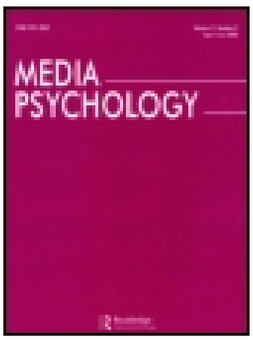

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Contributions of Game Genre and Masculinity Ideologies to Associations Between Video Game Play and Men's Risk-Taking Behavior

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ABSTRACT

Previous investigations of mainstream video games have documented a high prevalence of risk-promoting content, as well as a positive relation between video game play and participation in risk-taking behaviors such as reckless driving, substance use, and delinquency. In this study, we extend this work by investigating the role of video game genre and masculinity ideology within this relation. A sample of 273 undergraduate men from a large Midwestern university completed online surveys of their video game exposure, masculinity ideology, and participation in a range of high-risk behaviors. Results indicate that playing sports video games is associated with greater alcohol use, drug use, and delinquent behaviors, but action games are only associated with greater delinquency. In contrast, playing online video games was negatively associated with alcohol and drug use. Furthermore, the relation between sports video games and participation in risky behaviors was fully mediated by participants' adherence to masculinity ideology. These results reveal that the relations between video game play and risk outcomes were strongest for sports video games, and in some cases, were mediated by masculinity ideology.

Video games have become a mainstream form of entertainment for many Americans. According to the Entertainment Software Association (ESA; 2016), 63% of US households play video games regularly, and 65% of US households own a device used to play video games. Although women now make up 41% of the gaming population (ESA, 2016), notable gender differences in video game play remain. Research indicates that men prefer more high-action game genres, such as shooters, sports, racing, action/adventure, and strategy, compared to women, and also play more frequently (Rehbein, Staudt, Hanslmaier, & Kliem, 2016). Moreover, data indicate that 17 of the 20 best-selling console games from 2015 were genres preferred by men (Entertainment Software Association, 2016). These findings indicate that, despite similar overall usage rates, men still dominate mainstream gaming.

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Much attention concerning the potential effects of this medium has focused on the link between video games and aggressive beliefs or behaviors (for review, see Greitemeyer & Mügge, 2014), given that many video games contain violent content (e.g., Markey, Markey, & French, 2014). Here, research has supported links between video game play and aggressive behavior (e.g., Moller & Krahe, 2009; Yang, Huesmann, & Bushman, 2014) and desensitization to real-life violence (e.g., Carnagey, Anderson, & Bushman, 2007; Englehardt, Bartholow, Kerr, & Bushman, 2011). However, the extent to which video game play influences aggression is still debated, with some researchers reporting no correlation between violent game use and aggression (e.g., Breuer, Vogelesang, Quandt, & Festl, 2015; Markey et al., 2014).

Although it is important to acknowledge video game violence and explore the possible consequences for players, there are other content themes that warrant similar investigation. Researchers have found that video games depict numerous other concerning behaviors, such as reckless driving (e.g. *Burnout*, 2001; *Grand Theft Auto V*, 2014), substance abuse (e.g. *Sleeping Dogs*, 2012; *Max Payne 3*, 2012), and criminal behavior (e.g. *Mafia III*, 2016; *Grand Theft Auto V*, 2014). Therefore, in this study, we sought to explore the relation between video game play and a range of risky behaviors that include reckless driving, substance use, and delinquency.

Video games and risky behavior

Mature content and depictions of risky behavior are commonplace in video games, particularly those rated *teen* or *mature*. One study of 80 *teen*-rated games found that 69% required or rewarded killing, 27% contained sexual themes, and 15% depicted substances such as alcohol or drugs within the first hour of gameplay alone (Haninger & Thompson, 2004). A similar study on 37 *mature*-rated games found that 100% featured violence, 36% contained sexual themes, and 58% contained substance use within the first hour of gameplay (Thompson, Tepichen, & Haninger, 2006). However, it is worth noting that these content analyses are dated, and that representations may be different in modern games. Although the Entertainment Software Rating Board reported that only 40% of games created in 2014 were rated *teen* or *mature*, these games were also among the most popular, with 13 of the top 20 best-selling console games and all of the best-selling computer games of 2015 being rated either *teen* or *mature* (Entertainment Software Association, 2016). Thus, although not all games feature risky behaviors, these themes appear to be prominent in the most popular mainstream games.

Previous research has linked video game use to a number of risk-taking behaviors, including risky driving. In a survey study, Fischer and colleagues (2007) found that playing some racing games was associated with self-reports of obtrusive and competitive driving, reduced cautious road traffic behaviors,

and an increased number of reported car accidents. A series of follow-up experiments indicated that participants who were exposed to racing games showed an increased accessibility of risk-promoting cognitions and were more likely to drive recklessly in simulated driving tasks than participants who were exposed to neutral computer games (Fischer et al., 2009, 2007). Modern research supports these findings, with "drive 'em up" game play (but not circuit racing game play) predicting risky self-concept (Vingilis et al., 2016, p. 19). Several longitudinal studies further support this link. For example, playing driving-themed video games during adolescence predicted speeding and fun riding (e.g., driving fast for the thrill of it) 2 years later (Beullens, Roe, & Van Den Bulck, 2011), as well as an increased likelihood of having been involved in a car crash 5 years later (Beullens, Roe, & Van Den Bulck, 2013). Another study found that *mature* video game play during adolescence was associated with numerous risky driving habits up to 3½ years later, including speeding, tailgating, weaving, and a willingness to drink and drive (Hull, Draghici, & Sargent, 2012). Recent work (Vingilis et al., 2016) suggests such connections are mediated by risky self-concept, and therefore effects of risky game play on driving behavior may be indirect.

A second domain of risk taking that has been investigated in relation to video game play is substance use, though findings here are far more limited and inconclusive. For example, Brunborg, Mentzoni, and Frøyland (2014) found no correlation between video game use and heavy episodic drinking among Norwegian adolescents. In contrast, Ream, Elliott, and Dunlap (2011) found that using substances such as marijuana or alcohol while playing video games was connected with problematic substance use. Padilla-Walker, Nelson, Carroll, and Jensen (2010) found significant connections between frequency of video game use and heavy drinking, but only at two of six sampled universities. However, video game play was associated with drug use across all sampled universities.

Delinquency, defined as participation in minor to moderate crime, is a third domain of risk taking that has been linked with video game use, particularly among adolescents and young adults. Time spent playing video games has been linked to overall delinquent behavior and conduct problems (Exelmans, Custers, & Van Den Bulck, 2015). Violent video game play, specifically, has been linked to increased delinquency in juvenile offenders (DeLisi, Vaughn, Gentile, Anderson, & Shook, 2013). An experiment by Lee, Peng, and Klein (2010) found that participants who played a video game featuring a violent police officer later expressed more positive views toward crimes committed by police than did participants in a control group. Taken together, findings generally point toward a connection between delinquency and video game use. However, much like the literature concerning aggression, some studies have found no connections between gaming and delinquent behavior (e.g., Cunningham, Engelstätter, & Ward, 2016; Kanz, 2016).

Exploring the mechanisms: Masculinity and risky behavior

Although direct connections between video game use and risky behaviors might be expected due to social-learning mechanisms (Bandura, 1986), whereby players imitate or model the risky behaviors presented, it is also possible that indirect pathways exist. In particular, video game use could affect players' beliefs or cognitions about the world, and these beliefs could affect their risk-taking behavior. One set of beliefs that are relevant here are beliefs about masculinity, which have been consistently linked with participation in risky behaviors. *Masculinity* can be defined as the group of traits culturally associated with manhood in a given society. Although gender scholars acknowledge the existence of multiple forms of masculinity, notions of masculinity that embrace stereotypical masculine norms remain dominant and idealized (Connell & Messerschmidt, 2005). This traditional form of masculinity is comprised of several components, such as restrictive emotionality, self-reliance, dominance/power, toughness, rejection of sexual minorities, and antifemininity (e.g., Levant, Hall, & Rankin, 2013; Wilkinson, 2004). Because masculinity is a social construct with no innate basis, men must continually prove or validate their masculinity to others (Vandello & Bosson, 2013; Weaver, Vandello, Bosson, & Burnaford, 2010).

One such way to prove one's masculinity is through participation in risky behaviors (Sanders, 2011). Adherence to traditional notions of masculinity has been associated with some types of aggressive driving (for review, see Bogdan, Măirean, & Havarneaunu, 2016), and substance use (Iwamoto & Smiler, 2013; Sanders, 2011). Studies on alcohol consumption have found that binge drinking is associated with one's number of male friends (Tewksbury, Higgins, & Mustaine, 2008), and that certain masculine ideals, such as restrictive emotionality, are correlated with heavier alcohol use (Iwamoto, Cheng, Lee, Takamatsu, & Gordon, 2011). Sanders (2011, p. 52) argued that participation in delinquent behavior is another avenue through which adolescents can display their masculinity. In this qualitative study, participants described delinquent behaviors (e.g., underage drinking, gun use) as normal, or a "rite of passage" for boys. Furthermore, some participants described the way in which their delinquent behavior was modeled after a male figure they admired. Overall, these findings highlight the role of masculinity in encouraging high-risk behaviors. Thus, it is important to consider the types of messages about masculinity presented in video games.

Video games and masculinity

Content analyses indicate that video games remain male-dominated in several ways. First, male characters overwhelmingly outnumber female characters (e.g., Dill & Thill, 2007; Downs & Smith, 2010; Ogletree & Drake, 2007).

Second, men are portrayed as *playable* characters (characters whose actions are controlled by a player, rather than the rules of the game) or as central to the game plot more often than women (Downs & Smith, 2010; Miller & Summers, 2007; Williams, Martin, Consalvo, & Ivory, 2009). Not only are male characters more common and central than female characters, they are also portrayed in highly stereotypical ways. Compared to female characters, men are significantly more muscular (Miller & Summers, 2007) and have body dimensions inconsistent with the average American man, such as larger chests (Martins, Williams, Ratan, & Harrison, 2011). Additionally, men are often portrayed as powerful and aggressive (Dill & Thill, 2007; Miller & Summers, 2007; Ogletree & Drake, 2007). In one content analysis, 33.1% of male characters were categorized as hypermasculine (Dill & Thill, 2007). A longitudinal content analysis of video games from the years 1988 to 2007 suggests that these stereotyped portrayals have become more pronounced over time (Miller & Summers, 2011). Compared with earlier male characters, modern male characters were shown to be more muscular, powerful, and angry, as well as less happy, carefree, and innocent. These findings are unsurprising, as case studies of the culture surrounding game development reveal the field to be highly masculine, with little to no female presence or influence (Johnson, 2014).

According to cultivation theory (Gerbner, Gross, Jackson-Beeck, Jeffries-Fox, & Signorelli, 1978), continuous exposure to media content that portrays narrow messages can alter consumer perceptions of reality by cultivating beliefs that align with the media representations. Therefore, repeated exposure to stereotyped portrayals of men in video games may influence players' assumptions about masculinity and gender, and may encourage gamers to act in gender-typed ways themselves. Although very few studies have directly examined associations between masculinity and video game play, many have found connections between television use and masculinity (e.g., Giaccardi, Ward, Seabrook, Manago, & Lippman, 2016), and sports consumption and masculinity (e.g., Johnson & Schiappa, 2010). Given the prevalence of masculine content in video games, as highlighted, it stands to reason that similar connections could exist with gaming.

Despite the fact that few studies examine masculinity and video games directly, numerous researchers have examined video game use and connections to sexism. Although some researchers, such as Breuer, Kowert, Festl, and Quandt (2015) found no such connections, others have found that video game play is associated with sexist or traditional gender beliefs. For example, self-reported video game use has been linked, either directly or indirectly, to benevolent sexism (Stermer & Burkley, 2012), hostile sexism (Fox & Potocki, 2015), and sexualizing and objectifying cognitions (Yao, Mahood, & Linz, 2010). Some recent work has found that such sexism has tangible consequences for female players, such as receiving

more negative messages from other players (Kuznekoff & Rose, 2013) and having their work or contributions disregarded by male gamers (Tomkinson & Harper, 2015). Other work has found that gamers resist efforts to diversify the field, such as through including homosexual playable characters (Condis, 2015). These findings indicate that video game play is linked with traditional views about gender roles and sexism. Although direct connections to masculinity have not yet been made, we anticipate that more frequent video game use would encourage greater acceptance of masculinity ideology.

Video game genre as a possible moderator

Although video games have been linked with both risk taking and gender attitudes, the role of specific video game *genres* remains unclear. Like television or movies, there exist a wide range of genres within the video game medium that may differentially impact players' beliefs about masculinity and risk-taking. However, most studies have treated video games as a single variable, or have examined effects within only one genre (e.g., driving games). Results from studies that have compared genres lend support to the argument that different genres of games influence people in unique ways. For example, Fischer et al. (2009) found that players who played a racing game for 30 min scored significantly higher on a risky driving assessment than players who played either Tetris (a classic puzzle game) or an action game. Numerous other studies have found gender differences in terms of preferences for some game genres over others (e.g., Rehbein et al., 2016; Stein, Mitgutsch, & Consalvo, 2013)

Giving further weight to the potential influence of game genre, some studies have shown that playing certain genres of video games can influence or reveal aspects of players' personalities. For example, Peever, Johnson, and Gardner (2012) found that certain personality traits were correlated with preference for different video game genres. Drawing on the theory of narrative identity, which states that individuals use past experiences and stories about themselves to form a cohesive personality (Ricoeur, 1988), Crawford and Gosling (2009) argued that playing sports games could influence gamers' personalities and viewpoints through identification with their in-game avatar and integration of gaming experiences into their social interactions. They further argued that, due to the stereotypical portrayals of race and gender in many sports video games, such as *NFL Street* or *BMX XXX*, playing sports video games may alter players' attitudes or beliefs on issues such as race, gender, or violence. Thus, game genre could prove influential in investigations of video game use and players' beliefs. We therefore incorporate genre here.

This study

Overall, the current field of research suggests that video game content is rife with portrayals of risky behaviors, as well as depictions of traditional masculinity. Independently, both video game play and adherence to masculinity ideology have been linked with participation in risky behaviors. Although numerous studies suggest that video game effects vary by genre, the associations between game genre, masculinity, and risk taking remain unclear. We sought to address this question via the following hypotheses and research questions:

H1a-d: Endorsement of masculinity ideology will be positively associated with greater alcohol use (a), drug use (b), reckless driving (c), and delinquency (d).

RQ1: Which video games genres are associated with masculinity ideology?

RQ2: Which video games are associated with participation in risky behaviors?

RQ3: Does masculinity ideology mediate the relation between video game play and risky behaviors?

Method

Participants

Participants were 273 undergraduate men ages 17 to 26 (M = 18.99 SD = 1.17). Of this sample, 59.6% identified as White, 19.9% as Asian/Asian American, 4.4% as Latino/Hispanic, 5.1% as Black, 3.3% as Middle Eastern, and 6.6% as multiracial. Participants were generally from well-educated families. On average, mothers had completed a bachelor's degree, and fathers had completed some graduate education. Eighty-eight percent of participants identified as exclusively heterosexual.

Procedure

Participants were recruited from introductory psychology courses at the University of Michigan. All male students enrolled in introductory psychology classes could sign up for this study, which was identified by a number only. Participants were scheduled to come to a research lab in small groups and were told that they would be completing a study of media use and social relationships. At that point, participants were given 1 hr to complete an anonymous electronic survey that was administered on tablet computers.

Because this survey is part of a larger study on men's media use, social, and romantic relationships, additional measures were included in the survey packet that are not discussed herein. These additional measures were interspersed with the measures described in the following.

Measures

Video game exposure

Exposure was assessed by measuring both overall video game use and familiarity with a list of popular games. To measure overall use, participants were asked to indicate how many hours (0–10+) they spent playing video games on a typical weekday, Saturday, and Sunday. Weekday responses were then multiplied by 5 and added to Saturday and Sunday responses to create a single sum weekly score. To assess video game play in more detail, participants were asked to report how often they played each game from a list of 17 popular video game franchises (e.g., *Legend of Zelda, Grand Theft Auto, Madden NFL*) on a scale from 0 (*never*) to 3 (*all the time*). Franchises were chosen based on sales numbers throughout the franchises' history, which were obtained from various online newspaper articles; priority was given to franchises with strong sales in recent years. Mobile and casual games, such as *Tetris, Candy Crush*, or the *Wii Sports* franchises, were not included.

A confirmatory factor analysis in MPlus suggested that the video games fell into three categories: sports games, action games, and online games. Sports games (n = 3) emulate real-life sports, either by taking control of an athlete avatar or managing a virtual sports team (e.g., *Madden*). Games that fell into the *action* category (n = 7) shared a focus on physical enactment to advance in the game, often using violent or dangerous behaviors (e.g., *Halo, Call of Duty*). Online games (n = 2) included those that are exclusively played in an online multiplayer game mode (e.g., *World of Warcraft*). This includes subgenres, such as massive multiplayer online (MMOs) and multiplayer online battle arenas (MOBAs). Five games that did not significantly load onto any factor were dropped from further analyses. Mean scores were then calculated for each genre.

Masculinity ideology

Masculinity ideology was assessed using the Conformity to Masculine Norm Inventory-46 (CMNI, Parent & Moradi, 2009). The CMNI assesses personal adherence to masculinity ideology within nine dimensions of masculinity (e.g., emotional control, risk-taking, violence) by asking participants to report their level of agreement with 46 statements, such as "In general, I control the women in my life" and "Sometimes violent action is necessary." Responses were indicated on a 6-point scale (1 = *strongly disagree*; 6 = *strongly*

agree). A mean score was calculated across all 46 items, with higher scores indicating stronger adherence to masculinity ideology (α = .83).

Risk

Participants were asked about four types of risky behaviors: alcohol use, drug use, driving behaviors, and delinquency. To assess alcohol use, participants were asked to indicate how often they currently drink alcohol, drink to get drunk, and drink more than five drinks in one night on a scale from 0 (*never*) to 4 (*once a day or more*). An average score was computed across these three items, with higher scores indicating more alcohol consumption (α = .96). Drug use was assessed by having participants report how often they smoke marijuana, use prescription drugs for nonmedical/recreational reasons, and use other drugs (e.g., cocaine, ecstasy, acid, speed) on a scale from 0 (*never*) to 4 (*once a day or more*). A fourth item asked participants to indicate how often they smoked cigarettes within the last year, with responses ranging from 0 (*never*) to 4 (*11 or more times*). An average score was computed across these four items to create a single drug use score, with higher scores indicating higher rates of substance use (α = .68). To measure risky driving, participants were asked to indicate how often they had driven over 85 mph and how often they had driven more than 20 mph over the speed limit within the last year. Possible responses ranged from 0 (*never*) to 4 (*11 or more times*). An average score was computed across these two items to create a single risky driving score, with higher scores indicating riskier driving (α = .88).

Delinquency

Involvement in delinquent behaviors was assessed using a self-report measure originally created for the National Youth Survey (Elliott, Huizinga, & Ageton, 1985). Participants were given a list of 25 delinquent behaviors (e.g., purposely damaged or destroyed property that did not belong to you) and asked to indicate how often they had participated in each behavior during the previous year using a scale from 1 (*never*) to 5 (*10+ times*). An average score was computed across all items to create an overall delinquency score, with higher scores reflecting greater participation in criminal behavior (α = .84).

Results

Preliminary analyses

Descriptive statistics for all variables are reported in Table 1. Overall, men reported playing video games for an average of 8.16 hr per week. The most popular games were sports games, which were played significantly more than action games, $t(269) = 7.163$; $p < .001$, and online video games, $t(269) = 12.135$;

Table 1. Means and standard deviations of model variables (N = 271).

Variable	Mean	*SD*	Actual Range (Possible Range)
Media use			
Video game hrs/week	8.16	11.39	0–65 (0–70)
Frequency sports VG	1.93	.85	1–4 (1–4)
Frequency action VG	1.53	.51	1–3.43 (1–4)
Frequency online VG	1.16	.46	1–4 (1–4)
Masculinity ideology			
Overall endorsement	3.42	.49	2–5.20 (1–6)
Risk outcomes			
Drinking	2.72	1.07	1–4.33 (1–5)
Drug use	1.49	.67	1–3.75 (1–5)
Driving	2.12	.97	1–5 (1–5)
Delinquency	1.46	.38	1–3.12 (1–5)

$p < .001$. On average, participants scored slightly below the midpoint on the CMNI, with responses clustering between *disagree a little* (3) and *agree a little* (4). Means for all risk outcomes fell below scale midpoints. Risky drinking behaviors were the most prevalent, with 23.8% of men reporting participation in such behaviors a few times a week, and 20.5% reporting participation in such behaviors a few times a month.

Testing the main research question

We examined the relation between masculinity and risk taking (H1a-d), video game genres and masculinity (RQ1), and video games genres and risk taking (RQ2) with bivariate correlations. To control for Type I error among these tests, we used a Bonferroni correction ($\alpha = .05/23 = .002$). These correlations are presented in Table 2. Hypotheses 1a through 1d were fully supported; masculinity ideology was positively associated with all four risk behaviors. Overall hours of weekly video game play were not correlated with any of the four risk outcomes. Of the three video game genres, only sports games were significantly associated with masculinity ideology. Sports games also showed a positive association with greater alcohol use ($r = .27$, $p < .001$), and online games were negatively associated with alcohol use ($r = -.18$, $p = .003$).

To explore whether masculinity ideology mediated the relation between video game play and risk behaviors (R3), we used structural equation

Table 2. Correlations between model variables.

	Masculinity Ideology	Drinking	Drug Use	Driving	Delinquency
Video game hrs/week	-	−.08	−.03	−.01	.05
Frequency sports VG	.27***	.22***	.15*	.03	.12*
Frequency action VG	.06	−.02	−.01	.05	.12*
Frequency online VG	−.03	−.18**	−.13*	−.12	.03
Masculinity ideology	-	.33***	.22***	.31***	.36***

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

modeling with maximum likelihood estimation in MPlus. Because correlational analyses indicated that action and online games are not associated with masculinity ideology, mediation could not be present for those genres. Thus, our proposed model only includes sports games. Following the recommendations of Anderson and Gerbing (1988), we first tested a measurement model, followed by a structural model. For all models, corresponding scale items were assigned as indicators to each latent variable. Since our measures of masculinity ideology and delinquency were lengthy, indicators for these two constructs were distributed across three parcels by using a random number generator. The measurement model fit the data well, $\chi^2(121, N = 271) = 231.004$, $p < .001$, CFI = .96, RMSEA = .058 with 90% CI [.047 to .069]. Standardized factor loadings were all significant at $\alpha = .001$ and are listed in Table 3.

Next, we tested our proposed structural model, which included direct paths from sports video games (IV) to masculinity ideology (mediator), and masculinity ideology to each risk construct (DVs). Results (Figure 1) indicated that the model fit the data well, $\chi^2(125, N = 271) = 239.475$, $p < .001$, CFI = .96, RMSEA = .058 with 90% CI [.047 to .069]. This model explained 11% of the variance in masculinity ideology, 13% of the variance in drinking behaviors, 7% of the variance in drug use, 11% of the variance in risky driving, and 16% of the variance in delinquent behaviors. All proposed pathways (Figure 1) were significant, indicating that sports video games were

Table 3. Factor loadings for SEM model.

Factor Indicators	Factor Loading
Sports VG	
Madden	.782
NBA	.790
FIFA	.581
Masculinity ideology	
Item parcel 1	.937
Item parcel 2	.849
Item parcel 3	.840
Drinking	
How often do you currently drink alcohol?	.927
How often do you drink to get drunk?	.952
How often do you drink more than 5 drinks in one night?	.937
Drug use	
How often do you smoke marijuana?	.718
… prescription drugs for non-medical/recreational reasons?	.692
…drugs (e.g., cocaine, ecstasy, acid, speed)?	.685
How often during the past year have you smoked cigarettes?	.627
Driving	
How often during the past year have you driven over 85 MPH?	.892
…driven more than 20 MPH over the speed limit?	.890
Delinquency	
Item parcel 1	.790
Item parcel 2	.795
Item parcel 3	.916

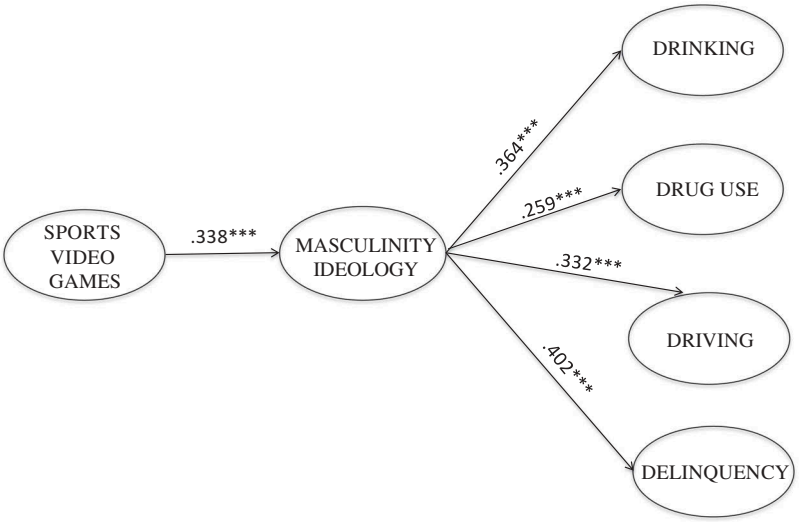

Figure 1. Full mediation model with standardized coefficients. Playing sports video games predicts adherence to masculinity ideology, which in turn, predicts drinking, drug use, reckless driving, and participation in delinquent behaviors.
χ^2 (125, N = 271) = 239.475, CFI = .961, RMSEA (90% CI) = .058 (.047-.069).
***p < 0.001

significantly associated with adherence to masculinity ideology, which in turn, was associated with greater participation in all risk categories.

Finally, we tested a nested model (Figure 2) to determine whether masculinity ideology fully mediates the relation between sports video games and risk behaviors. This nested model includes the same pathways as our proposed model specified previously, with additional pathways between sports video games and each risk category. Inclusion of these additional paths allow us to examine the relation between sports games and risk behaviors both indirectly (via masculinity ideology) and directly, consistent with partial mediation. This partially mediated model fit the data well, $\chi^2(121, N = 271) = 231.004$, $p < .001$, CFI = .96, RMSEA = .058 with 90% CI [.047 to .069]. We utilized a chi-square difference test (Kline, 2011) to compare this partially mediated model to the original, fully mediated model. A significant difference between models suggests that the model with more freely estimated parameters (i.e., partial mediation) fit the data better. In contrast, a nonsignificant difference between the models suggests that the models fit the data equally well, in which case the more parsimonious model (i.e., full mediation) is preferred (Kline, 2011). We found no significant difference between the models χ^2_{diff} (4) = 8.471, $p > .05$. Thus, masculinity ideology fully mediates the relation between Sports video games and participation in risky behaviors.

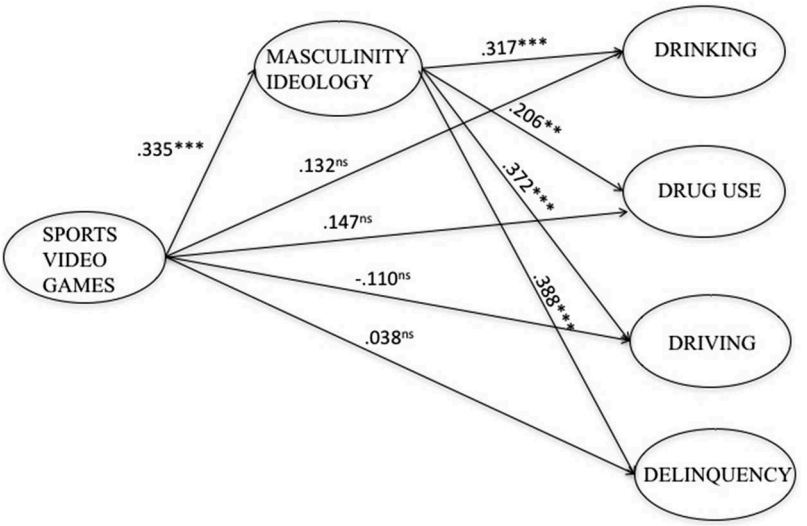

Figure 2. Partial mediation model with standardized coefficients. Playing sports video games predicts adherence to masculinity ideology, which in turn, predicts drinking, drug use, reckless driving, and participation in delinquent behaviors. No direct relationship was found between sports video game usage and any of the four risky behaviors.
χ^2 (121, N = 271) = 231.004, p < .001, CFI = .962, RMSEA (90% CI) = .058 (.047 - .069).
**p < 0.01; ***p < 0.001.

Discussion

Video games have become a mainstream form of entertainment, but remain controversial. Although previous studies have found an association between video game play and masculinity ideology, as well as between video game play and risky behaviors, less is known about how these three variables may interact when tested simultaneously within one model. In addition, we do not know how these relations may vary by game genre. Thus, this study sought to explore the relation between genres of video games, masculinity, and risky behaviors among undergraduate men within one comprehensive model. We hypothesized that masculinity ideology would mediate the relation between video game play and risky behaviors, and asked whether the nature of these relations would vary by game genre. Results indicated that genre differences did indeed exist. Particularly, masculinity ideology mediated the relation between game play and risky behaviors for sports games, but not action or online games.

In line with previous studies (e.g., Santana, Raj, Dicker, LaMarch, & Silverman, 2006), masculinity ideology was positively associated with risky behaviors. In fact, adherence to masculinity ideology was positively associated with all four risky behaviors measured: alcohol use, drug use, reckless driving, and delinquency. These finding highlight the way in which masculine norms can put men at risk for substance use problems, injury to themselves or others, or even prosecution and incarceration. Future research

should therefore take into account the role of masculinity when examining media use and risky behavior.

Correlational results indicated a positive relation only between sports video game play and masculinity ideology. No significant associations were found between action or online games and masculinity ideology. Although research on sports video games remains limited, playing and watching sports have generally been associated with masculinity ideology. For example, one study found that boys believed that both being masculine and appearing strong were factors important to playing sports (Klomsten, Marsh, & Skaalvik, 2005). Furthermore, experimental results indicate that asking participants to imagine themselves as competitive athletes primes self-reported masculinity (Clément-Guillotin & Fontayne, 2011). These results indicate that men who frequently play sports video games may be more vulnerable to adopting traditional attitudes about masculinity than men who primarily play other genres. At the very least, these findings indicate that violent games, by far the most scrutinized type of game, may not be exclusively problematic. Because of the unique nature of sports games as one piece a multimedia phenomenon (e.g., fantasy sports, watching sports, watching sports news), future work should also examine how sports video games fit into the larger domain of sports.

Our study also found an association between some, but not all, video game genres and risky behaviors. Sports games showed the strongest connection to risky behaviors, with positive links to alcohol use, drug use, reckless driving, and delinquency. Action games were only associated with delinquency, and online games were negatively associated with alcohol and drug use. Some research has found that playing online games is linked to poorer social interactions and more social anxiety (Lo, Wang, & Fang, 2005), which may explain why online gamers engage in fewer social risk behaviors, such as drinking. However, more recent studies have found mixed results (e.g., Reer & Kramer, 2014).

Although the results for the action category were weak overall, this outcome may have been a consequence of how the games loaded on the factors. For example, one game series that was classified as action, *Grand Theft Auto*, is commonly cited as an example of violent, sexist content. Conversely, another game series that loaded into the action category, *The Legend of Zelda*, does not contain such content. Because the action category was so diverse (despite the fact that the player character consistently engages in risky behaviors), it may have diluted the effects for games that have been labeled as problematic in the past, namely violent games such as *Grand Theft Auto* or *Call of Duty*. However, it is also possible that action games are not as problematic as previously thought. Further work should be done to clarify the differences between the broader genre of action games.

Although this study contributes to existing research on video games and risk, we acknowledge certain limitations. First, the correlational and cross-sectional nature of this study means that we cannot draw firm conclusions about causality or directionality. We argue that playing sports video games leads to a stronger adherence to masculinity ideology among men, which, in turn, leads to greater participation in risky behaviors. However, it is also possible to contend that men who strongly ascribe to masculinity ideology play certain video games, such as sports games, more often to validate or reinforce these beliefs. Further longitudinal and experimental work should be conducted to clarify the nature of this relation.

A second limitation of this study is the homogeneity of our sample. All of our participants were undergraduate men from the same Midwestern university. This presents a unique confound, given the importance many undergraduates place on college sports. NCAA sports are an important part of many college students' lives, and good programs are a status symbol for US universities (Lifschitz, Sauder, & Stevens, 2014). This is especially true at the Midwestern university sampled, which has one of the strongest athletic departments in the country. It is possible that this unique environment influenced our sample's perceptions of sports, sports video games, and masculinity. Additionally, the majority of participants were White, heterosexual, and came from two-parent households. Future research should attempt to recruit a sample with more racial, socioeconomic, and sexual diversity. Such expansion is particularly important, given research indicating an overrepresentation of male and White characters, underrepresentation of women and minority characters (Williams et al., 2009), and racial differences in video game play (Jackson, Von Eye, Witt, Zhao, & Fitzgerald, 2011).

It is also important to note that although previous studies have found a link between racing games and risky driving behavior (Fisher et al., 2009), we only found an association between sports game play and reckless driving. In this study, driving games such as *Need for Speed* and *Grand Theft Auto* fell into the larger category of action games. Since our action genre also included games that are often categorized as violent or first-shooter games (e.g., *Halo, Call of Duty, Assassins Creed*), we were surprised to find no link between action games and masculinity, or between action games and risky behaviors. Future research should continue to explore video game genre categorizations through confirmatory factor analyses, and further investigate the relation between these genres and risk outcomes.

Finally, because this study was part of a larger project focused on men's media use and social and romantic relationships, several variables commonly associated with risk-taking were not measured (e.g., temperament) or controlled for (e.g., socioeconomic status, parental education, parental marital status). Future studies with larger sample sizes will allow for a greater

inclusion of control variables to form a more comprehensive model of video game use and risk outcomes.

Conclusion

Overall, this study has important implications for future research on video game play, gender beliefs, and risky behaviors. Our findings show that sports video games had the strongest associations with masculine ideology and risk behaviors compared to other genres, such as action games. Future studies should therefore avoid grouping all video games together and should explore how these relations change or remain stable across genres, particularly sports video games.

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