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ORIGINAL ARTICLE

I'll Take Gender Differences for $400: Using *Jeopardy!* to Analyze Attitudes Toward Risk

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Abstract
Studies have shown that women perform worse than men in winner-take-all competitions and often avoid such settings entirely, which could put women at a significant disadvantage in the labor market. Recent research, however, has challenged this view. One problem with testing for risk averse behavior is the difficulty of finding settings in which people can display it. We find such a setting in the Final Jeopardy segment of the game show *Jeopardy!* Using data on wagers in Final Jeopardy, we show that women who compete on the show are no more risk averse than men.

Keywords Gender · Risk aversion · Confidence

JEL Classification J16 · D81 · D91

Introduction

Studies of whether women and men respond differently to risk have been conducted both in the laboratory and in an array of real-world settings, ranging from the stock market to the sports arena. Virtually all the experimental studies and many non-experimental studies have found that women are more risk averse than men. Differences in risk aversion can have important implications for how women behave and are treated in the labor market. For example, greater risk aversion could cause women to avoid more competitive career paths, leading to persistent occupational segregation and wage differences. However, several recent studies have chipped away at the consensus that women are more risk averse.

Using a variety of approaches and contexts, these studies sound the same theme. While women might show greater risk aversion in a controlled, randomized

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experiment, such gender differences might not appear when women sort themselves into specific roles. These studies find that, when women operate in a domain in which they feel they have an expertise—in effect, when they are confident in their ability to generate a positive payoff—they behave no differently than men.

In this paper, we provide a real-world test of risk aversion that includes measures of confidence. We do so in the context of a unique setting, the betting behavior of contestants in the Final Jeopardy segment of the game show *Jeopardy!* We do this by analyzing the behavior of two different sets of players.

Our first set of players lead in a runaway entering Final Jeopardy. A runaway occurs when a player leads by such a large amount that he can be caught only if he bets exceedingly unwisely. In such a situation, the bets by first-place players are bounded only by their ensuring that they cannot be caught by a second-place player.

The second set of players are in second place entering Final Jeopardy. This set forms the basis for two tests of gender differences in bets in Final Jeopardy. The first test again asks whether women bet a smaller amount than men. The second test applies a probit analysis to a subset of second-place players to determine whether women follow a safer strategy then men when they are in second place.

Our model of the optimal betting strategy in Final Jeopardy builds on numerical examples that Metrick (1995) used to determine optimal bets in Final Jeopardy. We use two sets of data about 30 years apart to compare gender differences over time. The first data set uses more than eight seasons of *Jeopardy!* (2013–14 to halfway through 2021–22). The second data set uses the first five seasons (1984–85 to 1988–89) of the prime time version of *Jeopardy.*[1]

None of our results show evidence of gender disparities in betting behavior. This is consistent with the growing literature that claims that, when women feel confident about the situation they face, they behave no differently from men. If this is so, and if women and men self-select into occupations in which they feel relatively confident, then women who self-select do not face the limits suggested by the earlier literature.

In the next section of this paper, we provide an overview of the literature regarding gender differences in risk aversion, and we summarize three papers about player behavior on *Jeopardy!* These consist of two papers that focus on Double Jeopardy and Metrick's treatment of the behavior by first-place players in Final Jeopardy. In Section III, we build on Metrick's treatment of second-place players to create a theoretical model. In Section IV, we construct an empirical framework and describe the data set used to test our model. We present our results in Section V. A conclusion follows.

[1] A daytime version of the show ran for many years prior to the prime time version.

Background and Literature Review

Gender Differences Regarding Risk

Many studies have found that women are more risk averse than men (e.g., Croson and Gneezy 2009; Halko et al. 2012; Booth et al. 2014). They also show that women tend to avoid "economic contests" that provide all-or-nothing rewards (e.g., Niederle and Vesterlund 2007; Booth and Nolen 2012; Datta Gupta et al. 2013).

The consequences of these differences may be relatively benign. For example, Halko et al. (2012) report that female investment advisors in Finland follow more conservative strategies than their male counterparts, which may be a desirable attribute for some investors. In other settings, the differences can have unfortunate labor market consequences for women, as promotions and rewards in the corporate world are frequently based on winner-take-all rank order tournaments. (See, for example, Bognanno 2001; DeVaro 2006 ; and Belzil and Bognanno 2008.) If women avoid or perform poorly in such tournaments, they may encounter a glass ceiling even in the absence of overt discrimination.

In addition to being less risk averse, men also tend to overstate their abilities more than women do. Such overconfidence can also have real-world consequences. Bengtsson et al. (2005) find that it causes men to get high grades more frequently than women on Economics exams in Sweden. Briel et al. (2020) attribute a portion of the gender wage gap in Germany to a similar disparity.

At the same time, a growing number of articles note limits and exceptions to the general conclusion. For example, Booth and Nolen (2012) find that greater risk aversion among women may be a learned behavior. In their study of British high school students, they show that, while girls are generally more competition-averse than boys are, girls who come from single-sex schools behave much more like boys than girls from coeducational backgrounds. Booth et al. (2014) provide even stronger evidence that women are socialized to be more risk averse. They show that "after eight weeks in a single-sex environment, women were significantly *more* likely to choose the lottery than their counterparts in coeducational groups." (Booth et al. 2014: 126)

Wieland and Sarin's (2012) results suggest that Booth and Nolen's (2012) and Booth et al.'s (2014) finding reflect differences in confidence rather than attitudes toward risk *per se*. We highlight the difference between confidence and attitudes toward risk when we develop our own model below. Wieland and Sarin (2012) establish that, when one accounts for an individual's self-perceived area of expertise (what they call her "domain"), women are just as eager to compete as men are. The problem, in their view, is that domains are "governed by societally sanctioned gender norms," so men and women "are likely to feel more or less competent in different domains" (p. 151). This conclusion helps explain such seemingly anomalous results as Banko et al. (2016) finding that female professional tennis players are no more likely to lose in straight sets than men are.

Sarin and Wieland (2016) take this reasoning one step farther by noting that most experimental research on gender differences in risk aversion used objective probabilities that were revealed to the participants ahead of time. In the world outside the lab, however, most decisions require subjective probabilities. When Sarin and Wieland confront their experimental subjects with situations that require subjective probabilities, they find that gender differences in risk aversion disappear.

Jeopardy!

Jeopardy! Is a hugely popular television game show in which three contestants score points for correctly answering a series of clues.[2] Unlike other game shows, contestants on *Jeopardy!* are not randomly selected from the studio audience. Roughly 70,000 people take a qualifying test each year, and 2500 to 3000 are invited to auditions consisting of in-person testing, interviews, and mock contests with other hopefuls. Of these, 400 people are selected to appear on the show the next season (Brodeur 2017).

In each episode, the three contestants compete in three consecutive rounds: Jeopardy, Double Jeopardy, and Final Jeopardy. In Jeopardy and Double Jeopardy, the contestants choose from a 6x5 board that lists six categories of clues and five dollar-amounts. The amounts range from $200 to $1000 in Single Jeopardy and from $400 to $2000 in Double Jeopardy.

The game starts when the defending champion (the winner of the previous episode) chooses a topic and dollar amount, revealing a clue.[3] The first contestant to press a signaling device has the right to respond to the clue. Responding correctly adds the dollar amount to the contestant's total, while responding incorrectly or failing to respond within 30 seconds deducts that amount. A correct response also gives the contestant the right to select the next category and dollar amount, while failing to respond correctly gives other contestants a chance to answer. For example, on November 28, 2022, a contestant added $600 to her score by responding "Raiders of the Lost Ark" to the $600 clue for the Jeopardy category *Of Movies*: "This movie introduced the world to Indiana Jones."

One "Daily Double" is hidden on the board in the Jeopardy round, and two are hidden in Double Jeopardy. If a contestant selects a question with a Daily Double (which is revealed only after she specifies the category and dollar amount), she has the sole right to respond to the question and may bet up to her current score or $1000 ($2000 in Double Jeopardy), whichever is greater.

At the end of Double Jeopardy, the host reveals the topic for Final Jeopardy. Players sometimes finish Double Jeopardy with non-positive scores and are ineligible for Final Jeopardy. All contestants with positive scores then write the amount they want to bet, based on their assessment of their ability to answer the Final Jeopardy question correctly. The sum they bet is hidden, but all contestants know that it cannot

[2] The twist is that the questions are statements, and the contestants' responses must come in the form of a question.

[3] Double Jeopardy begins with a selection by the player with the lowest score at the end of the Jeopardy round.

exceed their score entering Final Jeopardy. After all bets have been recorded, the host reveals the question, and the contestants have 30 seconds to write their answers on a screen. Finally, each player's answer and bet are revealed.

Although the scores are in dollar amounts, only winners receive the monetary value of their score. The second-place finisher receives $2000, and the third-place finisher receives $1,000, amounts that are typically much less than what the winner receives.[4] More importantly, the winner also earns the right to return the next day to defend her title.

Two studies analyze betting differences between women and men in *Jeopardy!* Jetter and Walker (2017) study wagers on the Daily Double. They focus on whether the wagers are "consistent with the hypothesis of contestants anchoring heavily on the initial dollar value of a clue." Jetter and Walker find that the initial value of the clue has a positive impact on the amount wagered in Double Jeopardy. For example, players who uncover a Daily Double in a clue worth $400 wager less than if the clue were worth $1600. They interpret this result as evidence of anchoring, a term from behavioral economics that refers to people's dependence on irrelevant context when making decisions. As an aside, Jetter and Walker consider the role played by the gender of the contestant. They find that women generally bet less on the Daily Double and that the anchoring effect is weaker for women since the impact of interacting gender with the clue's initial value is negative.

Lindquist and Säve-Soderbergh (2011) also examine bets placed on the Daily Double, but they focus explicitly on the impact of gender on the size of the bets. They use a random effects regression to test whether a woman bets less on the Daily Double if she is the only woman on the panel and whether a man bets less when he is the only man. They find that women are intimidated when outnumbered by men, as they bet 25 percent less when they compete against two men. In contrast, men do not bet less when the other two contestants are women.

Most relevant for our study, Metrick (1995) develops optimal strategies for the contestants (regardless of gender) in first and second place entering Final Jeopardy under a variety of conditions. He then uses frequency distributions from 393 *Jeopardy!* contests to show that contestants tend to behave as predicted.

The simplest situation occurs in a runaway, when the leader entering Final Jeopardy has a score that is more than twice as much as the score of the second-place player when entering Final Jeopardy. That is, entering Final Jeopardy:[5]

$$x_1 > 2x_2, \tag{1}$$

where x_1 is the score of the leader entering Final Jeopardy and x_2 is the score of the person in second place. In this situation, the leader can ensure victory by betting

$$y_1 < x_1 - 2x_2, \tag{2}$$

[4] It is possible (albeit rare) for the second—and even the third-place finisher—to take home more money than the winner of a given contest.

[5] For some reason, Metrick uses weak inequalities, which do not guarantee a victory.

where y_1 is the Final Jeopardy bet of the player currently in first place. In a runaway, the leader should make a bet that is small enough that a wrong answer will not pull him below the maximum possible score of the second-place contestant. In this case, the bet of the player in second place is important only in deciding whether she will stay ahead of the player in third place and win an additional $1000.

In games that are not runaways, the player in first place entering Final Jeopardy must follow a different strategy. He must answer the Final Jeopardy clue correctly and bet enough to exceed the second-place contestant's maximum score. He can do so with a bet of at least

$$y_1 = 2x_2 - x_1 + 1 \tag{3}$$

Metrick notes that more than half the first-place contestants in this setting bet exactly the amount given by Eq. (3), and over 90 percent bet at least this amount.

Modeling the Behavior of Second-Place Contestants

Metrick's Treatment of Second-Place Players

Metrick (1995) notes that the strategies of second-place players in non-runaways depend on how far behind those players are. If $(1/2)x_1 < x_2 < (2/3)x_1$, Metrick shows that the second-place player has limited options. She must bet enough to surpass the first-place player under the assumption that he makes the optimal bet and answers the Final Jeopardy question incorrectly.

To see this, Metrick assumes a game in which the first-place player has a score of $10,000 and the second-place player has a score of $6000 at the end of Double Jeopardy. The first-place player's optimal bet is $2001, as the second-place player cannot catch him if both answer correctly ($12,001 exceeds the second-place player's maximal score of $12,000). The only way the second-place player can win in this situation is to bet at least $2000 and hope that she responds correctly in Final Jeopardy, raising her score to $8000, while the first-place player makes the optimal bet and answers incorrectly, for a final score of $7999.

Strategies become more interesting for the second-place player if $x_2 > (2/3)x_1$. In this case, she has the option of going high or going low. Continuing Metrick's numerical example, if $x_1 = 10,000$ and $x_2 = 7000$, the first-place player's optimal bet is now 4001, which ensures victory if both answer correctly. However, now the second-place player can win even with a bet of $0 if the first-place player bets optimally and answers incorrectly ($7000 > $5999). Alternatively, she can go high, placing a bet of up to $7,000, which will win only if she answers correctly.

A Theoretical Model of Second-Place Player Behavior

In this section, we develop a theoretical model that is consistent with Metrick's numerical examples. Although Metrick (1995) does not express it as such, he essentially describes game theoretic strategies by the first- and second-place players in Final Jeopardy. Following the Nash–Cournot framework, each player makes the optimal bet conditional on the assumption that the opposing player also makes the optimal bet. For the player who is leading when entering Final Jeopardy, the optimal strategy is trivial. He must ensure that his final score exceeds that of the second-place player. In all non-runaway situations, his optimal strategy is given by Eq. (3).

Like Metrick, we base our theoretical model on the simplifying assumption that the second-place player does not worry about the third-place player. In effect, we assume that the second-place player focuses solely on winning the contest and that the $1000 difference between second and third place does not matter to her.

When $x_2 < (2/3)x_1$, the second-place contestant's bet must exceed the difference between her score and that of the first-place contestant if he answers incorrectly:

$$y_2 > \left(x_1 - y_1\right) - x_2 \tag{4a}$$

where y_2 is the Final Jeopardy bet by the second-place player entering Final Jeopardy. If the first-place player bets optimally, we use Eq. (3) to substitute for y_1 in inequality (4a), which yields:

$$y_2 > \left\{x_1 - \left[2x_2 - x_1 + 1\right]\right\} - x_2 \tag{4b}$$

This implies that the optimal bet by the second-place contestant must satisfy:

$$y_2 > 2x_1 - 3x_2 - 1 \tag{4c}$$

If $x_2 > 2/3x_1$, the second-place player can either go low or go high. If the second-place player goes low, she wins if both players respond incorrectly in Final Jeopardy:

$$x_2 - y_2 > x_1 - y_1 = x_1 - \left[2x_2 - x_1 + 1\right] \tag{5a}$$

This simplifies to

$$y_2 < 3x_2 - 2x_1 - 1, \tag{5b}$$

Such a bet, including one equal to $0, will win if the first-place player answers the Final Jeopardy question incorrectly and makes the bet given by Eq. (3).

If the second-place player goes high, she bets:

$$y_2 \geq 3x_2 - 2x_1 - 1 \tag{5c}$$

This commonly takes the form of betting everything ($y_2 = x_2$). Metrick notes that this double-or-nothing bet is the most common bet made by second-place players in Final Jeopardy.

As noted above, recent literature suggests that whether the second-place contestant goes high or goes low depends on two factors. Second-place contestants are more likely to go high if they are more confident in their ability to answer the question or if they are less averse to risk. To show this, we begin by assuming that the participants Final Jeopardy possess von Neumann–Morgenstern utility functions, so a player with the endowment X who bets Y has expected utility:

$$E[U] = pU(X + Y) + (1 - p)U(X - Y), \tag{6}$$

where p is the player's subjective probability of giving a correct response to the Final Jeopardy clue. Since von Neumann–Morgenstern utility functions are invariant to affine transformations, we can restate Eq. (6) as

$$E[U] = pU(Z) + (1 - p)U(0) \tag{7}$$

The size of the bet in Final Jeopardy (Z) is thus depends on the (subjective) probability that the bet will pay off. The concavity of the individual's utility function is measured, for example, by the Arrow–Pratt measure of relative risk aversion:

$$R = -\frac{U''(Z)}{U'(Z)}. \tag{8}$$

If women are either less confident than men ($p_W < p_M$) or more risk averse than men ($R_W > R_M$), they will bet less in Final Jeopardy than men and will be more likely to follow a "go low" strategy. This clarifies the distinction between confidence and risk aversion that appears in the literature. The former reflects differences in the subjective probability of success, while the latter stems from differences in the concavity of the utility function.

Estimation Framework and Data

In this section, we use the theory presented above regarding optimal strategies in Final Jeopardy to develop a test of gender differences in attitudes toward risk when controlling for the degree of confidence. We use bets in Final Jeopardy for two practical reasons. First, Final Jeopardy is a stand-alone segment of the show. This gives the contestants time to formulate a coherent strategy and removes them from the immediate heat of competition. In contrast, Double Jeopardy comes during match play, giving the contestant only an instant to consider her bet. Second, the bet can be affected by many factors beyond the anchoring noted by Jetter and Walker (2017). Some factors, such as the contestant's momentum (as perhaps measured by how many previous clues she had answered correctly), would be difficult or impossible to ascertain.

Testing for Gender Differences in the Size of Bets

We perform two tests of gender differences in wagers made in Final Jeopardy. The first one tests for gender differences in the bets made by first-place contestants in runaways. In runaways, first-place contestants can ensure a win by betting \$0, or they can risk up to (but not including) the difference between their score entering Final Jeopardy and twice the score of the second-place contestant (see Eq. 2). A more risk averse contestant risks less money in such a situation.

The second one tests for gender differences in the bets made by second-place contestants in non-runaways. We do not consider their behavior in runaways because there is no chance of winning, barring a mistaken bet by the first-place player, of winning the game. Both sets of regressions follow the same basic format:

$$BET_{ig} = \beta_0 + \beta_1 SCORE_{ig} + \beta_2 DWOMAN_{ig} + \gamma' X + \delta' Z + \varepsilon_{ig} \tag{9}$$

In Eq. (9), BET_{ig} is the amount wagered by player i in game g, $SCORE_{ig}$ is the score of contestant i entering Final Jeopardy in game g, and $DWOMAN_{ig}$ is 1 when player i in game g is a woman. Since players cannot bet more than they have, $SCORE_{ig}$ is effectively a budget constraint, what player i is capable of wagering. We expect this to have a positive impact on wagers. To test the robustness of the results of this base model, we add X and Z, two vectors of control variables described below.

The vector X consists of controls that apply to men and women but varies depending on whether we are estimating the behavior of first-place or second-place contestants. For first-place contestants in runaways, we include the score of the second-place player, as the higher her score is, the less the first-place player can bet to maintain his lead if he answers incorrectly. Hence, we expect this variable to have a negative coefficient.

For second-place contestants in non-runaways, we include the score of the first-place player and the score of the third-place player. The higher the score of the first-place player, the more the second-place player will have to bet to surpass him, so we expect this variable to have a positive impact. The score of the third-place player is relevant if the second-place player is concerned about the \$1000 differential between a second- and third-place finish. The impact of this variable differs depending on how close the two scores are, so we have no clear prediction as to this variable's impact.[6]

Several control variables are designed to capture the comfort level of women contestants. It is possible that a woman would feel more at ease if she had more women around her. Hence, we add the percentage of women on the panel (0, 0.33, 0.67, or 1.0) as well as a dummy variable showing whether the host of *Jeopardy*! was a woman.[7] If women feel more comfortable when around other women and if they bet more when they feel more comfortable, then the coefficients of these variables should be positive. We include another "comfort" variable to the equation for second-place contestants, a dummy variable for whether the first-place contestant is a man. If women perform worse when in direct competition with men, this variable has a positive coefficient. Similarly, we include a dummy variable indicating whether the host was a woman, as was the case for many games following the death of long-time host Alex Trebek.

[6] If the second-place player has more than twice the third-place player's score (analogous to a runaway), a higher third-place score would have a negative impact. If she has less than twice the third-place player, she should bet more as the third-place score rises.

[7] Our data set includes the period following the death of long-time host Alex Trebek in which the show had several women as guest hosts and eventually hired Mayim Bialik to share hosting duties with Ken Jennings.

We also add two variables to capture the confidence that a player brings to Final Jeopardy, regardless of gender. The first captures whether the player is a defending champion. Having won a previous match, a defending champion might be more confident in her ability to answer the Final Jeopardy question correctly. The second indicates whether the contestant answered the question correctly. To the extent that players accurately assess their expertise in the Final Jeopardy subject, a player who answers the question correctly ex-post is more likely to have anticipated that fact ex-ante.

Finally, we employ a dummy variable equal to 1 if the first-place player is a man. This variable captures how the gender of the first-place player affects the betting behavior of the second-place player. This variable appears only in the equation for the second-place player.

To further test the robustness of our results we add the vector *Z*, which contains the interaction effect of several of the control variables with $DWOMAN_{ig}$. This allows us to see whether they impact women differently than men. Specifically, we interact $DWOMAN_{ig}$ with the variables designating the player's score entering Final Jeopardy, whether the player was a defending champion, whether the player answered the Final Jeopardy question correctly, whether the show had a female host, the percentage of women on the panel, and whether the player in first place was a man. We did not interact $DWOMAN_{ig}$ with the scores of other players, as the impact of these scores is to raise or lower the required bet and does not have an obvious impact on the player's confidence or attitude toward risk.

We run first- and second-place regressions using both the dollar amounts of scores and bets and the logarithms of these values. The latter regressions provide a check of the appropriate functional form, enable us to re-scale the data, and provide the opportunity to express several relationships as elasticities.

Testing for Gender Differences in Going High

We also test for gender differences in whether the second-place player goes high (as defined above) by first specifying the dummy variable $BETHIGH_g = 1$ whenever the second-place player goes high in Final Jeopardy and $BETHIGH_g = 0$ when she goes low. Recall that a second-place player goes low when her bet in Final Jeopardy satisfies Inequality (5b) and goes high whenever her bet satisfies Inequality (5c). Since the strategies apply only when $x_2 > 2x_1/3$, we restrict our sample to the matches in which this inequality holds.

The estimating equation for this test resembles Eq. (9), as it uses the same right-hand side variables. The only change is replacing BET_{ig}, the amount of the bet, with $BETHIGH_{ig}$, a variable that equals 0 if player *i* goes low in game *g* and equals 1 if she goes high. For the three versions used above, we estimate this equation with a probit using both dollar values and their logarithms. We report only the marginal effects of the probit.

Data

We estimate the above regressions using two data sets. The first includes 1,669 *Jeopardy!* episodes broadcast between September 16, 2013, and November 23, 2021. This accounts for almost all the matches played during this period. We excluded any special episodes, such as the Teachers and College tournaments and the annual Tournament of Champions. We did so because the participants, rules, and strategies for these contests differ from the regular matches.

The second data set includes 492 episodes, which aired between September 13, 1984, and June 30, 1989. This consists of the first five seasons of the prime time *Jeopardy!* show. Using this earlier data set allows us to see whether women's behavior changed over time. Again, we included only "regular" matches for this earlier data set. In addition, we had to discard several early episodes because we could not identify the gender of some players. Unlike later broadcasts, the early shows did not have pictures of the contestants on the website, so we based gender on whether the name was masculine or feminine. We discarded contestants with gender ambiguous names (e.g., Leslie) or with names we could not identify. Finally, because Alex Trebek was always the host for these earlier shows, we did not use the dummy variable indicating the gender of the host for the earlier data.

We used the *J! Archive* website (2023) for most of the data we collected.[8] This site lists all the clues and whether the contestant answered a given clue correctly. It also provides some demographic information about the contestants. Recent seasons include photos of the contestants, which allowed us to identify the gender of the participants. If we had used only recent broadcasts, we could also have identified the race of most participants. Unfortunately, earlier broadcasts did not feature such pictures. This forced us to delete several contests in which participants had names that were not clearly masculine or feminine. It also prevented us from using race as an explanatory variable. Neither new nor old broadcasts had information on the participants' age or education level.

While each participant lists an occupation, we were unable to use this information, as there were often no meaningful categories into which we could place the contestants. The website contained only idiosyncratic descriptions of their occupations, such as "accounting clerk" or "researcher."

Summary statistics for relevant variables in each overall sample appear in Table 1. In the later sample, slightly less than half the Jeopardy contestants are women. However, in the sample of players who are in second place entering Final Jeopardy, slightly over half are women (though the difference from the percent who were men is not statistically significant). Slightly less than a third of the contests are runaways. In the subsample of second-place players who satisfy the criterion $x_2 > 2x_1/3$, the percentage of those going high is over 90 percent.

While the means from the earlier years generally resemble the later values, there are three notable differences. First, fewer women appeared on the early

[8] Before discovering the archived data, we collected several seasons by hand, watching episodes of *Jeopardy!*

Table 1 Summary statistics for relevant variables

Variable	Mean	SD	Minimum	Maximum
Later data				
Bet in Final Jeopardy	6187	5078	0	60,013
First-place score entering Final Jeopardy	18,451	7747	4200	72,600
Second-place score entering Final Jeopardy	10,860	3718	−200	27,000
Third-place score entering Final Jeopardy	5723	3573	−7400	17,400
Game was a runaway	0.282	.450	0	1
Contestant responded correctly	0.473	0.499	0	1
Game eligible for betting high	0.512	0.500	0	1
Contestant bet high*	0.920	0.272	0	1
Percent of women on the panel	0.465	0.211	0	1
Contestant was a woman	0.465	0.499	0	1
Earlier data				
Bet in Final Jeopardy	3118	2277	0	24,000
First-place score entering Final Jeopardy	7869	2948	1500	27,500
Second-place score entering Final Jeopardy	4646	1965	−500	10,700
Third-place score entering Final Jeopardy	2096	1850	−5100	6800
Game was a runaway	0.304	0.460	0	1
Contestant responded correctly	0.503	0.500	0	1
Game eligible for betting high	0.482	0.500	0	1
Contestant bet high*	0.949	0.220	0	1
Percent of women on the panel	0.379	0.212	0	1
Contestant was a woman	0.372	0.484	0	1

*Conditional on the game's being eligible for the bet high/bet low distinction

Table 2 Key means for men and women

Variable	Men	Women
Later data		
Score entering Final Jeopardy	13,037	10,102
Bet in Final Jeopardy	6487	5836
Contestant bet high *	0.903	0.936
Earlier data		
Score entering Final Jeopardy	5238	4256
Bet in Final Jeopardy	3300	2810
Contestant bet high*	0.948	0.954

*Conditional on the game's being eligible for the bet high/bet low distinction

shows, which naturally led to a smaller percentage of women on any given panel. Second, scores were notably lower in the earlier shows. Most of the difference can be attributed to the doubling of dollar amounts in both the Jeopardy and the

Double Jeopardy rounds in 2001.[9] Finally, there are slightly more runaways, and consequently fewer games meet Metrick's criterion for strategic betting.

Table 2 breaks down several key variables by gender. A t-test shows that men have a higher score entering Final Jeopardy. Men also bet more than women do, but the probability of going high in Final Jeopardy does not differ significantly by sex.

Results

Recent Seasons

Our estimates of the determinants of bets in Final Jeopardy for recent seasons appear in Tables 3, 4, and 5. Table 3a, b shows the estimates for first-place contestants in runaway games, using dollar amounts (3a) and logarithms (3b). Table 4a, b do the same for bets by second-place contestants in games that are not runaways. Table 5a, b show the marginal effects of probit estimates for determinants of whether a second-place contestant goes high.[10] In each table, the first column shows results for our base model, the second column adds the controls from vector *X*, and the third column adds the interaction variables from vector *Z*. While one should not put too much emphasis on goodness of fit, the adjusted R^2 in the dollar amount tables 3a and 4a are more than twice the R^2 in the analogous logarithmic tables 3b and 4b, suggesting that the linear functional form is superior.

All three tables show little evidence that women are more risk averse than men, though some factors affect the confidence of women and men differently. The only direct impact of gender on betting behavior comes in Table 3a. When women lead in runaways, they initially bet more than men do, but the interaction of score with gender shows that this difference declines as the score entering Final Jeopardy rises. Women begin to bet less than men at $27,750, which is greater than the mean score entering Final Jeopardy.

Table 3a shows that an extra dollar in the first-place players' scores increases bets in Final Jeopardy by slightly less than $1; while, an increase in the second-place players' scores decreases bets by slightly more than $1. Perhaps because of the difference in scores, Table 3b shows that betting is strongly elastic with respect to the first-place player's score and roughly unitary elastic with respect to the second-place player's score.

The results in Table 4a, b are generally smaller in magnitude. A $1 increase in the second-place player's score increases the Final Jeopardy bet by from 25 to 50 cents, depending on the specification. A $1 increase in the first- or third-place player's score causes the second-place player to bet < 20 cents more. Table 4b shows these responses to be inelastic, particularly for the impact of the third-place player's score. This last result is consistent with our initial assumption that the second-place player

[9] Prize levels originally ranged from $100 to $500 in the Jeopardy round and from $200 to $1000 in the Double Jeopardy round. The amounts doubled on November 26, 2001.

[10] Underlying probits are available upon request.

Table 3 Bets by first-place contestants in runaways—(a) Linear (b) Logarithms

	Base model	Controls added	Interaction effects
(a)			
Contestant is a woman	200.4198 (0.34)	−133.2537 (−0.25)	6456.423*** (3.25)
Score entering final Jeopardy	0.7240*** (28.89)	0.8367*** (39.62)	0.8564*** (39.60)
Second Place Player's Score		−1.2494*** (−17.90)	−1.1883*** (17.02)
Player a defending champion		−568.1435 (−1.29)	−755.4227 (−1.45)
Answered correctly		1188.738*** (2.99)	1420.214*** (3.07)
Female host		822.043 (0.55)	1582.813 (0.91)
% of Women on panel		192.3719 (0.17)	576.2016 (0.42)
Interact woman with			
Score entering final Jeopardy			−0.2969*** (−4.23)
Player a defending champion			350.3771 (0.37)
Answered correctly			−884.38 (−1.01)
Female host			−3037.333 (−0.93)
% of Women on panel			−392.9062 (−0.16)
Adjusted R^2	0.6788	0.8191	0.8260
Observations	418	418	418
(b)			
Contestant is a woman	−0.09300 (−0.53)	−0.2566 (−1.32)	−0.0684 (−0.01)
Log of Score Entering Final Jeopardy	2.4288*** (12.14)	2.8877*** (12.69)	2.8664*** (12.38)
Log of 2nd place player's score		−0.9857*** (−6.54)	−0.9672*** (−6.37)
Player a defending champion		−0.1881 (−1.14)	−0.1166 (−0.59)
Answered correctly		0.3181** (2.19)	0.4439*** (2.61)
Female host		0.2528 (0.46)	0.7316 (1.22)
% of Women on panel		0.4883 (1.16)	−0.0665 (−0.13)
Interact woman with			
Log of score entering final Jeopardy			−0.3164 (−0.55)

Table 3 (continued)

	Base model	Controls added	Interaction effects
Player a defending champion			−0.4292 (−1.19)
Answered correctly			−0.4344 (−1.32)
Female host			−2.7128* (−1.83)
% of Women on panel			1.6229* (1.84)
Adjusted R^2	0.3025	0.3845	0.3937
Observations	366	364	364

t-statistics in parentheses for estimated coefficients

*Significant at 10%

**Significant at 5%

***Significant at 1%

is much more concerned about the player ahead of her than about the player behind her.

Table 5a, b shows the marginal effects of our probit estimates of the determinants of whether a second-place player goes high or low in Final Jeopardy. Neither the dollar amount specification (5a) nor the logarithmic specification (5b) shows any evidence that women go high or go low more than men. Again, the impact of scores is small in magnitude and corresponds to inelastic responses.

Our measures of confidence have roughly the anticipated impact. As expected, answering the Final Jeopardy question correctly frequently causes both women and men to bet more. Table 3a shows that answering correctly in Final Jeopardy is associated with an increase of $1,200 to $1,400 in the bet. However, the results in Table 3b show this to be a small percentage change.

Several interaction effects suggest that several factors affect women's bets differently from men's. Women who lead in runaways bet more when there are more women on the panel. In the logarithmic specification, women who are in second place in non-runaways are less affected than men by the anticipation of answering the Final Jeopardy question correctly. In both cases, however, this result is significant only at the ten percent level and is not replicated in the dollar amount equations.

Early Seasons

The estimates for our earlier data set appear in Tables 6a, b, 7a, b, 8a, b. They again show results for first-place contestants in runaways, second-place contestants in non-runaways, and second-place players who have the option of going high or low. While some differences exist between these results and those from over a generation later, our central finding—that women do not display greater risk aversion than men in their betting in Final Jeopardy—continues to hold.

Table 4 Bets by second-place contestants in non-runaways—(a) Linear (b) Logarithms

	Base model	Controls	Interaction effects
(a)			
Contestant is a woman	16.7019 (0.07)	127.6598 (0.42)	−1556.824 (−1.11)
Score entering final Jeopardy	0.5565*** (15.11)	0.3182*** (5.69)	0.2648*** (4.09)
1st place player's score		0.1853*** (4.59)	0.1847*** (4.57)
3rd place player's score		0.1859*** (5.20)	0.1865*** (5.20)
Player a defending champion		140.0294 (0.54)	−45.7110 (−0.13)
Answered correctly		292.7855 (1.21)	469.2906 (1.33)
Female host		−1242.905 (−1.61)	−1592.775 (−1.25)
% of Women on panel		−177.2703 (−0.22)	−416.0043 (−0.34)
Man in first place		−104.237 (−0.22)	−220.8428 (−0.50)
Interact with			
Score entering final Jeopardy			0.1156 (1.57)
Player a defending champion			328.9967 (0.63)
Answered correctly			−289.8366 (−0.59)
Female host			527.0821 (0.33)
% of Women on panel			371.7504 (0.23)
Man in first place			248.0324 (0.39)
Adjusted R^2	0.1758	0.2035	0.2016
Observations	1080	1080	1080
(b)			
Contestant is a woman	0.0264 (0.55)	0.0514 (0.83)	−1.9019 (−1.20)
Log of score entering Final Jeopardy	0.6991*** (8.63)	0.3917*** (3.11)	0.3108** (2.23)
Log of 1st place player's score		0.3798*** (2.91)	0.3577*** (2.71)
Log of 3rd place player's score		0.0756** (2.07)	0.0757** (2.07)
Player a defending champion		0.0352 (0.67)	−0.0220 (−0.30)
Answered correctly		0.0383 (0.77)	0.1401** (1.97)

Table 4 (continued)

	Base model	Controls	Interaction effects
Female host		−0.1690 (−1.08)	−0.1814 (−0.72)
% of Women on panel		−0.1177 (−0.73)	−0.2675 (−1.10)
Man in first place		−0.0224 (−0.35)	−0.0220 (−0.25)
Interact with			
Score entering final Jeopardy			0.2041 (1.21)
Player a defending champion			0.0911 (0.85)
Answered correctly			−0.1905* (1.92)
Female host			0.0106 (0.03)
% of Women on panel			0.2400 (0.73)
Man in first place			−0.0060 (−0.05)
Adjusted R^2	0.0639	0.0708	0.0708
Observations	1065	1030	1030

t-statistics in parentheses for estimated coefficients

*Significant at 10%

**Significant at 5%

***Significant at 1%

The results in Tables 6a, b roughly conform to those in 3a, b. The absolute responses follow the same pattern but are smaller in magnitude. The first-place players' bets were also elastic with respect to their own scores. However, bets were inelastic with respect to the second-place player's score. This result suggests that first-place contestants in runaways paid less attention to their opponents scores in the early years of the show.

The behavior of second-place players does not appear to be consistently more or less sensitive to scores in the early shows. A $1 increase in their own scores led second place players to bet 55 to 75 cents more in the early shows. The corresponding elasticities all fall in the inelastic range but range from statistically indistinguishable from 0 to being close to unitary elastic. A $1 increase in the first-place player's score had an impact that is comparable to later shows; it increased second-place players' bets by about 16 cents, with elasticities that ranged from statistically insignificant to almost 0.4. The dollar impact of the third-place player's score was again very small, corresponding to statistically insignificant elasticity.

If anything, the differences in the behavior of women and men are even smaller in the earlier data, as there are no statistically significant interaction effects,

Table 5 Marginal effects of probits for whether second-place player bets high—(a) Linear (b) Logarithms

	Base equation	Controls	Interaction
(a)			
Contestant is a woman	0.0365* (1.85)	0.0234 (0.98)	0.0816 (0.70)
Score entering final Jeopardy	$5.94(10)^{-6}$* (1.86)	0.00003*** (4.99)	0.0003*** (4.55)
1st Place player's score		−0.00003*** (−5.33)	−0.00003*** (−5.34)
3rd Place player's score		$4.65(10)^{-6}$ (1.63)	$4.78(10)^{-6}$* (1.69)
Player a defending champion		0.0023 (0.12)	0.0272 (1.01)
Answered correctly		0.0277 (1.45)	0.0482* (1.83)
Female host		−0.0536 (−1.02)	0.0208 (0.24)
% of Women on panel		0.0206 (0.33)	0.0876 (0.99)
Man in first place		0.0311 (1.31)	0.0328 (1.08)
Interact with			
Score entering final jeopardy			$2.33(10)^{-6}$ (0.37)
Player a defending champion			−0.0558 (−1.38)
Answered correctly			−0.0472 (−1.22)
Female host			−0.1416 (−1.28)
% of Women on panel			−0.0967 (−0.77)
Man in first place			0.0027 (0.06)
X^2	6.52 (0.0384)	47.53 (0.00)	54.52 (0.00)
Observations	771	771	771
(b)			
Contestant is a woman	0.2443* (1.83)	0.0282 (1.18)	0.1788 (0.26)
Log of score entering Final Jeopardy	0.4364* (1.74)	0.4545*** (5.56)	0.4554*** (5.17)
Log of 1st place player's score		−0.4512*** (5.60)	−0.4506*** (−5.61)
Log of 3rd place player's score		0.0029 (0.20)	0.0026 (0.18)
Player a defending champion		0.0063 (0.31)	0.0265 (0.98)

Table 5 (continued)

	Base equation	Controls	Interaction
Answered correctly		0.0360* (1.86)	0.0545** (2.03)
Female host		−0.0597 (−1.18)	0.0096 (0.12)
% of Women on panel		−0.0120 (−0.19)	0.0700 (0.80)
Man in first place		0.0257 (1.09)	0.0261 (0.86)
Interact with			
Log of score entering final Jeopardy			−0.0058 (−0.08)
Player a defending champion			−0.0408 (−1.00)
Answered correctly			−0.0431 (−1.11)
Female host			−0.1319 (−1.24)
% of Women on panel			−0.1334 (−1.06)
Man in first place			0.0050 (0.11)
X^2—prob value in parentheses	5.95 (0.0512)	49.99 (0.00)	56.56 (0.00)
Observations	771	750	750

t-statistics in parentheses for estimated coefficients

Prob value in parentheses for X^2

*Significant at 10%

**Significant at 5%

***Significant at 1%

though the interaction of being a woman and answering the Final Jeopardy question correctly comes close in Table 7b (t = 1.63). While having a man in first place diminished the bets of second-place contestants, this result holds for all second-place contestants, not just for women.

The results in Table 8a, b show that none of the factors affected whether second-place contestants went high or low in the early years of the show. This is in contrast with the more recent data, for which the scores of the three players had significant impacts, though gender did not.

We again see that greater confidence often affects the betting behavior of both men and women. Answering the Final Jeopardy question correctly leads to higher bets for women and men, though only for second-place players. First-place players bet more when they are defending champions, which is also a measure of confidence, though it does have a negative impact in one of the logarithmic

Table 6 Old data first-place runaways—(a) Linear (b) Logarithms

	Basic model	Controls	Interaction effects
Contestant is a woman	53.1920 (0.68)	463.9075 (1.22)	151.1684 (0.12)
Score entering final Jeopardy	0.4519*** (9.41)	0.5840*** (12.44)	0.5511*** (10.46)
Second place player's score		−0.7399*** (−6.18)	−0.7230*** (−6.03)
Player a defending champion		1224.915*** (3.82)	1193.305*** (3.11)
Answered correctly		40.4958 (0.14)	117.6016 (0.34)
% of Women on panel		145.0328 (0.18)	855.6302 (0.82)
Interact woman with			
Score entering final Jeopardy			0.1569 (1.57)
Player a defending champion			278.5204 (0.40)
Answered correctly			−268.5735 (−0.39)
% of Women on panel			−2505.165 (−1.44)
Adjusted R^2	0.3700	0.5532	0.8542
Observations	149	141	298
(b)			
Contestant is a woman	−0.2590 (−1.52)	−0.0898 (−0.51)	−2.2783 (−0.61)
Log of score entering final Jeopardy	1.7054*** (8.10)	2.1681*** (10.14)	2.0878*** (8.04)
Log of 2nd place player's score		−0.7008*** (−4.93)	−0.6904*** (−4.77)
Player a defending champion		0.5430*** (3.70)	0.6387*** (3.66)
Answered correctly		−0.0075 (−0.06)	0.0088 (0.06)
% of Women on panel		0.3177 (0.85)	0.7595 (1.63)
Interact woman with			
Log of score entering final Jeopardy			0.3182 (0.77)
Player a defending champion			−0.2161 (−0.65)
Answered correctly			−0.0166 (−0.05)
% of Women on panel			−1.2565 (−1.57)
Adjusted R^2	0.3254	0.4819	0.4808
Observations	144	134	134

Table 6 (continued)

t-statistics in parentheses for estimated coefficients

*Significant at 10%

**Significant at 5%

***Significant at 1%

specifications for second-place players. Here, though, the insignificance of the interaction effects shows that none of the factors affect women differently from men.

Conclusion

Gender differences in attitudes toward risk can severely handicap women in the labor market. While many studies have found that men and women view risk differently, recent research has raised questions about the labor market impact of such differences. If, for example, women are more risk averse than men only when they operate in a domain in which they feel themselves less expert, then women who choose to be in that domain should not behave differently from men.

This paper uses wagers in the Final Jeopardy segment of the gameshow *Jeopardy!* to test whether women who choose to compete with men behave differently from men. Applicants to appear on *Jeopardy!* must first pass a series of rigorous tests. Unlike experimental studies, the subjects of this study clearly self-select into the sample.

We use three different tests of betting behavior in Final Jeopardy. The first examines the behavior of first-place contestants in games that are runaways. The second looks at second-place contestants in games that are not runaways. The third looks at second-place players in non-runaways in which the second-place player's score is at least 2/3 that of the first-place player. In this situation, the second-place player has the option of going low by placing a small bet or going high by placing a large bet. All three tests indicate that women are not more risk averse than men in this setting. Moreover, this finding also held true forty years ago.

Our results also show that confidence plays a role in the betting decisions of men and women. Answering the Final Jeopardy question correctly is almost uniformly associated with higher bets for both men and women. In one case—first-place players in the 1980s—we find that being a defending champion positively affected one's wagers.

Our interaction effects reveal only a few differences between the sexes. In general, these pertain to the settings in which women find themselves. Moreover, these effects are sporadic, showing no clear pattern by player, specification, or time period. Most notably, we find only one setting (the log-log specification for second-place players in the more recent data) in which giving the correct answer—our main proxy for confidence—had a smaller effect for women.

Our findings thus provide added evidence for recent claims that, while women might be more risk averse overall, women who self-select into specific activities or

Table 7 Old data second-place non-runaways—(a) Linear (b) Logarithms

	Base model	Controls	Interaction effects
Contestant is a woman	−162.4931 (−0.86)	10.4141 (0.04)	−503.6629 (−0.43)
Score entering final Jeopardy	0.7580*** (15.19)	0.5844*** (6.53)	0.5535*** (5.86)
1st place player's score		0.1562** (2.29)	0.1553** (2.27)
3rd place player's score		−0.0547 (−1.02)	−0.0362*** (−1.16)
Player a defending champion		−93.9331 (−0.46)	97.9584 (0.41)
Answered correctly		181.1751*** (2.87)	586.7469*** (2.68)
% of Women on panel		−330.1976 (−0.58)	−293.3776 (−0.42)
Man in first place		−563.0397** (−2.25)	−652.8569** (−2.31)
Interact with			
Score entering final Jeopardy			0.1292 (1.07)
Player a defending champion			−672.0559 (−1.44)
Answered correctly			−179.6614 (−0.46)
% of Women on panel			−27.1345 (−0.02)
Man in first place			161.2025 (0.26)
X^2	0.4075	0.4160	0.4136
Observations	341	319	319
(b)			
Contestant is a woman	−0.1000 (−0.91)	−0.0326 (−0.22)	−0.2497 (−0.83)
Log of score entering final Jeopardy	0.7670*** (5.33)	0.2978 (0.93)	0.2616* (1.76)
Log of 1st place player's score		0.5302 (1.61)	0.3976*** (2.80)
Log of 3rd place player's score		−0.0074 (−0.09)	0.0638 (1.63)
Player a defending champion		−0.2427* (−1.84)	−0.0558 (−0.71)
Answered correctly		0.3069*** (2.60)	0.2057*** (2.68)
% of Women on panel		−0.2372 (−0.63)	−0.3321 (−1.30)
Man in first place		−0.2602 (−1.60)	−0.0250 (−0.26)

Table 7 (continued)

	Base model	Controls	Interaction effects
Interact with			
Score entering final Jeopardy			0.00003 (1.63)
Player a defending champion			0.0652 (0.57)
Answered correctly			−0.1436 (−1.35)
% of Women on panel			0.1762 (0.51)
Man in first place			0.0071 (0.05)
Adjusted R^2	0.0766	0.0730	0.0888
Observations	339	290	823

t−statistics in parentheses for estimated coefficients

*Significant at 10%

**Significant at 5%

***Significant at 1%

occupations will behave no differently from men. We see no evidence of greater risk aversion by women in Final Jeopardy. While we find some evidence that women bet more heavily when conditions make them more confident, this evidence is neither strong nor uniform. We therefore conclude that in settings like Final Jeopardy, where women self-select to participate, they do not behave significantly differently from men.

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References

Banko, Lauren, Eva Marikova Leeds, and Michael A. Leeds. 2016. Gender Differences in Response to Setbacks: Evidence from Professional Tennis. *Social Science Quarterly* 97(2): 161–176.

Belzil, Christian, and Michael Bognanno. 2008. The Promotion Dynamics of American Executives. *Journal of Labor Economics* 26(2): 287–310.

Table 8 Old data—bet high—(a) Linear (b) Logarithms

	Base model	Controls	Interaction effects
Contestant is a woman	0.0059 (0.18)	0.0261 (0.67)	−0.1150 (0.00)
Score entering final Jeopardy	$-5.63(10)^{-6}$ (−0.71)	0.00001 (0.70)	$9.31(10)^{-6}$ (0.47)
1st Place player's score		−0.00002 (−1.01)	−0.00001 (−0.64)
3rd Place player's score		$-8.53(10)^{-6}$ (−0.97)	$-7.47(10)^{-6}$ (−0.90)
Player a defending champion		−0.0475 (−1.55)	−0.0082 (−0.26)
Answered correctly		0.0317 (1.06)	0.0234 (0.79)
% of Women on panel		−0.0761 (−0.77)	−0.1343 (−1.29)
Man in first place		−0.0589 (−1.39)	−0.0614 (−1.46)
Interact with			
Score entering final Jeopardy			−0.00002 (−0.66)
Player a defending champion			−0.5020 (−0.02)
Answered correctly			0.1107 (1.26)
% of Women on panel			1.5256 (0.01)
Man in first place			
X^2	0.55 (0.7587)	8.54 (0.3827)	19.33 (0.1133)
Observations	237	220	220
(b)			
Contestant is a woman	0.0062 (0.19)	0.0252 (0.60)	1.3802 (0.01)
Log of score entering final Jeopardy	−0.3352 (−0.74)	0.1119 (0.79)	0.0808 (0.59)
Log of 1st place player's score		−0.1594 (−1.04)	−0.1002 (−0.68)
Log of 3rd place player's score		−0.0148 (−0.60)	−0.1963 (−0.82)
Player a defending champion		−0.0504 (−1.52)	−0.0072 (−0.21)
Answered correctly		0.0342 (1.06)	0.0264 (0.83)
% of Women on panel		−0.0654 (−0.61)	−0.1327 (−1.19)
Man in first place		−0.0578 (−1.27)	−0.0636 (−1.43)
Interact with			

Table 8 (continued)

	Base model	Controls	Interaction effects
Log of score entering final Jeopardy			−0.1911 (−0.82)
Player a defending champion			−0.5595 (−0.02)
Answered correctly			0.1170 (1.17)
% of Women on panel			1.6978 (0.01)
Man in first place			0.1490 (0.00)
X^2	0.61 (0.7367)	7.87 (0.4460)	19.03 (0.1222)
Observations	237	201	201

t-statistics in parentheses for estimated coefficients prob value in parentheses for X^2

*Significant at 10%

**Significant at 5%

***Significant at 1%

Bengtsson, Claes, Mats Persson, and Peter Willenhag. 2005. Gender and Overconfidence. *Economics Letters* 86(2): 199–203.
Bognanno, Michael L. 2001. Corporate Tournaments. *Journal of Labor Economics* 19(2): 290–315.
Booth, Alison, Lina Cardona-Sosa, and Patrick Nolen. 2014. Gender Differences in Risk Aversion: Do Single-Sex Environments Affect their Development? *Journal of Economic Behavior & Organization* 99: 126–154.
Booth, Alison, Lina Cardona-Sosa, and Patrick Nolen. 2012. Choosing to Compete: How Different are Girls and Boys? *Journal of Economic Behavior & Organization* 81(2): 542–555.
Briel, Stephanie, Aderonke Osikominu, Gregor Pfeifer, Mirjam Reutter, and Sascha Satlukal. 2020. Overconfidence and Gender Differences in Wage Expectations, *IZA Discussion Paper 13157,* July.
Brodeur, Nicole. 2017. Here's how contestants get picked for 'Jeopardy!' *Toronto Star.* August 2, online at Here's how contestants get picked for 'Jeopardy!' | The Star.
Croson, Rachel, and Uri Gneezy. 2009. Gender differences in preferences. *Journal of Economic Literature* 47(20): 448–474.
Gupta, Datta, Anders Poulsen Nabanita, and Marie Claire Villeval. 2013. Gender Matching and Competitiveness: Experimental Evidence. *Economic Inquiry* 51(1): 816–835.
DeVaro, Jed. 2006. Internal Promotion Competitions. *Rand Journal of Economics* 37(3): 521–542.
Halko, Marja-Liisa., Markku Kaustia, and Elias Alanko. 2012. The Gender Effect in Risky Asset Holdings. *Journal of Economic Behavior & Organization* 83(1): 66–81.
J! Archive. 2023. *J! Archive*, online at J! Archive (j-archive.com).
Jetter, Michael, and Jay Walker. 2017. Anchoring in Financial Decision-Making: Evidence from *Jeopardy!*. *Journal of Economic Behavior & Organization* 141: 164–176.
Lindquist, Gabriella, and Jenny Säve-Soderbergh. 2011. "Girls will be Girls", Especially Among Boys: Risk-Taking in the "Daily Double" on *Jeopardy!*. *Economics Letters* 112(2): 158–160.
Metrick, Andrew. 1995. A Natural Experiment in "Jeopardy!" *American Economic Review* 85(1): 240–253.
Niederle, Muriel, and Lise Vesterlund. 2007. Do Women Shy Away from Competition? Do Men Compete Too Much? *Quarterly Journal of Economics* 122(3): 1067–1101.
Sarin, Rakesh, and Alice Wieland. 2016. Risk Aversion for Decisions Under Uncertainty: Are There Gender Differences? *Journal of Behavioral and Experimental Economics* 60: 1–8.

Wieland, Alice, and Rakesh Sarin. 2012. Domain Specificity of Sex Differences in Competition. *Journal of Economic Behavior & Organization.* 83(1): 151–157.