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Social Neuroscience

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

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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

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Non-sympathetic FRN responses to drops in others' stocks

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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 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.,

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

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