Impact of Hormonal Contraceptive Use on Women's Social and Financial Decision-Making: A Multi-Study Investigation
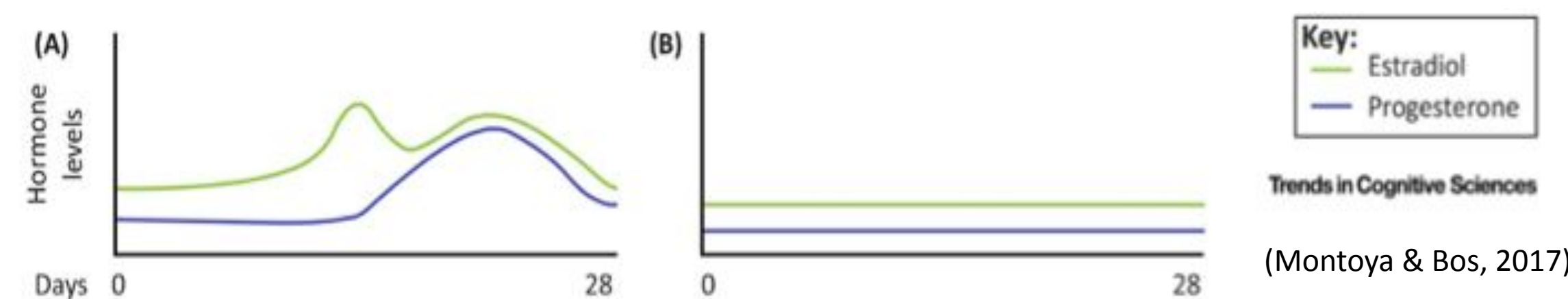
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BACKGROUND

- **At least 500 million women alive across the world today** are hormonal contraceptive users, with the drug being prescribed for reversible contraceptive purposes and their beneficial effects in some gynecological pathologies
- Hormonal contraceptive (HC) users experience **neurophysiological changes that could alter both the structure of their brain, as well as the function of numerous areas of the brain** pertaining to cognition and emotion, and therefore may influence decision-making outcomes.
- Through a negative feedback loops within the hypothalamic-pituitary-gonadal axis, the ovarian hormones present in **HCs suppress endogenous estradiol and progesterone fluctuations (see graph below).**

Key: Estradiol / Progesterone
Trends in Cognitive Sciences
(Montoya & Bos, 2017)

- This **HC-related suppression in ovarian hormones is in turn posited to also impact decision-making outcomes** that would otherwise be associated with and mediated by naturally fluctuating hormone levels
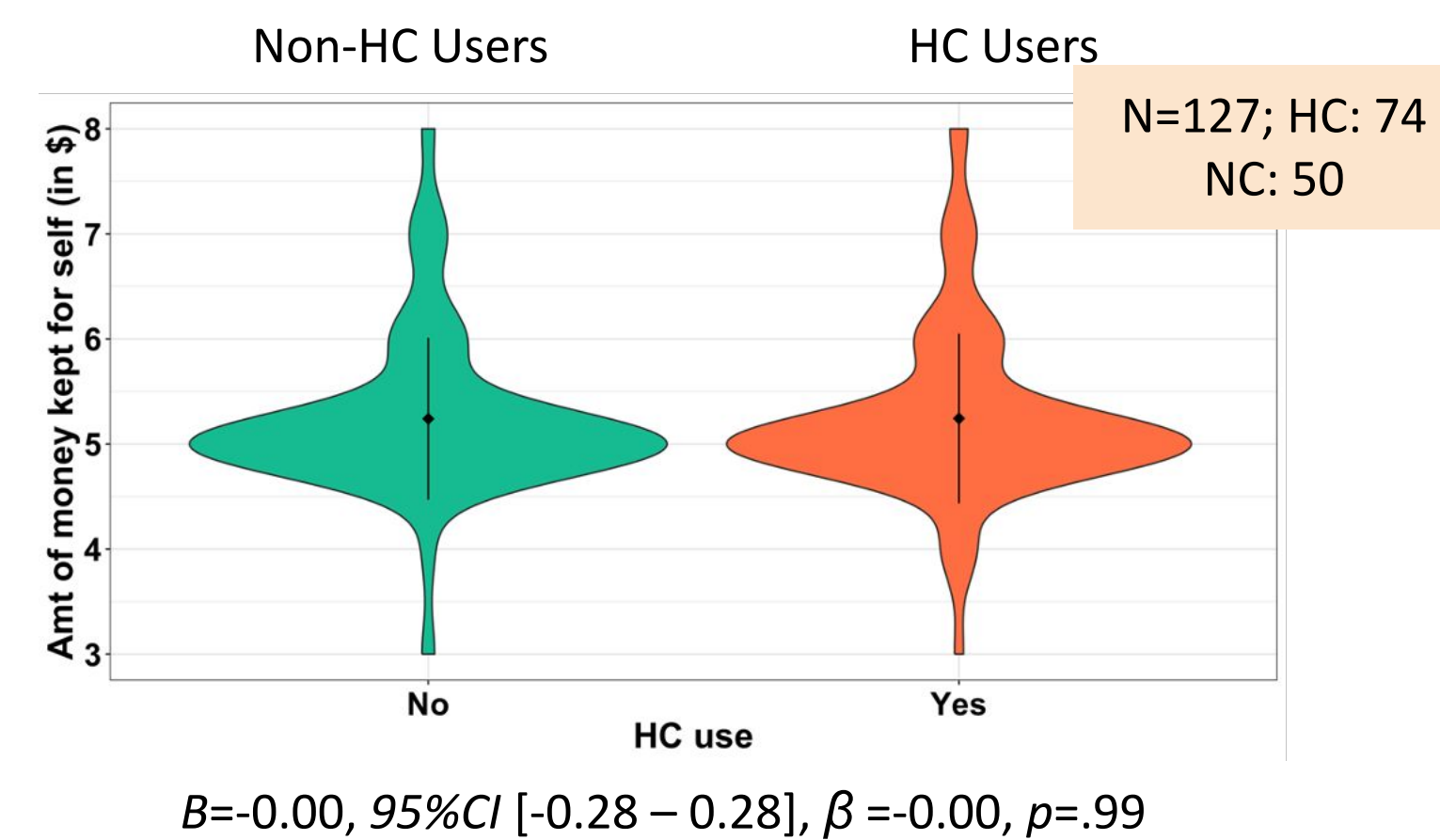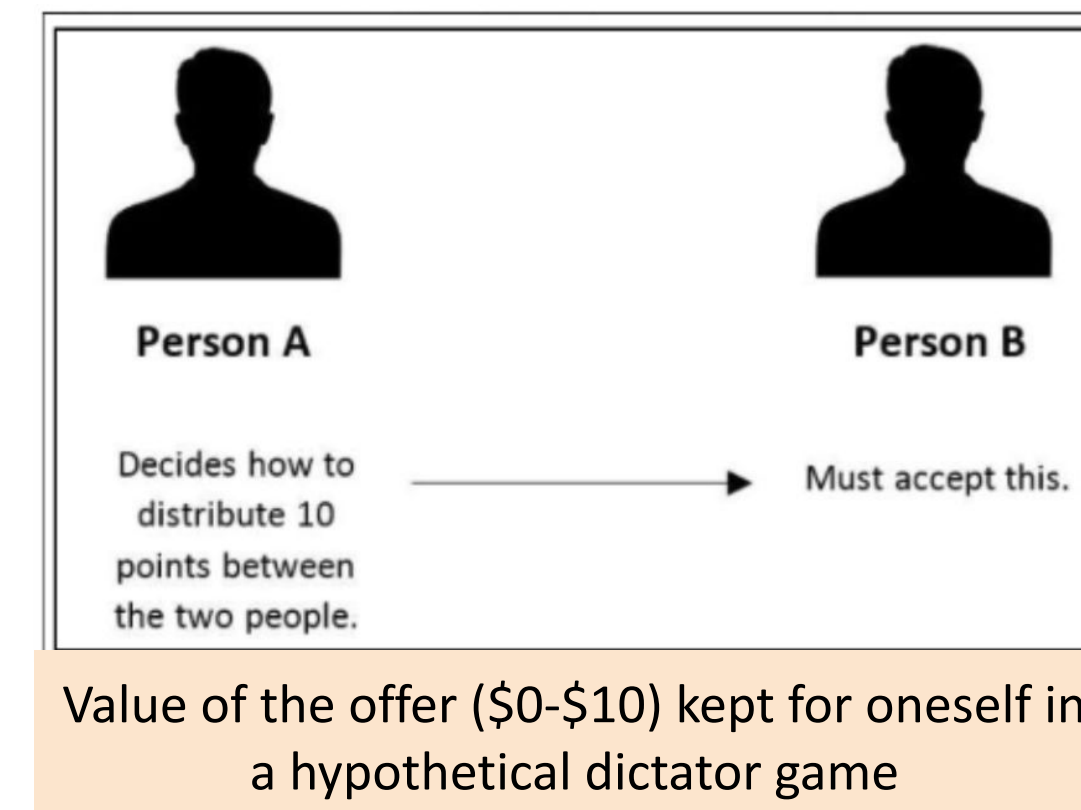
OBJECTIVES

- This research aims to investigate whether **hormonal contraceptive use impacts women's social and financial decision-making** across the domains of resource allocation competitive decision-making, negotiations, and risk-taking.

METHODS

- We **used a broad categorization of HC users** to include those using oral pills, patches, vaginal rings, and hormonal IUDs. We compared this group to participants **not using contraceptives or using non-hormonal methods**.
- Participants who identified as biologically female were included (**Total N=422; *M Age*=20.25; *SD*=4.48**).
- The outcomes of the following decision-making tasks, across five studies, were analysed for this study: Resource Allocation (Dictator Game Decisions, UG Decisions), Competitive Decision-making, Risk-taking, and Integrative Job Negotiations.

METHODS & RESULTS

Dictator Game Decisions

Value of the offer ($0-$10) kept for oneself in a hypothetical dictator game

N=127; HC: 74 NC: 50

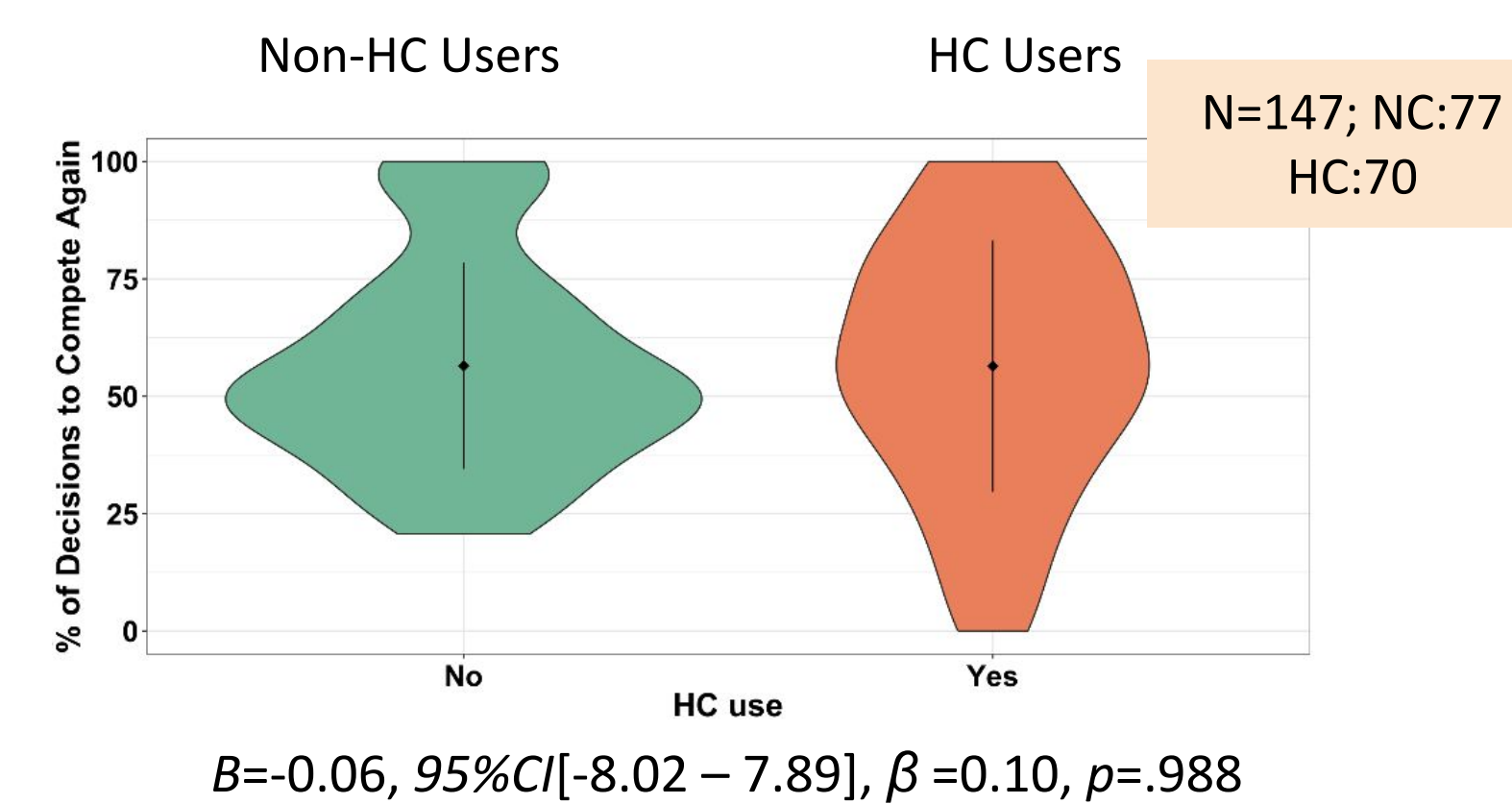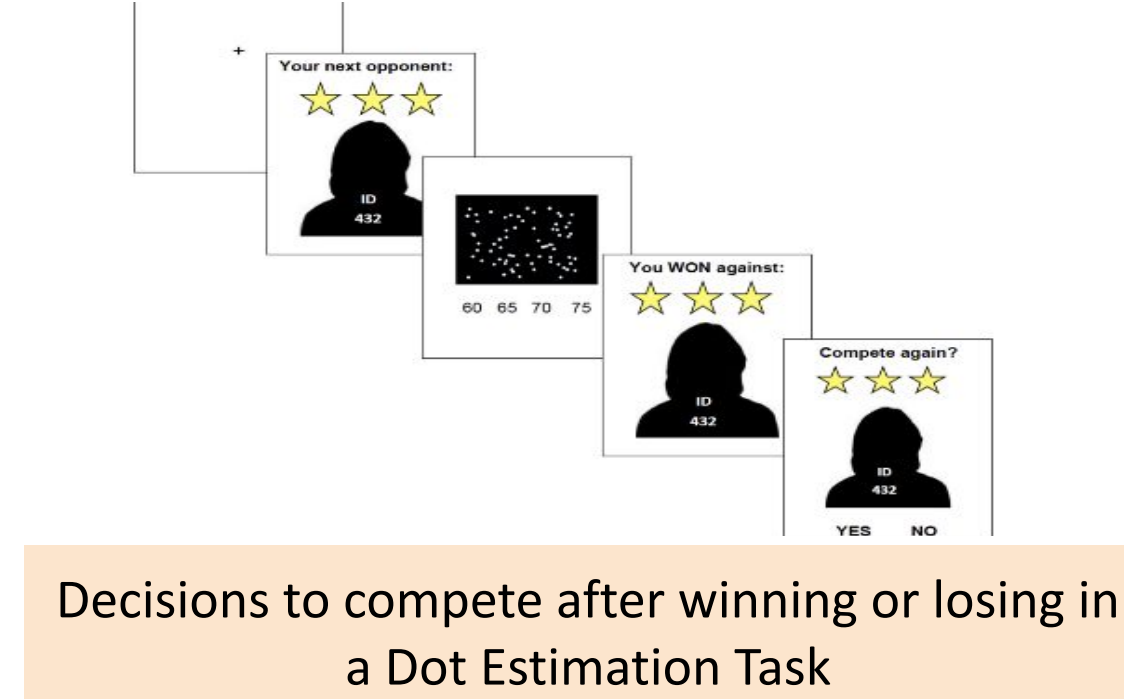*B*=-0.00, 95%CI [-0.28 – 0.28], β =-0.00, *p*=.99

Ultimatum Game Rejections

"Opponent was given $10 and they decided to make you an offer of $3 (out of the $10). If you decided to accept this offer, then the proposer would receive $7 and you- $3. If a you decide to reject the offer, then both you and the proposer will not receive any money - $0 for the proposer and $0 for you. Please indicate your decision to accept or reject the offer."
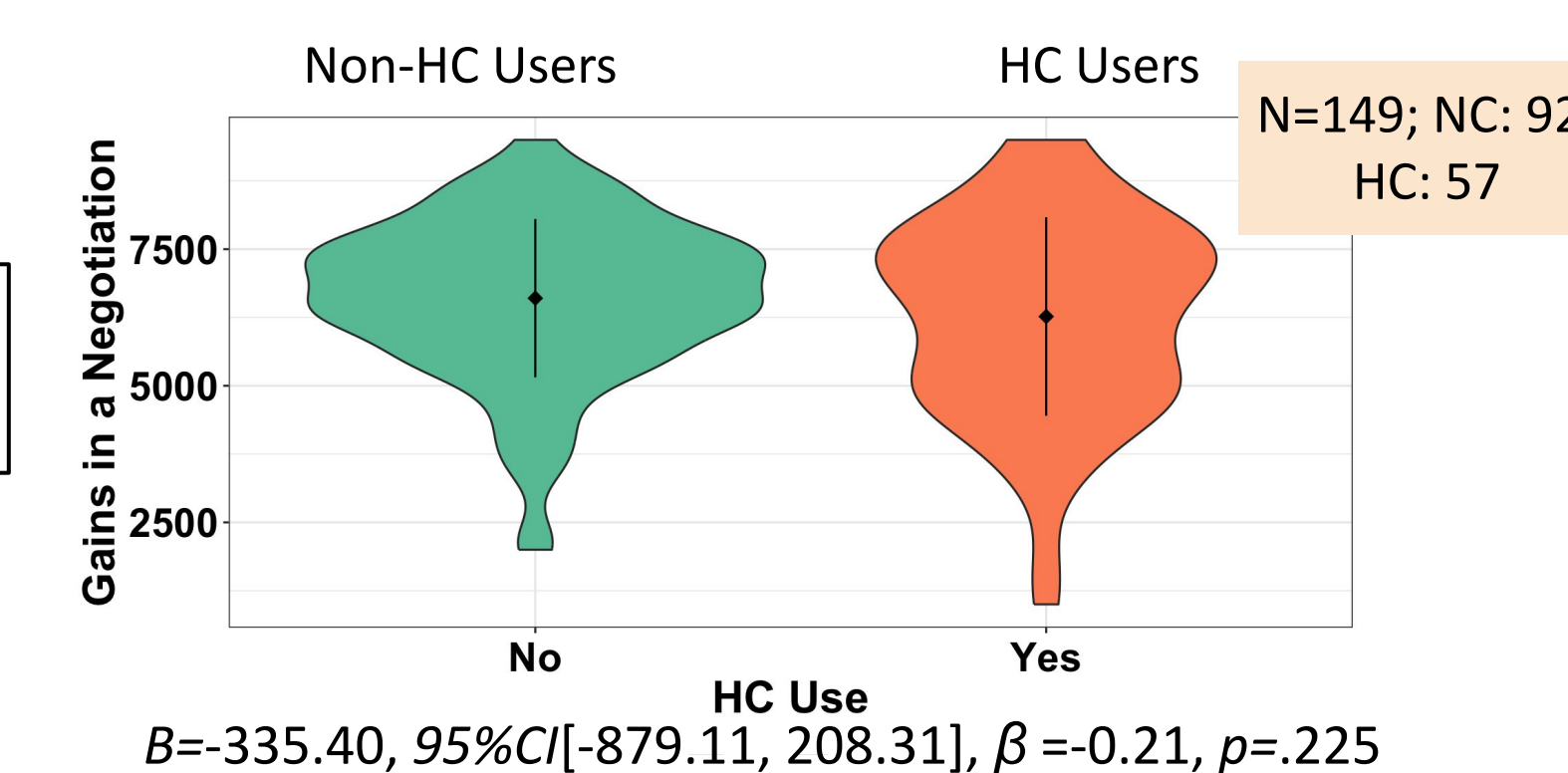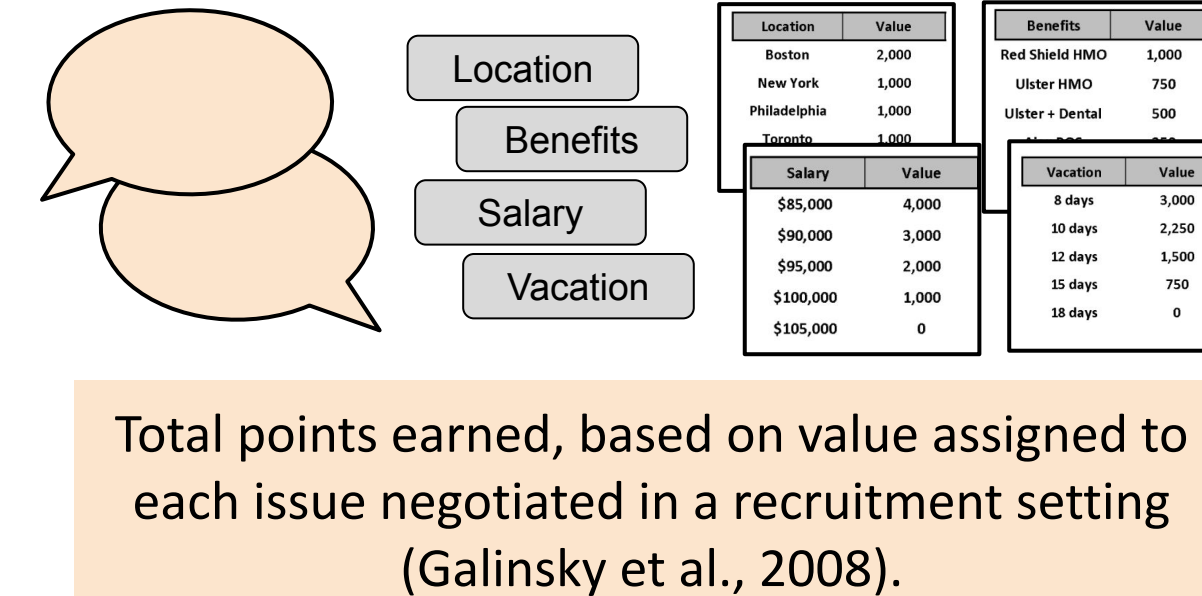
	No HC Use	HC Use
Accept the Offer	29	24
Reject the Offer	14	19

χ^2= 0.79, *p*=.375
OR :1.64, 95%CI[0.69-4.00], *p*=.269

Decisions to Compete

Decisions to compete after winning or losing in a Dot Estimation Task

N=147; NC:77 HC:70

B=-0.06, 95%CI[-8.02 – 7.89], β =0.10, *p*=.988

Integrative Job Negotiation

Total points earned, based on value assigned to each issue negotiated in a recruitment setting (Galinsky et al., 2008).

N=149; NC: 92; HC: 57

B=-335.40, 95%CI[-879.11, 208.31], β =-0.21, *p*=.225

Risk Attitude (Holt & Laury Task)
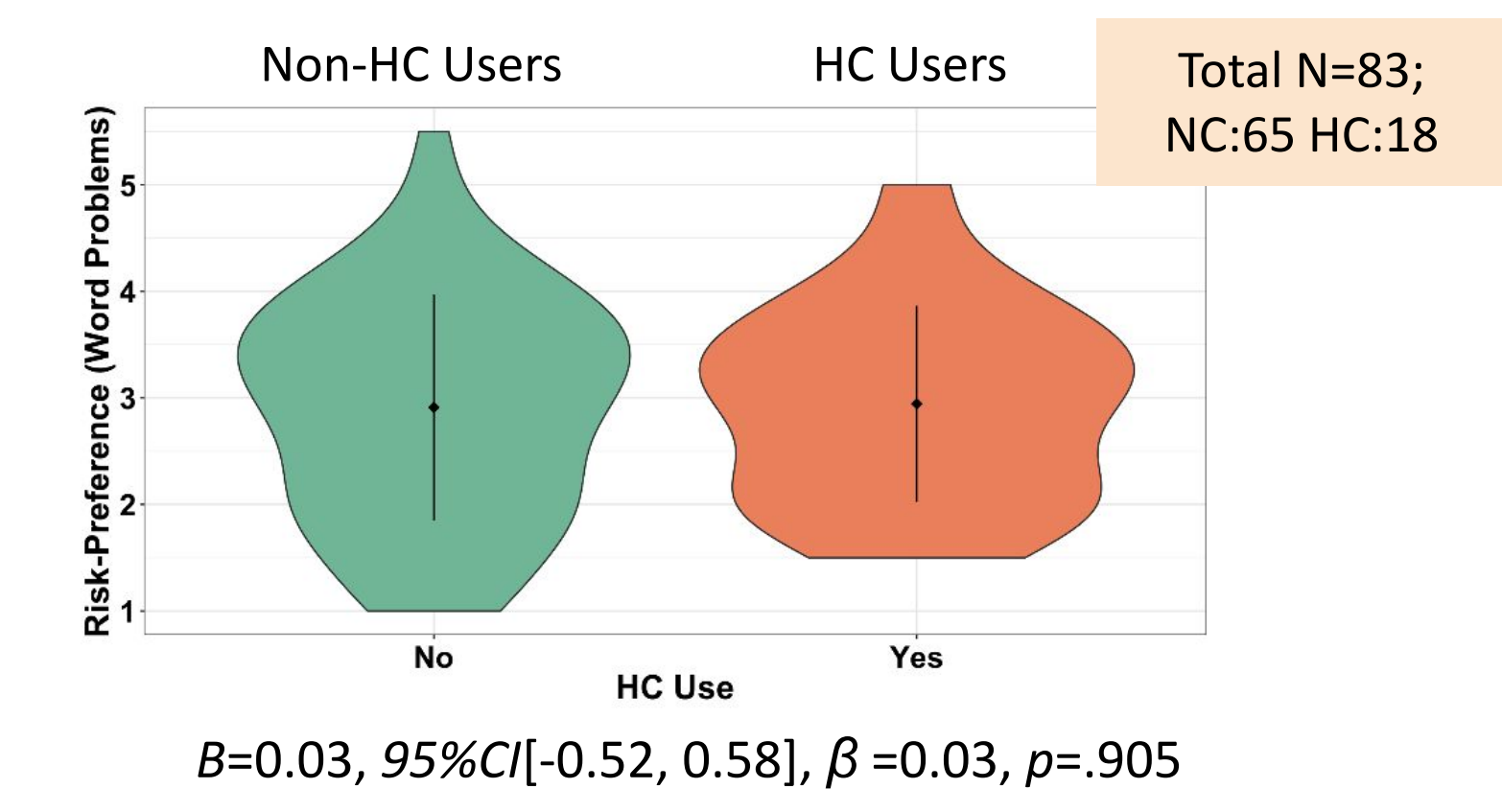

Risk attitude assessed through a series of binary-choice lotteries with varying payoffs and probabilities (Holt & Laury, 2002)

N=139; HC:75 NC:64

B=-0.27, 95%CI[-0.83, 0.28], β =-0.17, *p*=.330

Risk Preference (Gambles)
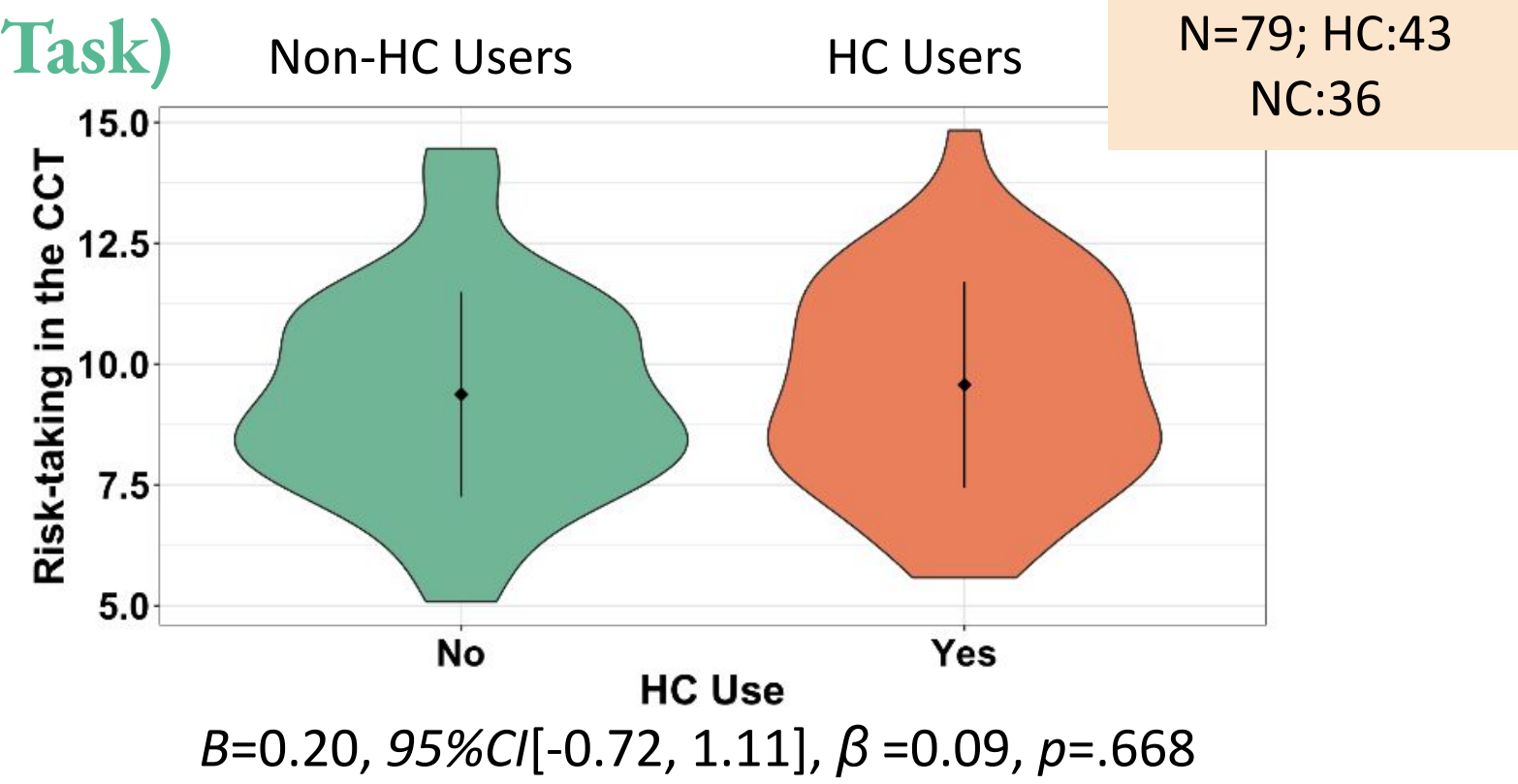

Risk preferences measured via a graded choice between a safe vs. risky option with equal expected value (Bruin et. al., 2007)

Total N=83; NC:65 HC:18

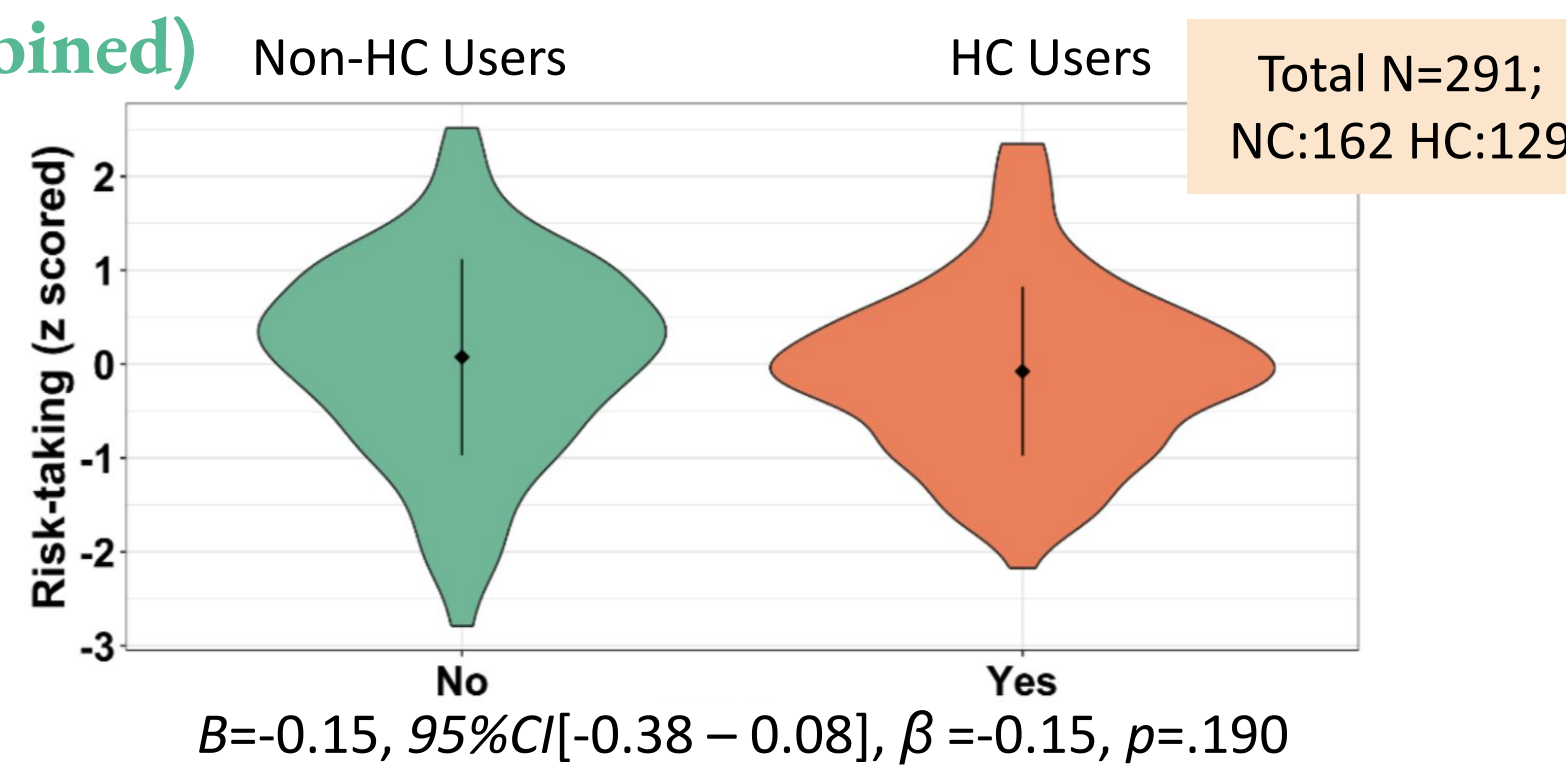*B*=0.03, 95%CI[-0.52, 0.58], β =0.03, *p*=.905

Risk Taking (Columbia Card Task)

Risk-taking was measured via decisions to flip cards under varying conditions of risk and uncertainty (Figner et al., 2009)

N=79; HC:43 NC:36

B=0.20, 95%CI[-0.72, 1.11], β =0.09, *p*=.668

Risk-Taking Measures (Combined)

Combined analysis of Risk Taking:
Risk-attitudes in the Holt and Laury task,
Risk-preferences between a risky vs. safe option,
& Risk-taking in the Columbia Card Task

Total N=291; NC:162 HC:129

B=-0.15, 95%CI[-0.38 – 0.08], β =-0.15, *p*=.190

MAIN FINDING

- HCs have **little to no direct effects** on social and financial decision-making, specifically in resource allocation, negotiation gains, competitive decision-making, and risk-taking

DISCUSSION & IMPLICATIONS

- **Relationship between HC use and women's behaviours is complex;** there may be other contextual and individual difference moderators
- **Additional variables to consider include:**
  - Menstrual cycle variations may contribute to variability in decision-making within the Non HC users group
  - Contraceptives can have different hormone compounds
  - Greater sample sizes to detect small and medium effect sizes
  - Measuring hormones (e.g. estradiol) as opposed to using a proxy
  - Consistently accounting for **factors impacting participant hormonal levels** (HRT, relationship status, etc)
  - **Age-related** hormonal level variation
  - **Gender gaps in agentic behaviour** due to the backlash effect
  - **System 1 & System 2 thinking** differentiation in risk-taking measures
  - Further research required to generate findings that go **beyond cis-women and the gender binary**
  - **Incentivizing** decisions (as opposed to hypothetical decision-making)

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