



Toward a deeper understanding of the ecological origins of distance construal[☆]



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HIGHLIGHTS

- Ecological correlations may explain positive correlations between all four distance aspects.
- Distinct linguistic terms trigger similar distance construals in many different judges.
- Negative verbs solicit more distant construals than positive action verbs and state verbs.
- Nouns related to powerful, uncontrollable targets solicit distant construals.
- These findings highlight the role language in distance regulation.

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ABSTRACT

In the present research we elaborate on an ecological account (Fiedler, Jung, Wänke & Alexopoulos, 2012) for the unitary distance dimension postulated in construal-level theory, highlighting linguistic influences on distance regulation. We first replicate that distinct action verbs solicit similarly distant or close episodes in many judges, producing strong positive correlations between ratings of four distance aspects (time, space, probability, personal distance). A primary semantic–pragmatic dimension that accounts for a large part of the verb impact is valence: Negative action verbs trigger more distant episodes than positive verbs. Experiment 1 rules out an alternative explanation in terms of participants' mood. Experiment 2 cross-validates the valence effect with a new sample of affective state verbs. Consistent with implicit verb causality, state verbs solicit more distant episodes than action verbs, suggesting lack of intentional control and power as another semantic–pragmatic dimension. Experiment 3 supports this interpretation using high- and low-power nouns.

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Introduction

Construal-level theory (CLT; Trope & Liberman, 2003, 2010) relies on the basic assumption that different modalities of psychological distance — particularly, temporal, spatial, social, and factual (i.e., probability) distance — converge in one underlying dimension. A noteworthy implication of this strong assumption is that different distance modalities are positively correlated (Maglio, Trope, & Liberman, 2013). What is temporally or factually distant (vs. close) also tends to be spatially or socially distant (vs. close). Support for this contention comes from more than a decade of rich empirical research on CLT

(Trope & Liberman, 2003, 2010), showing that priming high versus low distance in one modality induces similarly high versus low distance in all other modalities.

Fiedler, Jung, Wänke, and Alexopoulos (2012) have proposed an ecological account for the consistently positive correlations between such seemingly distinct conditions as time, space, probability, and social distance. They had actually started from a deliberate attempt to find compensatory relations or discounting effects (i.e., negative correlations such that high distance in one modality implies low distance in others). However, across several experiments that assessed ratings of an entire sample of imagined or memorized episodes on all four major distance aspects, they obtained amazingly strong positive correlations, both across participants and within participants across episodes. Moreover, positive correlations were not restricted to freely construed fictitious future episodes. Correlations were similarly positive when participants were asked to remember actually experienced episodes with fixed coordinates of all four distance aspects in the participants' biography.

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From an ecological perspective, indeed, it is not too surprising that what happened in a far-away place is more likely to have happened a long ago, and that unlikely events and unfamiliar people were encountered in remote places and times. To some extent, therefore, the positive correlations seem to reflect objective ecological correlations.

Focus of research: linguistic stimuli trigger psychological distance

Beyond replicating the full pattern of positive correlations and corroborating their ecological interpretation, the major aim of the present research is to understand within this ecological perspective the influence of one major part of the information ecology, namely, language. Specifically, we elaborate on the noteworthy finding that the consistently positive correlations obtained by Fiedler et al. (2012) had been triggered by distinct verbal stimuli. The action verbs that served as prompts for the construal or recall of behavioral episodes (e.g., think of an episode in which you *praise, avoid, or deceive*) led many participants to generate highly similar (fourfold) distances. Using an index similar to Cronbach's α , the systematic tendency of specific action verbs to elicit consensually high or low distance episodes in all individual participants was as high as .60 to .85.

As the existence of systematic distance variance is a precondition for the covariance between the four distance aspects, this remarkable finding means that specific verbal prompts solicited the entire pattern of consistent distance construal. Note that such a key role of language is well in line with our ecological theory approach (Fiedler & Wänke, 2009). Lexical stimuli are carriers of shared semantic and pragmatic knowledge that abstracts from the experiences of individual persons (Fiedler, 2008; Semin & Fiedler, 1988). Detached from internal cognitive and affective processes within specific individuals, the mere presence of verbal stimuli in the environment can attract or reject, elate or sadden, inspire or bore people, start or terminate thinking and regulate construal level and psychological distance. To be sure, lexical knowledge is reflective of the cognitive and affective processes of language users but it abstracts from individual people's experiences. The impact of verbal symbols and sound patterns is independent of the presence and actually of the survival of individual people. The linguistic substrate could still manifest in the environment after a population or culture has died in a catastrophe. By treating lexical stimuli as genuinely environmental, we are not claiming the primacy of language over cognition. However, once the substrate of affect and cognition is wired into the lexicon, literature, and communication rules, linguistic symbols alone become a surrogate of real affect and cognition and a toolbox for social communication and regulation (Fiedler, 2008).

Language – that is, shared environmental knowledge – is not only the primary medium of social and cultural learning. It is also the chief instrument for social interaction in such diverse variants as negotiation, persuasion, education, influencing, debating, lying and deception, advertising, ingratiation, therapy, and higher-order problem solving. Only a minor part of one's world knowledge is based on direct first-hand experience; the greatest part is conveyed via second-hand communication by parents, friends, teachers, and the media. Language was particularly shown to afford a versatile instrument for distance regulation (Semin, 2007). Linguistic abstractness, the most common measure in construal-level theory (Trope & Liberman, 2003, 2010) and in action-identification theory (Vallacher & Wegner, 1987), is the most frequently cited correlate of psychological distance.

It is thus not too surprising that verbal stimuli can be mapped on classes of episodes with distinct locations in the distance space. Note also that distance variation in real life is rarely ever based on real movements – it is based on mind traveling and mental simulation triggered by symbolic communication. People rarely travel to the other side of the globe, and lifetime provides us with only one forward opportunity for time traveling. Social contact to distant people is very restricted and unlikely events cannot be elicited *par force*. Therefore, the chief domain of psychological-distance theory is hardly locomotion in real

physical distance but it is mentally simulated distance. This symbolic process is apparently very sensitive to the semantic and pragmatic implications of verbal stimuli.

Two semantic dimensions: valence and power (lack of control)

As the same verbs solicit highly similar distance patterns in many participants, the variation in distance cannot be attributed to idiosyncratic memories. It must reflect ecological knowledge shared by most language users. In the present research we investigate two basic semantic and pragmatic dimensions that relate language to distance, beyond the peculiarities of particular verbs.

Valence

The first semantic aspect that discriminated between high and low distance episodes in all experiments by Fiedler et al. (2012) was valence. Participants construed more distant episodes when they were themselves the subject of behaviors described by negative action verbs (coerce, reject, avoid, disturb, deride, avoid) than when they were the subject of positive actions (praise, defend, take care of, endorse, convince, surprise).

Although at a functional level of analysis, valence is a meaningful dimension that appears in many theories and that has face validity for many important phenomena, it cannot be reduced to a single psychological cause. Valence always confounds several causal and structural aspects. Positive versus negative valence is related to approach and avoidance responses (Lang, Bradley, & Cuthbert, 1990; Lewin, 1935). Evaluation also serves a self-serving as well as a self-defining function. Distancing oneself from devalued actions satisfies a self-serving and a self-defining goal. The distinction between positive and negative is almost equivalent to the distinction between what is like myself and what is unlike myself (Blaney, 1986). Positive and negative stimuli also differ markedly in their cognitive representation, as specified in the density model advocated by Unkelbach, Fiedler, Bayer, Stegmüller, and Danner (2008). Negative stimuli are more functionally separated and more distant from each other in associative memory than positive stimuli, which are represented in denser clusters. Thus, positive stimuli are not only closer to the self but also closer to each other than negative stimuli (Byrne & Nelson, 1965; Fiedler, 1988; Schrauf & Sanchez, 2004). The density effect is also related to the higher occurrence rate of positive than negative behavior. Norm-violating negative behaviors are less frequent than norm-consistent (“normal”) behaviors, and this explains why more separate and less overlapping categories are needed to represent negative (than positive) information (Parducci, 1995), making negative behaviors more diagnostic (Ito, Larsen, Smith, & Cacioppo, 1998; Reeder & Brewer, 1979). It is impossible to disentangle all these interrelated aspects or to identify a single aspect as the only causal origin. But valence is still a meaningful theoretical variable that can be readily measured and manipulated.

Positive and negative verbs may induce pleasant versus unpleasant affective states in participants, who consequently exhibit approach (i.e., a reduction in distance) or avoidance behavior (i.e., an increase in distance), respectively. Such an alternative account in terms of intrapsychic mood states would be clearly distinct from the valence of an ecological symbol system. For an empirical test, the first experiment will start with a replication that includes a mood manipulation orthogonal to the valence of action verbs. If affective states mediate the impact of verb valence, a general mood main effect on the distance of the generated episodes can be expected, whereas the verb–valence effect should disappear when a mood factor is included. If, however, the distancing effect of negative (vs. positive) verbs reflects the suggested ecological mapping rule, then the verb–valence effect should persist regardless of mood. Support for a direct verb–valence effect would of course be most unequivocal if distance was independent of mood but only dependent on verb valence.

Power

The second dimension that we propose to account for a substantial part of the language–distance link is power. The assumption that powerful, uncontrollable stimuli induce high distance construal has already received strong support in a series of studies conducted by Smith and Trope (2006). Linguistic references to powerful and uncontrollable targets should prompt more distant episodes than references implying high personal control of clearly dominated, low-power objects. Though not strictly synonymous, in everyday social interaction power and (lack of) control are pragmatically correlated: Powerful people who manage the resources exert control over powerless others (Fiske, 1993).

For an empirical test, we conducted a second experiment according to the same basic procedure, except for the use of a new sample of stimulus verbs with clearly distinct semantic implications for power and intentional control. While Experiment 1 used the same interpretive action verbs (IAVs) as the prior research by Fiedler et al. (2012), a new sample of emotional state verbs (SVs) was used in Experiment 2. As evident from the literature on implicit verb causality (Brown & Fish, 1983; Fiedler & Semin, 1988; Rudolph & Försterling, 1997) and on the linguistic category model (Semin & Fiedler, 1988), these two verb classes have opposite implications concerning power and intentional control. IAVs imply internal causation and intentional control by the sentence subject. If an actor *deceives* or *convinces* an object person, an intentionally controlled action is attributed to the actor. The resulting emotion in the object person, who is assigned the role of a patient or experienter, is reflective of active control exerted by the subject. An opposite pattern of causal inferences is evoked by SVs. If a sentence subject *likes*, *envies*, or *respects* an object person, the semantic and pragmatic verb meaning implies a causal origin in the sentence object and an emotional or mental reaction in a powerless subject. Thus, granting that distance increases with the power of target objects, SVs should solicit more distant episodes than IAVs. Someone we *envy* or *respect* is further away than someone we *help* or *hurt*. A comparison across Experiments 1 (IAVs) and 2 (SVs) – using the same participant pool and procedure – offers an empirical test of this assumption.

Analogous to the distinction of positive and negative valence in social cognition, the distinction of IAV and SV affords a generic dimension. Again, moving from IAVs to SVs confounds several semantic features (object shift in locus of control; subject shift in locus of emotion; increasing abstractness; increasing temporal duration), which are interdependent, making it impossible to attribute the difference to any single feature. And again, the linguistic distinction abstracts from individual persons' cognitive and affective experiences with particular behaviors, summarizing a basic structural difference between actions and states that generalized across the lexicon. Detached from any first-hand experience, using SVs rather than IAVs (e.g., *hate* rather than *attack*) in second-hand communication – in newspapers, history books or in personal reviews – can affect causal attributions and distance construal toward targets one has never encountered. Again, this is not to postulate an ontological primacy of language before cognition. The point is only that generic semantic distinctions (like valence or power) can be used as exogenous variables that can be easily varied to influence distance construal – in experiments and presumably also in everyday life.

Note also that the prediction derived from implicit-verb causality diverges from an opposite prediction that might be derived from another perspective. Because SVs refer to internal emotional or mental states whereas IAVs refer to externally observable actions with manifest outcomes, the former might prime a more private, embodied, visceral experience, implying lowered distance. However, such a phenomenological perspective is not theoretically relevant to CLT's definition of distance – as egocentric distance between the subject and a judgment target (Maglio & Trope, 2012). What is relevant is not the subjective body feeling but the fact that SVs are more abstract than IAVs and thus more likely to foster high-level construal associated with higher distance (Liberman, Sagristano, & Trope, 2002; Semin & Fiedler, 1988). SVs typically involve abstract emotional reactions (*like*; *distrust*) which

are more enduring than IAVs (*invite*; *contradict*). SVs are also more distant than IAVs in terms of their causal origin. While SV sentences (“I admire”; “I suffer from”) refer to external causal origins of one's own affective reactions, IAV sentences (“I support”; “I insult”) refer to internally caused, intentional actions that originate in oneself (Fiedler & Semin, 1988). In other words, my SVs are to a lesser extent my own behaviors than my IAVs, and SVs should therefore elicit more distant episodes than IAVs.

Thus, just as the distance to socially powerful persons and uncontrolled settings is high (Smith & Trope, 2006), distance should also be high for episodes primed through linguistic stimuli that imply powerful causal origins beyond our internal control. We cross-validate this prediction in a third experiment using power-related nouns rather than interpersonal verbs as construal prompts. If the assumption is correct that power increases distance, then episodes prompted by high-power targets (professor, doctor) should be more distant than episodes prompted by corresponding low-power nouns (student, patient).

Note that the two semantic dimensions that are the focus of the present investigation, valence and power, can also be plausibly located in theoretical space. Valence (agreeableness) and power (potency) are closely related to various names for the “big two”: morality vs. ability (Reeder & Brewer, 1979), communality and agency (Judd, James-Hawkins, Yzerbyt, & Kashima, 2005), the major discriminatory dimensions in face perception (trustworthiness vs. dominance; Todorov, Said, Engel, & Oosterhof, 2008) and the major two dimensions in Osgood, Suci, and Tannenbaum's (1957) connotative space.

Summary of predictions

Across all three experiments, we expect to replicate a clear-cut pattern of distance variance triggered by specific verbal stimuli (action verbs, state verbs, and power-related nouns). We also expect these verbal stimuli to induce a consistent pattern of positive covariation across all four major distance aspects. To preview, Experiment 1 intends to replicate the differential impact of positive and negative IAVs on episode distance, in order to establish common ground with previous studies. To rule out an alternative account of verb–valence effects in terms of participants' affective states, we include a mood manipulation. In Experiment 2, replacing IAVs by a new set of SVs should yield convergent evidence for verb valence, and the distance of episodes triggered by SVs (implying a powerless patient role) should be generally higher than for IAVs (implying intentional control) in Experiment 1. Moreover, in Experiment 2, we include objectively scaled distance measures in addition to subjective distance ratings. We expect these measures to support the assumption of underlying ecological correlations. Finally, in Experiment 3, using high-power and low-power nouns, we expect to find further support for power (i.e., lack of control) as a semantic–pragmatic determinant of psychological distance, besides valence. We base our studies on relatively broad samples of linguistic stimuli selected in previous work (Semin & Fiedler, 1988) to represent a range of prototypical episodes of interpersonal behavior.

Experiment 1

Methods

Participants and design

Forty-four male and female student of the University of Heidelberg were randomly allocated to one of two (positive vs. negative) mood conditions. They completed a questionnaire that included six positive and six negative verb prompts and four distance aspects as repeated measures. This questionnaire was identical to the one used for the experiments reported in Fiedler et al. (2012).

Materials and procedure

Prior to the distance-rating questionnaire, participants were asked for their help with an independent pilot study allegedly purported to

select emotion-inducing film clips for future research. Depending on the condition, they either saw a short clip of a comedy series, namely Mr. Bean (positive-mood condition), or a documentary about a case of child abuse (negative-mood condition). A mood manipulation check, administered before and after the judgment task, asked participants to indicate their affective state on a graphical horizontal scale using a scroll bar. The end points were labeled “very depressed” and “very elated”. The graphical ratings were linearly transformed to values from 0 to 100.

The questionnaire consisted of general instructions on the first page and 12 judgment tasks on the remaining pages. Participants were told that the study was concerned with the influence of mental scenarios on questionnaire responding. Two sample tasks (*to argue with so.* and *to help so.*) served to familiarize participants with the procedure.

Each task started with the presentation of a positive or negative action verb (e.g., *to take care of so.*, *to deceive so.*). Participants were instructed to imagine themselves engaging in the social behavior specified by the verb and to briefly write down what kind of episode they were thinking of. Once the imagined episode was specified, they were asked to rate (on numerical scales from 1 to 6) the distance of the imagined episode with regard to four aspects: time, reality (probability), space, and personal distance. In particular, the temporal–distance rating asked whether the episode takes place “Rather in the near future” (left anchor) versus “Rather in the distant future” (right anchor). The social distance rating asked whether the object person was “Rather an acquaintance” versus “Rather a stranger”. The spatial distance scale asked whether the episode occurs “Rather at a near place” versus “Rather at a distant place”. For a measure of factual distance, participants rated the degree to which the behavior or event entailed in the episode is “Rather unlikely” versus “Rather likely”.

Note that unlike the temporal, social, and spatial distance ratings, the probability is inverted semantically (i.e., high probability implies low distance). Given this inversion, positive correlations between distance ratings cannot be due to a superficial response set (ticking right or left options on all scales). Because we were not interested in the semantic meaning of individual verbs, the verb ordering was held constant across participants: *to praise so.*, *to disturb so.*, *to defend so.*, *to deride so.*, *to deceive so.*, *to avoid so.*, *to care for so.*, *to endorse so.*, *to convince so.*, *to surprise so.*, *to coerce so.*, *to reject so.* Finally, participants were thanked, debriefed and asked to suggest any thought about the purpose of study.

These are the same 12 verb stimuli that were used to prompt the construal of episodes as in Fiedler et al. (2012). All stimuli were IAVs according to the Linguistic Category Model (Semin & Fiedler, 1988), selected in previous research (Fiedler, Bluemke, Freytag, Unkelbach & Koch, 2008) to represent typical examples of positive and negative social actions.

Results and discussion

Five of the 44 participants who did not complete the full questionnaire were excluded from the analyses. Using the data from the remaining 39 participants, we first analyze the reliability of the four distance ratings and their intercorrelations, before we turn to the crucial test of the relative impact of verb valence and participant mood.

As in previous research, we first conducted a check on the internal consistency of the four distance ratings, using an index proposed by Rosenthal (1987). This index measures the extent to which all judges agree in producing consistent distance ratings to the verb prompts (i.e., in producing little variance between judges but large variance between verbs). Like Cronbach’s α , the index takes on a maximal value of 1 if the inter-judge objectivity is perfect.

All four distance ratings yielded high objectivity indices: .780 (time), .884 (probability), .714 (space), and .876 (personal distance). These regularly obtained results testify, first, to the remarkable reliability of all four distance ratings and, second, to the systematic way in which different verb prompts solicit very similar distances in all individual judges. Fig. 1 summarizes these verb-specific differences, showing for instance that “to care for” prompts the construal of much less distant episodes than “to deceive”.

Separate objectivity indices were slightly but regularly higher for negative than for positive topics: .839 > .719 for time, .915 > .848 for probability, .831 > .441 for space, and .899 > .862 for personal distance. For the sake of completeness, we mention here this valence asymmetry, which turned out to be much stronger in subsequent experiments, reflecting stronger agreement in judgments of more distant episodes (solicited by negative prompts).

As in previous studies, consistently positive correlations were obtained among all four distance ratings. Correlations were particularly strong when computed per verb-topic (left part of Table 1) after averaging over judges. When judges were used as unit of analysis right part of Table 1, the correlations between all judges’ four distance ratings (averaged across topics) were also substantial. While the item-wise correlations reflect the impact of the verb meaning on the distance variance and co-variance, the latter correlations reflect interpersonal differences in the tendency to construe generally high- versus low-distance episodes. Apparently, both sources of variance support the formation of a joint distance dimension.

Having replicated this basic pattern, the crucial question that remains to be examined is whether the higher distance of episodes prompted by negative than positive verbs – provided it can be replicated – might reflect the judges’ affective states rather than the valence of the verb prompts. If participants’ mood mediates verb valence, then the inclusion of both factors within the same factorial analysis should eliminate the verb valence effect.

Starting with a check on the effectiveness of the manipulations, positive film clips led to clearly higher mood self-ratings ($M = 74.38$, $SD = 28.11$) than negative film clips ($M = 28.38$, $SD = 18.40$) immediately before the judgment task, $t(38) = 8.496$, $p < .001$. After the task, the mood effect was slightly reduced, but still significant, $M = 64.95$, $SD = 15.18$ vs. $M = 41.67$, $SD = 21.55$, $t(38) = 3.944$, $p < .001$. Thus, the mood manipulation was strong and enduring. As to verb valence, although the distinction of positive and negative verbs is common sense

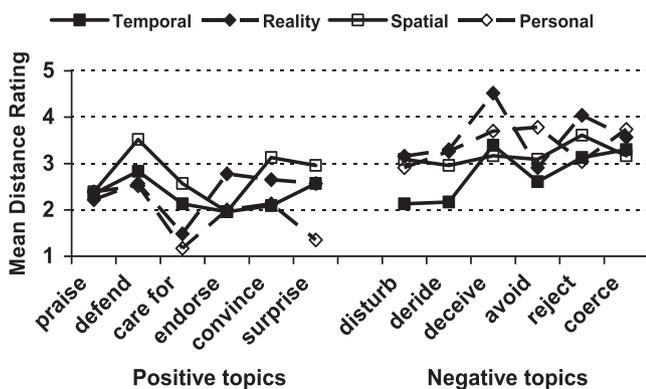


Fig. 1. Mean ratings of four distance aspects as a function of verbs in Experiment 1.

Table 1

Correlations between ratings and objective distance measures in Experiment 1, with items (left part) and participants (right part) as unit of analysis.

	Items as unit of analysis				Judges as unit of analysis		
	Time	Prob.	Space	Personal	Prob.	Space	Personal
Valence	-.58	-.80	-.34	-.90			
Time		+.81	+.78	+.66	+.70	+.63	+.44
Probability			+.64	+.87		+.52	+.28
Space				+.33			+.41

shared by all language users, it is still of interest to precisely assess the valence of individual verbs. Not surprisingly, ratings (from -5 to $+5$) by 80 new judges distinguished all positive ($M = 2.90$; $SD = 0.60$) from all negative IAVs ($M = -3.37$; $SD = 1.09$), $t(10) = 12.31$, $p < .001$.

Given the successful manipulation of mood and valence, we conducted a verb–valence \times participant mood analysis of variance (ANOVA) on the average distance ratings across all four aspects. ANOVAs were run both with items and with participants as unit of analysis, treating items as well as participants as a random factor. In the per-item ANOVA, ratings of all 12 episode topics were averaged separately across participants in the positive and negative mood conditions, respectively. In this analysis, mood is a repeated-measures factor whereas valence is a between-items factor. The only significant result was a marked valence main effect, $F(1,10) = 11.847$, $d = 2.177$, $p = .006$, replicating higher distance ratings for negative ($M = 3.06$) than positive episode topics ($M = 2.34$). The mood main effect was not significant, $F(1,10) = 2.755$, $p = .128$, although negative mood indeed resulted in somewhat higher distance ratings ($M = 2.77$) than positive mood ($M = 2.63$). The interaction was negligible, $F(1,10) = 0.119$. Mood did not exert the slightest moderating influence on the valence effect.

The ANOVA with participants as unit of analysis (based on their average distance ratings across positive vs. negative topics) with positive and negative valence as repeated measures and mood as a between-participant factor yielded a similar pattern. Only the valence main effect was clearly significant, $F(1,37) = 32.353$, $d = 1.870$, $p < .001$, but neither the mood main effect, $F(1,37) = 0.562$, nor the interaction, $F(1,37) = 0.013$.

Altogether, this clear-cut pattern corroborates the double contention that negative verbs trigger more distant construals than positive verbs. Thus, the pragmatic (i.e., ecological) distance of the verb meaning, rather than the mood state within the participants, triggers distance construal. As shown in the left part of Table 1, a strong negative correlation is consistently obtained between verb valence and all four measures of episode distance.

Experiment 2

So far, we have replicated the consistent pattern of strong positive correlations between all four distance aspects as well as the significantly higher distance of episodes solicited by negative than positive verbs. Moreover, as in prior studies, specific verbs elicited the construal of similarly distant or close episodes in many different individuals. An effective manipulation of the participants' mood states did not moderate the impact of the verbs' valence.

Elaborating on these highly regular findings, Experiment 2 constitutes an attempt to further broaden the scope of our verbal and ecological approach to understanding the origins of distance construal. We not only intend to replicate the impact of both the verb valence and of the specific verb meaning on distance construal using a fully new set of verb prompts – subjective state verbs replacing manifest action verbs. We are also interested in the relative distance solicited by affective state verbs compared to action verbs. Although the visceral components of affective states may be associated with low distance, a theoretical analysis in terms of construal-level theory (Trope & Liberman, 2010) and implicit verb causality (Brown & Fish, 1983; Fiedler & Semin, 1988; Semin & De Poot, 1997) suggests the opposite. Because state verbs imply external, uncontrollable causes, they should trigger more distant episodes than action verbs, which imply internal causal origins and intentional control.

Additionally, we made an attempt to gather more direct evidence for our ecological account of the unitary distance dimension. If the positive correlations between all four distance aspects actually reflect the ecological reality rather than merely the subjective projection of distance aspects onto plastically transformable rating scales, then it should be possible to measure these ecological correlations more objectively. We thus extended the questionnaire to include more specific information,

which allowed us to scale temporal distance (in months), spatial distance (in kilometers), probabilities (in %), and social distance (in terms of clearly defined social circles) in addition to the subjective ratings.

Methods

Participants and design

Twenty-five male and female participants were recruited from the pool of Bachelor students of the University of Heidelberg. Two participants who did not complete the questionnaire were excluded from analyses. Both independent variables (verb valence and distance aspects) were varied within participants.

Materials and procedure

The questionnaire used for Experiment 2 was identical to the one described in Experiment 1 except for two modifications. First, the verb prompts now consisted of six positive and six negative affective state verbs (according to the Linguistic Category Model), replacing the 12 interpretations action verbs. Again, the state verbs (love, envy, respect, fear, trust, dislike, admire, disregard, prefer, suspect, desire, hate) represent most typical state verbs in the lexicon. Secondly, after the questionnaire was completed as in Experiment 1, participants re-considered the same 12 episodes in the same order, and they were now asked to provide more precise distance information than in the first run. Specifically, they were asked to indicate the exact date and place of their imagined episode and to estimate the likelihood of the described behavior on a scale from 0% to 100%. To obtain at least an ordinal scale of social distance, participants classified the object person in the episode as a stranger, a colleague, a friend, a family member, or a partner (later coded as distance levels 5, 4, 3, 2, and 1, respectively).

Results and discussion

The completely new set of state verbs yielded similarly reliable distance ratings as the action verbs used in all previous experiments. The convergence of the distance ratings solicited by the 12 verb prompts is manifested in high indices of inter-judge objectivity for time (.683), probability (.785), and personal distance (.727); the objectivity was noticeably reduced for spatial distance (.434). Separate analyses revealed that inter-judge objectivities were regularly higher for negative than for positive state verbs (.340 > $-.127$ for time; .686 > .418 for probability; .530 > $-.042$ for space, and .408 > .387 for personal distance).

The intercorrelations between the average ratings of the 12 episode topics on the four distance aspects (left part of Table 2) are again strong and regularly positive. By comparison, when correlations were computed with judges as unit of analysis (based on average ratings for each distance aspect across all 12 episodes), clearly positive correlations were only obtained between three distance aspects (time, probability and personal distance). All correlations involving spatial distance were

Table 2
Correlations between ratings and objective distance measures in Experiment 2, with items (left part) and participants (right part) as unit of analysis.

	Items as unit of analysis				Judges as unit of analysis		
	Time	Prob.	Space	Personal	Prob.	Space	Personal
<i>Valence</i>	-.75	-.81	-.43	-.77			
Time		+.88	+.87	+.47	+.67	-.01	+.70
Probability			+.66	+.48		-.14	+.49
Space				+.30			-.06
<i>Objective distance measures</i>							
Time		+.10	+.09	+.07			
Probability			+.21	+.09			
Space				+.03			

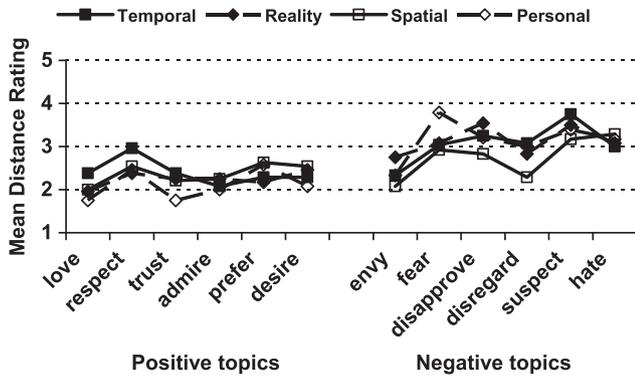


Fig. 2. Mean distance ratings as a function of verbs (grouped by valence) in Experiment 2.

negligible or even negative in sign. Apparently, interpersonal differences in spatial distance did not contribute much to the positive correlation pattern.

Did state verbs also produce a similar valence effect on psychological distance as manifest action verbs? Indeed, a glance at Fig. 2 shows that this was indeed the case. The a-priori classification of SVs as either positive ($M = +2.47$; $SD = 1.86$) or negative ($M = -2.88$; $SD = 0.95$) was again confirmed by the same 80 judges' valence ratings as in Experiment 1, $t(10) = 6.28, p < .001$. These valence scores were markedly correlated with all four distance measures (see first row in the left part of Table 2).

Statistical tests were based on comparisons of individual participants' average distance ratings across all positive versus negative verbs. Negative state verbs led to higher distance ratings regarding time ($M = 3.731, SD = 0.490$ vs. $M = 2.911, SD = 0.322$), $t(10) = 3.425, p = .006$, probability ($M = 3.055, SD = 0.546$ vs. $M = 2.123, SD = 0.363$), $t(10) = 3.479, p = .006$, space ($M = 3.249, SD = 0.458$ vs. $M = 2.860, SD = 0.295$), $t(10) = 1.747, p = .111$, and personal distance ($M = 3.759, SD = 0.455$ vs. $M = 2.669, SD = 0.515$), $t(10) = 3.888, p = .003$. For the grand average across all four aspects, the valence effect became most reliable ($M = 3.448, SD = 0.374$ vs. $M = 2.641, SD = 0.140$), $t(10) = 4.955, p < .001$.

As already mentioned, the generic valence dimension is likely to bear substantial ecological correlations to other variables, which constitute an integral part of the pragmatic meaning of positive and negative valence. Nevertheless, it is interesting to see whether a natural confound of valence, namely frequency of occurrence, accounts for the valence effect. Using word frequency as a proxy for the frequency of the reference events, indeed, the correlation across all 24 IAVs and SVs used in Experiments 1 and 2 between the mean valence ratings and word frequencies of the 24 verbs (in the data base of the University of Leipzig, <http://wortschatz.uni-leipzig.de/>) is considerable, $r = .57$. Positive verbs are much more frequent than negative verbs. However, verb-specific distance, valence ($r = -.78$) is clearly a more direct predictor of episode distance than word frequency ($r = -.29$).

To disentangle the independent impact of valence and frequency and to further check on the difference between verbs high (IAV) versus low on intentional control (SV), we included three predictors in a regression analysis of the 24 verb-specific distance ratings: mean valence rating, word frequency, and verb category (coding IAVs and SVs as +1 and -1, respectively). The results of the regression analysis corroborate the significance of both semantic dimensions, valence and implicit verb causality, in the construal of distance. When the influence of other predictors is controlled for, the independent contribution of valence is further accentuated, $\beta = -.96$; $t(22) = -8.28$; $p < .001$. In contrast, the regression weight of frequency changes its sign, $\beta = +.31$; $t(22) = +2.62$; $p = .016$. This means that word frequency serves a suppressor role (Conger & Jackson, 1972), binding error variance of the chief predictor; frequency accounts for those aspects of valence that

Table 3

Correlations between ratings of distance aspects (time, probability, space, personal distance) in Experiment 3, with items (left part) and participants (right part) as unit of analysis. Power is coded 1 vs. 0 for high vs. low-power items.

	Items as unit of analysis				Judges as unit of analysis		
	Time	Prob.	Space	Personal	Prob.	Space	Personal
Power	+.35	+.46	+.19	+.58			
Time		+.84	+.85	+.70	+.34	+.58	-.11
Probability			+.63	+.85		+.06	+.18
Space				+.46			+.03

reduce the correlation with distance. Such a pattern is not compatible with frequency accounting for the relation between valence and distance.

Does the distinction of action verbs (Experiment 1) and state verbs (in Experiment 2) also account for part of the distance variance, beyond the impact of valence and frequency? Indeed, a negative correlation between verb classes and distance ($r = -.36$) reflects higher distance estimates for SVs than IAVs, consistent with the notion that reduced intentional control comes along with higher distance. The corresponding regression weight for verb classes is also negative and significant, $\beta = -.41$; $t(22) = -4.26$; $p < .001$, indicating a contribution independent of word frequency and valence. Obviously, IAVs (implying intentional control over manifest actions) instigate less distant episode construal than SVs (implying lack of control over externally caused affective states). Although the two sets of stimulus verbs were not randomly sampled from the lexicon, they do represent reasonably broad convenience samples that provide at least tentative support for verb classes as a linguistic determinant of distance construal.

Finally, an analysis of the objective measures of the episodes' temporal distance, spatial distance, probability distance, and social distance, also reveals regularly positive correlations, which are however much smaller than those between subjective distance ratings (see Table 3). Still, the average correlation of each distance aspect with all others, computed within each participant across episode topics, was positive for time, $t(19) = 2.140, p = .046$, probability, $t(19) = 2.204, p = .040$, and personal distance, $t(19) = 2.683, p = .015$. For spatial distance, the contrast was not quite significant, $t(19) = 1.633, p = .119$. Inter-judge objectivities were high for time (.600), probability (.581), and space (.791) but reduced for personal distance (.357).

Thus, although the objective distance correlations are also regularly positive, they are clearly lower than the correlations between subjective distance ratings. Why should this be the case? A reasonable account that suggests itself is that enhanced correlations of the subjective ratings reflect the impact of a joint distance dimension. Once an episode is classified as high or low on the joint dimension, it is consistently construed as high or low in all four ratings.

Experiment 3

The results of Experiment 2 corroborate the contention that the episodes prompted by specific verbs in many different participants resemble each other in terms of the verb-specific psychological distance. Moreover, 12 state verbs yielded generally higher distance ratings than the 12 action verbs used in prior studies, while the valence effect was maintained. Negative verbs triggered more distant episodes than positive verbs. Our tentative account of the overall difference between verb classes was based on the notion of implicit verb-causality, which focuses on SVs' external causal origin and lack of intentional control, as distinguished from the IAVs' internal causal origin and intentional control. This suggests that in addition to negative valence, lack of control over powerful targets constitutes another distinction (Smith & Trope, 2006) that might help to understand the impact of verbs on distance construal.

To check on this tentative interpretation, we ran a third study using still another set of 12 completely new language prompts. We replaced the 12 action verbs or state verbs used so far by 12 noun prompts that varied systematically in their associations of power and control. If the assumption is correct that lack of control over highly powerful targets facilitates high-distance construal, high-power (vs. low-power) nouns should lead to systematically higher distance ratings of all four aspects than low-power nouns.

Methods

Participants and design

Twenty-six male and female students of the University of Heidelberg completed a questionnaire (as part of a longer session with several studies) that followed the same format and design as in previous experiments. Six of the 12 linguistic prompts used for the questionnaire were nouns referring to high power (boss, teacher, doctor, policeman, professor, politician). The remaining six (child, waiter, loser, student, patient, handicapped person) referred to low power.

Materials and procedure

The materials and procedures were the same as in previous experiments, except for the replacement of the verb prompts by the noun prompts and two notable adjustments of the instructions. First, rather than to imagine fictitious future episodes, we asked participants to think of real past episodes. Second, instructions asked participants to recall an episode with a person denoted by the prompt as a target object, not to imagine themselves' engaging in the action or state expressed by a verb. Thus, given the "politician", the student participants were not asked to imagine behaving themselves like a politician. Instead, they were asked to recall being involved in an episode with a politician as a target.

Once an episode had been recalled for each noun prompt, it was rated for the same four distance aspects. However, the rating scales were modified to reflect the change in the task from imagining a fictitious future episode to recalling a real, past episode. The poles of the temporal distance scale then referred to the near and distant personal past. The factual distance scale asked participants whether they presently think the episode was a frequent, probable episode. The personal distance scale referred to how close (left) versus distant (right) the other person in the remembered episode was to the participant today. Finally, the spatial distance scale asked whether the episode occurred at a near or distant place.

Results and discussion

Initial analyses of inter-judge objectivities again revealed the same systematic distance variation across episodes prompted by different nouns in by many judges. The inter-judge objectivity was higher for personal distance (.830) and probability distance (.778) than for temporal (.558) and spatial distance (.490). Apparently, power-related social roles constrain the construal of social and factual distance more than the localization in time and space. However, interestingly, high objectivity indices were obtained for all four distances, when only the six high-power items were included in the analyses: .671, .779, .715, and .820 for temporal, probability, spatial, and personal distance, respectively. Given the egocentric definition of psychological distance in CLT, it appears indeed plausible that discrimination is easier on the more distant (i.e., high-power) side of the scale (Krüger, Fiedler, Koch, & Alves, 2013; Maglio et al., 2013). Consistent with this notion, an ordinal increase in objectivity was obtained for all 2×4 distance aspects when only negative verbs (i.e., more distant episodes) were included.

As in all previous studies, the intercorrelations among all four distance aspects are regularly positive and particularly high when average ratings per items (averaged across judges) are used as unit of analysis (see left part of Table 3). These item-wise distance ratings are also

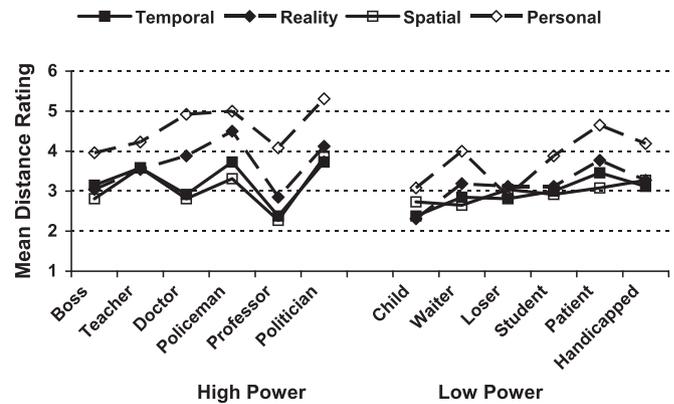


Fig. 3. Mean distance ratings elicited by high vs. low power nouns in Experiment 3.

positively related with the binary classification as high- (coded 1) versus low-power (coded 0) items, as indicated in italics in the first row. The correlations with judges as unit of analysis (right part of Table 3) are mixed and generally lower.

Turning to the central research question, regarding the impact of uncontrollable power on distance construal, it is evident from Fig. 3 that, as expected, all four distance ratings tend to be higher for episodes prompted by high-power than by low-power prompts. This difference was confirmed in contrasts of all participants' average distance ratings across high-power items versus all low-power items. These contrasts were consistent for distance in time ($M = 3.250$, $SD = 0.779$ vs. $M = 2.936$, $SD = 0.626$, $t(25) = 1.941$, $p = .064$), probability ($M = 3.654$, $SD = 0.966$ vs. $M = 3.128$, $SD = 0.774$, $t(25) = 3.627$, $p = .001$), space ($M = 3.103$, $SD = 0.683$ vs. $M = 2.949$, $SD = 0.771$, $t(25) = 1.208$, $p = .238$), personal distance ($M = 4.583$, $SD = 0.747$ vs. $M = 3.782$, $SD = 0.749$, $t(25) = 4.613$, $p < .001$), and for the grand average across all four aspects ($M = 3.647$, $SD = 0.491$ vs. $M = 3.199$, $SD = 0.449$, $t(25) = 4.892$, $p < .001$).

Again, one might contend that low power targets (like child and waiter) are more frequently encountered than high-power targets (like boss and politician), and that frequency of occurrence, rather than power, is the proper determinant of distance. And again, we do not make a serious attempt to isolate power from its natural confounds. We rather treat power as an exogenous variable that may of course be related to rareness. It is still interesting that across the 12 nouns of Experiment 3 frequency correlates weakly with power ($r = +.21$) and with valence ($r = -.25$), reflecting slightly higher frequencies of high-power and negative targets, and that for these 12 stimuli power correlates more strongly with distance ($r = +.47$) than valence ($r = -.20$) and frequency ($r = .00$). This means that neither valence nor frequency can account for the relationship between control (power) and distance within the present set of 12 nouns, which is of course too small to warrant any generalizing conclusions.

We finally regressed the average distance ratings solicited by all 36 verbal prompts in all three experiments as a function of the three predictors: valence, control, and frequency. For the second predictor, we coded IAV verbs and low power nouns as low (-1) and SV verbs and high power nouns as high ($+1$) in power. The obtained regression weights, which measure the impact of each predictor beyond the variance accounted by the other predictors, corroborate the predictive value of valence, $r = -.48$, $\beta = -.80$, $t(34) = -5.71$; $p < .001$, as well as power, $r = +.35$, $\beta = +.40$, $t(34) = +3.49$; $p = .001$. However, the zero-order correlation of frequency and distance of solicited episodes was negligible ($r = +.06$), and its positive regression weight (opposite in sign to the weight of valence and control), $\beta = +.52$, $t(34) = +3.73$; $p < .001$, is completely due to its role as a suppressor of distance-unrelated aspects of valence.

Altogether, these findings corroborate the contention that both power and valence are semantic and pragmatic dimensions that

account for a large part of the impact of specific linguistic stimuli on the construal of psychological distance. Positive and negative terms, IAVs and SVs, or nouns representing high or low power, can be used to manipulate distance in psychological experiments and, presumably, to regulate distance in verbal interaction.

General discussion

Let us first summarize the major results before we turn to a discussion of theoretical and practical implications. Applying the same methodology as in earlier research (Fiedler et al., 2012), we gathered further evidence for impressively strong positive correlations between all four aspects of psychological distance (time, space, probability, and personal distance), in accordance with CLT. Using a more systematic design than in most previous CLT research, we assessed ratings of imagined or remembered episodes solicited by 36 different verb or noun prompts with regard to all four distance aspects. Virtually all correlations between the average temporal, spatial, factual, and personal distance of the 36 verbally prompted episode topics were clearly positive. Only spatial distance tended to correlate weaker with the other three aspects. We replicated and extended this consistent pattern across three sets of verbal prompts, testifying to the robustness and the external validity of the empirical results.

According to our ecological account for the existence of a unifying joint dimension of psychological distance, the positive correlations seem to reflect a kernel of ecological truth. What happens in the far-away future is actually more likely to take place in a remote place and to involve more unlikely events and behaviors vis-à-vis less familiar persons than what happens right now. Supportive evidence for this assumption was obtained in one experiment, when the episodes' distance in time, space, and probability was measured quantitatively, and an ordinal scale served to measure social distance more objectively. Even these objective correlations were positive above chance. However, interestingly, these objective ecological correlations were not as high as the correlations among the subjective ratings. This marked discrepancy of objective and subjective correlations implies, apparently, that once an episode is internally coded on the joint dimension as either distant or close, this categorization will lead to consistent subjective ratings on all distance aspects.

While the actual existence of objective correlations between such different modalities as time, space, probability and personal distance reflects an ecological origin, the size of the correlations can be understood as a consequence of a unifying distance dimension. Just as a joint valence dimension implies a halo effect (Cooper, 1981) – what is positive (negative) in one respect is assumed to be also positive (negative) in other respects – a joint distance assumption implies that what is construed as distant (close) in one aspect is also likely to be construed as distant (close) on other aspects. Thus, the clearly stronger correlations in the subjective construal than in the objective measures of distance provide supportive evidence for the operation of an underlying joint dimension.

Covariance between different distance aspects can only be found if there is sufficient distance variance in the first place. Episodes must vary sufficiently in their “true” location of the distance dimension. Fulfilling this premise, the second major finding was that distinct linguistic stimuli triggered the construal of episode topics that many individual judges construed consensually at different levels of psychological distance. The basic variance between high and low distance episode types was manifested consistently in all four aspects, giving rise to strong positive correlations. To be sure, part of the (co)variance in distance ratings also originated in systematic inter-individual differences between judges preferring generally closer or more remote episodes. However, the correlations across judges were weaker than the correlations across episode types. Indeed, this influence of distinct verbal stimuli on the consensual construal of (distant vs. close) episode types was replicated with three non-overlapping sets of 12 stimuli.

Our evidence also suggests that two semantic–pragmatic dimensions can account for a large part of the distance (co-)variance. With regard to the valence dimension, first, negative action verbs and state verbs solicited regularly more distant construal than positive action verbs or state verbs. Apparently, the natural tendency to avoid negative and to approach positive targets affords a general rule for distance regulation, to consume and lump together positive episodes but to isolate and set oneself apart from negative episodes. Note that the persistent tendency to construe negative episodes from a safe distance does not contradict the finding that increasing distance allows us to discover more positive aspects of decision options and attitude objects (Eyal, Liberman, Trope, & Walther, 2004; Herzog, Hansen, & Wänke, 2007). Indeed, the very ability to focus from a distance on the ideal aspects provides an explanation for the tendency to distance oneself from undesirable episodes.

The second dimension that discriminates between high and low distance topics is social power and its implications for control. On the one hand, affective state verbs referring to external causal influences beyond our internal intentional control tend to trigger higher distance construal than manifest action verbs that describe internally controlled intentional actions. On the other hand, noun prompts referring to powerful and hardly controllable targets generate higher distance construal than low-power nouns. For a common denominator, it appears that people spontaneously construe unwanted (negative) and uncontrollable (powerful) topics at higher distances than wanted (positive) and controllable (powerless) topics. These two determinants of distance construal are independent of each other and independent of word frequency.

With regard to the broader research program of CLT, the present findings may be helpful to understand when and why judgment targets vary in reality. We believe that language constitutes a major part of the information environment, affording a versatile instrument for distance framing and distance regulation (see also Maglio, Rabaglia, Feder, Krehm, & Trope, 2014). We suspect that verbal framing may be a more common source of distance manipulation in everyday life than actual locomotion in time, space, and social circles. To test and exploit the manifold insights from CLT research, say, in the area of consumer preference and choice, it is hardly feasible to actively manipulate the consumers' spatial distance from their decision options, or to impose long temporal delays on their choices, or to manipulate the social surplus value or probability of choice outcomes. However, language affords an extremely efficient instrument for distance framing, which can be used to trigger mental time traveling (Miles, Nind, & Macrae, 2010), counterfactual reasoning, and imaginative construal processes (Hansen & Wänke, 2011). The present results highlight the fact that simple lexical stimuli are sufficient to solicit either distant or close episodes, consistent with other evidence on the power of simple lexical priming (Fiedler, 2008).

The question that suggests itself is whether the strong and robust influence of specific verbs or nouns can be actually used to induce the various changes in judgments and decisions that have been the focus of countless CLT studies. Thus, when people make actual judgments or choices, could the same lexical primes, and their coordinates on the valence and power dimension, exert a similar strong influence as in the present research? Can high-power nouns or affective state verbs be applied (in task framing or advertising) to induce more dispositional attributions (Nussbaum, Trope, & Liberman, 2003), simplifying lexicographic decisions based on primary attributes (Todorov, Goren, & Trope, 2007), underweighting of probabilities (Sagristano, Trope, & Liberman, 2002), or consideration of long-term utility (Trope & Liberman, 2000) than low-power nouns or action verbs? Does verbal distance framing or priming only work when lexical stimuli are attached to the decision targets proper? Might it even be possible to induce a high- or low-distance mindset by simply manipulating the verbal context? Can the impact on decisions be expected to increase with the frequency and density of verbal priming? – Future research may soon

lead to empirical answers to these theoretically intriguing and practically important questions.

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