

“bitchy,” “pushy,” “frigid,” and “ball-busting”), or as warm but incompetent, illogical, and irrational; the doormat whom no one takes seriously (also “ditsy,” “silly,” “airhead,” or “emotional”).

However, while these accounts may resonate with common public perceptions, there is a lack of systematic large-scale research on the media coverage sentiment of women and men, in particular as they

According to

talented, ambitious, and hard-working than equivalent men as they must overcome institutional barriers against women's advancement. For example, women in politics may be subjected to more stringent selection and promotion processes (Jalalzi 2008; Palmer and Simon 2008). It therefore stands to reason that as they move up the organizational hierarchy, those women who remain in the pool of potential candidates for promotion will be more qualified than their male counterparts. Recent studies on female politicians show that on average they indeed tend to be of higher quality, work harder, and perform better than their male colleagues (Bauer 2020; Fulton 2012; Lazarus and Steigerwalt 2018).

Some recent research further suggests that women in leading executive positions in business may offer advantages to their firms, including improved firm performance, though evidence is not unequivocal (

These arguments then lead to the same prediction as the one produced by the paper cut argument: an interaction effect of gender and fame on media sentiment (H2). At the same time, if the mechanism driving this interaction effect is the media acting as a mirror, then famous women's worse media sentiment does not stem from media bias but rather reflects a disproportionate frequency of negative events occurring in famous women's public lives. These negative events are part of their bi-

DATA AND ANALYTICAL STRATEGY

Neelam Saiee

Our primary data source for analyzing newspapers' coverage volume and sentiment is the Lydia text analysis system (Bautin, Vijayarenu, and Skiena 2008)

sub-categories. While for many categories, lists are not exhaustive, they nevertheless tend to capture the large majority of men and women who have made the most significant imprint in specific domains. Importantly, previous research has found that Wikipedia editors are predominantly white and male (Antin et al. 2011; Collier and Bear 2012). This has the potential to introduce racial and gender underrepresentation into the contents of Wikipedia. However, while some studies suggest that women are underrepresented in certain categories of Wikipedia, such as sociologists (Adams, Brückner, and Naslund 2019) and engineers (White 2018), others report that relative to their share in various occupational domains, women are not underrepresented on Wikipedia and may, in fact, be slightly overrepresented (Wagner et al. 2015; Wang, Pappu, and Cramer 2021). While such potential misrepresentation may affect some of our analyses, for some categories, such as senators, lists are exhaustive and hence representative.

In order to collect our index of names, we first generated an initial list of larger social and occupational domains, based in part on common newspaper categorizations. These domains include politics, business, entertainment, sports, science, and crime. We then devised a list of important sub-domains within each of these larger categories. For example, within the domain of entertainment we identified the following sub-categories: Actors (TV and film), directors, singers, and dancers. Finally, for some domains, we identified more specific sub-categories, in which individuals are particularly likely to attract media attention (e.g., U.S. senators in politics, Oscar nominees in entertainment, and Pulitzer Prize winners in literature).

Next, we merged this domain-specific data with our Lydia data, which provided the number of

co-occur with these negative or positive life events, providing support for the validity of our sentiment measure.

It could be argued that a sentiment analysis that simply measures “positive” vs. “negative” references is too crude when trying to capture subtle differences in media coverage, in particular, differences between women and men. For example, some scholars have argued that news reports on women of-

T 1. Descriptive Statistics (N = 42,862)

Variable	Mean	Std.
Fame		
Number of media mentions per person	4,400	50,152
Number of media sentences per person	3,297	36,088
Number of media articles per person	1,468	11,405
Media sentiment	.214	.480
Encyclopedic sentiment	.512	.354
		Percentage
Woman		29.9%
Politicians		9.2%
House representatives		1.5%
Senators		0.4%
Businesspeople		7.0%
CEOs		1.8%
Billionaires		1.1%
Entertainers		33.8%
Oscar nominees		1.1%
Emmy nominees		1.2%
Criminals		5.2%
Athletes		9.2%
Tennis Grand Slam winners		0.3%
Olympic medalists		0.7%
Scientists		13.5%
Nobel Prize winners		0.5%

representatives and Oscar and Emmy nominees. In other subcategories – such as tennis Grand Slam winners and Nobel Prize winners – there is no statistically significant difference. These results provide strong support for H1 that women’s media coverage overall is more positive than men’s.

We next examine the role of fame in producing divergent sentiment for men and women. In [Figure 1](#), we present two panels showing the interaction between gender, fame, and coverage sentiment. Panel 1 is based on the data from our larger sample of nearly 14 million person names (the Lydia newspapers sample), showing results for both well-known individuals and relatively obscure ones, who have appeared in the news only once or twice during the period of the study. Panel 2 is based on the smaller sample we collected from Wikipedia (N = 42,862), including individuals who are all well-known enough to have a Wikipedia entry. Note that there are relatively few individuals on Wikipedia with very little coverage, as indicated by the widening confidence intervals at lower levels in panel 2, but not in panel 1. The analyses of both samples show a similar pattern: at low levels of fame (1 to 10 yearly mentions), women receive coverage that is substantially more positive than that of equally renowned men (a 10 percent to 20 percent difference in coverage tone). However, as the number of mentions grows, the coverage tone associated with men remains fairly stable and even slightly improves, while the coverage tone for women becomes increasingly negative, resulting in an eventual elimination, and even reversal of sentiment differences. Indeed, among the most famous individuals, those who received in the order of one million mentions, the coverage of men is more positive than that of women.

While [Figure 1](#) supports the notion that women, unlike men, are more heavily scrutinized when they are famous, it leaves important questions about the origins of the effect unanswered. In

T 2. Media Sentiment by Gender and Domain

Field	Women			Men			Difference	
	N in sample	Median # mentions per year	Mean sentiment	N in sample	Median # mentions per year	Mean sentiment	Women vs. men: sentiment difference	
House representatives	1,061	339	.19	2,897	324	.16	.04*	
Senators	141	4,784	.24	296	7,615	.18	.05*	
CEOs	30	32,400	.23	146	33,451	.22	.01	
Billionaires	484	208	.39	2,543	161	.31	.08***	
Oscar nominees	149	378	.38	653	199	.37	.01	
Emmy nominees	53	139	.45	421	652	.39	.06	
Tennis Grand Slam winners	5,950	202	.28	8,532	341	.21	.07***	
Olympic medalists	234	6,920	.24	231	15,771	.18	.06**	
Nobel Prize winners	235	3,000	.27	259	5,268	.20	.07**	
	356	214	-.25	1,880	147	-.39	.14***	
	953	814	.41	2,994	824	.32	.10***	
	55	6,403	.28	54	6,223	.31	-.04	
	160	1,562	.51	128	2,927	.42	.09**	
	1,220	63	.27	4,555	76	.22	.05**	
	20	442	.35	214	146	.41	-.06	

*p < .05
 **p < .01
 ***p < .001 (two-tailed independent sample t-test)

In [Figure 2](#), we present results for coverage tone by gender and fame for men and women who were classified into six major social and occupational domains by the Wikipedia categorization pages. Panels one through six of the figure present results for politicians, businesspeople, entertainers, criminals, athletes, and scientists (see [online Appendix C](#) for a random sample illustrating more- and less-famous individuals included in each of these categories). Because of the reduced sample sizes, the top categories are now too sparse for most domains, so we collapsed the 1,000,000 and 100,000 categories into the 10,000 mentions category.

The results presented in [Figure 2](#) demonstrate.

T 3. OLS Regression of Media and Biographical Sentiment

	Model 1: media sentiment		Model 2: media sentiment		Model 3: biographical sentiment		Model 4: biographical sentiment	
	β	SE(β) ¹	β	SE(β) ¹	β	SE(β) ¹	β	SE(β) ¹
Fame (log10)	-.01**	.00	-.02***	.00	-.02***	.00	-.02***	.00
Female	.15***	.02	.12***	.02	.05***	.01	.03**	.01
Female * Fame	-.03***	.01	-.03***	.01	.00	.00	.01	.00
Politician			-.06***	.01			-.06***	.01
Criminal			-.59***	.01			-.29***	.01
Businessperson			.10***	.01			-.03***	.01
Entertainer			.00	.01			-.02***	.00
Athlete			.13***	.01			-.07***	.01
Scientist			-.01	.01			-.02***	.01
Interaction	.19***	.01	.25***	.01	.54***	.01	.58***	.01
N	42,862		42,862		42,862		42,862	
R ²	.01		.09		.01		.04	

¹Heteroskedasticity-consistent standard errors

*p < .05

**p < .01

***p < .001 (two-tailed)

The robustness of these results is confirmed in regression analysis. In Table 3 we present results from OLS regression models predicting coverage sentiment from gender, fame, and their interaction. Model 2 is the same as model 1, except that it includes dichotomous variables measuring membership of six major social and occupational domains, into which names on Wikipedia are categorized. We use heteroskedasticity-robust standard errors because at very low fame levels, numbers of positive and negative mentions are naturally also low, leading to higher variance in the dependent variable. Both models show a significant interaction effect: On our sentiment scale from -1 to 1, for each unit (=10-fold) increase in fame the gender difference in sentiment is a full .03 points smaller. At low and intermediate levels of fame, women receive better coverage. At very high levels of fame, men receive better coverage.

Media as a Mirror?

The robust interaction effect we present above lends support to the paper cut thesis that media discourse about women vis-à-vis comparable men becomes more negative as they acquire greater fame. However, the evidence presented so far may alternatively be interpreted as reflecting negative real-world actions or occurrences in the life of famous women (H3). That is, the media may be accurately reporting on true variability in the actions taken by or events occurring to men and women of different fame levels. Perhaps famous women “deserve” more negative coverage, for example, because they are put into tougher situations or are being deliberately thwarted, hindered, or blocked from succeeding.

To differentiate between these two alternative accounts, we evaluate parallel patterns in biographical sentiment, testing H3 and H4. The “media as a mirror” account predicts that biographical sentiment patterns will match media sentiment patterns. The “paper cut” account instead predicts that biographical sentiment will be more positive for women at all levels of fame. These predictions do not consider the spillover problem mentioned earlier, whereby media coverage may be partly reflected in encyclopedic content. The setup of the test is thus stacked against the paper cut thesis, as it increases the likelihood of finding evidence for the media as a mirror thesis.

- Aaldering, Loes, and Daphne Van der Pas. 2020. "Political Leadership in the Media: Gender Bias in Leader Stereotypes during Campaign and Routine Times." *British Journal of Political Science* 50:911–31.
- Adams, Julia, Hannah Brückner, and Cambria Naslund. 2019. "Who Counts as a Notable Sociologist on Wikipedia? Gender, Race, and the 'Professor Test.'" *Socius* 5:1–14.
- Alessio, John C., and Julie Andrzejewski. 2000. "Unveiling the Hidden Glass Ceiling: An Analysis of the Cohort Effect Claim." *American Sociological Review* 65(2):311–15.
- Antin, Judd, Raymond Yee, Coye Cheshire, and Oded Nov. 2011. "Gender Differences in Wikipedia Editing." *Proceedings of the 7th International Symposium on Wikis and Open Collaboration*, October, 11–14. <https://doi.org/10.1145/2038558.2038561>.
- Baker, Ted, Howard E. Aldrich, and Liou Nina. 1997. "Invisible Entrepreneurs: The Neglect of Women Business Owners by Mass Media and Scholarly Journals in the USA." *Entrepreneurship & Regional Development* 9(3):221–38.
- Barden, Maria. 1996. *Women Politicians and the Media*

- Huckerby, Jayne. 2003. "Women Who Kill Their Children: Case Study and Conclusions Concerning the Differences in the Fall from Material Grace by Khoua Her and Andrea Yates." *Duke Journal of Gender Law & Policy* 10:149–72.
- Huddy, Leonie, and Nayda Terkildsen. 1993. "Gender Stereotypes and the Perception of Male and Female Candidates." *American Journal of Political Science* 37(1):119–47.
- Jalalzai, Farida. 2008. "Women Rule: Shattering the Executive Glass Ceiling." *Politics & Gender* 4(2):205–31.
- Jia, Sem, Thomas Lansdall-Welfare, Saatviga Sudhahar, Cynthia Carter and Nello Cristianini. 2016. "Women Are Seen More Than Heard in Online Newspapers." *PLOS One* 11(2). DOI:10.1371/journal.pone.0148434.
- Joo, J. H. 2002. "The Influence of News Frames on the Audience's Attitudes: Examining News Stories on Women Cabinet Members." Master's Thesis, Korea University, Seoul, Korea.
- Kahn, Kim F. 1992. "Does Being Male Help? An Investigation of the Effects of Candidate Gender and Campaign Coverage of U.S. Senate Candidates." *The Journal of Politics* 54(2):497–517.
- Kahn, Kim F. 1994. "The Distorted Mirror: Press Coverage of Women Candidates for Statewide Office." *The Journal of Politics* 56(1):154–73.
- Khan, Walayet, and Joao Paolo Vieito. 2013. "CEO Gender and Firm Performance." *Journal of Economics and Business* 67:55–66.
- Koenig, Anne, Alice Eagly, Abigail Mitchell, and Tiina Ristikari. 2011. "Are Leader Stereotypes Masculine? A Meta-Analysis of Three Research Paradigms." *Psychological Bulletin* 137(4):616–41.
- Krefting, Linda. 2002. "Re-Presenting Women Executives: Valorization and Devalorization in US Business Press." *Women in Management Review* 173(4):104–19.
- Lazarus, Jeffrey and Amy Steigerwalt. 2018. *Gendered Vulnerability: How Women Work Harder to Stay in Office*. Ann Arbor: University of Michigan Press.
- Lloyd, Ann. 1995. *Doubly Deviant, Doubly Damned: Society's Treatment of Violent Women*. New York: Penguin.
- Lumpkin, Angela. 2009. "Female Representation in Feature Articles Published by Sports Illustrated in the 1990s." *Women in Sport and Physical Activity Journal* 18(2):38–51.
- Manning, Alan, and Farzad Saidi. 2010. "Understanding the Gender Pay Gap: What's Competition Got to Do with It?" *Industrial and Labor Relations Review* 63:681–98.

- Ross, Karen. 2007. "The Journalist, the Housewife, the Citizen and the Press." *Journalism* 8(4):440–73.
- Ross, Karen. 2009. *Gendered Media: Women, Men, and Identity Politics*. Lanham, MD: Rowman and Littlefield.
- Ross, Karen, and Cynthia Carter. 2011. "Women and News: A Long Winding Road." *Media, Culture & Society* 33(8):1148–65.
- Rudman, Laurie, Corinne Moss-Racusin, Julie Phelan, and Sanne Nauts. 2012. "Status Incongruity and Backlash Effects: Defending the Gender Hierarchy Motivates Prejudice against Female Leaders." *Journal of Experimental Social Psychology* 48(1):165–79.
- Ryan, Kaitlyn. 2013. "The Media's War on Women: Gendered Coverage of Female Candidates." *Xavier Journal of Politics* 4(1):13–25.
- Ryan, Michelle, and Alexander Haslam. 2005. "The Glass Cliff: Evidence That Women Are Over-represented in Precarious Leadership Positions." *British Journal of Management* 16:81–90.
- Saner, Emine. 2014. "Feisty, Flounce and Bossy: The Words Used to Put Women Down." *The Guardian*. <http://www.theguardian.com/lifeandstyle/2014/sep/01/feisty-flounce-bossy-words-put-women-down>.
- Sanghani, Radhika. 2014. "Feisty, Frigid, and Frumpy: 14 Words We Only Use to Describe Women." *The Telegraph*. <http://www.telegraph.co.uk/women/womens-life/11067727/Downton-Abbey-row-14-words-we-only-use-to-describe-women.html>.
- Scharrer, Erica. 2002. "An 'Improbable Leap': A Content Analysis of Newspaper Coverage of Hillary Clinton's Transition from First Lady to Senate Candidate." *Journalism Studies* 3(3):393–406.
- Schlehofer, Michelle, Bettina Casad, Michelle Bligh, and Angela Grotto. 2011. "Navigating Public Prejudices: The Impact of Media and Attitudes on High-Profile Female Political Leaders." *Sex Roles* 65:69–82.
- Shor, Eran. 2018. "Media Partisanship and Coverage Sentiment: Are Conservative Newspapers More Negative toward Women?" *Social Science Quarterly* 100:307–19.
- Shor, Eran, and Alex Miltsov. 2020. "The Price of Greater Representation: A Cross-National Analysis of Women's Parliamentary Representation and Media Coverage Sentiment." *Newspaper Research Journal* 41:455–68.
- Shor, Eran, Arnout van de Rijt, and Babak Fotouhi. 2020. "A Large-Scale Test of Gender Bias in the Media." *Sociological Science* 6:526–50.
- Shor, Eran, Arnout van de Rijt, and Alex Miltsov. 2019. "Do Women in the Newsroom Make a Difference? Sentiment toward Women and Men as a Function of Newsroom Composition." *Sex Roles* 81:44–58.
- Shor, Eran, Arnout van de Rijt, Alex Miltsov, Vivek Kulkarni, and Steven Skiena. 2015. "A Paper Ceiling: What Explains the Sex-Ratio Inequality in Printed News Coverage?" *American Sociological Review* 80(5):960–84.
- Shor, Eran, Arnout van de Rijt, Charles Ward, Saoussan Asakar, and Steven Skiena. 2014a. "Is There a Political Bias? A Computational Analysis of Female Subjects' Coverage in Liberal and Conservative Newspapers." *Social Science Quarterly* 95:1213–29.
- Shor, Eran, Arnout van de Rijt, Charles Ward, Aaron Blank, and Steven Skiena. 2014b. "Time Trends in Printed News Coverage of Female Subjects, 1880–2008." *Journalism Studies* 15:740–56.
- Shugart, Helene. 2003. "She Shoots, She Scores: Mediated Constructions of Contemporary Female Athletes in Coverage of the 1999 US Women's Soccer Team." *Western Journal of Communication* 67(1):1–31.
- Smith, Kevin B. 1997. "When All's Fair: Signs of Parity in Media Coverage of Female Candidates." *Political Communication* 14(1):71–82.
- Trimble, Linda, and Nastasja Treiberg. 2010. "Either Way, There's Going to Be a Man in Charge: Media Representations of New Zealand Prime Minister Helen Clark." Pp. 115–36 in *Cracking the Highest Glass Ceiling: A Global Comparison of Women's Campaigns for Executive Office*, edited by R. Murray. Santa Barbara, CA: Praeger.
- Tuchman, Gaye. 2000. "The Symbolic Annihilation of Women by the Mass Media." Pp. 150–74 in *Culture and Politics: A Reader*, edited by L. Crothers and C. Lockhart. New York: St. Martin's Press.
- van Acker, Elizabeth. 2003. "Media Representations of Women Politicians in Australia and New Zealand: High Expectations, Hostility or Stardom." *Policy and Society* 22:116–36.
- van de Rijt, Arnout, Eran Shor, Charles Ward and Steven Skiena. 2013. "Only 15 Minutes? The Social Stratification of Fame in Printed Media." *American Sociological Review* 78(2):266–89.
- Van der Pas, Daphne, and Loes Aaldering. 2020. "Gender Differences in Political Media Coverage: A Meta-Analysis." *Journal of Communication* 70:114–43.
- van Zoonen, Liesbet. 1988. "Rethinking Women and the News." *European Journal of Communication* 3(1):35–53.
- van Zoonen, Liesbet. 1994. *Feminist Media Studies*. London: Sage.
- Vincent, John, Paul Pedersen, Warren Whisenant and Dwayne Massey. 2007. "Analysing the Print Media Coverage of Professional Tennis Players: British Newspaper Narratives About Female Competitors in the Wimbledon

- Wagner, Claudia, David Garcia, Mohsen Jadidi, Markus Strohmaier. 2015. "It's a Man's Wikipedia? Assessing Gender Inequality in an Online Encyclopedia." *Proceedings of the Ninth International AAAI Conference on Web and Social Media* 9(1):454–63.
- Waldon, Theresa. 2005. "Pinned by Gender Construction?: Media Representations of Girls' Wrestling." *Women in Sport and Physical Activity Journal* 14(2):52–68.
- Wang, Alice, Aasish Pappu, and Henriette Cramer. 2021. "Representation of Music Creators on Wikipedia, Differences in Gender and Genre." *Proceedings of the Fifteenth International AAAI Conference on Web and Social Media (ICWSM 2021)*.
- Weber, Andrea, and Christine Zulehner. 2010. "Female Hires and the Success of Start-up Firms." *The American Economic Review* 100(2):358–61.
- Weimann, Gabriel, and Gideon Fishman. 1988. "Attribution of Responsibility: Sex-Based Bias in Press Reports on Crime." *European Journal of Communication* 3:415–30.
- White, Alice. 2018. "The History of Women in Engineering on Wikipedia." *Science Museum Group Journal* Autumn 2018(10). doi: <http://dx.doi.org/10.15180/181008>.
- Wilczynski, Ania. 1991. "Images of Women Who Kill Their Infants." *Women & Criminal Justice* 2(2):71–88.
- Zoch, Lynn, and Judy V. Turk. 1998. "Women Making News: Gender as a Variable in Source Selection and Use." *Journalism & Mass Communication Quarterly* 75:762–75.