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The hidden zero effect: Representing a single choice as an extended sequence reduces impulsive choice

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Delay of gratification; self-control; self-regulation; temporal discounting; impulsiveness; delay discounting; framing; temptation; judgment and decision making; reconstrual; reframing

Splurge on a vacation, or save for retirement? Sleep in late, or get up to exercise? The ability to resist a tempting, immediately available reward in order to obtain a larger delayed reward is the hallmark of self-control, and predicts important life outcomes such as academic achievement (Duckworth & Seligman, 2005) and social adjustment (Mischel & Ayduk, 2004). Unfortunately, immediate rewards are often difficult to resist. One key factor that makes them so appealing is *temporal discounting* – the tendency to consider events as less important if they occur in the distant future, rather than in the near future (Ainslie, 2001). This tendency tempts us to choose a small immediate reward over a larger delayed reward, simply because the first is immediately available – a choice that can greatly sabotage the attainment of our long-term goals.

To study temporal discounting, researchers (e.g. Estle, Green, Myerson, & Holt, 2007) typically have participants choose between smaller-sooner rewards and larger-later rewards (e.g., “Would you prefer [A] \$5 today, OR [B] \$6.20 in 26 days?”). Decision-makers commonly view such situations as a choice between a *good* alternative soon and a *better* alternative later. However, what is not mentioned explicitly in such situations is the fact that choosing to receive one alternative also means choosing *not to receive* the other. In other words, decision-makers are implicitly encouraged to choose between *one-shot* events, rather than between *sequences* of events, in which choosing an immediate reward also means choosing to receive nothing later, and vice versa (e.g., “Would you prefer [A] \$5 today and \$0 in 26 days, OR [B] \$0 today and \$6.20 in 26 days?”).

People’s choices are heavily influenced by ways in which the alternatives are framed, even when the different frames are logically equivalent (Tversky & Kahneman, 1981). Given that people prefer sequences that improve over time (Ariely & Zauberman, 2003; Frederick, Loewenstein, & O’Donoghue, 2002), we hypothesized that representing each alternative as a sequence of outcomes, by explicitly referring to the hidden zero in each alternative, would increase participants’ willingness to choose larger delayed rewards over smaller immediate rewards, as they would prefer to choose sequences that appear to improve over time.

Method

Our study was conducted online with two general population samples, recruited through online advertisements. Participants in the first sample ($n = 112$ [14 males], mean age = 33.7, $SD = 13.5$) made choices about hypothetical monetary rewards. Participants in the second sample ($n = 57$ [13 males], mean age = 32.1, $SD = 11.0$) made choices about real monetary rewards, and were informed in advance that one of their choices (selected randomly) would serve as the basis for their payment.¹ Therefore, participants were motivated to make each choice based on what they would actually like to receive, since any choice may be the one that will determine the magnitude and timing of their payment (McClure, Laibson, Loewenstein, & Cohen, 2004).

Each participant completed a monetary choice questionnaire, which consisted of 15 choice-pairs. For each choice-pair, participants indicated their preference between an immediate reward and a delayed larger reward. Participants were randomly assigned to two conditions: Participants in the *hidden-zero* condition viewed traditional choice-pairs (e.g. “[A] \$5 right now, OR [B] \$6.20 in 26 days”), while participants in the *explicit-zero* condition viewed choice-pairs in which the immediate option always ended with the phrase "...and \$0 in ___ days" and the delayed option always started with the phrase "\$0 today and..." (e.g. “[A] \$5.00 today and \$0 in 26 days OR [B] \$0 today and \$6.20 in 26 days”). Immediate rewards ranged from \$2 to \$8, delayed rewards ranged from \$5.40 to \$8.70, and delays ranged from 7 to 140 days.² Importantly, the magnitudes and delays of rewards for each choice-pair were constant across conditions. Impulsiveness scores were computed by counting the number of times a participant indicated a preference for the sooner-smaller reward (range: 0-15).

Results and Discussion

When making choices about hypothetical money (Sample 1), participants in the explicit-zero condition exhibited significantly lower levels of impulsiveness ($M = 6.10$, $SD = 4.20$) than participants in the hidden-zero condition ($M = 9.24$, $SD = 3.20$), $t(110) = 4.43$, $p < .001$, $p_{rep} = .99$, $d = 0.84$. Similarly, when making choices about real money (Sample 2), participants in the explicit-zero condition exhibited significantly lower levels of impulsiveness ($M = 4.42$, $SD = 2.90$) than participants in the explicit-zero condition ($M = 6.13$, $SD = 3.35$), $t(54) = 2.03$, $p = .05$, $p_{rep} = .92$, $d = 0.55$ (see Figure 1).

Despite the fact that the hidden-zero and explicit-zero formats of presentation were logically equivalent, the latter resulted in lower rates of impulsive choice, possibly because the explicit-zero format caused each choice to appear as a *sequence*, thereby encouraging people to select the improving sequence (i.e. the larger-later reward). The explicit-zero format may also draw attention to the *opportunity cost* of each choice, thereby encouraging people to choose the alternative that incurs a lower opportunity cost (i.e. choosing to forego the smaller-sooner reward). Additional research is required to elucidate the underlying mechanism, and to test this effect in real-world settings (e.g., retirement savings).

¹In the second sample, one outlier (over 2 standard deviations from group mean) was dropped from analysis. Including his data does not alter the pattern of results.

²Full questionnaire available upon request.

The data shown here demonstrate how changing our construal of alternatives that we face, even without changing their objective values, can powerfully impact our ability to make decisions based on their future consequences (Magen & Gross, 2007). The way we represent alternatives matters: By simply mentioning the “obvious” downsides of alternatives, we may help decision-makers choose in a more informed and balanced manner, thereby helping people place more weight on the achievement of their long-term goals, rather than on immediate gratification.

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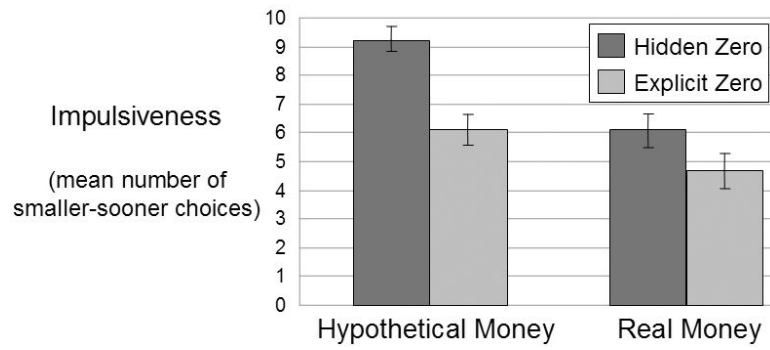


Figure 1. Mean number of smaller-sooner choices (out of 15 choice-pairs) for each condition in each group. Error bars represent one standard error.