Routledge
Taylor & Francis Group

Social Neuroscience

ISSN: 1747-0919 (Print) 1747-0927 (Online) Journal homepage: http://www.tandfonline.com/loi/psns20

Non-sympathetic FRN responses to drops in others' stocks

Wenqi Wei, Lei Wang, Zhe Shang & Jenny C. Li

To cite this article: Wenqi Wei, Lei Wang, Zhe Shang & Jenny C. Li (2015) Non-sympathetic FRN responses to drops in others' stocks, Social Neuroscience, 10:6, 616-623, DOI: 10.10 0 1 0 1 .2015.1013222

To link to this article: http: d .doi.org 10.10 0 1 0 1 .2015.1013222

h

u lished online: 16 Fe 2015.

Su mit your article to this ournal

rticle ie s: 56

ie related articles

ie Crossmark data

h h

Full erms & Conditions o access and use can e ound at
http: .tand online.com action ournalIn ormation ournalCode psns20

Download by: e as & ni ersity Li raries **Date:** 20 No em er 2015, t: 06: 6

Routledge
Taylor & Francis Group

Non-sympathetic FRN responses to drops in others' stocks

Wenqi Wei, Lei Wang, Zhe Shang, and Jenny C. Li

[illegible]

Downloaded by [Texas A&M University Libraries] at 06:46 20 November 2015

Previous neuroeconomic studies have observed that people displa s mpathetic neural responses to ard others' misfortunes. We argue that the reverse emotions, such as gloating or *schadenfreude*, ma also emerge in certain circumstances. To e amine this theor , e recorded feedback-related negativit (FRN) to ard others' large or small gains or losses in a stock market conte t. We adopted the frame ork of social distance, according to hich e h pothesi ed that because others in the stock market are far a a , unidentified, and indistinct, people ould sho less s mpath or even *schadenfreude* to ard others' large losses. The results indicated that FRN at F z as significantl less negative hen observing larger decreases in others' stock, indicating that others' large losses are not une pected negative events in the stock market and suggesting the e istence of *schadenfreude.* Our research contributes to the understanding of social neurofinance b demonstrating the *schadenfreude* effect in relation to the stock market. This stud also provides ne information regarding the relationship bet een FRN and the social emotions that form the e pectations of gain and loss.

Keywords: Event-related potential; Feedback-related negativit ; S mpath ; *Schadenfreude*; Social neurofinance.

The current bod of ork in neuroeconomics suggests that humans are highl empathetic and even altruistic to ard others' negative feedback outcomes. For e ample, Yu and Zhou (2006) observed similar feedback-related negativit (FRN) patterns hen people are faced ith their o n gains and losses and the gains and losses of others. As FRN is generall elicited to ard une pected negative outcomes, Yu and Zhou concluded that such findings indicate an observational learning effect hereb similar neural mechanisms underlie the evaluation of one's o n and others' feedback outcomes.

Ho ever, an investigation of the literature reveals that this ma be far from the truth. When facing others' losses, human beings ma either feel s mpath or feel negative, uns mpathetic emotion such as *schadenfreude* (pleasure in others' misfortunes). The feeling of *schadenfreude* has been demonstrated both in neural (Takahashi et al.,

In some circumstances, human beings sho less s mpath or more negative emotions. Imagine someone losing $100; e ma feel s mpath . Ho ever, if it as not $100 but $1,000,000, hat ould e feel? Thinking that greed rich people deserve the loss, e ma gloat rather than feel s mpath . Such a circumstance suggests the quantit effect. If e see someone

Correspondence should be addressed to: Lei Wang, Department of Ps cholog , Peking Universit , Beijing 100871, China. E-mail: lei ang@pku.edu.cn

We deepl thank Dr. Jorge Moll, the Editor, and revie ers for their constructive and helpful comments and suggestions on an earl version of the manuscript.

This ork as supported b NSFC [grant nos. 71021001, 91224008, and 91324201].

e kno cr ing over his loss, e feel s mpath ; ho ever, a loss suffered b a stranger living far a a ma elicit less s mpath . This circumstance suggests the distance effect. In the current stud , e

Koenigs & Tranel, 2007). The current research contributes to our understanding of brain responses to financial outcomes although the brain mechanism of financial decision-making remains unkno n. Second, the participants in the current research ere all students and thus ma be ine perienced in financial markets. Future research should e amine the current findings among actual stockholders or fund managers to increase e ternal validit .

The present stud contributes to the literature on social neurofinance. Moreover, e suggest that the notion of FRN as a reflector of negative surprise should be applied to research on social emotions because social emotions pla important roles in determining e pectanc . We call for more research into this specific area of finance in future neuroeconomic investigations.

Original manuscript received 20 Ma 2014
Revised manuscript accepted 26 Januar 2015
First published online 17 Februar 2015

REFERENCES

Alter, A., & Balcetis, E. (2011). Fondness makes the distance gro shorter: Desired locations seem closer because the seem more vivid. *Journal of Experimental Social Psychology*, *47*, 16–21. doi:10.1016/j.jesp.2010.07.018

Armstrong, R. A., & McGehee, R. (1976). Coe istence of species competing for shared resources. *Theoretical Population Biology*, *9*, 317–328. doi:10.1016/0040-5809(76)90051-4

Baltes, B., Dickson, M., Sherman, M., Bauer, C., & LaGanke, J. (2002). Computer-mediated communication and group decision making: A meta-anal sis. *Organizational Behavior and Human Decision Processes*, *87*, 156–179. doi:10.1006/obhd.2001.2961

Bandura, A. (1977). *Social learning theory.* Orrville, OH: Prentice Hall.

Burnham, T. C. (2007). High-testosterone men reject lo ultimatum game offers. *Proceedings of the Royal Society B: Biological Sciences*, *274*, 2327–2330. doi:10.1098/rspb.2007.0546

Davis, M. H. (1980). A multidimensional approach to individual differences in empath . *JSAS: Catalog of Selected Documents in Psychology*, *10*, 85.

Feather, N. T., & Sherman, R. E. (2002). resentment, schadenfreude, and s mpath : Reactions to deserved and undeserved achievement and subsequent failure. *Personality and Social Psychology Bulletin*, *28*, 953–961. doi:10.1177/014616720202800708

Fujita K, Henderson, M., Eng J, Trope Y, & Liberman, N. (2006). Spatial distance and mental construal of social events. *Psychological Science*, *17*, 278–282. doi:10.1111/j.1467-9280.2006.01698. .

Fukushima, H., & Hiraki, K. (2006). Perceiving an opponent's loss: Gender-related differences in the medial-frontal negativit . *Social Cognitive and Affective Neuroscience*, *1*, 149–157. doi:10.1093/scan/nsl020

Fukushima, H., & Hiraki, K. (2009). Whose loss is it? Human electroph siological correlates of non-self re ard processing. *Social Neuroscience*, *4*, 261–275. doi:10.1080/17470910802625009

Garcia, S. M., & Tor, A. (2009). The N-effect: More competitors, less competition. *Psychological Science*, *20*, 871–877. doi:10.1111/j.1467-9280.2009.02385.

Gehring, W. J., & Willoughb , A. R. (2002). The medial frontal corte and the rapid processing of monetar gains and losses. *Science*, *295*, 2279–2282. doi:10.1126/science.1066893

Hajcak, G., Moser, J. S., Holro d, C. B., & Simons, R. F. (2006). The feedback-related negativit reflects the binar evaluation of good versus bad outcomes. *Biological Psychology*, *71*, 148–154. doi:10.1016/j.biops cho.2005.04.001

Holro d, C. B., Coles, M. G., & Nieu enhuis, S. (2002). Medial prefrontal corte and error potentials. *Science*, *296*, 1610–1611. doi:10.1126/science.296.5573.1610

Holro d, C. B., Larsen, J. T., & Cohen, J. D. (2004). Conte t dependence of the event-related brain potential associated ith re ard and punishment. *Psychophysiology*, *41*, 245–253. doi:10.1111/j.1469-8986.2004.00152.

Koenigs, M., & Tranel, D. (2007). Irrational economic decision-making after ventromedial prefrontal damage: Evidence from the Ultimatum game. *The Journal of Neuroscience*, *27*, 951–956. doi:10.1523/JNEUROSCI.4606-06.2007

Li, P., Jia, S., Feng, T., Liu, Q., Suo, T., & Li, H. (2010). The influence of the diffusion of responsibilit effect on outcome evaluations: Electroph siological evidence from an ERP stud . *Neuroimage*, *52*, 1727–1733. doi:10.1016/j.neuroimage.2010.04.275

Marco-Pallar s, J., Kn mer, U. M., Strehl, S., Schr der, A., & M nte, T. F. (2010). When decisions of others matter to me: An electroph siological anal sis. *BMC Neuroscience*, *11*, 86. doi:10.1186/1471-2202-11-86

Miltner, W. H., Braun, C. H., & Coles, M. G. (1997). Event-related brain potentials follo ing incorrect feedback in a time-estimation task: Evidence for a "generic" neural s stem for error detection. *Journal of Cognitive Neuroscience*, *9*, 788–798. doi:10.1162/jocn.1997.9.6.788

Nieu enhuis, S., Holro d, C. B., Mol, N., & Coles, M. G. (2004). Reinforcement-related brain potentials from medial frontal corte : Origins and functional significance. *Neuroscience & Biobehavioral Reviews*, *28*, 441–448. doi:10.1016/j.neubiorev.2004.05.003

Ochs, J., & Roth, A. E. (1989). An e perimental stud of sequential bargaining. *American Economic Review*, *79*, 355–384.

Rigoni, D., Pole**zz**i, D., Rumiati, R., Guarino, R., & Sartori, G. (2010). When people matter more than mone : An ERPs stud . *Brain Research Bulletin*, *81*, 445–452. doi:10.1016/j.brainresbull.2009.12.003

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment*, *63*, 506–516. doi:10.1207/s15327752jpa6303_8

Downloaded by [Texas A&M University Libraries] at 06:46 20 November 2015

Semlitsch, H. V., Anderer, P., Schuster, P., & Presslich, O. (1986). A solution for reliable and valid reduction of ocular artifacts, applied to the P300 ERP. *Psychophysiology*, *23*, 695–703. doi:10.1111/j.1469-8986.1986.tb00696.

Slonim, R., & Roth, A. E. (1998). Learning in high stakes ultimatum games: An e periment in the Slovak Republic. *Econometrica*, *66*, 569–596. doi:10.2307/2998575

Stuhlmacher, A. F., & Citera, M. (2005). Hostile behavior and profit in virtual negotiation: A meta-anal sis. *Journal of Business and Psychology*, *20*, 69–93. doi:10.1007/s10869-005-6984-

Takahashi, H., Kato, M., Matsuura, M., Mobbs, D., Suhara, T., & Okubo, Y. (2009). When our gain is m pain and our pain is m gain: Neural correlates of env and schadenfreude. *Science*, *323*, 937–939. doi:10.1126/science.1165604

Trope, Y., & Liberman, N. (2010). Construal-level theor of ps chological distance. *Psychological Review*, *117*, 440–463. doi:10.1037/a0018963

Yu, R., & Zhou, X. (2006). Brain responses to outcomes of one's o n and other's performance in a gambling task. *Neuroreport*, *17*, 1747–1751. doi:10.1097/01.nr.0000239960.98813.50

Downloaded by [Texas A&M University Libraries] at 06:46 20 November 2015