Gender differences in competitiveness and risk-taking among children, teenagers, and college students: Evidence from Jeopardy!

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Australian Gender Economics Workshop

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Research questions

Studies show that...

1. women (sometimes) like competition less than men
   [this evidence is not as consistent]
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2. women are more risk-averse than men
   [this is pretty universal across studies]
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2. women are more risk-averse than men
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3. the gender of opponents could influence both patterns
   (e.g., see Alison Booth’s studies with Patrick Nolan and others)
Our specific research questions

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Our specific research questions

We ask 3 questions:

1. At what age (if any) do we observe gender differences in *competitiveness*?
2. At what age (if any) do we observe gender differences in *risk-taking*?
3. Does the gender of opponents influence competitiveness and risk-taking at young ages?
Our data: Jeopardy shows in the US since 1984

*Jeopardy!*

- Game show where 3 contestants compete against each other to answer up to 61 ‘clues’ in 3 rounds of play.
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*Jeopardy!*

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- Clue values $200, $400, $600, $800, and $1,000 in the first 30 clues, then doubled for the next 30 (*Final Jeopardy!* at the end ignored here for various reasons)
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- Clue values $200, $400, $600, $800, and $1,000 in the first 30 clues, then doubled for the next 30 (*Final Jeopardy!* at the end ignored here for various reasons)
- Whoever has the highest score at end of episode takes $$$ home and comes back next episode
Setup

Gender differences in competitiveness & risk-taking
Importantly:

There are episodes exclusively for kids (aged 10-12), teenagers (aged 13-17), and undergraduate college students.
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We measure **competitiveness** by (i) winning an episode, (ii) choosing to answer a clue (‘buzzing in’), and (iii) answering correctly.

**Risk-taking:** wager in *Daily Double* clues.
Data, Identification, and Shortcomings

**Data:** We accessed the *J!Archive* website and hired a programmer to ‘scrape’ all available episodes with full info on each clue, contestants’ names, etc.

**Sample:** 62 kids, 202 teenager, 188 college student episodes.
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Shortcomings: Self-selection on the show – contestants may not be representative of the average female or male in society. [similar in lab experiments?]
Likelihood to win episode for female

Likelihood to win episode for male

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Likelihood to answer correctly for female

Likelihood to answer correctly for male

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Gender differences in competitiveness & risk-taking
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Wager as % of maximum

<table>
<thead>
<tr>
<th>Age group</th>
<th>Kids</th>
<th>Teenagers</th>
<th>College students</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wager female</td>
<td>0.28</td>
<td>0.31</td>
<td>0.34</td>
<td>0.37</td>
</tr>
<tr>
<td>Wager male</td>
<td>0.28</td>
<td>0.31</td>
<td>0.34</td>
<td>0.37</td>
</tr>
</tbody>
</table>
## Winning episode and answering

| Dependent variable: | Kids | | | | | | Teenagers | | | | | | College students |
|---------------------|------|------|------|------|------|------|-----------------|------|------|------|------|------|-----------------|------|------|------|
|                     | (1)  | (2)  | (3)  | (4)  | (5)  | (6)  | Winning episode | Answering | Winning episode | Answering | Winning episode | Answering |
| Female              | -0.066 | -0.023* | -0.042 | -0.010 | -0.077* | -0.011 | (0.070) | (0.013) | (0.039) | (0.007) | (0.041) | (0.007) |
| Control variables\(a\) | yes | | yes | | yes | | | | | | | |
| \# of players       | 186 | 186 | 310 | 310 | 299 | 299 | | | | | | |
| \# of episodes      | 62 | 62 | 202 | 202 | 188 | 188 | | | | | | |
| \(N\)               | 186 | 10,878 | 606 | 36,813 | 561 | 34,185 | | | | | | |

**Notes:** Standard errors clustered on the player level are displayed in parentheses. * \(p < 0.10\), ** \(p < 0.05\), *** \(p < 0.01\).

\(a\)Includes binary indicators for black and other non-white races, as well as STEM clues and the 20 most common categories, the \$\ value of the clue, and the account balance of the contestant (both individual and relative to their opponents).
### Data

#### Results

<table>
<thead>
<tr>
<th></th>
<th>Kids</th>
<th>Teenagers</th>
<th>College students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Answering correctly</td>
<td>Wager</td>
<td>Answering correctly</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>0.015</td>
<td>0.030</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.042)</td>
<td>(0.007)</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td># of players</td>
<td>186</td>
<td>124</td>
<td>310</td>
</tr>
<tr>
<td># of episodes</td>
<td>62</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>N</td>
<td>3,716</td>
<td>182</td>
<td>12,824</td>
</tr>
</tbody>
</table>

**Notes:** Standard errors clustered on the player level are displayed in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

\[a\] Includes binary indicators for black and other non-white races, as well as STEM clues and the 20 most common categories, the $ value of the clue, and the account balance of the contestant (both individual and relative to their opponents).
The gender of opponents: Females

Since contestants cannot choose the gender of their opponents, we can test whether they compete or wager differently when competing against the other gender.
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The number of male opponents is not a statistically significant predictor of females’ competitiveness or risk-taking. The same when forming binary variables for 1 or 2 male opponents.
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This result prevails for kids, teenagers, and college students in our sample.
The gender of opponents: Males

No differences in winning episode and choosing to answer.
No differences in winning episode and choosing to answer. But:

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Kids</th>
<th>Teenagers</th>
<th>College students</th>
</tr>
</thead>
<tbody>
<tr>
<td># of female opponents</td>
<td>0.019</td>
<td>-0.049</td>
<td>-0.014**</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.057)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Control variables(^a)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td># of players</td>
<td>97</td>
<td>64</td>
<td>157</td>
</tr>
<tr>
<td># of episodes</td>
<td>62</td>
<td>49</td>
<td>189</td>
</tr>
<tr>
<td>N</td>
<td>1,968</td>
<td>91</td>
<td>7,153</td>
</tr>
</tbody>
</table>

Notes: Standard errors clustered on the player level are displayed in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.
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What can we learn?

Takeaways:

- No gender differences in competitiveness among kids, teenagers, and college students in *Jeopardy*!
- Males begin to wager (= risk) substantially more as they become teenagers, leading to the emergence of the gender gap. Magnitude: teenage girls wager 7.3 percentage points less of their maximum wager than teenage boys ($\approx$ $451$).
- Surprisingly, gender of opponents doesn’t matter for young females.
- Male teenagers and college students wager substantially less when competing against females.