

## THE NEURAL BASIS OF COMPETITIVE EMOTIONS



**Simone G. Shamay-Tsoory**  
 Department of Psychology,  
 University of Haifa, Mount  
 Carmel, Haifa 31905, Israel

E-mail:  
[sshamay@psy.haifa.ac.il](mailto:sshamay@psy.haifa.ac.il)

*Simone Shamay-Tsoory is  
 director of the Social and  
 Affective Neuroscience Lab at  
 Haifa University. She graduated  
 from Ben Gurion University and  
 did her PhD at Haifa University.*

*Her main research interests  
 are in understanding the  
 neural mechanisms underlying  
 social cognition and emotional  
 understanding. One focus  
 has been on empathy and  
 "competitive" emotions such as  
 envy and gloating, and another  
 has been on the differentiation  
 and relative importance of  
 emotional and cognitive aspects  
 of theory of mind. She has  
 studied patients with focal  
 lesions in the frontal lobes and  
 psychiatric patient groups.*

### SIMONE G. SHAMAY-TSOORY

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A large corpus of evidence concerning social comparison processes indicates that relative material payoffs affect people's well-being and behavior. Envy and schadenfreude are competitive emotions related to social comparison. Envy is a negative reaction in the face of another person's good fortune while schadenfreude is the joy about the misfortune of another.

We propose that the neural network which mediates envy and schadenfreude involves the "mentalizing network" and the reward/punishment systems. To examine our model we conducted a lesion study, an fMRI study and a study involving administration of oxytocin.

These studies demonstrate differential patterns of activation in the reward and mentalizing networks in envy and schadenfreude.

The pattern of activation in the ventral striatum suggests that winning money can seem like a loss when another person wins a larger amount. Likewise, losing money can seem like a gain when another person loses more.

Finally, we show that the oxytocinergic system modulates the feeling of envy and schadenfreude. Specifically, intranasal administration of oxytocin increases ratings of envy and schadenfreude in competitive situations, suggesting that this hormone has a general role in negative as well as positive social behaviors.

Although it has been well established that humans are motivated to seek rewards and avoid punishments, our studies demonstrate that humans are as sensitive to social comparisons, that even a loss can induce joy when it is compared to another's greater loss. These processes seem to be mediated by the reward system and the oxytocinergic system.