



Case Report

When soon feels far and later looms imminent: Decoupling absolute and relative timing estimates

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ABSTRACT

Time estimation regarding the occurrence of unknown future events can be done on both absolute (“How many days from now will it happen?”) and relative (“How far from now does it feel?”) units, yet investigations to date have examined each with little reference to the other. We consider both constructs simultaneously, documenting an instance in which absolute versus relative units result in a reversal for timing estimates. In Study 1, people thinking at a higher, abstract level of construal report later time estimates on an absolute unit but sooner time estimates on a relative unit, a pattern reversed among those at a lower, concrete level. Study 2a replicates that people thinking abstractly report later time estimates on an absolute unit while simultaneously using a broader scope by which to conceptualize time, and Study 2b provides evidence that these processes provide one possible mechanistic account for the reversal: People estimating time on a relative unit compare a subject (an absolute time estimate) to a referent (the salient mental time scope), which accounts for the tendency of people thinking abstractly (concretely) to report shorter (longer) estimates in relative time. Theoretical and practical implications for the estimation and experience of time are discussed.

People live in the present yet continually consider prospects for the future. One such future-oriented consideration speculates as to the occurrence of future events (“When should I make that phone call?”). Answers to these kinds of questions carry significant meaning insofar as simulation of possible futures often serves as a guide for how to act in the present (Gilbert & Wilson, 2007). Here, we note that such questions can be answered using two different units: an *absolute* amount of time until the event (measured in milliseconds, months, or millennia) or a *relative* sense of a seemingly short or long duration until the event (feeling ‘pretty soon’ or ‘very far away’). We propose that just because an event may be expected to occur close in time on an absolute unit, it need not feel that way on a relative unit (and vice versa), decoupling two seemingly overlapping constructs (cf. the date/delay effect; LeBoeuf, 2006; Read, Frederick, Orsel, & Rahman, 2005) and exploring how this divergence might arise in the first place.

1. Absolute and relative timing

A prerequisite to consideration of any timing estimate mandates that the future event under consideration be unknowable, at least to the person doing the estimating. Otherwise, the estimator would be hard pressed to provide anything other than the known answer: Determining

the number of days until the next presidential election takes little more than a calendar and some basic algebra. To illustrate a timing estimate using an absolute unit for an unknown future event, consider a hopeful dieter, still full from Thanksgiving dinner, promising to eat more healthfully as of January 1st of the next year (Dai, Milkman, & Riis, 2014; Peetz & Wilson, 2013), though it is uncertain that the diet will actually start then. On November 24th, they plan to stop being so gastronomically short-sighted in exactly 38 days.

Relative timing estimates can similarly be made for unknown future events, as in the case when a person might simply intuit, independent from any defined, absolute metrics, that s/he will propose marriage to her/his partner in the not-so-distant future. However, research on relative timing often first fixes the absolute timing of a future event in order to probe the factors under which a given onset seems, in a relative sense, close or far in time. In racing against an impending deadline, set at some absolute amount of time in the future, those working on a task that requires more effort perceive that deadline as looming closer (Jiga-Boy, Clark, & Semin, 2010), which in turn prompts more urgent action (Tu & Soman, 2014), underscoring the relevance of relative timing (see also Bashir, Wilson, Lockwood, Chasteen, & Alisat, 2014; Peetz & Wilson, 2013; Peetz, Wilson, & Strahan, 2009; Pennington & Roese, 2003).

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2. Timing and mental construal

As a first step toward decoupling absolute and relative timing, we identify one well-established determinant of the former: level of mental construal. As articulated by construal level theory (Trope & Liberman, 2010), the same target of consideration can be represented in a manner that emphasizes either its specific, secondary, and incidental features (i.e., low-level, concrete construal) or its general, primary, and defining features (i.e., high-level, abstract construal). Because people tend to think concretely about things in the present and abstractly about things belonging to the future, a bidirectional association arises between closeness (distance) in time and concrete (abstract) mental construal (Bar-Anan, Liberman, & Trope, 2006). Thus, not only does consideration of the future paint an abstract picture, but any means by which to paint an abstract picture causes that depicted object to be assigned to a more distant (absolute) time.

Accordingly, an abstract frame of mind causes targets of consideration to be mentally situated farther into the future. Research to date has provided evidence in support of this claim in the form of absolute – and not relative – timing estimates. Liberman and Förster (2009) used a mindset manipulation that had participants identify either abstract, big-picture components of visual stimuli or concrete, detailed components thereof before asking them to estimate the timing of a future event in (absolute) days. Participants thinking abstractly estimated that it would happen more days from the present relative to their concrete counterparts. An earlier investigation (Liberman, Trope, McCreary, & Sherman, 2007) had found a similar pattern of results when assessing timing with an open-ended format (i.e., “how much time from now would” an actor take action). But might this effect hinge, in part, upon the particular formatting of the timing question? Specifically, might asking a similar question in relative terms alter this established pattern?

3. The present investigation

Whereas absolute timing estimates make a judgment on a defined unit (like days), relative timing estimates ask people to gauge whether an amount of time seems short or long. The relative nature of such judgments necessitates that they derive from a comparison process (e.g., Parducci, 1965). Unlike absolute timing, which can require only a subject to make the timing estimate (e.g., some number of days), relative, undefined timing requires both a subject and a referent. Of greatest importance to the present investigation, when making a relative timing estimate, not only the subject (an absolute timing estimate) but also the referent (a salient mental time scope) should vary as a function of construal level. To the latter, abstract construal, in its ability to take a broader perspective, causes people to think in broader brushstrokes (Henderson, Fujita, Trope, & Liberman, 2006; Liberman, Sagristano, & Trope, 2002). As applied to measurement, Maglio and Trope (2011) found that participants led to think abstractly generated larger scales with which to assess quantities. Therefore, an abstract (versus concrete) frame of mind should expand the referent time scope against which the subject is compared, shrinking the relative timing estimate.

Thus, we propose that level of mental construal will impact relative timing estimates in a manner that runs opposite to that already established for absolute timing estimates. As documented in the construal level literature, people led to think concretely (abstractly) should situate unknown future events as sooner (later) when making an absolute timing estimate (e.g., in days). However, if prompted to make a relative timing estimate (feeling sooner or later), we predict that people thinking concretely (abstractly) should feel that the event is farther (closer) in time as a function of the different comparison referent (i.e., time scope) generated and used by concrete and abstract thinkers: People thinking concretely may intuit a future event to be closer in absolute time (e.g., 3 days, versus an abstract 7 days), but, due to the

fine-grained pattern of thought characteristic of concrete thinking (e.g., hour-level time scope, versus abstract year-level time scope), they will appraise any amount of absolute time using an especially small unit of measurement (e.g., a relatively extended 3 days against an hour-level scope, versus a trivial 7 days against a year-level scope in an abstract frame of mind), and, as a result, as much longer (Kantner, 2011). Three studies provide evidence for both the hypothesized effect and the scaling mechanism upon which it is proposed to rely, and we report all measures, manipulations, and exclusions in these studies.

4. Study 1

4.1. Method

Based on an anticipated effect size of 0.30 per our analysis of previous research related to timing and construal (e.g., Liberman & Förster, 2009), Study 1 would need a sample size of at least 190 in order to achieve power of 0.80 (given an α error probability of 0.05). Accordingly, we recruited 192 volunteers from Amazon's Mechanical Turk platform to participate in exchange for \$1. Sixteen participants were excluded because of their failure to complete the study, leaving a final sample size of 176 ($M_{\text{age}} = 31.41$; 40% female). This study used a 2 (construal level: high, low) \times 2 (timing estimate unit: absolute, relative) between-subjects design, with participants randomly assigned to one of four conditions ($N_{\text{high-absolute}} = 37$, $N_{\text{high-relative}} = 53$, $N_{\text{low-absolute}} = 50$, $N_{\text{low-relative}} = 36$).

This study was framed as a survey on people's daily behaviors. The first task was designed to manipulate abstract and concrete construals, respectively, by having participants list ends or means for the focal action “maintain good physical health”. Specifically, those in the abstract condition were repeatedly asked *why* they maintain good physical health. After providing a response (e.g., “to look good”), participants were asked *why* they engage in their response. Participants provided four such successive responses, with each “*why*” question prompting an increasingly abstract response. Participants in the concrete condition, in contrast, were asked *how* they maintain good physical health. After providing a response (e.g., “by working out”), participants were asked *how* they engage in their response. Similarly, participants provided four such successive responses, with each “*how*” question prompting an increasingly concrete response. This method manipulates level of construal in a manner that impacts subsequent, unrelated judgments (Freitas, Gollwitzer, & Trope, 2004; Fujita & Han, 2009).

Participants proceeded to the time estimation task, in which they estimated when three future activities would occur: a dentist visit, a physical examination, and filing taxes (modified from Liberman & Förster, 2009). Via random assignment, they made this estimation on either an absolute or a relative unit. Those in the absolute condition read, “Imagine that a new dental clinic opened in your neighborhood. You receive a note that you can get a free dental examination and cleaning. In how many days from now would you go?”, then indicated the number of days. The questions for the physical examination and tax filing were similar. Those in the relative condition read the same first sentence but were instead asked, “How soon would you go?”, then responded on a scale ranging from 1 (*a really short time from now*) to 10 (*a really long time from now*). Again, the questions for the physical examination and tax filing were similar.

In order to address potential confounding variables, we next gauged how long it had been since each participant's last visit to the dentist, last physical exam, and last tax filing, in addition to liking, fear, and perceived importance of those activities. Because none of these factors showed any relation to our dependent measure, they are not included in our formal analyses. After completing the tasks, participants were probed for suspicion, debriefed, paid, and thanked for their participation. None of the participants correctly guessed the aim of this study.

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