

3Rs: Replace, Refine, Reduce

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<http://www.kittenwar.com/kittens/69827/>

The Principles of Humane Experimental Technique
by Russell and Burch (1959)

- ▶ Replace
- ▶ Refine
- ▶ Reduce

Experimental evidence of massive-scale emotional contagion through social networks

Adam D. I. Kramer^{a,1}, Jamie E. Guillory^{b,2}, and Jeffrey T. Hancock^{b,c}

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<http://dx.doi.org/10.1073/pnas.1320040111>

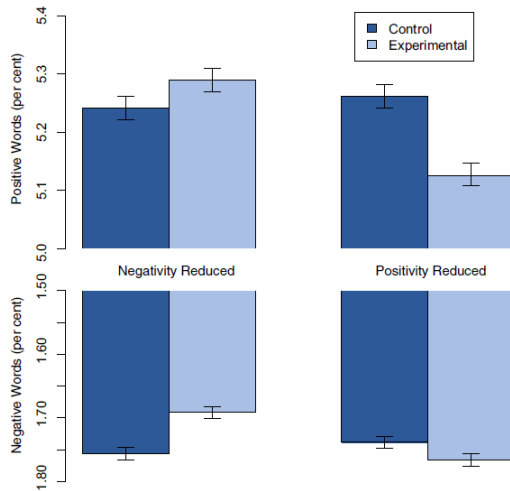


Fig. 1. Mean number of positive (*Upper*) and negative (*Lower*) emotion words (percent) generated people, by condition. Bars represent standard errors.

Editorial Expression of Concern and Correction

PSYCHOLOGICAL AND COGNITIVE SCIENCES

PNAS is publishing an Editorial Expression of Concern regarding the following article: “Experimental evidence of massive-scale emotional contagion through social networks,” by Adam D. I. Kramer, Jamie E. Guillory, and Jeffrey T. Hancock, which appeared in issue 24, June 17, 2014, of *Proc Natl Acad Sci USA* (111:8788–8790; first published June 2, 2014; 10.1073/pnas.1320040111). This paper represents an important and emerging area of social science research that needs to be approached with sensitivity and with vigilance regarding personal privacy issues.

Replace experiments with less invasive methods

Replace experiments with less invasive methods

Detecting Emotional Contagion in Massive Social Networks

Lorenzo Coviello¹, Yunkyu Sohn², Adam D. I. Kramer³, Cameron Marlow³, Massimo Franceschetti¹, Nicholas A. Christakis^{4,5}, James H. Fowler^{2,6*}

Refine treatments to make them less harmful

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Rather than blocking posts, they could have boosted posts

Reduce the number of participants

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- ▶ Difference-in-difference estimator rather than a difference-of-means estimator.

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- ▶ Difference-in-difference estimator rather than a difference-of-means estimator.
- ▶ Would have cut the required sample size, perhaps by half (based on Deng et al. (2013) & Xie and Aurisset (2016)).

When should we care about reducing the number of participants?

When should we care about reducing the number of participants?

1. uncertainty about whether the experiment will cause harm
2. participation was not voluntary

AND, A SHORT DISTANCE
AWAY...

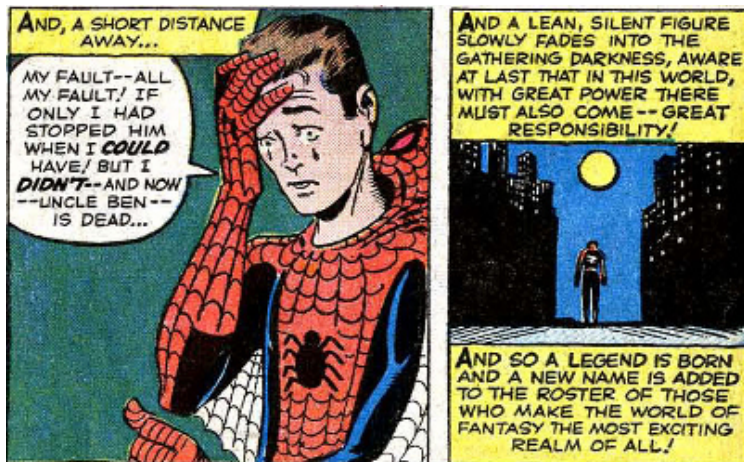
MY FAULT--ALL
MY FAULT! IF
ONLY I HAD
STOPPED HIM
WHEN I **COULD**
HAVE! BUT I
DIDN'T--AND NOW
--UNCLE BEN--
IS DEAD...



AND A LEAN, SILENT FIGURE
SLOWLY FADES INTO THE
GATHERING DARKNESS, AWARE
AT LAST THAT IN THIS WORLD,
WITH GREAT POWER THERE
MUST ALSO COME-- GREAT
RESPONSIBILITY!



AND SO A LEGEND IS BORN
AND A NEW NAME IS ADDED
TO THE ROSTER OF THOSE
WHO MAKE THE WORLD OF
FANTASY THE MOST EXCITING
REALM OF ALL!



With great power there must also come
great responsibility

The 3 Rs shows that humane methods can be an opportunity:

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- ▶ potentially more efficient than standard methods

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- ▶ potentially more efficient than standard methods
- ▶ stimulates interesting research (e.g., differential privacy)

Questions?

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