Computers in Human Behavior 27 (2011) 1262–1264

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Pornography-seeking behaviors following midterm political elections in the United States: A replication of the challenge hypothesis

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ARTICLE INFO

Article history:
Available online 2 February 2011

Keywords:
Pornography
Challenge hypothesis
Google
Politics
Elections

ABSTRACT

The current study examined a prediction derived from the challenge hypothesis; individuals who viciously win a competition of rank order will seek out pornography relatively more often than individuals who viciously lose a competition. By examining Google keyword searches during the 2006 and 2010 midterm elections in the United States, the relative popularity of various pornography keyword searches was computed for each state and the District of Columbia the week after each midterm election. Consistent with previous research examining presidential elections and the challenge hypothesis, individuals located in traditionally Republican states tended to search for pornography keywords relatively more often after the 2010 midterm election (a Republican victory) than after the 2006 midterm election (a Democratic victory). Conversely, individuals located in traditionally Democratic states tended to search for pornography relatively less often following the 2010 midterm election than they did following the 2006 midterm election.

1. Introduction

The challenge hypothesis (Wingfield, Hegner, Dufty, & Ball, 1990) predicts that testosterone levels tend to rise during competition. Specifically, it suggests that the changes in testosterone that occur in response to challenges help support various reproductive behaviors (e.g., mate guarding, dominance disputes, etc.). Although this hypothesis was originally proposed to account for testosterone and aggression relations found among birds, the challenge hypothesis has been recently extended to research on humans (Archer, 2006). Consistent with the challenge hypothesis, researchers have found that following various types of competitions (e.g. wrestling, basketball, coin toss, etc.) individuals who win a competition tend to have greater increases in their testosterone than individuals who lose a competition (for a review see Archer (2006)).

The challenge hypothesis extends to vicarious experiences as well; a spectator can experience similar changes in testosterone levels. For example, male fans watching their favorite sports team tend to have higher levels of testosterone if their team wins the competition than if their team loses the competition (Bernhardt, Dabbs, Fielden, & Lutter, 1998). This effect has even been observed following political elections. After the 2008 United States presidential election, men who voted for the winning candidate (Barack Obama) had higher testosterone levels after the election than men who voted for a losing candidate (Stanton, Saini, & LaBar, 2009). Due to the link between testosterone and sex-related behaviors (see Archer, 2006; van Anders & Watson, 2006), at least one researcher speculated that there may be an "Obama baby bump" nine months after the election (Choi, 2009).

Although an Obama baby bump has not been detected, which may be due to the prevalence of contraception use, it is possible that other types of sexual behaviors, such as the seeking of pornography, may be more easily detected. Given the above discussed links between viciously winning a competition and increases in testosterone (Bernhardt et al., 1998; Stanton et al., 2009) and testosterone and sexual behaviors (Archer, 2006; van Anders & Watson, 2006) it seems likely that men who vicariously win a competition will express more interest in sexual behavior and therefore seek out pornographic material more than individuals who viciously lose a competition. Consistent with this notion, Markey and Markey (2010) found that individuals located in Blue states (Democratic voting states) searched for pornographic keywords on the internet more frequently after the 2008 presidential election (when a Democratic candidate won the election) than after the 2004 presidential election (when a Republican candidate won the election). Conversely, after the 2008 presidential election individuals located in Red states (Republican voting states) tended to search for pornography less often than after the 2004 presidential election.

In addition to demonstrating that pornography-seeking behaviors seem to change following presidential elections, Markey and Markey (2010) also found that after the 2006 midterm election

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doi:10.1016/j.chb.2011.01.007

(when Democrats captured the House of Representatives, the Senate, and a majority of governorships and state legislatures) states that were traditionally Blue states had higher rates of pornography-seeking behaviors than Swing states (i.e., states which tend to favor both Democratic and Republican candidates), which had higher rates of pornography-seeking behaviors than Red states. Although this finding is consistent with the challenge hypothesis is it somewhat limited because, at the time, there was no way to examine if these findings would reverse (as they did in the 2004 and 2008 presidential elections) if Republicans had a victory during a midterm election.

The recent 2010 midterm election, when Republicans had a clear victory (capturing the House of Representatives, the majority of governorships and state legislatures, and gaining the largest number of Senate seats since 1994), affords a condition that can be contrasted to the findings of the 2006 midterm election. Using data provided from this election cycle it is now possible to test specific hypotheses derived from the challenge hypothesis to recent midterm elections in the United States. Specifically, it is hypothesized that individuals located in traditionally Red states will search for pornography on the internet more often after the Republican victory during the 2010 midterm election than after the Democratic victory during the 2006 midterm election. Additionally, it is hypothesized that individuals located in traditionally Blue states will search for pornography less often following the 2010 midterm election than they did following the 2006 midterm election. Such findings would not only replicate previous research showing a trend reversal of Red and Blue states following the 2004 and 2008 presidential elections but would also demonstrate that this effect generalizes to midterm elections.

2. Method

2.1. Participants

Participants in this study were all individuals residing in the United States who entered select pornography keywords into the Google search engine in 2006 and 2008. Other than the state participants resided in and when they searched for the select pornography keywords, no other demographic information is available.

2.2. Measurements and procedure

2.2.1. State voting style

State voting style was determined by each state's tendency to vote either predominantly for the Republican Party, the Democratic Party, or for both parties. States and the District of Columbia were classified into one of these three categories by compiling the mean margin of victory in the 1992, 1996, 2000, 2004, and 2008 presidential election (Alpha = .97). States with an average margin of victory of greater than 5% for the Democratic candidate were classified as Blue states, states with an average margin of victory of greater than 5% for the Republican candidate were classified as Red states, and the remaining states were classified as Swing states.

2.2.2. Pornography-seeking behavior

In order to determine which keywords individuals typically use to find pornography on the internet the internet service WordTracker was utilized (see Markey & Markey, 2010). By compiling data from millions of searches each week, WordTracker was able to identify the top keywords individuals tend to use to find pornography (WordTracker, 2009). This was done by first providing WordTracker with the seed word "porn." WordTracker than searched the top 100 websites that rank highest on search engines for the term "porn" and extract additional keywords utilized by these sites. From this analysis, the 10 most frequently occurring, nondomain specific, pornography keywords were extracted (e.g., "xvideos," "boobs," "tits," etc.). The pornographic keywords used in the current study are identical to the keywords used previously to examine changes in pornographic-seeking behaviors after presidential elections (Markey & Markey, 2010). A complete list of the ten keywords utilized for the current research is available from the first author.

Google Trends was then used to determine the popularity of these pornography keywords. By analyzing a portion of Google searches, Google Trends computes the relative number of searches done on a given set of keywords. Through recording user's IP addresses, Google Trends provides a "snap shot" of what is on the public's mind in a particular area of the United States at different points in time (Google, 2009). For each state, Google Trends sampled a portion of Google web searches to determine how many searches for the pornography keywords had been conducted in a given week relative to the average number of searches on Google for those keywords over a given year. Although Google Trends does not supply the raw number of searches that occurred, the information they provide allows for the computation of a search volume index (SVI), which provides the percent increase or decrease from the yearly mean for the pornography keywords for a given week (Google, 2009). Because there are fluctuations in the SVI that occur across all the states at different times of the year that are unrelated to elections a relative search volume index (RSVI) was computed by centering each state's weekly SVI across all states (i.e., the mean state RSVI score was 0%; this linear transformation does not alter any of the results yielded from the statistical analyses performed). The interpretation of the RSVI is fairly straight-forward. A RSVI score of 0% indicates a state had a search volume index for pornography keywords equivalent to the norm for that state on a given week. A RSVI score of 2% indicates that a state had a score 2% higher than the norm for that state on a given week and a RSVI score of −2% indicates a search volume index for pornography keywords 2% lower than the norm for that state on a given week. It is important to note that because the RSVI is a relative score it removes any differences that might exist between states due to population, internet access, or a state's overall tendency to search for pornography keywords (Google, 2009). In the current study, RSVI pornography keyword scores were computed for the week after the 2006 and 2010 midterm elections (including the Election Day itself) for each state.[2]

3. Results

Fig. 1 displays the mean RSVI for Red, Blue, and Swing states the week after the 2006 and 2010 midterm elections. In order to examine the expected interaction between the year of an election (2006 and 2010) and a state's political orientation (Red, Blue, and Swing states) a 2 (Year of Election) × 3 (State's Political Orientation) mixed model ANOVA was computed. Because RSVI's are relative values there was no main effect for Year of Election and the main effect of State Political Orientation was also not significant ($F(2, 48) = .07$, $p = .93$, $\eta^2 = .00$). However, as expected, there was a significant Year of Election × State Political Orientation interaction ($F(2, 48) = 4.60$, $p < .05$, $\eta^2 = .16$). Simple effect analyses revealed that there was no significant change in RSVI of pornographic keywords for Swing states ($F(1, 6) = .06$, $p = .97$, $\eta^2 = .00$). As hypothesized, there was a significant increase in RSVI of pornographic keywords between 2010 and 2006 for Red states ($F(1, 21) = 4.30$, $p = .05$, $\eta^2 = .16$) and a significant decrease in RSVI

[2] All data from this study were supplied by Google on November 8, 2010.

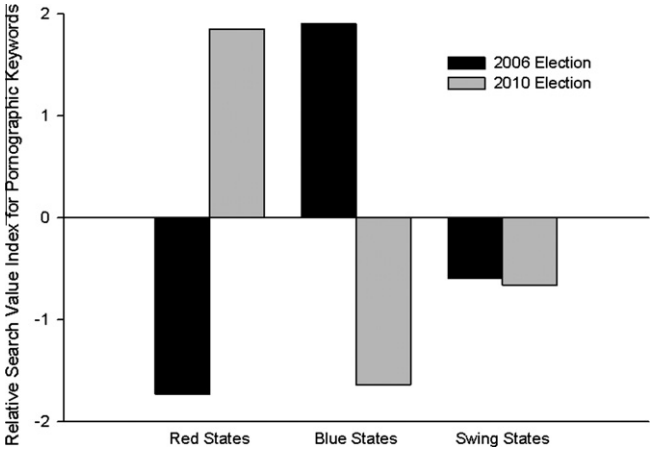

Fig. 1. Pornography-seeking behaviors for Red, Blue, and Swing states the week after the 2006 and 2010 midterm elections.

between 2010 and 2006 for Blue states ($F(1, 21) = 5.17$, $p < .05$, $\eta^2 = .20$).

4. Discussion

The current study examined the differences in pornographic-seeking behaviors following the 2006 and 2010 midterm elections in the United States. It was found that individuals located in traditionally Republican states (i.e., Red states) tended to search for pornography relatively more often after the Republican victory during the 2010 midterm election than after the Democratic victory during the 2006 midterm The reverse of this trend was found for individuals residing in traditionally Democratic states (i.e., Blue states). In these states, individuals tended to search for pornography relatively less often following the 2010 midterm election than they did following the 2006 midterm election.

The findings from this study are consistent with the challenge hypothesis, which predicts that individuals, who win a competition of rank order, even if that victory is only vicarious, tend to experience greater increases in their testosterone than individuals who lose a competition (Bernhardt et al., 1998; Stanton et al., 2009). Given the link between testosterone and sexual behaviors (Archer, 2006; van Anders & Watson, 2006) it is possible that the changes in pornography-seeking behaviors observed in the current study examining midterm elections and the previous study examining presidential elections (Markey & Markey, 2010) reflect changes in an individual's level of testosterone. Of course, the exact casual mechanism for this change cannot be determined from these data. For example, it is probable that a person who voted for the winning political party might simply be happier and more interested in sex than individuals who voted for the losing political party. In other words, it might have been changes in voters' affect rather than testosterone levels that explain the observed changes in pornography-seeking behaviors. However, such a conclusion is inconsistent with previous research which suggests that positive affect is either unrelated or negatively related to various sexual behaviors (Frohlich & Meston, 2002; Reid, Carpenter, & Lloyd, 2009; Reid, Carpenter, Spackman, & Willis, 2008; Rinehard & McCabe, 1998).

Although the results of the current study support the challenge hypothesis, the findings of this study must be considered in the context of its limitations. Other than location, Google Trends does not supply data regarding specific individuals' searches for a given term. Therefore, it is unknown if the effects observed in this study are equivalent across various demographic variables. Additionally, because the data used in this study are based on aggregated data some caution is warranted when using these results to predict the behaviors of individuals. However, given that these findings are consistent with results examining the changes of testosterone among individuals after vicarious victories or defeats (cf., Bernhardt et al., 1998; Stanton et al., 2009) it is unlikely that the use of aggregate data is a confound in this study. Finally, although the relative data computed from Google Trends (i.e., the RSVI) removes any overall differences that might exist between states or between time periods, it doesn't provide the raw number of times a term was searched for in a given time period. However, given the number of searches for pornography that occur each day (Ropelato, 2006), it seems likely that even a tiny change in RSVI reflects thousands of additional searchers. Therefore, the percent differences presented in Fig. 1 for each election cycle might actually reflect thousands (even millions) of additional searches beyond what is typical for a given state.

The present findings remind us that our interest in sex and our sexual behaviors should be considered in the context of evolutionary (e.g., the challenge hypothesis) and contextual experiences. Although we often like to believe that our sexual experiences and desires are consciously determined, complex interactions likely occur between the events in our day-to-day lives and our hormones that encourage or discourage the likelihood of engaging in sexual behaviors with another person or in the virtual world provided by the internet. Further, the findings from this study provide yet one more example of the potentially intricate links between sex and politics.

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