



Published in final edited form as:

Health Commun. 2014 March ; 29(3): . doi:10.1080/10410236.2012.745043.

Social Comparison Framing in Health News and Its Effect on Perceptions of Group Risk

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Abstract

News about health disparities often compares health risks faced by different demographic groups. Does this social comparison produce a contrast effect? It was hypothesized that when two racial groups are compared, people would perceive the relatively more at-risk group to be more, and the less at-risk group to be less, at-risk than if the same risk information was presented without the comparative reference group. Three experiments with Black and White respondents tested effects of intergroup social comparison framing (SCF) on perceptions of risk for sexually transmitted infections and skin cancer. SCF (including one White and two Black disparity frames) did not raise respondents' perceived risk regarding the more at-risk racial group, but consistently lowered respondents' risk ratings for the less at-risk racial group. The finding that the same statistic was perceived differently in comparative and non-comparative contexts underscores the importance of considering effects of communication about disparities.

The U.S. government's *Healthy People* (2010) goals on health disparities, along with related publications issued by the World Health Organization, Institute of Medicine, and the CDC, reflect increased attention to health inequalities. The various publications complement promulgation of policies aimed at encouraging research into health inequalities, including measuring and tracking demographic health differences (Bleich, Jarlenski, Bell, & LaVeist, 2012). Academic studies, policy reports, and speeches by public officials serve as sources for news stories about racial health and healthcare disparities (Amzel & Ghosh, 2007; Taylor-Clark, Melbane, SteelFisher, & Blendon, 2007). At the same time, the way that epidemiological data is analyzed and statistics related to health disparities are presented can result in different narratives about health inequalities and progress depending on chosen reference points and reference groups (Harper et al., 2010). Therefore, as scholars and policymakers increasingly turn their attention to examining disparities and release findings from those studies, an important research question is raised: what are the effects of communication *about* health disparities on people who are exposed to these messages in the news?

Examining the effects of communication about disparities on outcomes related to prevention behavior and intentions (Nicholson et al., 2008), redistributive and healthcare policy support (Gollust & Lynch, 2011; Rigby et al., 2009) and media interest (Hinnant, Oh, Caburnay, & Kreuter, 2011; Lumpkins, Bae & Cameron, 2009) is an emerging field of study. One way that communication research can contribute to a better understanding of the effects of news about disparities is through experimental examination of message features, such as message frames (Niederdeppe, Bu, Borah, Kindig & Robert, 2008). Although the term "health disparities" has often been used to refer to racial or ethnic disparities in particular, scholars and government agencies have defined health disparities more and less broadly and argued

for various definitional boundaries based on criteria related to socio-structural and moral dimensions (see Braveman, 2006; Carter-Pokras & Baquet, 2002). Yet, at the heart of any communication about health disparities is the actual statement of difference. For example, CDC's 2011 *MMWR* report on health disparities and health inequalities defines health disparities as "differences in health outcomes and their determinants between segments of the population, as defined by social, demographic, environmental, and geographic attributes" (p. 3). Elsewhere in the same report the term is defined as "differences in health outcomes between groups that reflect social inequalities" (p. 1). Both definitions center on differences between groups. A core component of disparity information typically comprises a social comparison that communicates unequal risk for negative health outcomes between groups, such as racial groups (i.e., an intergroup social comparison).

The way in which risk groups are defined, and beliefs about who is at risk for a public health problem, can have implications for what kinds of solutions are put forth and what level of political support policies receive (Vaughan & Seifert, 1992). Indeed, a major rationale for reporting on stories about disparities is to raise public awareness of differential risks faced by various groups as a step toward building public support for helping to mitigate health inequalities (Benz, Espinoza, Welsh & Fontes, 2011; CDC, 2011). Yet the comparative aspect of health disparities and its influence on key outcomes, such as risk perception, remains understudied. Buunk & Gibbons (2007) define social comparison as "any process in which individuals relate their own characteristics to those of others" (p. 16). However, rather than comparing one individual with another, social comparisons in media messages about disparities instead compare demographic groups or other socially meaningful subpopulations, potentially making comparative group risk salient. Therefore, these intergroup comparisons can be conceptualized as a key message feature of disparity stories – *social comparison frames* (Bigman-Galimore, 2011). For example, Blacks have been portrayed in the news as comparatively worse off in terms of health and healthcare (Amzel & Ghosh, 2007; Cohen et al., 2008; Gandy, Kopp, Hands, Frazer & Phillips, 1997, Gandy & Li, 2005; Kim, Kumanyika, Shive, Igweatu, & Kim, 2010; Stryker, Fishman, Emmons & Viswanath, 2009; Taylor-Clark et al., 2007). A fundamental question then is whether and how these racial social comparison frames affect risk perception. This paper presents results from three experiments that tested whether intergroup social comparisons that focus on racial disparities alter perception of risk faced by the racial groups in the comparison, particularly whether presenting the same racial risk statistics in comparative and non-comparative contexts elicit differential risk ratings.

Several lines of research suggest that the comparative aspect of health disparity stories may affect risk judgments among those who are exposed to the information. First, communication research finds that information from the media tends to affect perceptions about others more than beliefs about oneself and serves as a guide for understanding important problems and risks faced by society (Dearing & Rogers, 1996; Mutz, 1998; Tyler & Cook, 1984). Second, the manner in which risk is presented or framed can affect perceptions and judgments even when equivalent probabilities are presented. People have trouble understanding statistical and probabilistic information and systematic biases can occur when people process information on risk (Klein & Stefanek, 2007; Reyna, Nelson, Han, & Dieckmann; 2009, Rothman & Kiviniemi; 1999, Tversky & Kahneman, 1974). Dual process models, such as the Elaboration Likelihood Model (Petty & Cacioppo, 1986), Heuristic Systematic Model (Chaiken, Liberman, & Eagly, 1989) and Fuzzy Trace Theory (Reyna, 2008), underscore the importance of contextual information and framing in information processing. In line with the idea that context matters, the comparative relationship between risks can have distinct effects on health-related risk perceptions and other outcomes, even when absolute risk information is held constant (e.g., Klein & Stefanek, 2007). It makes a difference whether risk information implies a person is above

average in terms of risk or below average for health issues like genetic risk (Klein, 1997) and breast cancer (Fagerlin, Zikmund-Fisher, & Ubel, 2007). There is also evidence that comparative risk information in hypothetical vignettes can influence affect and perceived susceptibility (French, Sutton, Marteau, & Kinmonth, 2004), as well as optimism about hypothetical surgery (Flugstad & Windschitl, 2003).

At the same time it is important to consider that the studies just discussed on comparative risk compare information that is portrayed as personal risk with information about risks for other individuals or reference groups. In contrast, although news stories may feature individual exemplars, the mass media generally does not provide information tailored to individual audience members. Instead, it conveys group-level risk information, including social comparison frames with intergroup comparisons. Yet perceptions of groups are also shaped by how they are contextualized in comparison to other groups and the relative statuses of those groups (e.g., Rothgerber & Worchel, 1997; Tajfel, 1974). Saliency of reference groups and prior beliefs and schemas about the groups involved in an intergroup social comparison can produce contrast or assimilation effects and influence social judgments by shifting standards for judgment, because people are influenced by beliefs about the relationship between the social groups and the attributes considered to be typical of members of those groups (see Biernat, 2005). Furthermore, media serve as a source for intergroup delineations and contrasts by supplying cues and frames, as well as priming existing schemas and stereotypes (e.g., Dalisay & Tan, 2009; Entman & Rojecki, 2001; Mastro, 2009; Mendelberg, 2001; Ramasubramanian & Oliver, 2007).

Therefore, to the extent that a story with health disparities is communicating differential racial risk and either implicitly or explicitly conveying that one group faces a higher risk than another, the heuristic interpretation or intuitive gist of the statistical information is that one group is more at-risk group and the other group is less at-risk in a way that is considered consequential enough to be newsworthy. Upon retrieving information, people may be expected to apply the salient comparative intergroup contrast when evaluating level of racial risk, potentially shifting perceived risk for the more at-risk group higher, and risk for the less at-risk group lower. Windschitl and his colleagues provide some support for this contrast hypothesis (Windschitl, Martin, & Flugstad, 2002). In experiments, students who had been randomly assigned to read vignettes that stated women had a 12% prevalence for a fictitious disease rated women's vulnerability higher when the vignette also stated that men had a 4% prevalence (i.e., a comparatively lower risk) compared to when men were said to have a 20% prevalence (i.e., a comparatively higher risk). A similar effect was observed for White risk when African Americans were provided as the reference group.

While the findings have obvious applicability to intergroup social comparison framing in the disparity context, the Windschitl et al. (2002) study design was not focused on teasing out directionality of the effect or testing social comparison framing in the context of non-fictitious health risks in the news. The study did not examine the effects on what are considered the non-target reference groups or assess whether being provided with comparative information raises the perceived risk for the more at-risk group, reduces the perceived risk for the less at-risk group, or both. The lack of a non-comparative condition in particular leaves unclear what effect a health disparity frame might exert on racial risk perception versus a story with a non-comparative risk frame, such as an "impact" news frame that focuses on risk for one racial group (Nicholson et al., 2008). In addition, due to the small number of African Americans in the sample, the experiments did not explore whether risk perception or framing effects differed based on race of the perceiver. There was some evidence that the framing effects extended to both men and women for the gender-related comparison.

In order to test whether intergroup social comparison frames that focus on racial disparities alter perception of risk faced by racial groups and produce a contrast effect, a series of three online survey experiments varied the kind of risk statistics presented in a news story. Based on the literature and the contrast hypothesis, it was hypothesized that:

H1a: When respondents are exposed to a social comparison frame in which the more at-risk racial group is compared with a less at-risk racial group, they will rate the more at-risk racial group to be more at-risk than they would have rated it in the absence of the statistic for the less at-risk racial group.

H1b: Conversely, those respondents who are exposed to the social comparison frame will rate the less at-risk racial group as less at-risk than would have been the case in the absence of the statistic for the more at-risk racial group.

The baseline control provides insight into perceptions of racial risk in the absence of race-specific risk information. An additional set of research questions examined whether effects differed based on the race of the person reading or watching the news story:

RQ1a: Are there differences in perceived racial risk based on race of the respondent?

RQ1b: Is there an interaction between race of respondent and frame condition?

Study One

Study One was an online experiment that focused on a health disparity message related to sexually transmitted infections (STIs) in Black and White female adolescents. Although disparities between Whites and minorities regarding HIV/AIDS are well known, other STIs are also disproportionately prevalent among Blacks (Barrow, Newman, & Douglas, 2008; Newman & Berman, 2008). A notable example of social comparison frames in news coverage is a 2008 CDC study on STI risk that garnered television coverage on channels like CBS and CNN and appeared in major newspapers. For instance, a *New York Times* article noted that: “Nearly half the African-Americans in the study of teenagers ages 14 to 19 were infected with at least one of the diseases monitored in the study – human papillomavirus (HPV), Chlamydia, genital herpes and trichomoniasis, a common parasite. The 50 percent figure compared with 20 percent of [W]hite teenagers....” (Altman, 2008).

It was hypothesized that those who were exposed to a news broadcast about the CDC report that included a social comparison frame where both Black risk and White risk were presented would view Black teen girls as more at-risk than those who saw the same risk statistic for Black teens without the lower White statistic [*H1a*]. In addition, those who viewed the story with the social comparison frame would rate Whites teen girls as less at-risk than those who saw the same White statistic in the non-comparative context [*H1b*]. The study also examined whether there were differences in perceived group risk based on race of respondent [*RQ1a*] and whether race moderated framing effects [*RQ1b*].

Method

Stimuli—A New Jersey (NJN) public television news story that covered the CDC STI report and that had included racial risk for both Black and White teens was edited into four conditions by retaining or removing content. No content was added. The baseline control condition reported risk for each of the four STI diseases among teen girls (age 14–19) with no explicit mention of race or racial statistics. The White only (WO) condition included the baseline information from the control story and the overall STI rate for Whites (20%) in the CDC study. The Black only (BO) condition had the baseline information and the overall STI rate in Blacks (50%). The social comparison frame condition (SCF) included the baseline

information as well as both the 20% figure for Whites and the 50% figure for Blacks. With the exception of the voiceover sentence and accompanying footage of the racial risk statistics, the four videos were identical (see Figure 1 for the screen shots of the statistical differences by condition).

Sample—Respondents ($N = 302$) were females, age 18 (44.4%) or 19, who either self-identified as Black/African American (50.0%) or White. The CDC report on STIs singled out teenage girls age 14–19. Study One tested the effect of racial social comparison framing in the target population and held constant the nonracial demographics in the risk frames (i.e., gender, age). Participants in this web-based study were recruited using electronic invitations sent out by Survey Sampling International (SSI). Excluding ineligible participants who were disqualified for failing to answer the demographic screening questions (i.e., gender, age, race) or for answering them incorrectly, 227 eligible respondents began but did not complete the survey.ⁱ Compared with the distributions for those who completed the survey ($N = 302$), there were no significant differences in completion rates based on age. However, White respondents (51.6%) were less likely to complete the survey than Black respondents (64.0%), $\chi^2(1, N = 529) = 7.77, p = .005$.

Procedure—The online experiment was a 2×4 factorial study design that was conducted in Fall 2010 and approved by the University of Pennsylvania’s IRB. Race of respondent (Black, White) and frame condition (Control, WO, BO, SCF) were the factors. Eligible respondents were randomly assigned to one of the four video conditions based on a constrained randomization design to ensure nearly equal cell sizes for the four experimental conditions for the two racial groups. There were no significant differences for demographic variablesⁱⁱ across the frame conditions, indicating that randomization was successful. After they watched the video, participants were asked a series of questions that were the same for all the experimental conditions.

Measures

Perceived group risk—The perceived group risk scale items were adapted from Morton & Duck’s (2001) risk scale and also included the perceived vulnerability item from Windschitl et al. (2002). The Black racial risk scale ($\alpha = .81$) represented the average of five items: “How important a problem are STDs to [Black teenage girls]?” ($1 = not\ at\ all\ important\ to\ 7 = very\ important$); “How likely is it that...will be affected by STDs in the future?” ($1 = very\ unlikely\ to\ 7 = very\ likely$); “How worried should...be about being affected by STDs in the future?” ($1 = not\ at\ all\ worried\ to\ 7 = very\ worried$); “How much risk do you think...feel from STDs?” ($1 = none\ at\ all\ to\ 7 = a\ great\ deal$); and “How vulnerable are...to STDs?” ($1 = not\ at\ all\ vulnerable\ to\ 7 = very\ vulnerable$).ⁱⁱⁱ The White racial risk scale ($\alpha = .81$) comprised the same items, but instead asked about White teenage girls. Although the overall question order was the same, the order in which the versions of each question were presented (i.e., whether it pertained to Black or White teen girls) was randomly assigned for each respondent.

ⁱAssignment to condition was recorded after video viewing in Study One. Consequently, differential dropout by condition was only examined for Studies Two and Three.

ⁱⁱDemographic variables included age, gender, race, political orientation and socioeconomic status.

ⁱⁱⁱAlthough dropping one item on how much risk the respondent thought Black teenage girls feel from STDs would have raised the alpha to .82 for the Black risk scale and dropping the problem importance item would have raised the alpha to .81 (which is the same as the current alpha due to rounding) for the White scale, the items were retained because the variables loaded onto one factor using principal components factor analysis (PCA) and the items had been part of the published scale from Morton & Duck (2001). Retaining all scale items maintains comparability across the perceived risk scales.

Analysis

Effects of framing and race of respondent on perceived risk were tested with analysis of variance (ANOVA). Separate ANOVAs were conducted for the Black and the White group risk scale outcome measures. Specific hypotheses related to the contrast effect hypothesis were examined using simple contrasts.

Results

Contrast effect for the more at-risk group—[H1a] Framing did not significantly affect perceptions about Black group risk across the experimental conditions, $F(3, 293) = .66, p = .57$. Because the contrast hypothesis specified a difference between the SCF and BO frame conditions in particular, the contrast effect for those frames was examined. Although descriptively respondents in the SCF condition ($M = 5.75, SE = 0.12$) did report higher risk for Black teen girls as a group when compared with respondents in the BO condition ($M = 5.56, SE = 0.13$) (see Table 1), the differences were not statistically significant, $p = .26$.

Contrast effect for the less at-risk group—[H1b] There were significant differences by frame conditions based on the overall ANOVA for perceptions of STI risk for White teen girls, $F(3, 294) = 2.96, p = .03, \eta_p^2 = .03$. As hypothesized, the simple contrast showed that respondents assigned to the news story with the White statistic (WO) in a non-comparative context rated White risk higher ($M = 5.42, SE = 0.12$) than those who saw the social comparison frame ($M = 4.99, SE = 0.13$), $p = .01, 95\% CI [.09, .78]$. In addition, perceptions of White risk in the SCF condition was marginally lower than for the control condition ($M = 5.28, SE = 0.12$), $p = .09$. The results suggest that the SCF condition lowered perception of White risk (see Table 1).

Racial differences—[RQ1a] On average, Black respondents perceived both Black teens ($M = 5.97, SE = 0.07$), $F(1, 293) = 41.51, p = .001, \eta_p^2 = .12$, and White teens ($M = 5.47, SE = 0.09$), $F(1, 294) = 23.48, p = .001, \eta_p^2 = .07$, to be more at-risk for STIs than did White respondents ($M = 5.25, SE = 0.08, M = 4.88, SE = 0.08$, respectively) (see Table 1). [RQ1b] However, there were not significant interactions between race of respondent and frame condition for the Black group risk, $F(3, 293) = .54, p = .65$, nor for the White group risk outcome measure, $F(3, 294) = .62, p = .60$.

Post-hoc—Although the theoretical focus was on social comparison framing, the pattern of results led to an examination of the effect of the frame with just the Black statistic (BO) on perception of White racial risk. The average for the WO frame ($M = 5.42, SE = 0.12$) was higher than for the BO frame based on the simple contrast ($M = 5.02, SE = 0.14$), $p = .02, 95\% CI [.07, .74]$. However, the BO frame was not significantly different from the control condition ($M = 5.28, SE = 0.12$), $p = .12$.

Conclusions

There was partial support for the contrast hypothesis. The White statistic did not affect respondents' perception of Black racial group risk [H1a]. The Black statistic, however, did affect perception of White racial risk. The social comparison frame coverage lowered perception of risk for the less at-risk group, even when the objective risk was the same for that group [H1b]. There was some evidence that mere mention of the Black risk statistic reduced perception of STI risk faced by White teen girls. There was not statistical evidence of any interaction between frame condition and race of the respondent [RQ1b]. However, there was a main effect in which Black respondents perceived Black and White teens to be more at-risk for STIs than did White respondents [RQ1a].

Although Study One showed that messages about racial disparities can change risk perception for racial risk even when the facts about absolute risk are the same, it is also worth keeping in mind that the findings have some limitations in terms of generalizability. First, respondents were 18- and 19-year-old Black and White females who completed the survey. A second consideration is that the study tested contrast effects in the context of a particular topic and message, meaning there could be a case-category confound (Jackson, 1992). STIs are just one health condition where there are disparities and the focus was on a Black disparity. Furthermore, the exposure was a single exposure to an online television clip. A second set of experiments was conducted to address these limitations.

Studies Two and Three

Skin cancer is the most common type of cancer in the United States. Although basal cell cancer and squamous cell cancer are most prevalent, melanoma incidence has been on the rise and is associated with more fatalities (Watson et al., 2011). Melanoma is more common in White Americans. However, five-year survival rates are worse for Black Americans. Consequently, if viewed in terms of incidence, the disparity can be framed as a White disparity and if discussed in terms of survival outcomes, it can be framed as a Black disparity. Skin cancer incidence and STI risk comparisons are related to disparities in risk for contracting an illness. Adding an experiment that uses a survival rate as an outcome allows for generalization to disparity messages based on health outcomes. Furthermore, while STIs represent a stigmatized condition, skin cancer carries less of a stigma, but is still seen as relatively preventable (Lucas, Lakey, Alexander, & Arnetz, 2009).

Studies Two and Three comprised two online experiments. Both were designed to address key limitations from Study One in order to gain a broader perspective on the pattern of results. The experiments focused on skin cancer, used a newspaper article as the stimulus and were tested in the context of a mixed gender adult population.

The first experiment featured a White disparity in the social comparison frame that related to melanoma incidence. It was expected that those who saw the social comparison frame would view Whites as more at-risk for skin cancer than those who saw the same risk statistic in a non-comparative context [*H1a*]. However, those who viewed the social comparison frame would rate Blacks as less at-risk than those who saw the same Black statistic in a non-comparative context [*H1b*].

For Study Three, in which there was a Black disparity related to melanoma survival rates, the pattern of predictions was expected to be the reverse and match the predictions presented in Study One. The two experiments also tested if there were differences by race of respondent [*RQ1a*] and whether there was an interaction between frame condition and race of the respondent [*RQ1b*].

Method

Stimuli—The 2×4 factorial designs for the two experiments parallel the design described for Study One. All versions of the stimulus article contained figures related to annual cases of melanoma as well as statistics related to melanoma survival rates. Studies Two and Three shared a nonracial control condition. The Black only, White only, and social comparison conditions are abbreviated in Study Two as BOI, WOI, and SCFI to indicate that the framing focused on the incidence statistic. In Study Three, the conditions are abbreviated as BOS, WOS, and SCFS, because the framing focused on the survival statistic. Regardless of the experimental condition, the news story was presented in the same *USA Today* online template and used the same material from news stories about skin cancer that were retrieved via LexisNexis by entering terms such as “skin cancer”, “Black”, “African American”,

“disparity”, and “melanoma.” The material was supplemented with information from the National Cancer Institute’s website on melanoma and skin cancer. The only information that differed in the news stories was whether race-specific statistics were given and whether they were given in a social comparison context (see Table 2).

Sample—Participants for Studies Two and Three were recruited through SSI. To be eligible, respondents had to self-identify as either White or Black and as age 18 or older. In Study Two ($N = 409$; $M_{\text{age}} = 45.2$, $SD_{\text{age}} = 15.9$; 56.7% female; 49.1% Black) and Study Three ($N = 404$; $M_{\text{age}} = 44.0$, $SD_{\text{age}} = 15.6$; 56.9% female; 50.0% Black), age, experimental condition, and gender were not associated with likelihood of completing the survey. However, White respondents completed experiment Study Two at a somewhat higher rate (89.3%) than did Black respondents (81.7%), $\chi^2(1, N = 479) = 4.90, p = .03$. Study Two focused on skin cancer, a condition that disproportionately affects Whites, and involved a White disparity. For Study Three, which paired the skin cancer topic with a Black survival disparity, there was no significant difference in completion rates between Blacks (86.0%) and Whites (87.1%).

Study procedure—Both experiments were conducted in Spring 2011, were approved by the University of Pennsylvania’s IRB, and followed the same procedure as Study One, except that there were two opportunities for exposure to the statistical information. Respondents viewed a short lede that included the key statistical information associated with each randomly assigned condition, followed by a question about interest and likelihood of sharing the story (not discussed here). Participants were then shown the full story. Afterward, respondents answered a series of questions, which were the same across conditions. In both Study Two and Three, respondents were randomly assigned to condition using a constrained randomization design. However, because there was a lag in time to finish the surveys and the quotas were based on completed surveys, the condition accrual was not identical and some conditions accrued more participants than others. There were no significant differences for the demographic variables^{iv} across the frame conditions, indicating that randomization was successful.

Measures

The group risk scales comprised an average of the same five items that had been used in Study One. However, instead of asking about STIs, they addressed skin cancer (e.g., “How important a problem is skin cancer to... [Whites, Blacks]?”). The scales had good internal reliability in both Study Two (Black $\alpha = .94$, White $\alpha = .93$) and Three (Black $\alpha = .94$, White $\alpha = .93$).

Analysis

The analysis used the same statistical approach as in Study One.

Results for Study Two

Contrast effect for the more at-risk group—[*H1a*] The ANOVA did not detect differences in perceptions of White risk across the four conditions, $F(3, 400) = 1.06, p = .37$. Although descriptively the average perceived risk was higher in the social comparison frame (SCFI) ($M = 6.02, SE = 0.09$) than the White only (WOI) condition ($M = 5.79, SE = 0.11$) (see Table 3), the difference was not significant based on the simple contrast, $p = .20$.

^{iv}Demographic variables included age, gender, race, political orientation and socioeconomic status.

Contrast effect for the less at-risk group—[H1b] Framing had a significant effect on respondents' perception of Black group risk across the experimental conditions, $F(3, 400) = 10.05, p = .001, \eta_p^2 = .07$. In line with the contrast effect hypothesis, Blacks were perceived as significantly more at-risk in the Black only (BOI) condition ($M = 4.59, SE = 0.15$) than in the SCFI condition ($M = 3.47, SE = 0.14$), $p = .001, 95\% CI [.73, 1.55]$ (see Table 3). They were also perceived as significantly more at-risk in the control condition ($M = 3.99, SE = 0.15$) than in the SCFI condition, $p = .02, 95\% CI [.08, .93]$. In addition, there was a borderline significant difference between perceived risk in the SCFI condition and the WOI condition ($M = 3.92, SE = 0.16$), $p = .05, 95\% CI [-.001, .83]$.

Racial differences—[RQ1] On average, White respondents ($M = 4.23, SE = 0.11$) perceived Blacks as a group to be more at-risk for skin cancer than did Black respondents ($M = 3.76, SE = 0.11$), $F(1, 400) = 10.27, p = .001, \eta_p^2 = .02$ (see Table 3). At the same time, Black respondents ($M = 6.14, SE = 0.07$) perceived Whites to be more at-risk for skin cancer when compared with Whites respondents ($M = 5.56, SE = 0.08$), $F(1, 400) = 28.38, p = .001, \eta_p^2 = .07$. [RQ1b] There were no significant interactions between race of respondent and frame condition for either Black group risk, $F(3, 400) = 0.42, p = .73$, or for White group risk, $F(3, 400) = .70, p = .55$.

Post-hoc—The frame condition that presented the Black statistic (BOI) showed higher perception of Black risk when compared with the other frame conditions. Besides the hypothesized contrast between the BOI and SCFI condition, the control ($M = 3.99, SE = 0.15$), $p = .004, 95\% CI [-1.06, -.21]$, and White only frames ($M = 3.92, SE = 0.16$), $p = .001, 95\% CI [-1.14, -.31]$, both had lower perceived Black risk when compared with the Black only condition ($M = 4.59, SE = 0.15$). Mention of Black risk therefore did elevate perception of Black risk for melanoma, while the social comparison frame lowered perception of Black risk when compared with the control condition.

Results for Study Three

Contrast effect for the more at-risk group—[H1a] There was a significant framing effect across conditions for Black group risk, $F(3, 396) = 13.31, p = .001, \eta_p^2 = .09$. However, the simple contrast test showed that perception of Black risk in the social comparison frame condition (SCFS) ($M = 4.96, SE = 0.14$) was not significantly higher than in the Black only condition (BOS) ($M = 4.72, SE = 0.17$), $p = .24$. The SCFS condition did differ significantly from the nonracial control condition ($M = 3.99, SE = 0.15$), $p = .001, 95\% CI [-1.40, -.55]$, and the White only (WOS) condition ($M = 3.82, SE = 0.15$), $p = .001, 95\% CI [-1.55, -.72]$. In both cases, average perceived Black risk in the social comparison frame (SCFS) condition was significantly higher than in the other conditions (see Table 4).

Contrast effect for the less at-risk group—[H1b] There was also a significant framing effect across the experimental conditions for White group risk, $F(3, 396) = 4.90, p = .002, \eta_p^2 = .04$. As hypothesized, the WOS condition ($M = 6.02, SE = 0.10$) resulted in higher perceptions of White risk when compared with the SCFS condition ($M = 5.47, SE = 0.12$), $p = .001, 95\% CI [.24, .87]$ (see Table 4). Respondents assigned to the control condition ($M = 5.79, SE = 0.12$) also perceived White risk to be higher than respondents in the SCFS condition, $p = .04, 95\% CI [.02, .67]$. There was not a significant difference between the SCFS and BOS ($M = 5.50, SE = 0.14$) condition, $p = .61$.

Racial differences—[RQ1a] There was a marginally significant main effect for race for the Black risk outcome, $F(1, 396) = 3.16, p = .08, \eta_p^2 = .01$. Black respondents ($M = 4.24, SE = 0.12$) trended toward reporting lower perceptions of risk for Blacks as a group when compared with White respondents ($M = 4.50, SE = 0.10$) (see Table 4). White respondents

($M = 5.39$, $SE = 0.09$), meanwhile, reported lower perceptions of skin cancer risk for Whites as a group compared to Black respondents ($M = 6.01$, $SE = 0.08$), $F(1, 396) = 28.30$, $p < .001$, $\eta_p^2 = .07$. [RQ1b] There was not a significant interaction between race and frame condition for the White risk outcome, $F(3, 396) = 1.46$, $p = .23$, nor for the Black risk outcome, $F(3, 396) = .15$, $p = .93$.

Post-hoc—As was the case in Study One, which also featured a Black disparity, the pattern of results suggested that mere mention of Black risk lowered perceived White risk. The simple contrast confirmed the WOS frame ($M = 6.02$, $SE = 0.10$) showed higher perceived White risk for skin cancer compared to the BOS frame ($M = 5.50$, $SE = 0.14$), $p = .005$, 95% CI [.15, .80]. However, the BOS condition was not significantly different from the control condition ($M = 5.79$, $SE = 0.12$), $p = .13$.

Conclusions

Studies Two and Three replicated the partial support for the contrast effect found in Study One. Regardless of whether the social comparison frame featured a Black disparity or a White disparity, the less at-risk racial group was perceived by both Black and White respondents to have a lower risk in the social comparison frame condition than in the frame that reported the same racial risk in a non-comparative context. For the experiments with Black disparities, mere mention of the Black risk statistic also appeared to lower perception of White group risk when compared with the White only frame.

There was evidence of racial differences in risk perception. In Studies Two and Three, Black respondents perceived skin cancer risk for Whites to be higher than White respondents. At the same time, there was some evidence that White respondents perceived skin cancer risk for Blacks to be higher than did Black respondents. In other words, there was a tendency for outgroup respondents to perceive greater average skin cancer risk for a racial group when compared with respondents who were members of the ingroup. However, there was not statistical evidence that race of the respondent moderated framing effects.

Figure 2 visually summarizes the difference in perceived racial group risk between the social comparison frame and the other frame conditions across the three experiments (see Figure 2). The right-hand side of each chart depicts risk perceptions for the less at-risk racial group in the disparity. The shaded column with the circular markers show estimates and 95% confidence intervals from the simple contrasts for the difference in perceived risk between the social comparison frame conditions and the conditions with the equivalent statistic in a non-comparative context. The confidence intervals are above zero, indicating that the perceived risk for the less at-risk racial group was lower in the social comparison frame even though objective risk was equivalent. The left-hand side of the charts shows perceived risk for the more at-risk racial group. The shaded column with the triangular markers illustrate the difference in perceived risk for the social comparison frame conditions and the frame conditions that presented an equivalent non-comparative risk statistic for the more at-risk group. The 95% confidence intervals overlap zero and thus reflect the non-significant difference between the two framing conditions. [Fig. 2]

Discussion

Health disparities are increasingly considered an important focus in public health and medicine, yet there is surprisingly little research that tests the effects of communication *about* disparities. Stories in the media that communicate about health disparities often compare one group to another based on risk for health outcomes using social comparison frames. This set of experiments examined whether this social comparison framing affects perception of group risk. Although prior research suggested that such comparisons were

likely to affect group risk even when absolute risk was held constant, the finding had not been tested in the context of disparities in the news and the direction of the effect was unclear. That is, do such comparisons produce a contrast effect that raises perceptions of risk for the more at-risk group, lowers perceptions of risk for the less at-risk group, or do social comparisons in health disparity stories do both?

The current experiments establish that social comparison frames did not significantly raise readers' and viewers' average perceptions of risk for the more at-risk racial group when compared to a frame with equivalent risk information in a non-comparative context, but did lower it for the less at-risk group. This pattern of effects replicated across three experiments in the context of real health conditions using statistics that appeared in health news stories. The findings also indicated that mentioning Black risk, as is the case for a racial "impact" or targeted health frame, might sometimes affect perceived risk even if Blacks are not explicitly compared to Whites, suggesting that existing schemas about racial risk and reference groups may be implicitly invoked even when they are not explicitly mentioned (Devos & Banaji, 2005).

Given that the key finding was a consistent pattern in which social comparison framing in news stories lowered perception of risk for the less at-risk group, what implications might the results have for health communication, public health and public policy more generally? Overall, the findings make a clear case for the importance of group cues and reference groups in risk perception and support literature that argues that beliefs about comparative risk can sometimes leave a more dominant impression than the absolute risk information. Therefore, the current study supports the view expressed by some scholars that comparative risk has a persuasive element and that framing matters. While scholars have discussed this in the context of doctor-patient communication (Fagerlin, Zikmund-Fisher & Ubel, 2011) and health communication more generally (Windschitl et al., 2002), this research underscores the implications for health disparity coverage in particular.

The results from this study specifically suggest that intergroup social comparison framing does not necessarily raise perception of risk above and beyond what would be communicated using a story that focused on risk for the more at-risk group. On the other hand, it did lower perceived risk for the less at-risk racial group, which could have unintended consequences. Although groups with lower risk may not warrant the same level of testing as higher risk groups, one question is whether heuristics based on social comparison risk information gleaned from the mass media and other sources might nevertheless be taken too far, resulting in "reverse" health disparities (Wiehe, Rosenman, Wang, Katz, & Fortenberry, 2011). For example, because skin cancer is known to be much more prevalent in fair skinned people and Whites, signs of skin cancer may be dismissed in Blacks, contributing to the aforementioned late diagnoses and worse survival rates from melanoma (Rouhani, Hu, & Kisner, 2008). In the case of STIs, recent studies suggest that White young women are tested less often for Chlamydia and that symptomatic White women were comparatively less likely to receive a Chlamydia test, while Blacks and Hispanics were more likely (Wiehe, Rosenman, Wang, & Fortenberry, 2010).

Limitations

The study does have some limitations. First, this research focused on Black and White health disparity frames and included respondents who self-identified as either Black or White. It is possible that readers and viewers from other racial groups might respond differently. In addition, while content analyses have found Black disparities to be the most common type of racial disparity (Amzel & Ghosh, 2007, Kim et al., 2010), the findings may not generalize to other kinds of racial disparities. They also may not generalize to other kinds of social comparison frames, including those with very small differences in risk

between the two groups. As was noted earlier, magnitude and even direction of a disparity can depend on choice of statistics and reference points (Harper et al., 2010). From a practical standpoint, a story seeking to raise awareness about disparities is not likely to feature social comparisons with very small differences in magnitude, unless the story is comparing more than two groups or reporting on progress toward elimination of a disparity. However, one might expect that for very small differences in risk between groups, the main intuitive gist would be more assimilative in nature than contrastive, in which case one would not expect a contrast effect.

Finally, the framing effects themselves tended to be small. The exposure was a single exposure in Study One and included two opportunities for exposure to the risk information in Study Two. On the one hand, the fact that there were effects in such a minimal paradigm suggests that the longer-term effects of systemic social comparison framing might be underestimated in the current studies. It is also true, however, that people are exposed to different kinds of risk information and there might be competing frames in day-to-day life, which could dampen effects. At the same time, because these were established real health conditions, the effects elicited in the study could also represent effects after cumulative exposure to risk information and potentially competing frames.

Yet a key strength of the study is the robust main finding. The study included multiple mediums and topics, and included disparity frames in which Blacks were more at-risk and in which Whites were more at-risk. The experiments used different statistics, two of which were presented in a percent format, and one of which was presented using incidence proportions. Two social comparison frames featured risk for getting a disease, a negative outcome, while a third presented likelihood of melanoma survival, a positive outcome. The results held for both the 18–19 year-old female population in Study One and the mixed gender adult population in Studies Two and Three. Despite these changes in the format and audience, the social comparison frame consistently resulted in lowered risk perception for the less at-risk group when compared with the non-comparative risk frame.

In light of these findings, it is worth examining more closely whether social comparison frames distort medical decisions or amplify ideas about disparities that might in turn affect policy and policy support and behavior. In the context of what is known about confirmatory biases (Nickerson, 1998), and race and framing (e.g., Gandy, 2009; Wailoo, 2011), differences between groups can become exaggerated as people look for particular conditions in groups that are believed to be more at-risk and fail to investigate or notice them in groups perceived to be less at-risk, suggesting a potential for racialization of health problems.

Future research should further examine the finding that the contrast effect only affected perceptions regarding the less at-risk group. However, it is worth noting that there is precedent for asymmetrical effects in social comparison research (French et al., 2004). It will also be important to test whether the effects of intergroup social comparison framing seen for race extend to other demographic categories, such as socioeconomic status, geographic regions, sexual orientation and educational status. Because perceived risk is a key construct in behavioral and information seeking models and plays a role in policy, there are also potential implications for behavior, communication and public opinion.

The current experiments provide clear evidence that social comparison framing in news coverage about health disparities can have an effect on risk judgments. Other research has found that racial disparity frames can negatively affect desire for cancer screening among African Americans (Nicholson et al., 2008). Given the efforts to raise awareness of health disparities, it is worthwhile to pay attention to how framing can be harnessed in ways that

promote public health and reduce disparities, and to ensure that there are not unintended consequences that undermine public health and health communication goals.

Acknowledgments

This research was supported by NCI grant# 5P20CA095856, the Russell Ackoff Doctoral Student Fellowship and the Wharton Risk Management and Decision Processes Center, and the Yerby Postdoctoral Fellowship. The research does not reflect the views of the granting organizations. The author would like to thank Joseph Cappella, Robert Hornik, Michael Delli Carpini, K. Viswanath, Shawnika Hull, Rebekah Nagler, Ashley Sanders-Jackson, Damian Thomas and two anonymous reviewers for their valuable comments on earlier drafts of this manuscript.

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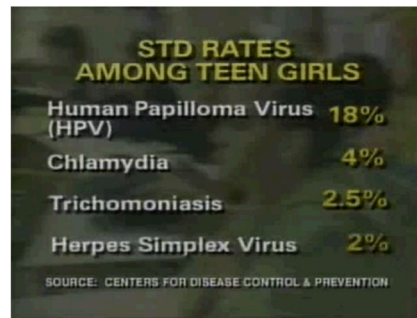
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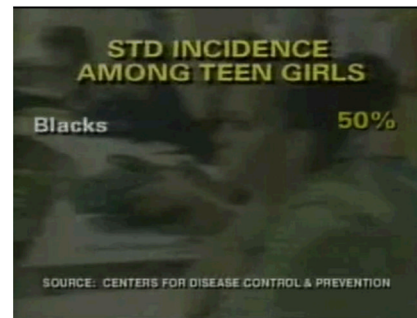
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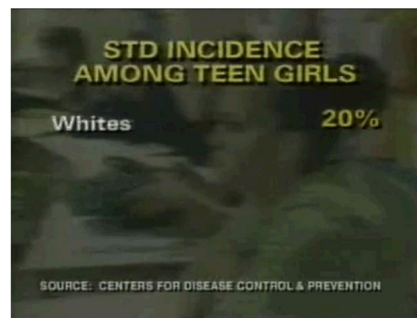
a. Control condition



b. Black only condition (control condition + Black statistic)



c. White only condition (control condition + White statistic)



d. Social comparison condition (control condition + Black + White statistics)

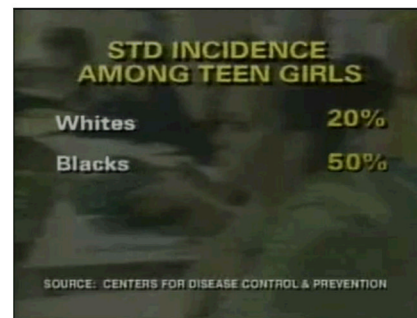


Figure 1.
Informational Differences across Experimental Conditions in Study One

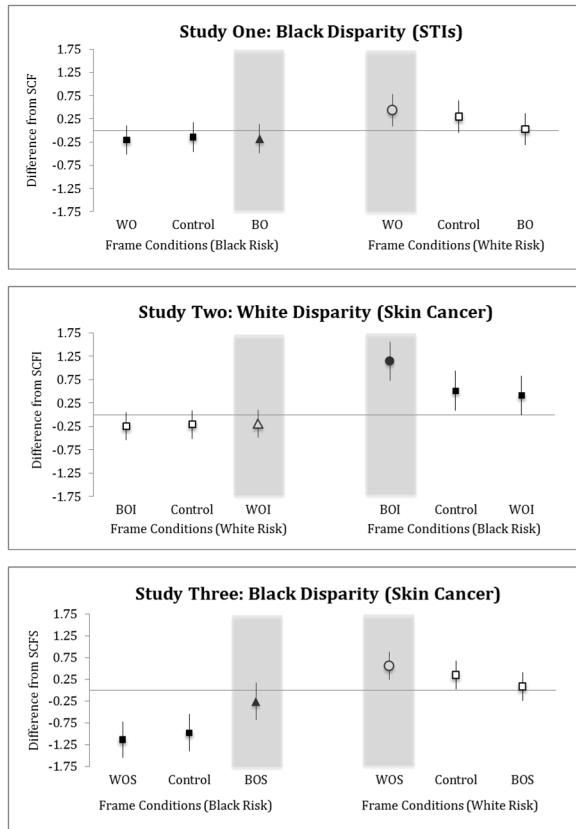


Figure 2. Differences in Perceived Group Risk Relative to the Social Comparison Frame Condition

Note. In this figure, the shaded columns with circular markers on the right-hand side of the charts (WO, BOI and WOS) show the difference between the social comparison frame conditions and the non-comparative frame conditions that included an equivalent risk statistic for the less at-risk group in the disparity. The 95% confidence intervals based on the simple contrasts are above zero, indicating that the perceived risk for the less at-risk racial group was lower in the social comparison frame. The shaded columns with triangular markers on the left-hand side of the figure (BO, WOI and BOS) represent the difference between the social comparison frames and the conditions with an equivalent risk statistic for the more at-risk group. The confidence intervals overlap zero visually illustrating the finding that, relative to a non-comparative frame condition with an equivalent risk statistic, social comparison framing did not significantly increase perceived risk regarding the more at-risk group. Frame conditions: WO/WOI/WOS = White only non-comparative frame; BO/BOI/BOS = Black only non-comparative frame; SCF/SCFI/SCFS = social comparison frame; Control = nonracial control condition

Table 1
 Study One: Effects of Social Comparison Framing and Race of Respondents on Perceived STI Risk

Contrast Effect	Frame condition	N	Mean	SE	Median
<i>Black group risk</i>					
	WO	77	5.53	.11	5.60
	Control	74	5.59	.11	5.70
	BO	76	5.56	.13	5.60
	SCF (reference)	74	5.75	.12	6.00
<i>White group risk</i>					
	WO	77	5.42*	.12	5.40
	Control	75	5.28#	.12	5.40
	BO	76	5.02	.14	5.20
	SCF (reference)	74	4.99	.13	4.80
Racial Differences Respondent's race					
<i>Black group risk</i>					
	White	151	5.25***	.08	5.40
	Black (reference)	150	5.97	.07	6.00
<i>White group risk</i>					
	White	151	4.88***	.08	5.00
	Black (reference)	151	5.47	.09	5.60

Note. WO = White only frame, Control = control condition, BO = Black only frame, and SCF = Social comparison frame. Hypothesized contrasts are shaded. Differs from the reference group at the

$p < .10$,

* $p < .05$,

*** $p < .001$ significance level (two-tailed) based on simple contrasts.

Table 2

Differences across Conditions in Study Two

Frame Condition	
Shared control	Melanoma is diagnosed in more than 68,000 Americans a year. When melanoma is caught early, survival rates are 98 percent, but if the cancer has spread before it is discovered, survival rates plummet to 16 percent.
Study Two	
White only (WOI)	In the US, the average annual melanoma rate among whites is about 22 cases per 100,000 people. When melanoma is caught early, survival rates are 98 percent, but if the cancer has spread before it is discovered, survival rates plummet to 16 percent.
Black only (BOI)	In the US, the average annual melanoma rate among blacks is about 1 case per 100,000 people. When melanoma is caught early, survival rates are 98 percent, but if the cancer has spread before it is discovered, survival rates plummet to 16 percent.
Social comparison frame (SCFI)	Melanoma is over twenty times more common in whites than blacks. In the US, the average annual melanoma rate among whites is about 22 cases per 100,000 people compared to about 1 case per 100,000 people among blacks. When melanoma is caught early, survival rates are 98 percent, but if the cancer has spread before it is discovered, survival rates plummet to 16 percent.
Study Three	
White only (WOS)	Melanoma is diagnosed in more than 68,000 Americans a year. When melanoma is caught early, survival rates are high, but if the cancer has spread before it is discovered, survival rates plummet. The five-year melanoma survival rate is 85 percent among whites.
Black only (BOS)	Melanoma is diagnosed in more than 68,000 Americans a year. When melanoma is caught early, survival rates are high, but if the cancer has spread before it is discovered, survival rates plummet. The five-year melanoma survival rate is 59 percent among blacks.
Social comparison frame (SCFS)	Melanoma is diagnosed in more than 68,000 Americans a year. When melanoma is caught early, survival rates are high, but if the cancer has spread before it is discovered, survival rates plummet. Blacks tend to be diagnosed later, at more serious stages of cancer, and to have lower survival rates than whites. The five-year melanoma survival rate is 59 percent among blacks compared to 85 percent for whites.

Table 3
 Study Two: Effects of Social Comparison Framing and Race of Respondents on Perceived Skin Cancer Risk

Contrast Effect	Frame condition	N	Mean	SE	Median
<i>Black group risk</i>					
	BOI	105	4.59***	0.15	4.80
	Control	95	3.99*	0.15	4.00
	WOI	103	3.92#	0.16	4.00
	SCFI (reference)	105	3.47	0.14	3.40
<i>White group risk</i>					
	BOI	105	5.79	0.12	6.20
	Control	95	5.79	0.12	6.20
	WOI	103	5.79	0.11	6.00
	SCFI (reference)	105	6.02	0.09	6.20
Racial Differences Respondent's race					
<i>Black group risk</i>					
	Black	201	3.76***	0.11	3.60
	White (reference)	207	4.23	0.11	4.20
<i>White group risk</i>					
	Black	201	6.14***	0.07	6.40
	White (reference)	207	5.56	0.08	5.80

Note. BOI = Black only frame, Control = nonracial control, WOI = White only frame, and SCFI = social comparison frame (White disparity). Hypothesized contrasts are shaded. Differs from the reference group at the

p .10,

* *p* .05,

*** *p* .001 significance level (two-tailed) based on simple contrasts.

Table 4
 Study Three: Effects of Social Comparison Framing and Race of Respondents on Perceived Skin Cancer Risk

Contrast Effect	Frame condition	N	Mean	SE	Median
<i>Black group risk</i>					
	WOS	108	3.82***	0.15	3.60
	Control	95	3.99*	0.15	4.00
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	BOS	95	4.72	0.17	5.00
	SCFS (reference)	106	4.96	0.14	4.90
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<i>White group risk</i>					
	WOS	108	6.02***	0.10	6.20
	Control	95	5.79*	0.12	6.20
	BOS	95	5.50	0.14	5.80
	SCFS (reference)	106	5.47	0.12	5.60
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Racial Differences Respondent's race					
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<i>Black group risk</i>					
	White	202	4.50#	0.10	4.40
	Black (reference)	202	4.24	0.12	4.20
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<i>White group risk</i>					
	White	202	5.39***	0.09	5.60
	Black (reference)	202	6.01	0.08	6.40

Note. BOS = Black only frame, Control = nonracial control, WOS = White only frame, and SCFS = social comparison frame (Black disparity). Hypothesized contrasts are shaded. Differs from the reference group at the

$p < .10$,

* $p < .05$,

 p .001 significance level (two-tailed) based on simple contrasts.

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