

A Three-Site Reproduction of the Joint Simon Effect with the NAO Robot

Strait et al., 2020



Anna Henschel, #TeamSoBots Journal Club, 29.05.2020

Today's paper

Day 1 Session 3: Reproducibility and HRI



A Three-Site Reproduction of the Joint Simon Effect with the NAO Robot

Megan Strait

The University of Texas Rio Grande Valley, Edinburg, TX
megan.strait@utrgv.edu

Florian Lier^{1,2}

¹Corporate Research, Robert Bosch GmbH, Germany
²Bielefeld University, Bielefeld, Germany
florian.lier@de.bosch.com

Jasmin Bernotat, Sven Wachsmuth,
Friederike Eyssel
Bielefeld University, Bielefeld, Germany

Robert Goldstone, Selma Šabanović
Indiana University, Bloomington, IN
{rgoldsto,selmas}@indiana.edu

 *Best paper award*

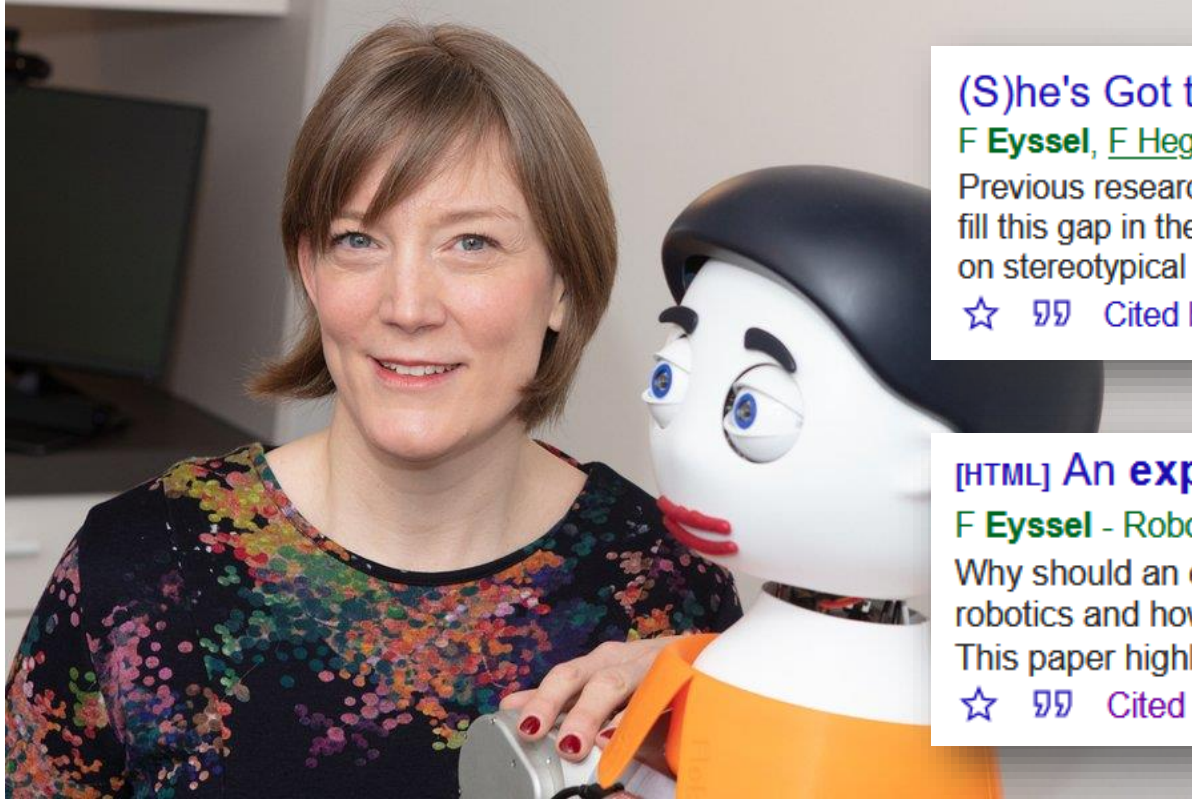
Today's paper

5. REPRODUCIBILITY IN HUMAN-ROBOT INTERACTION

This theme targets research that makes a contribution supporting the science of HRI via reproducing, replicating or re-creating prior HRI/HRI-relevant work, and artifacts for HRI research, to help our community build a strong and reliable evidence base. (Note: This refers to the entire field, not only papers published at the ACM/IEEE HRI conference.) To incentivize submission to this new track, this year accepted papers will receive ACM badges on their papers upon publication (see [[ACM 2016](#)]).

<https://humanrobotinteraction.org/2020/full-papers/>

Some more background



[\(S\)he's Got the Look: Gender Stereotyping of Robots¹](#)

[F Eyszel](#), [F Hegel](#) - *Journal of Applied Social Psychology*, 2012 - [Wiley Online Library](#)

Previous research on gender effects in robots has largely ignored the role of facial cues. We fill this gap in the literature by experimentally investigating the effects of facial gender cues on stereotypical trait and application ascriptions to robots. As predicted, the short-haired ...

☆ [🔗](#) Cited by 178 [Related articles](#) [All 7 versions](#)

[\[HTML\] An experimental psychological perspective on social robotics](#)

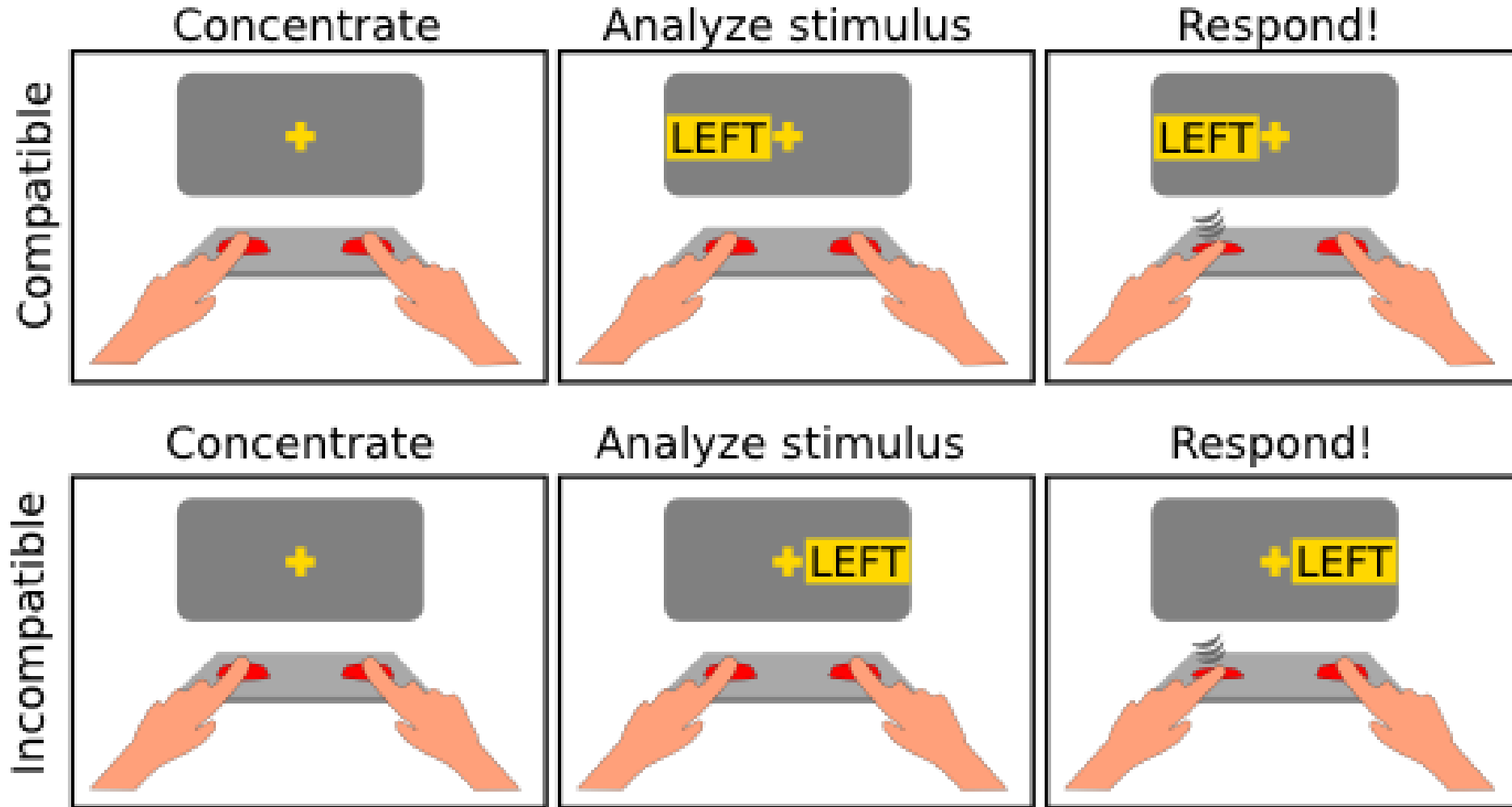
[F Eyszel](#) - *Robotics and Autonomous Systems*, 2017 - [Elsevier](#)

Why should an experimental psychologist bother entering a relatively novel field like social robotics and how could the scientific community in social robotics potentially gain from this? This paper highlights the theoretical and practical gains and challenges associated with an ...

☆ [🔗](#) Cited by 25 [Related articles](#) [All 5 versions](#)

“Again, **psychology can benefit from research in HRI** and virtual reality in that these research contexts allow for relatively close experimental control and thus facilitate reproducibility.”

The Joint Simon Effect



The Joint Simon Effect

Replication of Stenzel et al. (2012)

OBSERVATION

When Humanoid Robots Become Human-Like Interaction Partners:
Corepresentation of Robotic Actions

Anna Stenzel
University of Muenster

Eris Chinellato
Imperial College London and Jaume I University

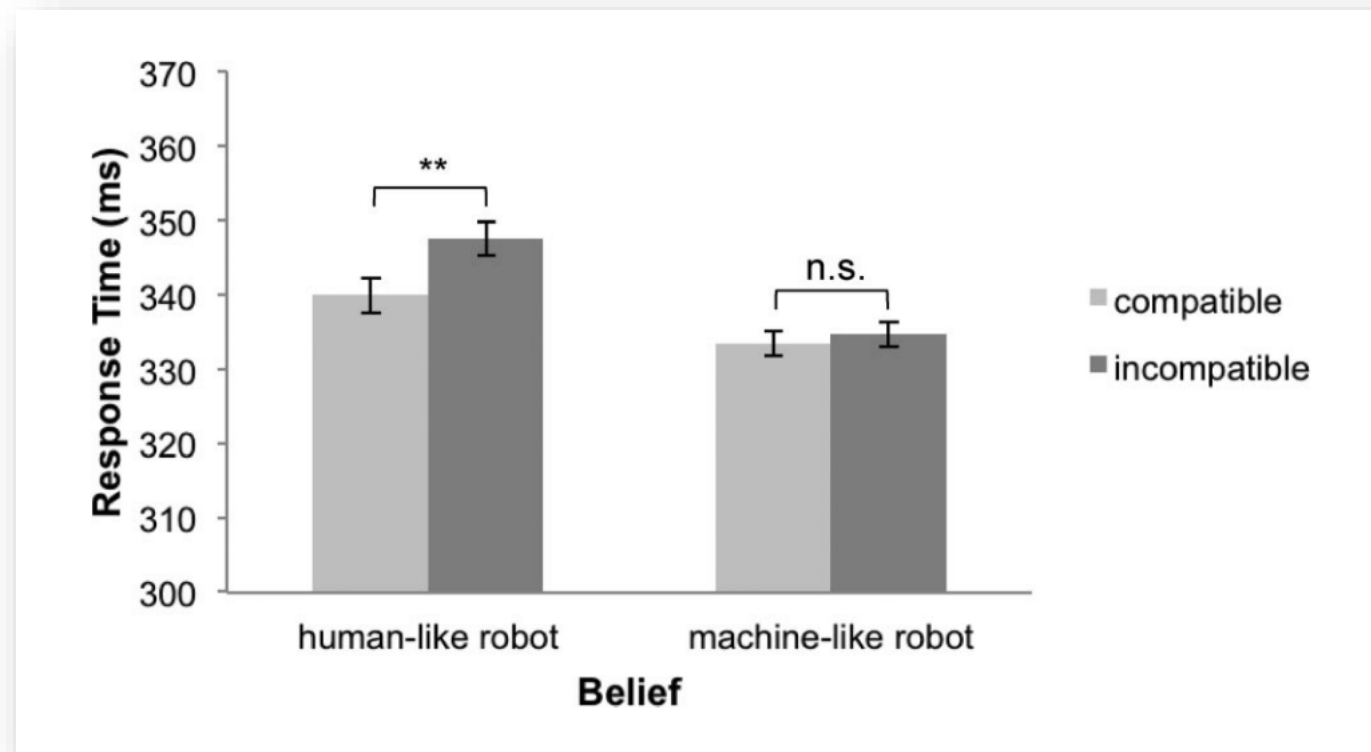
Maria A. Tirado Bou
Jaume I University

Ángel P. del Pobil
Jaume I University and Sungkyunkwan University

Markus Lappe and Roman Liepelt

The Joint Simon Effect

Replication of Stenzel et al. (2012)



Methods

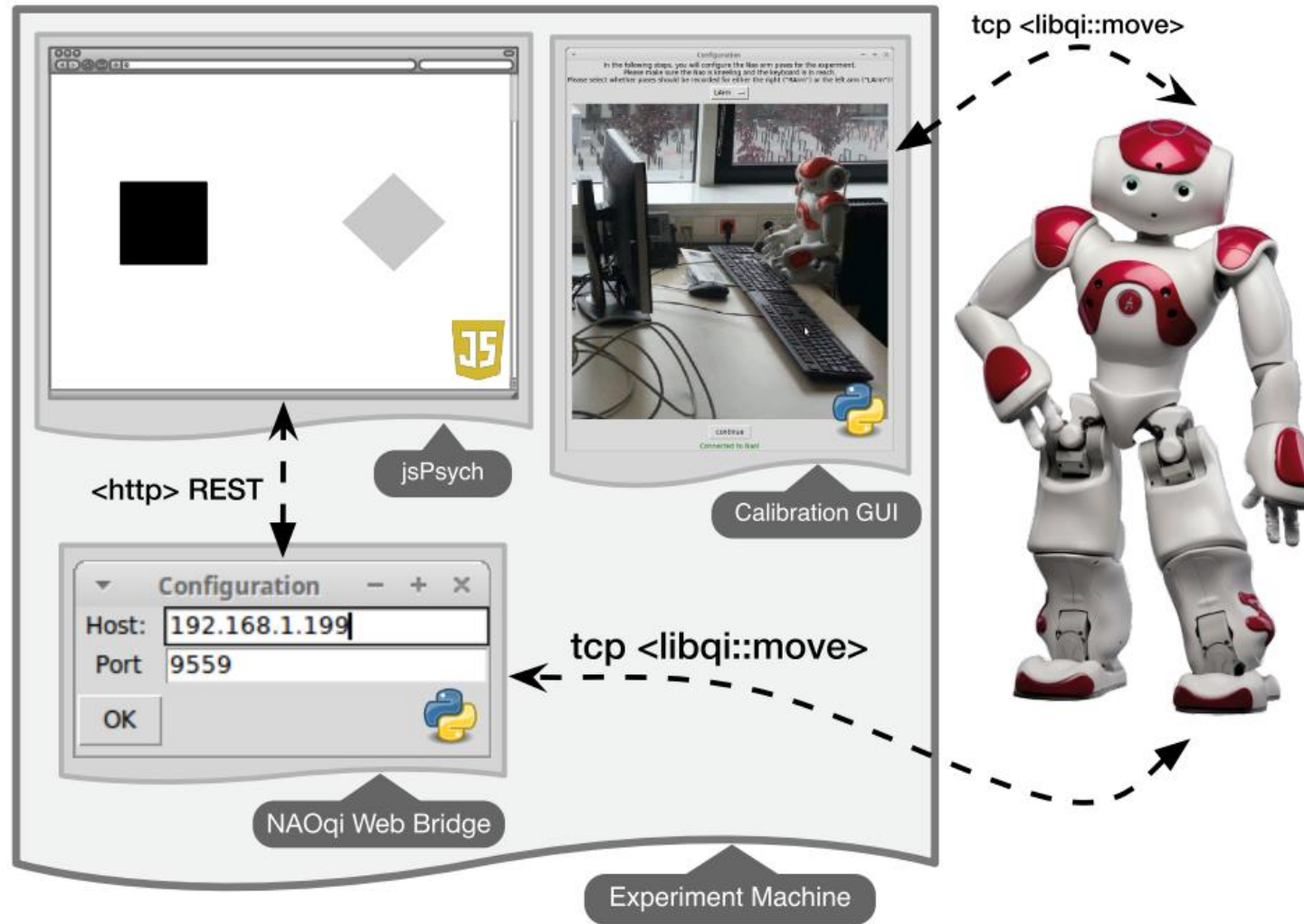


Methods

Table 1: Participant demographics (sample size, mean age, and the proportion of participants who recognized the NAO and had prior *direct* exposure/s to robots) by site.

	N	$M_{age} \pm 1 SD$	<i>NAO Familiarity</i>	<i>Preexposure</i>
Site 1	47	24.61 \pm 4.01	45%	47%
Site 2	51	19.51 \pm 2.39	4%	2%
Site 3	72	21.72 \pm 4.41	29%	1%

Methods



Methods

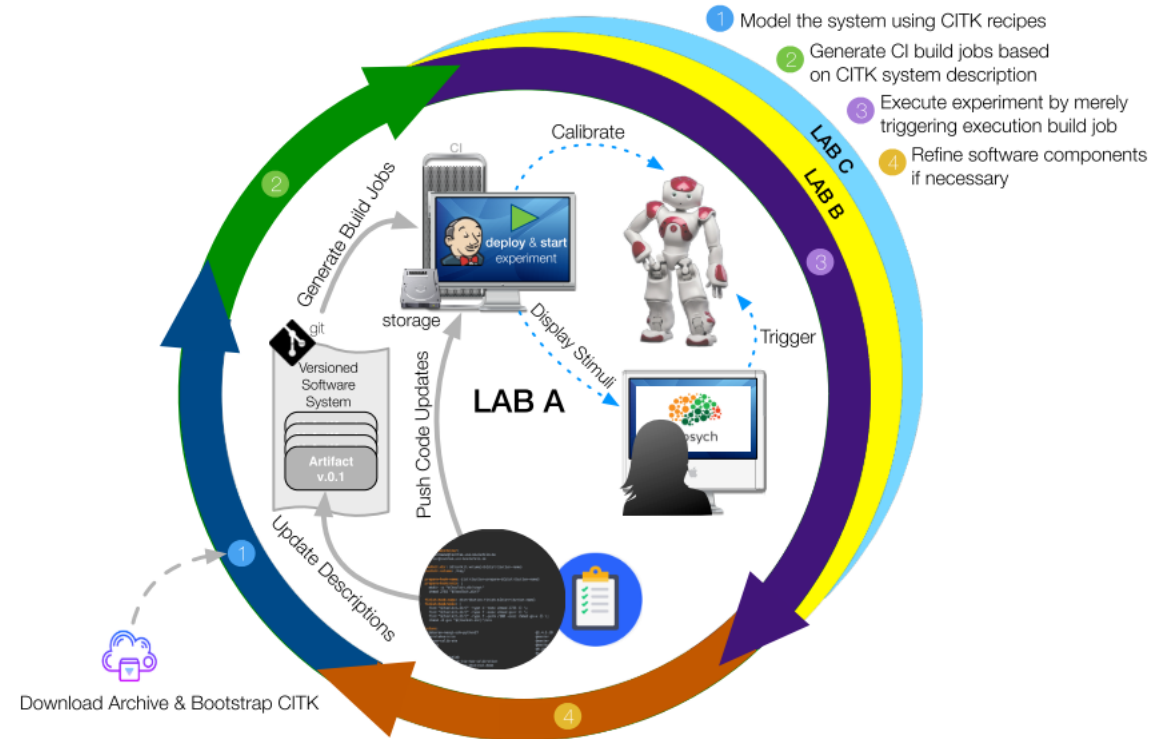


Figure 3: CITK development process: from artifact aggregation ❶ to deployment ❷, execution ❸ and refinement ❹

Methods



Published A Three-Site Reproduction of the Joint Simon Effect with the NAO Robot (Megan Strait et al.)

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[Edit Capsule](#)



[Sign Up](#)

Files

Core Files ⓘ

- ▶ metadata 691 B ✓
- ▶ environment 499 B ✓
- ▼ code 3.75 KB ✓
 - R ANOVA.r 2.55 KB ✓
 - LICENSE 1.04 KB ✓
 - run 163 B ✓
- ▼ data Manage Datasets 14.7 KB ✕
 - Data.csv 8.29 KB ✕
 - LICENSE 6.4 KB ✕
 - .gitignore 7 B ✓

Results ⓘ

▼ results
Your files will appear in the timeline.

Other Files ⓘ

```
run x
1 #!/usr/bin/env bash
2 set -ex
3
4 # This is the master script for the capsule. When you click "Reproducible
5 Rscript "ANOVA.r"
6
```

Reproducibility

▶ Re-Run

Timeline

- Jan 8, 2020
Published Version 1.0
Currently viewing
- Author ran Jan 8, 2020 00:00:06
▼ Published Result
output 7.04 KB
- Megan Strait committed Jan 8, 2020
Version 1.0
- Jan 8, 2020
Created capsule

Results

Results

Table 2: Results of hypothesis testing (H_1). Inferential and descriptive statistics (from left to right): Main effect of *congruence* on reaction time (F), degrees of freedom of the denominator (DFd), significance (p), effect size (*partial* η^2); mean difference in RT between incongruent and congruent trials (i.e., *joint Simon effect*; $M_{\Delta RT}$), standard deviation (SD), and magnitude of the paired difference (Cohen's d_z).

	F	DFd	p	η_p^2	$M_{\Delta RT}$	SD	d_z
Site 1	25.27	37	< .01	.40	9.74 ms	12.48 ms	.78
Site 2	6.36	45	< .02	.12	5.40 ms	14.59 ms	.37
Site 3	22.20	70	< .01	.24	6.72 ms	12.04 ms	.55

Discussion points

- *What did you think about the open science methods employed in this paper? Sample size justification/ pre-registration/ data & code sharing?*

Discussion points

- *What did you think about the open science methods employed in this paper? Sample size justification/ pre-registration/ data & code sharing?*
- *How social is the joint Simon effect? (no association between perceived intentionality of the robot and magnitude of the Simon effect)*

Discussion

The **Dolk et al. (2011)** study suggests that neither the integration of another person nor the integration of another person's action into one's own action, task, or body representation is necessary for the JSE to occur. As even non-social events are sufficient to reliably influence an individual's own task performance, it seems to be the presence or expectation of salient events as such that underlies the JSE. Hence, the JSE may be socially induced by the presence of a responding co-actor without necessarily being social in nature. Indeed, **Dolk et al. (2013a)** observed significant JSEs induced by a Japanese waving cat and a ticking metronome.



<https://www.frontiersin.org/articles/10.3389/fpsyg.2014.00974/full>

Open questions

Where are all the replication studies in HRI?

Do HRI researchers use Bayesian statistics?

A positive note to finish on:

*“Innovation points out paths that are possible;
replication points out paths that are likely; progress
relies on both”*

- Open Science Collaboration, 2015

A cup of Glasgow ReproducibiliTea:



Non Interventional Open Systematic Reviews
NIRO (<https://osf.io/erkwa>)



Speakers:

Marta Topor

@MartaTopor

Jade Pickering

@Jade_Pickering

A cup of @GlasgowTea - all ECRs welcome!
2pm June 16th 2020 (BST) via Zoom