate fit with the data, $\chi^2(1324) = 3245.59$, $p < .001$, CFI = .86, RMSEA = .06, $\chi^2/df = 2.45$. Modification indices revealed that the fit of the model would improve by allowing the error terms of one of the indicators of music television (i.e., MTV) to correlate across the first three waves and by correlating the error terms of two of the items for exposure to pornography (i.e., the two items about pornographic pictures) in each wave. After these modifications, the model showed an acceptable fit, $\chi^2(1317) = 2385.36$, $p < .001$, CFI = .92, RMSEA = .05, $\chi^2/df = 1.81$. The

significant hypothesized paths are shown in Fig. 2. All parameter estimates for the hypothesized model are shown in Table 2.

Partial support for Hypothesis 1 was found as music television in W2 predicted the acceptance of gendered sexual roles in W3, $B = .04$, $\beta = .11$, $SE = .05$, $p = .02$ (95% bias-corrected bootstrapped CI: .02/.21). However, music television in W1 did not predict gendered sexual roles in W2 and online pornography did not predict the acceptance of gendered sexual roles across the first three waves. No support was found for Hypothesis 2 as the acceptance of gendered sexual roles did not significantly predict music television or online pornography across the first three waves.

Hypotheses 3 and 4 also were not supported. Music television and online pornography in W3 did not significantly predict the acceptance of gendered sexual roles in W4 and neither were the inverse relationships significant. No support was found for Hypothesis 5 as music television and online pornography in W3 did not predict rape myth acceptance in W4. Hypothesis 6 found support as the acceptance of gendered sexual roles in W3 predicted rape myth acceptance in W4, $B = .22$, $\beta = .30$, $SE = .07$, $p < .001$ (95% bias-corrected bootstrapped CI: .16/.44). Finally, partial support was found for Hypothesis 7 as music television in W2 indirectly predicted rape myth acceptance in W4 through the acceptance of gendered sexual roles in W3, $B = .01$, $\beta = .03$, $SE = .02$, $p = .04$ (95% bias-corrected bootstrapped CI: .01/.07). The indirect relationship between pornography in W2 and rape myth acceptance in W4 was not statistically significant.

Testing Gender and Age Group Differences

A multigroup analysis was used to investigate gender differences in the hypothesized model. The fit of an unconstrained model in which the predictive paths between the central variables could differ between men and women was compared to a model in which these parameters were constrained to be equal among boys and girls (Rigdon, Schumacker, &

Wothke, 1998). These two models were identical to the main model used for the hypothesis tests, except that gender was no longer included as a control variable. Factor loadings and intercepts for the indicators of the latent variables were held invariant across the groups in both models. A chi-square difference test showed a significant difference in the fit of the unconstrained model, $\chi^2(2613) = 4127.52$, $p < .001$, CFI = .87, RMSEA = .06, and the constrained model, $\chi^2(2637) = 4165.35$, $p < .001$, CFI = .86, RMSEA = .06, $\Delta\chi^2(24) = 37.84$, $p = .04$. However, the models showed a poor fit with the data (CFI < .90). As the results of this multigroup model cannot reliably be interpreted, the differences between genders are not examined further.

Age differences in the hypothesized model was tested by comparing the youngest half of the sample (age in W1: $M = 14.44$, $SD = 1.16$, range 12-16) to the oldest half (age in W1: $M = 16.62$, $SD = 0.60$, range 16-18). The chi-square test did not reveal a significant difference between the fit of the unconstrained model, $\chi^2(2681) = 4629.82$, $p < .001$, CFI = .85, RMSEA = .06, and the fit of the constrained model, $\chi^2(2705) = 4659.46$, $p < .001$, CFI = .85, RMSEA = .06, $\Delta\chi^2(24) = 29.63$, $p = .20$. Like the multigroup model for gender, this model did not show a good fit with the data.

DISCUSSION

The current study aimed to test the reciprocal relationships between exposure to media content in which gendered sexual roles are displayed and the acceptance of these gendered sexual roles. Additionally, the study examined whether this relationship continues over the transition from adolescence to emerging adulthood and whether the acceptance of gendered sexual roles in adolescence can develop into an acceptance of rape myths in emerging adulthood. These aims were based on Wright's (2011) $_3$AM, which suggests that when adolescents view media content portraying gendered sexual roles, these gendered sexual scripts may be stored in memory and guide their future behavior in sexual situations.

Repeated exposure to similar media scripts over time may strengthen these cognitive scripts and increase the likelihood of acting in accordance with these scripts (Huesmann, 1988; Wright, 2011). No overall support was, however, found for the assumptions of the 3AM. Viewing music television only predicted a stronger acceptance of gendered sexual roles over one of the time periods.

Music Television, Gendered Sexual Roles, and Rape Myth Acceptance

A major aim of the current study was to examine long-term relationships between media use, the acceptance of sexual stereotypes, and rape myth acceptance. The results showed that those who reported a stronger acceptance of gendered sexual roles than their same-aged peers in adolescence showed higher levels of rape myth acceptance than their peers in emerging adulthood, five years later. Furthermore, a positive relationship occurred between adolescents' exposure to music television relative to their peers in Wave 2 and their acceptance of gendered sexual roles in Wave 3, six months later. Support was found for the hypothesis that adolescents' exposure to music television relative to their same-aged peers would predict rape myth acceptance in emerging adulthood through its positive association with the acceptance of gendered sexual roles.

This result can have far-reaching consequences. Although cognitive scripts in which men are viewed as sex-obsessed and women as sex objects present a biased view of reality, they may not yet have strong behavioral consequences for youth who are not (yet) involved in sexual interactions. When they do encounter sexual situations, these scripts may guide their behavior to reflect these biased sexual views (Wiederman, 2005; Wright, 2011). This becomes exceedingly problematic when the gendered sexual scripts evolve into more extreme scripts about sexual coercion and rape. Although offensive sexual behavior also occurs during adolescence, it is more prevalent during emerging adulthood. Cognitive scripts about rape may especially guide behavior in emerging adulthood, when opportunities for offensive

sexual behavior increase due to sexual exploration and a higher prevalence of casual sex (Arnett, 2013; Lyons et al., 2015). As offensive sexual behavior can also occur and have harmful consequences during adolescence, however, effects of sexual media on rape myth acceptance should also be studied further in this developmental phase. The results suggest that adolescence may be an important time to establish views about sex and relationships that put forward equality and mutual consent. However, adolescents encounter biased messages about sex in their media use (Kim et al., 2007; Wright, 2009). Thus, the study of the relationship between media use and the development of biased sexual views remains warranted and adolescents' media use may have long-lasting, and potentially harmful, implications.

Regarding the measure for music television exposure, it should be noted that only participants' overall exposure to these channels was assessed. Thus, nothing is known about which specific contents were viewed on these channels. It was assumed that music channels' content is high in gendered sexual messages as content analyses have indicated the presence of such messages in typical programs of these channels, such as reality dating shows and music videos (Aubrey & Frisby, 2011; Ferris et al., 2007). However, the messages conveyed in these different programs may vary. Prior research has already shown that exposure to these specific programs can predict adolescents' and emerging adults' acceptance of gendered sexual roles (Ferris, et al., 2007; ter Bogt, et al., 2010; Ward, Hansbrough, & Walker, 2005). In the current study, we aimed to examine the relationship for a broader type of media for which we can assume that gendered sexual roles are portrayed in at least several of its programs. Music television has been shown to be popular among adolescent samples (Beullens & Van den Bulck, 2014; ter Bogt et al., 2010) and was frequently viewed by the adolescents in the current sample. The analyses controlled for overall television viewing to avoid that the measure for music television would also measure exposure to other

programming. However, the chosen measure did not allow to conclude which specific mediated scripts could lead to an effect on sexual stereotypes.

Online Pornography, Gendered Sexual Roles, and Rape Myth Acceptance

No support was found for our hypotheses regarding online pornography. Adolescents' exposure to online pornography relative to their same-aged peers did not predict their later acceptance of gendered sexual roles relative to their peers. Online pornography exposure in adolescence also did not predict rape myth acceptance in emerging adulthood. These results were in contrast to expectations, as portrayals of gendered sexual roles were expected to have stronger effects in more than in less sexually explicit content (Wright, 2011). A reason for these null findings may be that the adolescents in this study reported watching little online pornography despite conclusions of prior scholars that pornography consumption is relatively common among adolescents and the frequency of pornography use steeply increases during adolescence (Peter & Valkenburg, 2006a; Rasmussen & Bierman, 2016). The participants may have understated their online pornography consumption as this could be considered taboo. The classroom setting in which the questionnaires were administered in the first three waves may have contributed to this feeling. A biased reporting of pornography use may have resulted in too little variance in this measure to detect statistically significant relationships.

Additionally, if reports of pornography consumption were biased, truthful reporting might be explained by characteristics that were not taken into account in the study. Adolescents who openly report their pornography consumption may be more open towards sex in general (Löfgren-Mårtenson & Månsson, 2010; Svedin, Åkerman, & Priebe, 2011). Perhaps adolescents who are more open about sex tend to have more progressive attitudes about sex, which could cancel out a potential effect of pornography consumption on sexual stereotypes. The 3AM points out the important role of previously existing scripts in the study of sexual media effects (Wright, 2011). Future studies on the relationship between

pornography exposure and sexual stereotypes may benefit from taking into account participants' openness toward sex as a preexisting cognition.

The lack of a relationship between online pornography exposure and the acceptance of gendered sexual roles or rape myths was in contrast to expectations based on pornographic content's portrayals of men as the primary recipient of sexual pleasure and women as sex objects (Hald et al., 2010; Klaassen & Peter, 2015). However, online pornography consists of numerous genres, some of which depict more equality or portray women in a more dominant position than men (Klaassen & Peter, 2015; Vannier et al., 2014). Possibly, adolescents' exposure to these sexually explicit genres that challenge traditional sex roles could lead them to form more progressive views of gender equality in sex. More research is needed to uncover to which types of content adolescents are exposed in their use of online pornography.

Reciprocity and Differences between Genders and Age Groups

A reciprocal relationship between media use and the acceptance of gendered sexual roles was hypothesized. The results offered no support for the hypothesis that adolescents' acceptance of gendered sexual roles relative to their same-aged peers predicts more exposure to music television or online pornography than their peers. This result is in line with previous studies that did not find that adolescents' selective exposure to online pornography or music videos could be predicted by their acceptance of sexual gender stereotypes (Peter & Valkenburg, 2011; van Oosten et al., 2015), although evidence to the contrary has also been found (Peter & Valkenburg, 2009).

The results of the current and previous studies suggest that a person's acceptance of gendered sexual roles is not a good predictor of one's exposure to media in which gendered sexual roles are portrayed. This does not mean, however, that there are no other personality characteristics or preexisting attitudes that may predict exposure to these kinds of media. Similar to our results, Ward et al. (2015) found that adolescent boys' consumption of men's

magazine could not be predicted by their stereotypical beliefs about women's courtship strategies. They suggested that this relationship may be moderated by characteristics of the media user. Perhaps, the inclusion of characteristics such as pubertal status or sexual experience may shed more light on media selection processes.

It was expected that the results would be different for boys than for girls due to the gendered nature of the outcomes that were studied. Boys may be more likely than girls to adopt the gendered sexual roles they encounter in their media consumption as these roles generally seem to favor them more. Whereas boys are portrayed as more active in sexual interactions and receive more rewards for engaging in sex, girls are shown as taking up a more passive sexual role and encounter more challenges when being sexually active (Kim et al., 2007). Despite these different gender roles, some studies found no gender differences in the studied relationships (Peter & Valkenburg, 2009; ter Bogt et al., 2010). Other studies did find significant differences, though sometimes results were only significant for boys (ter Bogt et al., 2010; Vandenbosch & Eggermont, 2012) or only for girls (van Oosten et al., 2015). The current study adds a mixed conclusion to this knowledge. Although the results of the multigroup analyses suggest that the results may differ by gender, these differences could not be investigated due to the low level of model fit when the analyses were split up by gender. As such, the current knowledge on gender differences in the associations between media use and gendered sexual roles remains mixed and follow-up research on this question is advised.

Although model fit was again insufficient, a multigroup test did not seem to suggest differences in the results between the younger and the older half of the sample. Age differences were expected due to the wide age range of the participants in the study. In the first wave, the youngest participant was 12 and the oldest 18, whereas in the final wave, the youngest participants (who were 12 or 13 in W1) were 18. A second measure was taken to deal with the large age range in this study. The sample was divided in three age groups and a

participant's scores on each of the central variables were calculated as their reported score relative to the mean of their age group. This measure was taken as, for instance, a 13-year-old's frequency of pornography use may not be comparable to that of an 18-year-old, which could impact the results of a model where no age distinctions are made. Thus, the current study does not examine adolescents' absolute level of pornography use (or the other measures), but whether they consume pornography more or less frequently than their same-aged peers.

Limitations and Conclusion

The current longitudinal study was limited by dropout in the follow-up study (Wave 4). The final sample consisted of approximately one fourth of the participants in the baseline sample. This level of attrition is higher than in previous studies which conducted a follow-up after an interval of several years (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Huesmann, Moise-Titus, Podolski, & Eron, 2003; Keel, Baxter, Heatherton, & Joiner, 2007; McFarlane et al., 2013). A reason for this lower response is that the follow-up was not yet planned at the time of the initial three-wave study. Thus, no contact information was collected at that time, which complicated the contacting process in the fourth wave. Furthermore, analyses showed that the study's retention rate was biased in favor of more privileged participants in terms of their own and their fathers' educational level and their immigration backgrounds.

As previously mentioned, an additional limitation is that only overall exposure to music channels was examined. Therefore, no conclusions can be drawn about which specific contents or televised scripts may have an effect on the acceptance of gendered sexual roles and rape myths. One potential solution for future research may be to ask participants which specific television programs they watch. Analyses of these programs' content can inform a weighting procedure which can determine more precisely how often participants are exposed

to certain scripts (Vandenbosch & Eggermont, 2014; Zurbriggen, Ramsey, & Jaworski, 2011). Also experimental research may further determine which media formats and which particular elements of these formats result into different media effects. A final limitation of the current longitudinal design is that little is known about the five-year period between the third and fourth wave. Many changes can take place over the course of five years and during the transition from adolescence to emerging adulthood, including developments regarding sex and relationships (Arnett, 2013). Although information about this five-year period is limited, we argue that this interval strengthens the study by allowing to investigate long-term associations. Moreover, this is one of the first studies to examine whether media use during adolescence has implications that can still be discerned in a later stage in life.

In sum, the current four-wave panel study examined the reciprocal relationships between the use of music television or online pornography and the acceptance of gendered sexual roles over time. On the one hand, this study found, as expected, a long-term indirect association between a higher frequency of music television viewing than same-aged peers during adolescence and a stronger acceptance of rape myths than same-aged peers during emerging adulthood. This relationship occurred indirectly through the acceptance of gendered sexual roles. This result suggests that adolescents' media use and the subsequent development of gendered views about sex may have a lasting impact on sexual stereotypes, which could become increasingly problematic, especially in the context of emerging adulthood. On the other hand, no associations were found between adolescents' frequency of online pornography use relative to their same-aged peers and their acceptance of gendered sexual roles and rape myths relative to their peers. These results show, in combination with the mixed finding of prior research, that the full extent of the media's impact on sexual stereotypes is still unclear. Both long and short-term associations were studied in an attempt to shed more light on these mixed findings, but uncertainties about these processes remain.

Prior researchers have concluded that young people's sexuality is a complex process and that the media's role in this process may depend on several conditions, including developmental differences and pre-existing cognitions (Ward, 2003, 2016; Wright, 2011). Overall, the study suggests that a long-term impact of media use on sexual attitudes is possible, but further research is needed to understand the conditions in which such associations occur.

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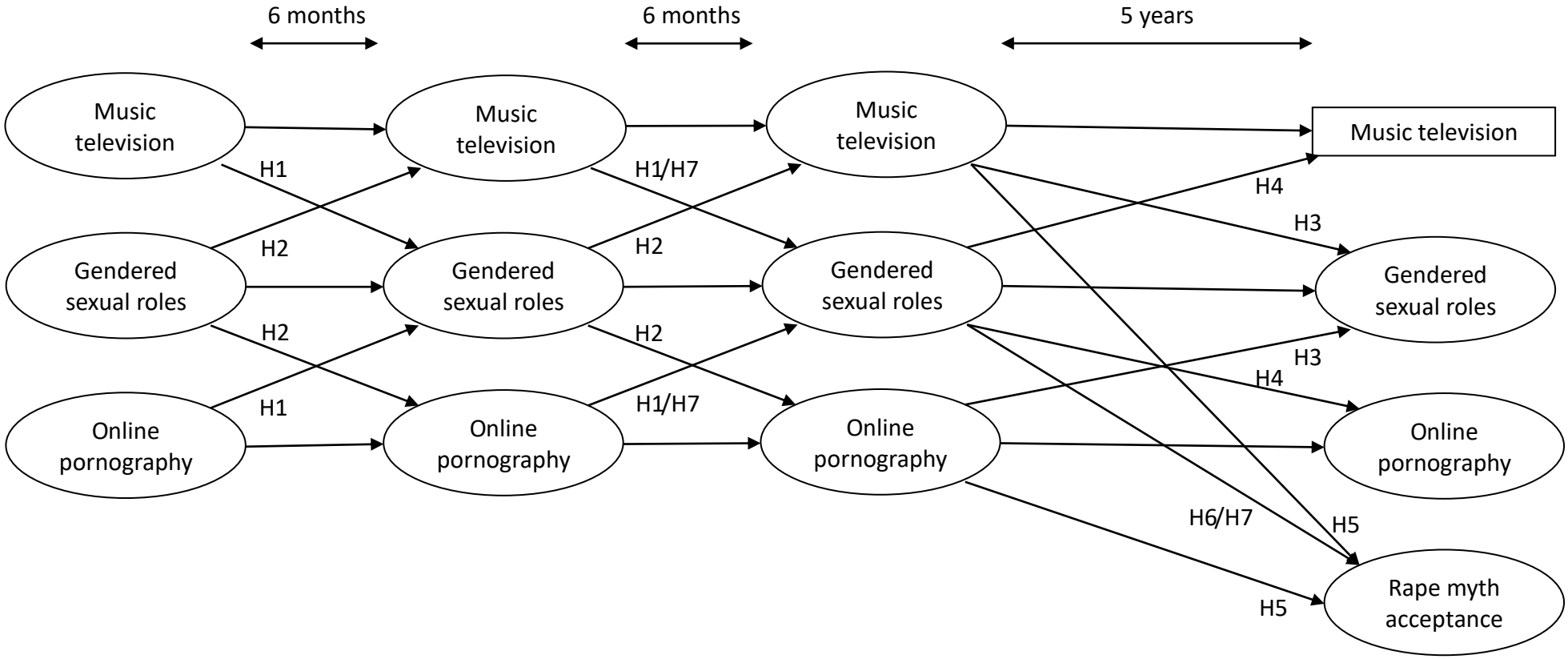
Figures

Figure 1. The hypothesized model. Ellipses represent latent variables, squares represent manifest variables. For clarity, control variables, measurement parts, covariances, and residual variances are not shown.

Figure 2. Results for the hypothesized model. Drawn paths are significant at $p < .05$. Coefficients represent standardized betas. For clarity, control variables, measurement parts, covariances, and residual variances are not shown.



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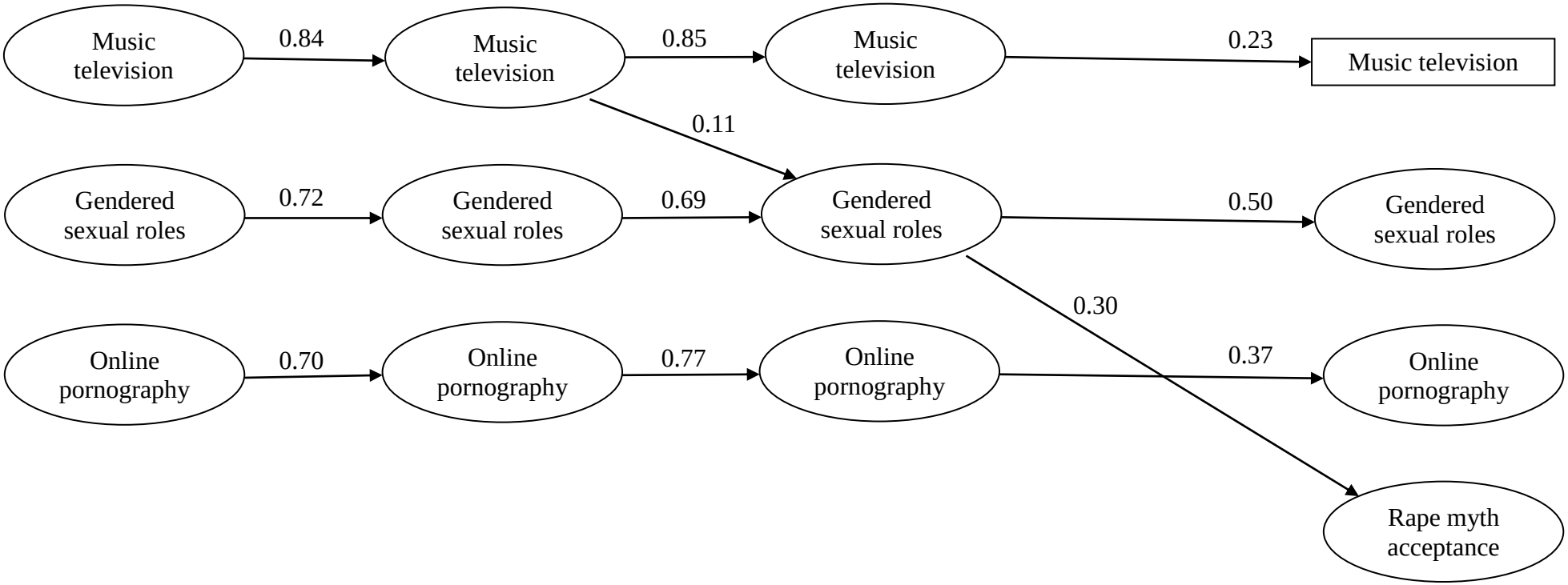

Figure 2. Results for the hypothesized model. Drawn paths are significant at $p < .05$. Coefficients represent standardized betas. For clarity, control variables, measurement parts, covariances, and residual variances are not shown.

Tables

Table 1

Zero-order correlations, means, and standard deviations for the variables in the model

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. CQP (W1)	1	.09	-.05	-.05	.06	-.01	-.04	-.14	-.05	-.02	-.16*	-.15	-.09	-.17*	-.11
2. TV	-.04	1	.14	.18*	.37***	.25**	.10	.14	.12	-.02	.21**	.25**	.24**	.08	.02
3. Music TV (W1)	-.06	.29***	1	.81***	.68***	.29***	.32***	.31***	.21*	.18*	.19*	.05	.31***	.19*	-.07
4. Music TV (W2)	.04	.27***	.72***	1	.79***	.21***	.17*	.27**	.21**	.13	.18*	.05	.30***	.16*	-.02
5. Music TV (W3)	.13	.23**	.67***	.81***	1	.28***	.20*	.20*	.24**	.17*	.23**	.11	.33***	.09	-.04
6. Music TV (W4)	.07	.20**	.30***	.25***	.30***	1	.14	.18*	.14	.05	.06	-.05	.19*	.03	-.04
7. Porno (W1)	-.04	.12	.10	.14	.11	.13	1	.66***	.54***	.19*	.20*	.12	.18*	.16*	-.04
8. Porno (W2)	.21**	.18*	.17*	.22**	.15*	.06	.42***	1	.68***	.36***	.20*	.23**	.28**	.11	-.04
9. Porno (W3)	-.11	-.01	.06	.17*	.14*	.02	.50***	.55***	1	.36***	.10	.20*	.37***	.14	.01
10. Porno (W4)	-.09	-.14*	.07	.04	.04	.04	-.01	.10	.23**	1	-.01	-.01	.06	.08	-.08
11. GSR (W1)	-.05	.32***	.09	.14	.13	.06	.04	.07	.06	.06	1	.64***	.52***	.34***	.18*
12. GSR (W2)	.03	.22**	.12	.17*	.13	.17*	.10	.13	.15*	.07	.63***	1	.63***	.34***	.17*
13. GSR (W3)	.02	.03	-.04	.08	.10	.01	-.01	.03	.10	.05	.50***	.64***	1	.38***	.15
14. GSR (W4)	.04	.06	.12	.11	.09	.22**	.04	-.03	-.02	-.11	.35***	.40***	.40***	1	.45***
15. RMA (W4)	.08	-.02	.04	.01	.00	.06	.04	.04	.05	-.15*	.18**	.24**	.21**	.48***	1
M(*SD*) males	3.09 (0.63)	3.14 (1.53)	4.44 (1.93)	4.37 (1.88)	4.13 (1.98)	2.16 (1.74)	1.99 (0.98)	2.31 (1.22)	2.36 (1.28)	3.22 (1.36)	2.95 (0.52)	2.91 (0.50)	2.90 (0.58)	2.76 (0.51)	2.20 (0.59)
M(*SD*) females	3.20 (0.75)	2.71 (1.11)	4.27 (1.80)	4.24 (1.68)	3.81 (1.75)	2.52 (1.79)	1.08 (0.28)	1.10 (0.32)	1.09 (0.38)	1.47 (0.76)	2.85 (0.47)	2.77 (0.45)	2.74 (0.46)	2.58 (0.54)	1.90 (0.59)

Note. CQP = communication quality with parents; TV = overall TV viewing; GSR = acceptance of gendered sexual roles; RMA = rape myth acceptance. Means and SDs for overall TV viewing are for the average across the four waves. Correlations with overall TV viewing are for TV viewing measured at the same wave as the corresponding variable. Correlations above the diagonal are for males, correlations below the diagonal are for females.

*p < .05; **p < .01; ***p < .001

Table 2

Path coefficients for the hypothesized model.

	B	*β*	*SE* (*β*)	*p* (*β*)	95% CI for *β*
Music TV (W1) → Music TV (W2)	0.82	**.84**	.03	< .001	.79, .90
Music TV (W1) → GSR (W2)	-0.01	-.04	.06	.47	-.15, .07
GSR (W1) → Music TV (W2)	0.04	.01	.04	.80	-.07, .09
GSR (W1) → GSR (W2)	0.67	**.72**	.06	< .001	.61, .84
GSR (W1) → Porno (W2)	0.04	.02	.04	.68	-.07, .10
Porno (W1) → GSR (W2)	0.03	.06	.07	.43	-.08, .19
Porno (W1) → Porno (W2)	0.85	**.70**	.05	< .001	.60, .79
Music TV (W2) → Music TV (W3)	0.91	**.85**	.03	< .001	.79, .90
Music TV (W2) → GSR (W3)	0.04	**.11**	.05	.02	.02, .21
GSR (W2) → Music TV (W3)	0.02	.00	.04	.90	-.07, .07
GSR (W2) → GSR (W3)	0.80	**.69**	.05	< .001	.59, .78
GSR (W2) → Porno (W3)	0.05	.03	.04	.51	-.05, .10
Porno (W2) → GSR (W3)	0.08	.14	.07	.05	-.01, .27
Porno (W2) → Porno (W3)	0.79	**.77**	.05	< .001	.67, .86
Music TV (W3) → Music TV (W4)	0.27	**.23**	.05	< .001	.13, .34
Music TV (W3) → GSR (W4)	0.01	.02	.06	.73	-.09, .13
GSR (W3) → Music TV (W4)	0.20	.05	.05	.35	-.06, .16
GSR (W3) → GSR (W4)	0.50	**.50**	.06	< .001	.39, .62
GSR (W3) → Porno (W4)	-0.04	-.02	.05	.70	-.11, .08
Porno (W3) → GSR (W4)	-0.03	-.04	.07	.52	-.18, .08
Porno (W3) → Porno (W4)	0.44	**.37**	.06	< .001	.26, .49
Music TV (W3) → RMA (W4)	-0.01	-.04	.07	.53	-.17, .09
GSR (W3) → RMA (W4)	0.22	**.30**	.07	< .001	.16, .44
Porno (W3) → RMA (W4)	-0.04	-.10	.08	.21	-.27, .05

Note. GSR = acceptance of gendered sexual roles; RMA = rape myth acceptance. Statistically significant *β* coefficients are in bold.