
Symposium SA-1
Saturday, July 29, 2006

Serotonin and human behavior along the agonistic-affiliative axis

Simon N. Young



Low serotonin function is associated with aggressive behavior, particularly impulsive aggression, and treatments that increase serotonin function have achieved some success in treating aggression. In monkeys serotonin regulates many aspects of social behavior and increased serotonin function not only decreases aggressive behaviors, but also increases affiliative behaviors. This raises the possibility that serotonin may regulate more normal aspects of behavior along the agonistic-affiliative axis in humans, and that it may promote pro-social behaviors. Research in social psychology has provided the means to study this question, using a type of method called ecological momentary assessment (Moskowitz, *J.Pers.Soc.Psychol.* 1994; 66:921-933). In this method participants fill in a one page form, which asks questions about their mood and behavior, after each social interaction throughout the day. Behavior is assessed along two axes termed agreeable-quarrelsome and dominant-submissive. While such behaviors vary greatly from one interaction to another after about 70 interactions (6 per day for 12 days) mean values asymptote.

In a double-blind cross-over study we investigated at the effect of tryptophan (1 g TID) and placebo, each given for 12 days, on 98 healthy volunteers (Moskowitz et al. *Neuropsychopharmacology* 2001; 25:277). Tryptophan decreased quarrelsome behaviors and increased dominance, which is consistent with results from monkey studies. In a second study (aan het Rot et al, unpublished) we studied the effect of tryptophan on 39 healthy volunteers with high trait quarrelsomeness. In this population tryptophan not only decreased quarrelsome behaviors, but increased agreeable behaviors. It also improved mood and increased the perception that those the participants were interacting with were agreeable. There was no consistent effect on dominance. Effect sizes were in the moderate to large range.

In the two studies the participants were not able to guess, better than by chance, when they were on tryptophan and when on placebo. This suggests that the participants were unaware of their changes in behavior. Serotonin may be altering the tone of a neuronal system that regulates social interaction but is not accessed by conscious thought.