Social Psychological and Personality Science
1-10

DOI: 10.1177/19485506211037576
journals.sagepub.com/home/spp
SAGE

The Gender-Equality Paradox and Optimal Distinctiveness: More Gender-Equal Societies Have More Gendered Names

Allon Vishkin[1], Michael L. Slepian[2], and Adam D. Galinsky[2]

Abstract

Findings in several domains have documented a gender-equality paradox, where greater social and economic gender equality predicts increased gender differentiation. Many of these findings have used subjective rating scales and thus have been dismissed as artifactual due to different reference groups in more versus less gender-equal societies. Although recent research has documented the gender-equality paradox using an objective criterion—pursuit of degrees in STEM—the robustness of this finding has also been challenged. The current investigation offers evidence for the gender-equality paradox using an objective marker of gender differentiation: baby names. We find given names are more phonetically gendered in more gender-equal societies, with female names being more likely unvoiced (a softer sound) and male names being more likely voiced (a harder sound). We offer a theoretical explanation based on optimal distinctiveness theory to explain why increasing gender equality might motivate a preference for greater gender differentiation.

Keywords

gender, gender equality, stereotypes, optimal distinctiveness theory

Societies across the globe are becoming more gender equal, with women increasing their representation in governments (Kittilson, 2006) and managerial positions (Powell, 2000). As gender inequalities in division of labor and access to resources have declined over time (Inglehart & Norris, 2003), gender differences have also narrowed across several outcomes, including violent crime (Lauritsen et al., 2009) and math performance (Wai et al., 2010).

While gender equality between males and females has been increasing, researchers have also identified a counterintuitive finding: Social and economic gender equality has been associated with larger gender differences across many psychological variables, including personality traits (Costa et al., 2001), moral judgments (Atari et al., 2020), and values (Schwartz & Rubel, 2005). These studies suggest that increasing gender equality at the social or economic level can intensify gender differences at the psychological level.

Despite the support for the gender-equality paradox, many of these findings have been dismissed as artifactual (Guimond et al., 2007; Wood & Eagly, 2012). Studies documenting larger gender differences in more gender-equal nations have predominantly used subjective rating scales, where participants rate themselves relative to an undefined reference group. If different respondents use different reference groups, cross-group comparisons along subjective rating scales may only reflect differences in reference groups rather than any real psychological differences (Heine et al., 2002). Specifically, because nations with *less* gender equality tend to restrict interactions between men and women, their citizens are more likely to compare themselves to those within their own gender. By contrast, nations with *more* gender equality have less restricted interactions between genders, and respondents can compare themselves to anyone (Guimond et al., 2007; Wood & Eagly, 2012). If the reference groups used to make self-judgments differ across nations as a function of gender equality, then different reference groups may account for any apparent increase in gender differences in more gender equal countries. This would mean that gender differences found in more gender-equal nations, despite being found across a wide range of outcomes (personality traits, moral judgments, and values), are an artifactual consequence of different reference groups.

Recent research has been less subject to this limitation of different reference groups by documenting a gender-equality paradox using an objective marker of gender differences that

[1] Institute for Social Research, University of Michigan, Ann Arbor, MI, USA
[2] Columbia University, New York, NY, USA

Corresponding Author:
Allon Vishkin, Institute for Social Research, University of Michigan, Ann Arbor, MI 48109, USA.
Email: avishkin@umich.edu

does not rely on subjective ratings: pursuit of degrees in science, technology, engineering, and math (STEM) fields (Stoet & Geary, 2018). Nevertheless, the robustness of these findings has also been contested. Richardson and colleagues (2020) noted that it is difficult to draw clear conclusions in this domain because different metrics used to assess STEM participation lead to different results. Moreover, STEM participation is a long process across the education journey, so identifying a specific point in students' academic trajectories where gender equality might have a causal impact is difficult.

Naming Newborns as a Test of the Gender-Equality Paradox

The current research overcomes these concerns by using objective markers of gender differentiation created at a single point in time: the names parents give their babies. Given that one's name is used as a basis for representing the self (Mehrabian, 2001), the name parents give to their baby likely reflects qualities that parents wish to see in their baby. For instance, some people might prefer to give a highly masculine name to a boy and a highly feminine name to a girl, whereas others might prefer to use names that are less gendered. Thus, people's choice of baby names may reflect personal preferences related to gender differentiation.

Recent research has found that baby names are gendered through the voiced versus unvoiced nature of phonemes. Building on sound symbolism research (Topolinski & Boecker, 2016; Topolinski et al., 2014), Slepian and Galinsky (2016) documented that vocal cord vibration during the pronunciation of a name's initial phoneme plays a critical role in predicting which names are assigned to males versus females.

Voiced phonemes are characterized by the vibration of the vocal cords, which modulate the flow of air, producing a rougher, harder sound. In contrast, unvoiced phonemes are pronounced with no vibration of the vocal cords, producing a breathier, softer sound. Given stereotypes of men as tough or agentic and women as tender or communal, Slepian and Galinsky reasoned that people are more likely to use names with initial voiced phonemes for boys and unvoiced phonemes for girls. They found an association between voiced names and gender in 270 million names given to children over 75 years and experimentally with novel names. They established that this effect was driven through gendered associations by showing this effect was mediated by how hard or soft a name sounded and was moderated by gender stereotype endorsement. Other scholars have observed similar and additional phonetic differences between male and female names (Cai & Zhao, 2019; Oyama et al., 2019), and the voiced-name effect has also been replicated in applied settings, such as in the phonetics of brand names (Park et al., 2021; Pathak & Calvert, 2020; Pathak et al., 2020).

The fact that parents give names to their babies with sounds that symbolically map onto gender stereotypes presents an opportunity to explore the gender-quality paradox using an objective marker that is not susceptible to the limitations of subjective rating scales. Furthermore, assessing gender differentiation in baby names is beneficial because they are given at a single time point; in contrast, prior studies have examined gender differentiation as a function of gender equality using objective markers, such as completion of STEM degrees, but such markers represent complex processes comprising years of decisions and experiences in aggregate.

If the gender-equality paradox is psychologically real—that is, more gender-equal societies demonstrate greater gender differentiation—then the voiced-gendered-name effect should be greater in more gender-equal societies, with voiced names given more often to males and unvoiced names given more often to females. To test this prediction, Study 1 analyzed every name given to every registered child born in the United States from 1880 to 2018 and also analyzed the 100 most common English and Welsh names from 1904 to 1994. It is well established that each of these societies has become more gender equal across time (England & Li, 2006; Inglehart & Norris, 2003), and differences in the roles of men and women have decreased over this time period (Twenge, 2001). We predicted that voiced names would be increasingly given to males and unvoiced names would be increasingly given to females over time. Study 2 then examined variation in gender equality across the 50 U.S. states at a single point in time. Data for all studies are open-access and all scripts are available on the Open Science Framework (https://osf.io/7gnx8/?view_only=2d75a9d8728d48b3ae2d48c7f28f9ea9).

Study 1: Birth Data Over 100 Years and Across Two Societies

Method

United States Name Data From 1880 to 2018

Data were downloaded from the U.S. Social Security database of Social Security card applications for births that occurred in the United States from 1880 to 2018. The number of names included in the database is 351,704,578. The data consist of those who applied for a social security number and are limited to instances wherein the sex and year of birth were recorded, the given name is at least two letters long, and as long as there were at least five instances of the name in a given year to ensure personal privacy.

English and Welsh Name Data From 1904 to 1994

Data were downloaded from the Office for National Statistics (www.ons.gov.uk). The oldest set of data available consisted of the 100 most common English and Welsh names, separately for males and females, for every 10 years from 1904 to 1994 ($N = 2{,}000$).

Classification of Names as Voiced and Unvoiced

Consistent with prior work (Slepian & Galinsky, 2016), we classified names as voiced versus unvoiced based on their first phoneme. Voiced names were classified as names beginning

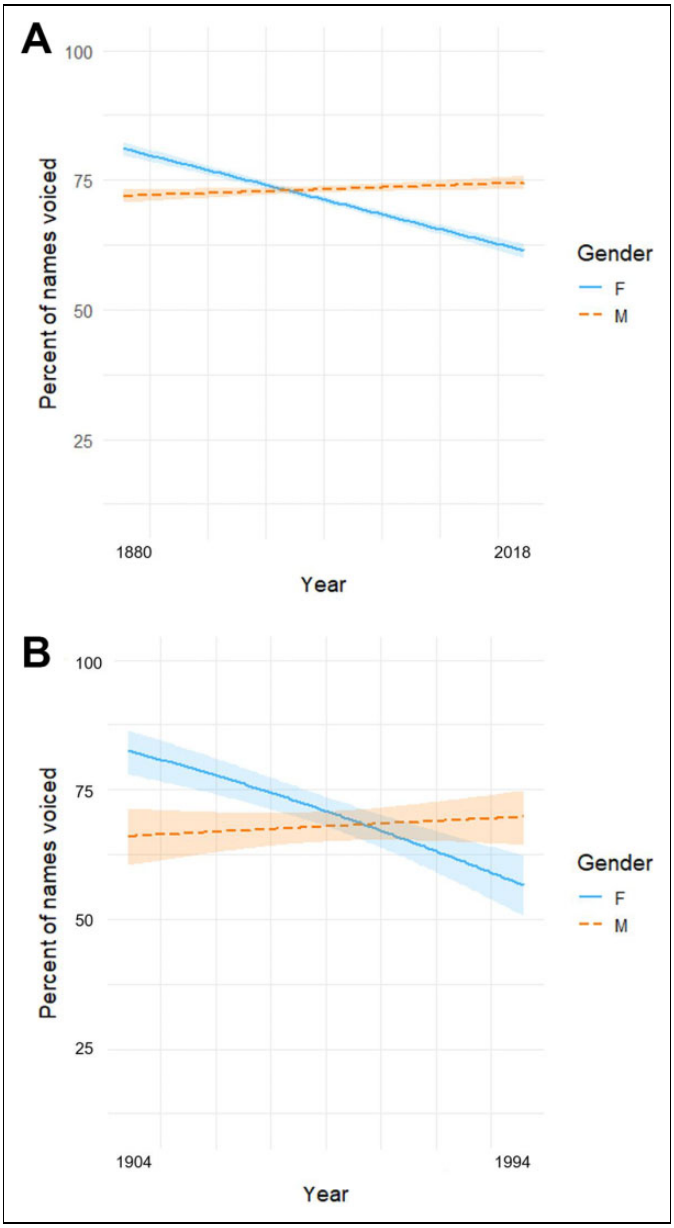

Figure 1. Effect of time and gender on voicing of all names by percent, U.S. data from 1880 to 2018 (Study 1, A) and English and Welsh data from 1904 to 1994 (Study 1, B) with 95% confidence intervals.

with *A*, *B*, *D*, *E*, *G*, *I*, *J*, *L*, *M*, *N*, *O*, *R*, *U*, *V*, *W*, *X*, *Y*, and *Z*. Unvoiced names were classified as names beginning with *C*, *F*, *H*, *K*, *P*, *Q*, *S*, *and T*.[1]

Analytic Approach

In all studies, we used the lme4 package to run multilevel models (Bates et al., 2015), the lmerTest package to calculate statistical significance (Kuznetsova et al., 2017), and the r2glmm package to calculate effect sizes (Jaeger, 2017) in the R software environment (Version 3.6.1; R Core Team, 2013).

Results and Discussion

United States

We conducted a multilevel regression predicting proportion of voiced (vs. unvoiced) names by every gender for every year ($N = 278$), with gender (female = −.5, male = .5) as a Level 1 predictor, year as a Level 2 predictor, and their interaction, with intercepts for years as random factors.

The predicted main effect emerged for gender, $b = 1.96$, $t = 4.64$, $p < .001$, 95% CI [1.13, 2.78], $R^2 = .061$, indicating that voiced names were more frequently given to males than to females. In addition, a main effect emerged for time, $b = -0.06$, $t = -9.81$, $p < .001$, 95% CI [−0.07, −0.05], $R^2 = .297$, indicating that unvoiced names became more prevalent with time.

These main effects were qualified by an interaction, $b = 0.16$, $t = 15.34$, $p < .001$, 95% CI [0.14, 0.18], $R^2 = .416$. As can be seen in Figure 1A, simple slope analyses revealed that, over time, female names became less voiced, $b = -0.14$, $t = -17.35$, $p < .001$, whereas male names became more voiced, $b = 0.02$, $t = 2.26$, $p = .025$.

To address the possibility that these results are driven by a small set of highly popular names, we conducted the multilevel regression counting each unique name in every year once, such that every unique name equals one data point, regardless of the number of times it was given in a particular year. The predicted interaction remained significant, $b = 0.08$, $t = 9.68$, $p < .001$, 95% CI [0.06, 0.09], $R^2 = .206$.

English and Welsh Data

We conducted a multilevel logistic regression predicting voicing of the 2,000 names with gender (female = −.5, male = .5) as a Level 1 predictor, year as a Level 2 predictor, and their interaction, with intercepts for years as random factors. Across unique names, there was an effect of time, $b = -0.004$, $t = -3.57$, $p < .001$, 95% CI [−0.006, −0.002], $R^2 = .006$, indicating that unvoiced names became more common with time, with no effect of gender, $b = -0.08$, $t = -1.43$, $p = .15$, $R^2 = .001$.

Critically, the predicted interaction emerged, $b = 0.01$, $t = 4.70$, $p < .001$, 95% CI [0.006, 0.014], $R^2 = .011$. As can be seen in Figure 1B, simple slope analyses revealed that, over time, female names became less voiced, $b = -0.009$, $t = -5.73$, $p < .001$, whereas the voicing of male names did not change, $b = 0.001$, $t = 0.81$, $p = .42$.

Analyzing a century of archival data from both the United States and England, our analyses found that the voiced-gender-name effect has been increasing over time. Specifically, female names became increasingly unvoiced over time in both the United States and in England and Wales, and male names had become more voiced in the United States. In other words, a phonetic difference between male and female names—whether the first phoneme produces a rougher, harder sound which is linked with gender stereotypes of men as rough and agentic, versus a breathier, softer sound which is linked with gender stereotypes of women as tender and communal (Slepian & Galinsky, 2016)—has been increasing over time. This demonstrated change in the gendering of names over time could not be driven by certain names becoming more popular over time for a given gender (e.g., a highly popular name could be given to tens of thousands of babies in a year) because the same pattern of results were obtained when only analyzing unique names per year.

These findings indicate that gender differentiation has increased over time. Nevertheless, many things change across historical time other than just gender equality. Therefore, in Study 2, we used a more direct index of gender equality.

Study 2: State-Level Gender Inequality

Study 2 examined present-day gender equality across the 50 United States. Using state-level measures of leadership and nonleadership gender equality as our index of gender equality, we tested whether the rate of baby name gendering is higher in more gender equal states.

Method

Gender Equality Measures

We obtained state-level ratings of gender equality from Hagan and Lu (2019), the most recent available data at the time of writing. Hagan and Lu (2019) divided these indicators into leadership-based and general (nonleadership) metrics.

Leadership-Representation Gender Equality

An especially relevant measure of gender equality is leadership representation. Women are underrepresented in leadership positions and as societies become more gender equal, more women attain leadership positions. Hagan and Lu (2019) created a leadership measure that captures the percentage of female business owners, percentage of house or senate seats in state legislature held by women, postgraduate or professional degrees held by women, percentage of women among those who work full time and earn more than $100,000, and the percentage of females in boardroom, management, and executive positions. The state with the highest score for gender equality on these leadership-based indicators was Maryland with a score of 82.30, followed closely by Washington, Virginia, and Massachusetts, and the states with the lowest scores were Alabama, North Dakota, South Dakota, and finally Mississippi with a score of 12.20.

Nonleadership Gender Equality

Hagan and Lu (2019) also identified another kind of state-level gender equality focused on workforce participation which includes median pay ratio by gender, percentage of women in the labor force, college degree attainment by women, and healthcare coverage and poverty level for women. The state with the highest score for nonleadership gender equality was Vermont, with a score of 86.40, followed closely by Minnesota, Maryland, and Hawaii, and the states with the lowest scores were Oklahoma, Louisiana, Alabama, and finally Mississippi with a score of 11.20. These metrics were culled by Hagan and Lu (2019) from U.S. census data, the Bureau of Labor Statistics, the National Conference of State Legislatures, and Bloomberg News.

The distinction between gender equality in leadership positions and the workforce is an important one (Seo et al., 2017). Around the 1950s, women began entering the workforce in greater numbers, but mere participation in the workforce (i.e., labor for pay) is distinct from achieving equality in leadership opportunities. Indeed, while the proportion of women's employment reached 47% in 2012, only 14.6% of executive officer positions in Fortune 500 companies were occupied by women. Accordingly, we retain the division of the two kinds of gender equality measures in our analyses (from Hagan & Lu, 2019).

Baby Names

Data on baby names were downloaded from the U.S. Social Security database of Social Security card applications for births that occurred in the United States. The data consist of those who applied for a social security number and are limited to instances wherein the sex and year of birth are recorded, and the given name is at least two letters long (for privacy reasons, the database does not include an entry for names given less than five times that year). In 2018, the most recent year available at the time, this data set consisted of 2,927,696 given names across the 50 States.

Control Variables

We controlled for several state-level differences which may explain gender differences in voiced versus unvoiced names. First, we controlled for year of statehood because previous research has demonstrated that more unique names are given in states that achieved statehood more recently (Varnum & Kitayama, 2011). The preference for unique names may also affect selection of names that are not stereotypically gendered. Second, we controlled for state-level sex ratios, that is, the proportion of males per 100 females in each state (Statista, 2018), because this ratio might shape the expression of more or less gender stereotypical traits (Maner & Ackerman, 2020). Finally, we controlled for state-level population in 2018 (U.S. Census Bureau, 2018) because states with larger populations might have a more diverse set of names for boys and girls than states with smaller populations, potentially skewing the selection of gender stereotypical names.

Results and Discussion

We first computed the proportion of voiced versus unvoiced names given to males and to females in every state. Then, we ran a multilevel regression to predict the proportion of voiced names, with gender (female = −.5, male = .5) as a Level 1 predictor, state-level gender equality in leadership as a Level 2 predictor, and their interaction, with state-level intercepts as random factors. We also controlled for year of statehood, sex ratios, and population.

State-level gender equality in leadership positions interacted with gender to predict the voicing of baby names, $b = 0.03$, $t = 2.76$, $p = .008$, 95% CI [0.01, 0.06], $R^2 = .039$ (see Table 1). Simple slope analyses revealed that states with greater gender equality, as captured by leadership metrics, were more likely to give males a name beginning with a voiced phoneme, $b = 0.05$, $t = 2.48$, $p = .016$, although the voicing of female names did not vary by this metric, $b = 0.01$, $t = 0.67$, $p = .50$ (see Figure 2).

This pattern of results was specific to gender equality in leadership representation. Nonleadership gender equality did not interact with gender to predict voicing of baby names, $b = 0.02$, $t = 1.25$, $p = .217$, $R^2 = .008$. Furthermore, when including both measures of gender equality in the same regression, as well as their interactions, only gender equality in leadership representation interacted with gender to predict voicing (see Table 1). The results remained unchanged when controlling for year of statehood, sex ratios, and population.

To address the possibility that these results are driven by a small set of highly popular names, we conducted the multilevel regression when considering each unique name in every state once, such that every unique name equals one data point, regardless of the number of times it was given in a particular state. This analysis assigns equal weight to a name only given five times versus thousands of times per state and included 93,161 such names. We conducted a multilevel regression with state-level gender equality and gender as predictors and voicing as the dependent variable. The predicted interaction between gender equality as captured by leadership representation and gender on the given name was significant, $b = 0.04$, $t = 2.87$, $p = .006$, 95% CI [0.01, 0.07], $R^2 = .042$ (see Table 2).

Supplemental analyses on years adjacent to Study 2's data set (i.e., analyses conducted on 2017 data and analyses conducted on 2019 data) replicated the finding that states with greater gender equality in leadership representation had a larger voiced-gender-name effect. More specifically, in every analysis we conducted using leadership gender equality, the predicted interaction was significant. However, the results were less robust when we also included the interaction between gender and nonleadership gender equality (see Supplemental Results). These findings suggest that, in explaining an increased differentiation between names given to males versus females, the distinction between leadership gender equality and nonleadership gender equality may not be clear cut.

Using a measure of state-level gender equality, we found that states with greater gender equality had a larger voiced-gender-name effect, with male names being more voiced relative to female names. These findings conceptually replicate the findings from Study 1 using a direct index of gender equality.

General Discussion

Numerous findings have revealed a gender-equality paradox, with greater gender equality predicting greater gender differentiation along a number of psychological variables, from values to personality traits to career choices. Despite this wide range of variables, findings documenting gender-equality paradox have been challenged as an artifact of self-report measures (Wood & Eagly, 2012) and for a lack of robustness across indicators (Richardson et al., 2020). In contrast, the present investigation used a simple, straightforward, and objective marker assessed at a single point in time that reflects a decision based on gender: the name parents give to a newly born baby. Examining whether the name was voiced versus unvoiced (which varies by gender; Slepian & Galinsky, 2016), we found evidence for a gender-equality paradox, with more gender-equal societies giving names to children that are more phonetically gendered. Study 1, using a century of data from the United States and England and Wales, found the voiced-gender-name effect grew stronger across a time period over which gender equality has increased. Study 2 used cross-sectional data for the 50 United States and found that the voiced-gender-name effect was larger in more gender-equal states.

The current findings demonstrate that gender differentiation has increased over time and is stronger in more gender-equal regions, suggesting a real and nonartifactual gender-equality paradox. This differentiation has long-term consequences. The names babies receive typically follow them for life and impact life outcomes (Bertrand & Mullainathan, 2004; Botelho & Abraham, 2017; Laham et al., 2012). Phonetically gendering baby names reflects parents' preferences for gendering their child, even if implicitly. As such, our outcome measure represents a clear gender-based decision. Thus, an important contribution of the current investigation is our use of an objective marker that not only captures but can also create gender differentiation.

Furthermore, our measure of preferences for gender differentiation spans more than a century. While such a time frame is not uncommon for measures of explicit self-reported attitudes (e.g., Newport, 2013), it is rarely available for nonexplicit attitudes, for which previous research has examined a time frame of no more than 13 years (Charlesworth & Banaji, 2019). Consequently, the current investigation reveals how an implicit measure of people's preferences toward gender differentiation has changed over time and answers the call to address temporal variation in psychological science (Muthukrishna et al., 2020).

Research on the gender-equality paradox relies traditionally on cross-country comparisons. The measure we relied on, the voicing of the first phoneme of names, has been demonstrated across cultures and languages (Slepian & Galinsky, 2016). However, baseline differences in the prevalence of different names between languages may vary greatly. Consequently, we operationalized gender equality using different two methods. First, consistent with the notion that gender equality has increased across historical time (England & Li, 2006;

Table 1. Predicting Voicing From Gender and State-Level Gender Equality (Study 2).

	Model 1				Model 2				Model 3				Model 4			
Predictors	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI
(Intercept)	73.62	.24	301.80	[73.15, 74.10]	73.62	.24	312.49	[73.16, 74.09]	73.62	.25	299.81	[73.14, 74.11]	73.62	.24	309.27	[73.16, 74.09]
Gender	1.82***	.25	7.38	[1.34, 2.31]	1.82***	.22	8.27	[1.39, 2.25]	1.82***	.25	7.35	[1.34, 2.31]	1.82***	.22	8.19	[1.39, 2.26]
Statehood	—	—	—	—	0.01	.01	0.87	[−0.01, 0.02]	—	—	—	—	0.01	.01	0.72	[−0.01, 0.02]
Population	—	—	—	—	0.07^{+}	.03	1.98	[0.00, 0.13]	—	—	—	—	0.06^{+}	.04	1.82	[−0.00, 0.13]
Sex ratio	—	—	—	—	0.04	.14	0.32	[−0.22, 0.31]	—	—	—	—	0.06	.15	0.40	[−0.23, 0.35]
Gender × Statehood	—	—	—	—	0.01	.01	1.01	[−0.01, 0.02]	—	—	—	—	0.01	.01	0.84	[−0.01, 0.02]
Gender × Population	—	—	—	—	0.10**	.03	3.29	[0.04, 0.16]	—	—	—	—	0.10**	.03	3.07	[0.04, 0.16]
Gender × Sex Ratio	—	—	—	—	0.09	.13	0.68	[−0.16, 0.33]	—	—	—	—	0.10	.14	0.74	[−0.17, 0.37]
Nonleadership equality	—	—	—	—	—	—	—	—	−0.01	.02	−0.61	[−0.04, 0.02]	−0.01	.02	−0.28	[−0.04, 0.03]
Gender × Nonleadership Equality	—	—	—	—	—	—	—	—	−0.01	.02	−0.77	[−0.05, 0.02]	−0.01	.02	−0.31	[−0.04, 0.03]
Leadership Equality	0.06***	.01	4.81	[0.03, 0.08]	0.06***	.01	4.80	[0.03, 0.08]	0.06***	.02	3.90	[0.03, 0.10]	0.06**	.02	3.45	[0.03, 0.09]
Gender × Leadership Equality	0.03**	.01	2.76	[0.01, 0.06]	0.03**	.01	2.84	[0.01, 0.05]	0.04*	.02	2.53	[0.01, 0.08]	0.04*	.02	2.15	[0.00, 0.07]
Random effects																
σ^2			1.52				1.21				1.54				1.24	
τ_{00}			2.21				2.17				2.25				2,21	
Intraclass correlation coefficient			0.59				0.64				0.59				0.64	
N			50				50				50				50	
Observations			100				100				100				100	
Marginal R^2/conditional R^2			.386/.749				.468/.807				.386/.750				.457/.805	

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

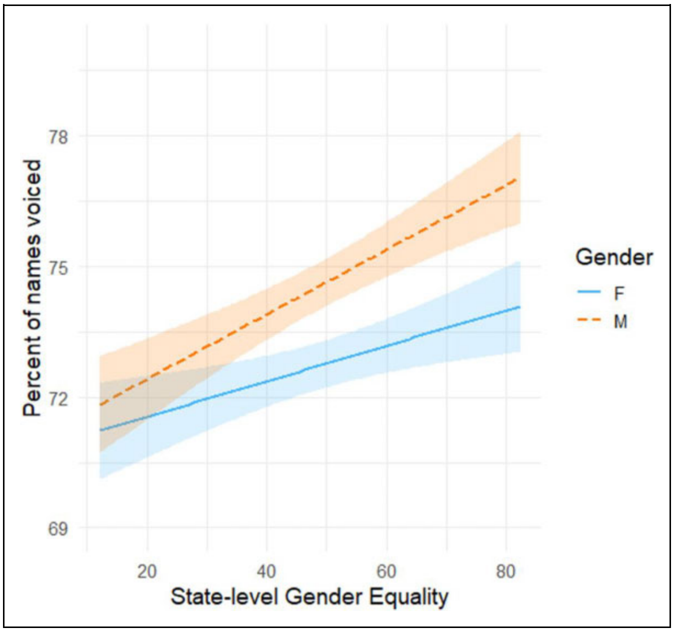

Figure 2. Effect of state-level gender equality in leadership representation and gender on voicing (Study 2) with 95% confidence intervals.

Inglehart & Norris, 2003) and inspired by the developing subdiscipline of historical psychology (Muthukrishna et al., 2020), we used historical time as a proxy for gender equality. Second, we compared U.S. states based on their levels of gender equality, which is primarily English speaking. Nevertheless, future work would do well to demonstrate whether preferences for gender differentiation also vary by country-level gender equality.

We focused on the interaction between gender and historical time (Study 1) or gender equality (Study 2) in predicting the voicing of baby names. One inconsistent finding is that the longitudinal findings in Study 1 demonstrated that historical time primarily predicted variation in the voicing of female names, whereas the cross-sectional findings in Study 2 demonstrated that gender equality primarily predicted variation in the voicing of male names. It is possible that gender equality has a stronger effect on females across historical time, but a stronger effect on males within a certain time frame. For instance, initial increases in gender equality may have increased a need for distinctiveness when naming female babies, but once the similarity between males and females crossed a certain threshold, gender equality led to a greater need for distinctiveness when naming male babies. Interestingly, the stronger association between historical time and the voicing of female (vs. male) names parallels the changes in explicitly endorsed masculine and feminine traits over time, where the endorsement of masculine-stereotyped traits increased among women over time, while the endorsement of feminine-stereotyped traits did not increase among men over time (Twenge, 1997). Further research is needed to examine how longitudinal and cross-sectional associations with gender equality might differ.

One limitation of assessing gender equality is that it is positively correlated with economic development (Inglehart & Norris, 2003). For instance, state-level Gross Domestic Product per capita is correlated with the measures of gender equality used in Study 2 (gender equality in leadership: $r = .50$; nonleadership gender equality: $r = .62$). Such high correlations make the two constructs difficult to tease apart, and thus phenomena ascribed to gender equality (in previous work and the current work) may be driven more precisely by economic development (Kuppens & Pollet, 2015). However, we have not identified a conceptually coherent reason for why economic development would affect gender differentiation of baby names. In contrast, below we present a conceptually coherent reason for why gender equality would prompt increased preferences for gender differentiation.

Why Might Gender Equality Increase Gender Differentiation? The Case for Optimal Distinctiveness

In demonstrating an association between gender equality and greater gender differentiation, the current work suggests a motivated process in which greater gender equality increases preferences for gender differentiation. One factor motivating the preservation of gender differences may be gender-essentialist beliefs (Breda et al., 2020). However, the motivation to differentiate between men and women might reflect a more general process as suggested by Optimal Distinctiveness Theory (Brewer, 1991). This theory posits that people seek balance between their inclusion within a group and preserving the distinctiveness of one's group. When the distinctiveness of one's social group is threatened, it motivates a need for distinctiveness that can be satisfied by endorsing and applying group stereotypes and emphasizing the uniqueness of one's group (Pickett et al., 2002; Pickett & Brewer, 2001). Optimal distinctiveness theory predicts that when an environment blurs the boundaries between genders, people may prefer to accentuate gender differences where they can. Indeed, experimentally increasing the perceived similarity between men and women increases the endorsement of gender norms (Ramati-Ziber et al., 2020; see also Martin & Slepian, 2018). When it comes to raising a child, gender is a major part of the group differentiation story, from clothes to toys to room decorations (Bem, 1981). Given such strong preference for gendering babies, optimal distinctiveness theory provides a parsimonious lens for understanding why increasing gender equality may motivate increasing gender differentiation.

Baby names are just one path to express preferences for gender differentiation. If greater gender equality motivates preferences for gender differentiation across many domains, then the achievements of gender equality may contain the seeds of its own undoing. Indeed, despite enormous progress in the second half of the 20th century, certain aspects of gender equality have stalled over the past two decades (England et al., 2020). Moving forward, a critical question is how to promote gender quality while also preserving preferences for optimal distinctiveness.

Table 2. Predicting Voicing of Unique Names From Gender and State-Level Gender Equality (Study 2).

	Model 1				Model 2				Model 3				Model 4			
Predictors	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI	*b*	*SE*	*t*	CI
(Intercept)	70.41	0.28	249.86	[69.86, 70.96]	70.41	0.27	257.30	[69.87, 70.95]	70.41	0.28	249.12	[69.86, 70.96]	70.41	0.28	254.43	[69.87, 70.95]
Gender	−2.84***	0.29	−9.85	[−3.41, −2.28]	−2.84***	0.29	−9.78	[−3.41, −2.27]	−2.84***	0.29	−9.75	[−3.41, −2.27]	−2.84***	0.29	−9.68	[−3.42, −2.27]
Statehood	—	—	—	—	−1.14	1.01	−1.13	[−3.11, 0.83]	—	—	—	—	−1.16	1.08	−1.07	[−3.27, 0.95]
Population	—	—	—	—	−0.01	0.04	−0.23	[−0.09, 0.07]	—	—	—	—	−0.01	0.04	−0.24	[−0.09, 0.07]
Sex ratio	—	—	—	—	0.33*	0.16	2.13	[0.03, 0.64]	—	—	—	—	0.34^{+}	0.17	1.97	[0.00, 0.67]
Gender × Statehood	—	—	—	—	−1.00	1.07	−0.94	[−3.09, 1.09]	—	—	—	—	−1.1	1.14	−0.96	[−3.34, 1.14]
Gender × Population	—	—	—	—	0.05	0.04	1.17	[−0.03, 0.13]	—	—	—	—	0.05	0.04	1.05	[−0.04, 0.13]
Gender × Sex Ratio	—	—	—	—	0.16	0.17	0.98	[−0.16, 0.49]	—	—	—	—	0.18	0.18	0.99	[−0.18, 0.54]
Nonleadership equality	—	—	—	—	—	—	—	—	0.02	0.02	0.85	[−0.02, 0.05]	0.00	0.02	−0.05	[−0.04, 0.04]
Gender × Nonleadership Equality	—	—	—	—	—	—	—	—	0.00	0.02	−0.18	[−0.04, 0.03]	−0.01	0.02	−0.26	[−0.05, 0.04]
Leadership Equality	0.05***	0.01	3.94	[0.03, 0.08]	0.01	0.02	0.69	[−0.03, 0.05]	0.04*	0.02	2.29	[0.01, 0.08]	0.06**	0.02	2.84	[0.02, 0.10]
Gender × Leadership Equality	0.04**	0.01	2.87	[0.01, 0.07]	0.04**	0.01	2.87	[0.01, 0.07]	0.04*	0.02	2.20	[0.00, 0.08]	0.04^{+}	0.02	1.90	[−0.00 , 0.08]
Random effects																
σ^2			2.08				2.11				2.12				2.16	
τ_{00}			2.93				2.69				2.93				2.75	
Intraclass correlation coefficient			0.58				0.56				0.58				0.56	
N			50				50				50				50	
Observations			100				100				100				100	
Marginal R^2/conditional R^2			.408/.754				.452/.759				.410/.752				.447/.757	

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by The Israel Science Foundation (grant no. 119/20) to the first author.

ORCID iDs

Allon Vishkin https://orcid.org/0000-0002-9655-7449
Michael L. Slepian https://orcid.org/0000-0002-4728-2178

Supplemental Material

The supplemental material is available in the online version of the article.

Note

1. This classification scheme will have some errors (e.g., some J names are unvoiced when making an H sound, and X can also be unvoiced), but these instances constitute a very low proportion of names in English.

References

Atari, M., Lai, M. H. C., & Dehghani, M. (2020). Sex differences in moral judgements across 67 countries. *Proceedings of the Royal Society B*, *287*, 20201201.

Bates, D. M., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*, 1–48.

Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, *88*(4), 354–364.

Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *The American Economic Review*, *94*, 991–1013.

Botelho, T. L., & Abraham, M. (2017). Pursuing quality: How search costs and uncertainty magnify gender-based double standards in a multistage evaluation process. *Administrative Science Quarterly*, *62*(4), 698–730.

Breda, T., Jouini, E., Napp, C., & Thebault, G. (2020). Gender stereotypes can explain the gender-equality paradox. *Proceedings of the National Academy of Sciences*, *117*(49), 31063–31069. https://doi.org/10.1073/pnas.2008704117

Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, *17*, 475–482.

Cai, Z. G., & Zhao, N. (2019). The sound of gender: Inferring the gender of names in a foreign language. *Journal of Cultural Cognitive Science*, *3*(1), 63–73.

Charlesworth, T. E. S., & Banaji, M. R. (2019). Patterns of implicit and explicit attitudes: I. Long-term change and stability from 2007 to 2016. *Psychological Science*, *30*(2), 174–192.

Costa, P. T., Jr., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, *81*, 322–331.

England, P., Levine, A., & Mishel, E. (2020). Progress toward gender equality in the United States has slowed or stalled. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(13), 6990–6997.

England, P., & Li, S. (2006). Desegregation stalled: The changing gender composition of college majors, 1971-2002. *Gender and Society*, *20*(5), 657–677.

Guimond, S., Branscombe, N. R., Brunot, S., Buunk, A. P., Chatard, A., Désert, M., Garcia, D. M., Haque, S., Martinot, D., & Yzerbyt, V. (2007). Culture, gender, and the self: Variations and impact of social comparison processes. *Journal of Personality and Social Psychology*, *92*, 1118–1134.

Hagan, S., & Lu, W. (2019, March 8). Ranking the U.S. States by gender equality. https://www.bloomberg.com/news/articles/2019-03-08/vermont-minnesota-are-the-best-states-for-gender-equality

Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference-group effect. *Journal of Personality and Social Psychology*, *82*, 903–918.

Inglehart, R., & Norris, P. (2003). *Rising tide: Gender equality and cultural change around the world*. Cambridge University Press.

Jaeger, B. (2017). *r2glmm: Computes R squared for mixed (multilevel) models* (Version 0.1.2). R package. https://cran.r-project.org/web/packages/r2glmm/

Kittilson, M. C. (2006). *Challenging parties, changing parliaments: Women and elected office in contemporary Western Europe*. Ohio State University Press.

Kuppens, T., & Pollet, T. V. (2015). Gender equality probably does not affect performance at the Olympic Games: A comment on Berdahl, Uhlmann, and Bai (2015). *Journal of Experimental Social Psychology*, *61*, 144–147.

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). LmerTest package: Tests in linear mixed effects models. *Journal of Statistical Software*, *82*, 1–26.

Laham, S. M., Koval, P., & Alter, A. L. (2012). The name-pronunciation effect: Why people like Mr. Smith more than Mr. Colquhoun. *Journal of Experimental Social Psychology*, *48*, 752–756.

Lauritsen, J. L., Heimer, K., & Lynch, J. P. (2009). Trends in the gender gap in violent offending: New evidence from the national crime victimization survey. *Criminology*, *47*, 361–399.

Maner, J. K., & Ackerman, J. M. (2020). Ecological sex ratios and human mating. *Trends in Cognitive Sciences*, *24*(2), 98–100. https://doi.org/10.1016/j.tics.2019.11.008

Martin, A.E., & Slepian, M.L. (2018). Dehumanizing gender: The de-biasing effects of gendering human-abstracted entities. *Personality and Social Psychology Bulletin*, *44*, 1681–1696.

Mehrabian, A. (2001). Characteristics attributed to individuals on the basis of their first names. *Genetic, Social, and General Psychology Monographs*, *127*, 59–88.

Muthukrishna, M., Henrich, J., & Slingerland, E. (2020). Psychology as a historical science. *Annual Review of Psychology*, *72*, 717–749.

Newport, F. (2013, July 25). *In U.S., 87% approve of Black- White marriage, vs. 4% in 1958*. Gallup. http://www.gallup.com/poll/163697/approve-marriage-blacks-whites.aspx

Oyama, T., Osaka, E., Kamada, A., Onzuka, C., & Motoki, Y. (2019). Cross-cultural and inter-periodical commonality of phonetic symbolism in initials of men and women: A preliminary study. *The Japanese Journal of Psychonomic Science*, *38*(1), 105–108.

Park, J., Motoki, K., Pathak, A., & Spence, C. (2021). A sound brand name: The role of voiced consonants in pharmaceutical branding. *Food Quality and Preference*, *90*, 104104.

Pathak, A., & Calvert, G. A. (2020). Sounds sweet, sounds bitter: How the presence of certain sounds in a brand name can alter expectations about the product's taste. *Food Quality and Preference*, *83*, 1–10.

Pathak, A., Calvert, G. A., & Lim, L. K. S. (2020). Harsh voices, sound branding: How voiced consonants in a brand's name can alter its perceived attributes. *Psychology and Marketing*, *37*(6), 837–847.

Pickett, C. L., Bonner, B. L., & Coleman, J. M. (2002). Motivated self-stereotyping: Heightened assimilation and differentiation needs result in increased levels of positive and negative self-stereotyping. *Journal of Personality and Social Psychology*, *82*, 543–562.

Pickett, C. L., & Brewer, M. B. (2001). Assimilation and differentiation needs as motivational determinants of perceived in-group and out-group homogeneity. *Journal of Experimental Social Psychology*, *37*, 341–348.

Powell, G. (2000). The glass ceiling: Explaining the good and bad news. In M. Davidson & R. Burke (Eds.), *Women in management: Current research issues* (pp. 236–249). Sage.

R Core Team. (2013). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing.

Ramati-Ziber, L., Shnabel, N., & Glick, P. (2020). The beauty myth: Prescriptive beauty norms for women reflect hierarchy-enhancing motivations leading to discriminatory employment practices. *Journal of Personality and Social Psychology*, *119*(2), 317–343.

Richardson, S. S., Reiches, M. W., Bruch, J., Boulicault, M., Noll, N. E., & Shattuck-Heidorn, H. (2020). Is there a gender-equality paradox in science, technology, engineering, and math (STEM)? Commentary on the study by Stoet and Geary (2018). *Psychological Science*, *31*(3), 338–341.

Schwartz, S. H., & Rubel, T. (2005). Sex differences in value priorities: Cross-cultural and multimethod studies. *Journal of Personality and Social Psychology*, *89*, 1010–1028.

Seo, G., Huang, W., & Han, S. H. C. (2017). Conceptual review of underrepresentation of women in senior leadership positions from a perspective of gendered social status in the workplace: Implication for HRD research and practice. *Human Resource Development Review*, *16*(1), 35–59.

Slepian, M. L., & Galinsky, A. D. (2016). The voiced pronunciation of initial phonemes predicts the gender of names. *Journal of Personality and Social Psychology*, *110*, 509–527.

Statista. (2018). Male to female ratio in the United States in 2018, sorted by state. https://www.statista.com/statistics/301946/us-population-males-per-100-females-by-state/

Stoet, G., & Geary, D. C. (2018). The gender-equality paradox in science, technology, engineering, and mathematics education. *Psychological Science*, *29*, 581–593.

Topolinski, S., & Boecker, L. (2016). Minimal conditions of motor inductions of approach-avoidance states: The case of oral movements. *Journal of Experimental Psychology: General*, *145*(12), 1589–1603.

Topolinski, S., Maschmann, I. T., Pecher, D., & Winkielman, P. (2014). Oral approach-avoidance: Affective consequences of muscular articulation dynamics. *Journal of Personality and Social Psychology*, *106*, 885–896.

Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles*, *36*, 305–325.

Twenge, J. M. (2001). Changes in women's assertiveness in response to status and roles: A cross-temporal meta-analysis, 1931-1993. *Journal of Personality and Social Psychology*, *81*(1), 133–145. https://doi.org/10.1037/0022-3514.81.1.133

U.S. Census Bureau. (2018). Total population. https://data.census.gov

Varnum, M. E. W., & Kitayama, S. (2011). What's in a name? Popular names are less common on frontiers. *Psychological Science*, *22*, 176–183.

Wai, J., Cacchio, M., Putallaz, M., & Makel, M. C. (2010). Sex differences in the right tail of cognitive abilities: A 30 year examination. *Intelligence*, *38*, 412–423.

Wood, W., & Eagly, A. H. (2012). Biosocial construction of sex differences and similarities in behavior. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology* (Vol. 46, pp. 55–123). Academic Press.

Author Biographies

Allon Vishkin is a postdoctoral fellow at the University of Michigan. He studies cultural differences in motivation and emotion.

Michael L. Slepian is the Sanford C. Bernstein & Co. Associate Professor of Leadership and Ethics at Columbia Business School. He studies the psychological effects of secrecy, the development and formation of trust, and person perception.

Adam D. Galinsky is a Professor at Columbia Business School. He received his Ph.D. from Princeton University. His research and teaching focus on leadership, negotiations, diversity, and ethics. He co-authored the best-selling book, *Friend & Foe* and delivered the popular Ted talk, *How to Speak Up for Yourself*. He is the Executive and Associate Producers on two documentaries, Horns and Halos (2003) and Battle for Brooklyn (2011), short-listed (final 15) for Best Documentary at the Academy Awards.

Handling Editor: Jennifer Bosson