Discounting Under Stress: An Experimental Study with Revised Tatiana-design

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In intertemporal decisions present or future values are calculated. In normative economics Discounted Utility Theory (Samuelson, 1937) serves as framework for intertemporal discounting. However a number of characteristics of discounting violate Discounting Utility Theory. Gain-loss asymmetry, time and size effect and delay-speed up asymmetry (e.g. Lowenstein Prelec, 1992) all indicate that normative model may be revised. In addition to these evaluating the value of an outcome can vary with mental and emotional states as well (e.g. Loewenstein 1996; Loewenstein, Hsee, Weber and Welch, 2001).

To study the effect of stress on discounting and to check whether hyperbolic discounting (e.g. Loewenstein and Prelec, 1992) fits to empirical results revised version of "Tatiana-design" (Dezső and Neszveda, 2009) was used. This study mainly addressed questions stemming from the first studies with "Tatiana-design". 96 BA students were enrolled in the two-stage, within subject experiment. Intertemporal tasks were real life scenarios, where three dimensions were manipulated: sign (gain, loss), cash sizes (10000, 50000, 250000, 1250000, and 6250000 HUF) and delays (1, 6, 12, 18 and 24months). In the first stage subjects discounted in neutral emotional state, whereas in the second stage subjects discounted under stress.

Our results show that (1) Hyperbolic function serves the best fit for data irrespective of emotional state. (2) A two-stage mental model in discounting was detected. An initial, fast yes/no decision, where "No" leads to unsubstansive discount rates ($r \leq 0.006$), and "Yes" leads to further calculations. (3) 12 month delay has a special effect: further delays (18 and 24 months) do not differ from it. (4) Stress significantly reduces discount rates for gains for all delays. On the contrary stress increases discount rates for losses for mid and long delays.

Keywords: intertemporal discounting, intertemporal anomalies, hyperbolic discounting, visceral effects