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The truth about "gender differences" in risk-taking

Executive summary

- *"Is risk behavior gender-specific?" No.* I conducted meta-analyses of over fifty empirical studies of gender and financial risk and found the connection between sex and risk preferences to be extremely weak. Any difference *between* the average man and the average woman is always trivial in comparison to the differences *among* men, and *among* women. Men and women are far more similar than different.
- *"Would a balanced gender mix in policy institutions make for better decisions?" Yes.* Even though women don't "bring something different," discarding the common association of economics and finance with "macho" traits would allow a more comprehensive set of human traits and interests to be appreciated by all leaders.

Full presentation

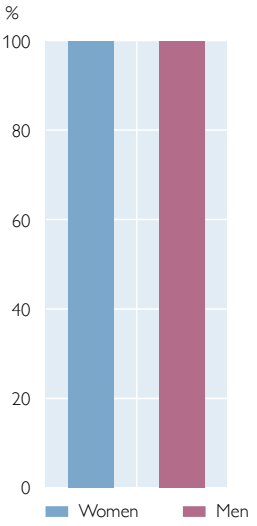
I would like to address in this talk two questions asked in the program for this conference:

- "Is risk behavior gender-specific?"
- "Would a balanced gender mix in policy institutions make for better decisions?"

Let's start with the first one. The idea of "gender-specific" behavior suggests something like what is illustrated in chart 1, where the horizontal axis measures scores on some behavioral variable. That is, all women do things one way, and all men do things a different way. The difference is categorical.

Chart 1

Categorical difference



Source: Author's illustration.

I am an economist, and several years ago, I became curious about the many scholarly articles coming out of the field of Behavioral Economics that claimed to find that "women are more risk-averse than men." While I am skeptical of any assertion that sounds like it may be just a stereotype, I am also an empirical researcher and respect what the data actually reveals. So, I went back to this literature to investigate the data and analyses behind up these claims. I did two meta-analyses (that is studies of others' studies) of the gender and risk literature and published these in scholarly journals as well as in a book (see reference list). Some of the studies I looked at gathered data through survey questions, others through experimental methods and a few through analysis of actual investment data.

The actual *data-derived* results in all these articles are far more accurately summarized by the following statement:

In our *sample*, we (maybe) found a *statistically significant difference in mean* risk aversion between men and women, with women *on average* being more risk averse. I've italicized a few important words:

- *Sample:* The fact that researchers were only looking at a sample means that whatever they find is really only generalizable to the particular group they took their sample from. Often,

this was undergraduate students in the researcher's home country. So, generalization to "men" and "women" always and everywhere is already suspect.

- *Statistically significant:* Contrary to how this sounds, this does *not* mean that the effect (in this case, of gender on risk-taking) is large or important. It only means that the effect is statistically *detectable* (that is, it is relatively unlikely that the results could have come from a population in which the effect was absent, purely by chance). While it is true that the larger the real effect is, the more likely the results are to be statistically significant, it is also true that the larger the *sample* is, the more likely is a statistically significant result. So, a result can be "statistically significant" even if the real effect is trivially small.
- *Difference in mean...on average:* The difference being compared here is the difference between the *average* man and the *average* woman, not all men and all women. But behavior also generally varies *among* women, and *among* men – perhaps to a much greater degree than *between* the sexes.

While a difference between *all* men and *all* women would look like chart 1, differences between men and women in actuality usually look a lot more like chart 2. The left side shows a stylized representation of the distributions of men's and women's heights. We know, just from looking around, that men are on average taller than women. This is reflected by the male mean ($\bar{X}_m$) being to the right of the female mean ($\bar{X}_f$). Most people are close to average, so the distributions reach their greatest heights at their means. Yet, some individual women are quite tall – taller than some men – as illustrated by the fact that there is a long "tail" of the blue line going off to the right. And some men are quite short. Once in a while, if you randomly paired up a man and a woman, you would end up with a woman who is taller than the man. One way of expressing how big the difference between the *average* man and woman is, *relative to* how much men differ from other men, and women differ from other women, is to use a measure called *Cohen's d*. This represents the number of standard deviations between the two means. For heights, d ≈ 2.60.

Chart 2

"On average" difference

Source: Author's illustration.

The right side in chart 2 illustrates a smaller "on average" difference of only $d \approx 0.35$. In this case, if you randomly paired a man and a woman, you would be nearly as likely to find the woman scoring higher than the man, as the man scoring higher than the woman.

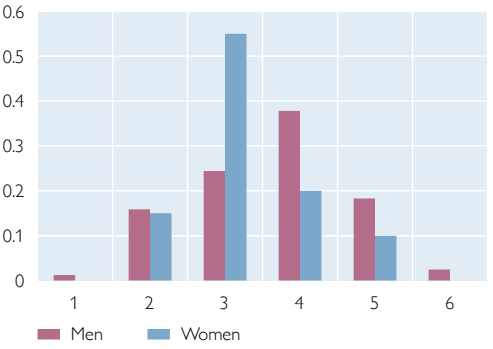
So, if the horizontal axis was measuring the tendency to take risks, and the distributions looked like the right side in chart 2, what could you say about the risk-taking tendencies of *an individual person*? Perhaps, say, this person is being considered for appointment to a policy-making board, and all you know about them is their sex. The answer is, "Basically, nothing." He or she could be from anywhere in their respective distribution and could therefore be either more or less risk-taking than a candidate of the other sex. Looking only at group averages can be misleading.

In my meta-analysis of over 50 studies of gender and risk, I found that the most precise estimates of the "on average" difference between men and women on risk-taking measures are *even smaller* than that shown in the right side of chart 2, at about $d \approx 0.13$. While this difference is of trivial *substantive* significance, such small differences can be statistically detectable in very large samples. Some of the actual values for d that I found in my first meta-analysis are shown in a table in the Appendix.

Psychologists call the fact that we humans often only see the part of reality that supports our pre-existing beliefs "confirmation bias." I found many cases of this in my meta-analyses. For example, one article surveyed samples of investment managers in four different countries. The data from one of these countries is shown in chart 3. We can see, even with a relatively large d value of 0.40, that the degree of overlap and similarity is high. Furthermore, this was the *only* country, out of the four, in which a difference was statistically detectable. Yet, the article claimed "a victory for gender difference" and suggested that female investors be paired with female investment advisors because of women's (supposedly) distinct investment style. The results from other three countries and the fact that the distributions overlap, which tell quite a different story, were ignored.

Chart 3

Example of data from one study



Source: Nelson (2015) based on data from Beckmann and Menkhoff (2008).
Note: Risk choice: 1 = very risk averse, 6 = little risk averse.

"Publication bias" also adds to public misperceptions, since findings of "we found *no* reliable evidence for difference" (that is, no statistically significant effect) have tended to be considered "not publishable" in scholarly journals.

So, *is risk behavior gender-specific?* The answer is a very clear *NO*. The case shown in chart 1 above (or even the one on the left side of chart 2) is soundly *contradicted by* the data. Men and women are far more similar than different.

On to the next question: *would a balanced gender mix in policy institution make for better decisions?* My answer to this question – it may surprise you – is *YES*. But this is *not* because individual women "bring something different" in regard to risk-taking to leadership groups. They do not.

However, psychological studies (as well as common observation) have shown that we tend to think of many things which don't "have" a male or female gender themselves in gendered terms. In Western cultures, for example, we tend to think of dogs as somehow more "masculine" and cats as more "feminine." More to the point, we have cognitively associated the fields of finance and economics with markets, risk-taking, innovation, achievement, efficiency and competition. We are (currently) far more hesitant to realize that financial and economic systems are also about – and part of – social relations. Or that caution, trustworthiness, resilience and cooperation are also absolutely necessary for them to be healthy and sustainable. What are the gender connotations of these lists? Clearly, finance has been thought of as a realm suited for "real (risk-taking etc.) men," and as not really in need of caution and care, which are culturally stereotyped as "womanly."

Could we discard *both* the social-level bias against women entering the sphere of financial leadership *and* the cognitive (gendered) bias about what the financial sector really needs? Then we could get to a "balanced gender mix," not only of women and men but of caution (to balance risk-taking), trustworthiness (to balance innovation), resilience (to balance efficiency) and cooperation (to balance competition). That would make for a safer and more society-serving financial sector, without needing to appeal to any spurious "gender differences in risk-taking." We could allow *all* these dimensions to be appreciated by *all* financial leaders. We could, furthermore, allow all these dimensions to be *enacted* by all financial leaders.

References

Nelson, J. A. 2014. The power of stereotyping and confirmation bias to overwhelm accurate assessment: The case of economics, gender, and risk aversion. In: Journal of Economic Methodology 21(3). 211–231.

Nelson, J. A. 2015. Are women really more risk-averse than men? A re-analysis of the literature using expanded methods. In: Journal of Economic Surveys 29(3). 566–585.

Nelson, J. A. 2018. Gender and Risk-Taking: Economics, Evidence, and Why the Answer Matters. New York: Routledge.

Nelson, J. A. 2018. Economics for Humans. 2nd edition. Chicago: Univ. of Chicago Press.

Appendix

Table 1

Some results from one meta-analysis

Author(s)	*Cohen's d*	Index of Similarity
Harris, Jenkins et al., 2006	–.34 to NSS to .74	—
Fehr-Duda, De Gennaro et al., 2006	–.25 to NSS to .49	—
Arano et al., 2010	NSS	—
Gneezy Leonard et al., 2009	NSS	—
Bernasek and Shwiff, 2001	NSS	.87
Lindquist and Save-Soderbergh, 2011	NSS	—
Holt and Laury, 2002	NSS to .37	.83 to .86
Booth and Nolen, 2012	NSS to .38	.84
Beckmann and Menkhoff, 2008	NSS to .46	.67 to .91
Dohmen, Falk et al., 2011	NSS to .48	.80 to .88
Meier-Pesti and Penz, 2008	NSS to .85	—
Powell and Ansic, 1997	.06 to .17	.90 to .93
Sunden and Surette, 1998	.08 to .16	.95 to .96
Barber and Odean, 2001	.09 to .26	—
Eriksson and Simpson, 2010	.19 to .22	.89 to .91
Hartog, Ferrer-i-Carbonell et al., 2002	.22 to .29	.85 to .96
Borghans, Golsteyn et al., 2009	.32 to .55	—
Eckel and Grossman, 2008	.55 to 1.13	.60 to .80

Source: Nelson (2014).

Notes: Articles are identified by author and date. A negative value for Cohen's d indicates that women, on average, took more risks than men. "NSS" means that the study included some results that were "not statistically significant." The "Index of Similarity" measures the proportion of overlap between men's and women's distributions, for the cases in which this can be unambiguously determined. The "most precise" estimates are those from samples of the largest size (not indicated here).