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„Neither Here nor There: How (In)congruence of
Processing Mode and Psychological Distance Affects
Social Judgment“

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We live in a globalized world that is well connected. Individuals have become increasingly mobile. Striving for a better life, we move to other cities or might even cross borders to seize opportunities, such as job offers or the chance for a quality education. We no longer only deal with people and events that take place in close proximity to us. In the news, we read about occurrences in faraway places that affect all our lives: elections, wars, sustainability policies, natural disasters, or the emergence of new diseases. We are frequently required to think and judge events or people that are spatially removed from us. Businesspersons, for instance, have to decide how to conduct business with someone on the other side of the world. Consumers have to judge whether it is safe to buy products from companies across the world or not. Politicians have to evaluate whether a new disease that has emerged in a faraway country poses a threat. The rise in popularity of email communication and social media only increase this trend. As a result, the question of how we make these decisions and judgments arises. How does the perception of (social) events as either near or distant affect our judgment?

A large body of work has studied the perception of spatially near versus distant objects and events. Research suggests that objects that are close to the individual are understood, perceived, and processed differently than spatially distant ones. In particular, the effect of distance on sensory modalities and representational systems (McNamara, 1986; Tversky, 2003, 2005) as well as neurological mechanisms (for a review, see Konen & Kastner, 2008), such as activation of different brain areas (Berti & Fassinetti, 2000; Halligan et al., 2003) or attention (McCourt, 2001; Nicholls, et al., 2011), have been studied. For representations of objects that are perceived as spatially near, individuals use their own body and the space surrounding it as the point of reference (Bryant & Tversky, 1999; Tversky, 2003). Such representations include information about the position of the object relative to their own body: Is the object to the left or to the right, in front or behind the individual's body? Is it on eye level or at the individual's feet? If objects are more spatially distant, however, their representations are more schematized and global (e.g., Bryant & Tversky, 1999; Tversky, 2003).

More recent research in the field of psychological distance within the framework of Construal Level Theory (CLT; Trope & Liberman, 2003, 2010) continues to investigate

differences in the representations of distal and proximal objects as well as its effects on judgment and decision making. The present study focuses on spatial distance and examines the effect of perceived spatial distance on people's judgment of social interactions. As such, it replicates an early study that has become central to CLT research (Henderson et al., 2006). To add to the existing literature regarding psychological distance and CLT, a second study explores how different processing modes, i.e. verbal and visual processing modes, affect the relationship between spatial psychological distance and construal level.

Construal Level Theory and Psychological Distance

In line with the earlier conceptions of spatial cognition mentioned above, CLT proposes that objects are represented differently depending on how psychologically close to or distant from the individual they are perceived to be (Trope & Liberman, 2010). The self and one's direct experience function as the point of reference, meaning that psychological distance increases when an object is removed from the self (Kalkstein et al., 2016). Importantly, this does not relate to the physical position of one's body but rather the "experienced location of the self" (Canzoneri et al., 2016). Moreover, the perceived distance rather than the objective distance is defining. Psychological distance can, thus, be understood as the subjective experience that an object, person, or event is either proximal or distal to the self (Trope & Liberman, 2010).

Psychological distance comprises four dimensions: temporal, spatial, social, and hypothetical (Trope & Liberman, 2010; Soderberg et al., 2015; Hernández-Ortega, 2018). According to a meta-study by Soderberg et al. (2015), out of the four dimensions, temporal distance has received the most attention thus far. It refers to the time an event takes place, i.e., whether it takes place close in time or is a long time away. Events in the present are perceived as closer, those in the future or past as more distant (Trope & Liberman, 2003; Soderberg et al., 2015). Even though significantly fewer studies have investigated past distance than future distance, both directions seem to have similar effects on distance perceptions (Soderberg et al., 2015). Hypothetical distance refers to the certainty of an event taking place. Real events or events that are certain are perceived as proximal, while events that are perceived to be less likely to occur create more psychological distance (Trope & Liberman, 2010; Wakslak et al., 2006). Just as the other distance dimensions, social

distance uses the self as the point of reference. Individuals perceive themselves as closer, others as more distant. We feel closer to people we know well, such as our families and friends, than to people we do not know. Moreover, similar others as well as members of a salient in-group are perceived as more proximal, while dissimilar others and members of a salient out-group are perceived as distal (Liviatan et al., 2008; Trope et al., 2007; Trope & Liberman, 2003). Spatial distance refers to where an event takes place or where an object is situated (Trope & Liberman, 2010). Objects or events that take place in an individual's physical proximity are perceived as closer, those physically distant from an individual as more distal.

People do not experience the world directly. Rather, we form mental representations, or construals, to perceive, understand, and interpret our surroundings. This enables us to think about the past or objects that are currently not present, and allows us to anticipate the future. According to CLT, objects or events can be represented on a high or low level of construal. High-level representations are more schematic, more general, and more abstract. They rely on more superordinate and essential aspects and omit secondary features, less relevant details, and incidental aspects (e.g., Hess et al., 2018; Trope & Liberman, 2010; Eyal et al., 2004), which can drastically alter the meaning of an event (Trope & Liberman, 2003). They contain the gist or the most central meaning of an object or event and, as such, are relatively simple and coherent. Low-level representations, in contrast, include secondary and contextual features and are rich in detail, and thus, lead to only marginal changes in the meaning of an event (Trope & Liberman, 2003). They are more concrete and subordinate. Consequently, they are less coherent and less structured representations than high-level representations (e.g., Hess et al., 2018; Trope & Liberman, 2010; Eyal et al., 2004).

Importantly, the same object, event, or action can be construed on a high or low level of abstraction (Bar-Anan et al., 2006). When encountering a cat, for example, it could be represented as an animal (high-level) or a European Shorthair (low-level). Moreover, representations are not either high- or low-level. Rather, they move on a continuum: from low to high levels of abstraction (Soderberg et al., 2015). A cat could be represented as an animal, a pet, a cat, a European Shorthair, or the neighbor's beloved, one-eyed European

Shorthair named Cleo (moving from unspecific and abstract to specific and concrete, from a higher to a lower level of representation). In comparison to *the neighbor's European Shorthair Cleo*, *cat* appears as rather abstract and high level. However, *cat* appears as rather concrete and low level in comparison to the very general category *animal*.

According to CLT, psychological distance affects how objects, people, and events are represented. In particular, psychological distance influences how abstract and schematic a representation is, i.e. on which level of abstraction, or construal, an object or event is represented (Liberman & Trope, 2009). Numerous studies have investigated the relationship between level of construal and psychological distance and findings support this basic propositions of CLT: Objects, events, and people that are perceived as psychologically distant from the individual are represented on a higher, more abstract level of construal. Objects, events, and people that are perceived as psychologically closer are represented on a lower, more concrete level of construal (e.g., Hess et al., 2018; Liberman & Trope, 2009; Fujita et al., 2006a; Eyal et al., 2004; Trope & Liberman, 2003, 2010; for a meta-study see also Soderberg et al., 2015). Distant objects are more likely to be described and understood in more abstract, schematic, and general terms than close ones, even when concrete information is available (Henderson et al., 2011). Arguably, people rely on high-level features when construing distant objects or events because they are less tangible and thus, more likely to change (Trope & Liberman, 2003; 2010).

Importantly, the relationship between psychological distance and level of construal is bidirectional. This means that not only does psychological distance affect the level of construal, but level of construal similarly affects the perceived psychological distance (Liberman & Trope, 2009; Liberman et al., 2002). A person in a more abstract, high-level mindset, thus, will perceive objects to be more distant. This bidirectional relationship implicates that the different distance dimensions affect each other via the level of construal (Lynch & Zauberman, 2007), which supports the early notion that all distance dimensions are interrelated (Liberman & Trope, 2009; Trope & Liberman, 2003). Using a Stroop task, Bar-Anan et al. (2007) found that psychological distance cues are automatically accessed, even when individuals were told to disregard these cues, and affect processing of other distance dimensions. Similarly, participants who expect to meet people in the more distant future

perceive these people as more socially distant than when they expect to meet them sooner (Stephan et al., 2011). Likewise, events that are less likely to occur are perceived as more spatially distant than certain events (Sungur et al., 2019), just as speakers who use more formal language (socially distant cues) appear to be more spatially distant (Stephan et al., 2010). In accordance with these findings, Maglio et al. (2013) found that increasing the distance on any dimension simultaneously increases the perceived distance on the other dimensions. This held true for all four distance dimensions. Zhang and Wang (2009) reported similar findings. It should be noted, however, that they found an asymmetry of the distance dimensions. In particular, perception of spatial distance was less affected by distance cues on other dimensions than the distance perceptions on the other dimensions. Spatial dimension is singled out as the most tangible distance and thus, Zhang and Wang (2009) propose that the spatial dimension is only affected by primes along the other dimensions when individuals are encouraged to think about similarities of the spatial and the other dimensions.

Productivity and Replications in the fields of psychological distance and CLT

Research in the fields of psychological distance and CLT has been very productive in the last two decades. While numerous studies focus on investigating the theoretical propositions of CLT, such as the relationship between the distance dimensions and level of construal (for a meta-analysis see Soderberg et al., 2015) or the interaction between the distance dimensions (e.g., Sungur et al., 2019; Maglio et al., 2013; Stephan et al., 2011; Bar Anan et al., 2007), implications for judgment and decision making have been studied increasingly (for an early review, see Trope & Liberman, 2010). Studies, for instance, show that central, goal-relevant features become more important when psychological distance is increased, while peripheral and more irrelevant features are more important for decision making when psychological distance is low (e.g., Trope & Liberman, 2010; Liviatan et al., 2008). Moreover, decisions will be more strongly based on values when they are psychologically distant because values are relatively abstract (Giacomantonio et al., 2010; Ledgerwood et al., 2010; Eyal et al., 2009). Furthermore, CLT has been studied in various contexts, such as consumer behavior (Irmak et al., 2013; Kim et al., 2008; Fiedler, 2007; Liberman et al., 2007; Dhar & Kim, 2007), sustainability and climate change engagement

(e.g., Wang et al., 2019; Chu & Yang, 2018; Singh et al., 2017; Brügger et al., 2016) and attitudes (Sacchi et al., 2016), self-control (Fujita et al., 2006b), stereotyping (Greijdanus et al., 2014; McCrea et al., 2012), prejudice (Luguri et al., 2012), empathy (Wolfin et al., 2011; Levy et al., 2002), and criminology (Gouseti, 2018).

Despite the popularity of CLT in several fields of study, many influential studies have not been replicated. Moreover, the existing replications have produced contradictory (e.g., Žeželj & Jokić, 2014), non-significant (e.g., McCarthy & Skowronski, 2011), or contrary (e.g., Gong & Medin, 2012) results, thus necessitating replications of both the basic propositions and application of CLT as well as an investigation of limits of the relationship between psychological distance and level of construal.

Replication in general has generated much interest in recent years, particularly since the Open Science Collaboration (2015) published a report, in which they estimate that only 36% of studies in psychology can be replicated successfully. Moreover, many studies are never replicated at all (Makel et al., 2012) and replications are at risk of never getting published, partly because replications are less attractive both for researchers and journals (Bardi & Zentner, 2017; Wiggins & Chrisopherson, 2019). Ensuing proclamations of a replication crisis in psychology incited much discussion about the reasons why only so few studies could be replicated and about ways to improve replication rates (e.g., Shrout & Rodgers, 2018; Trafimow, 2018; Bardi & Zentner, 2017) as well as reflection about the importance of replication. Replication of studies functions as a measure for self-correction (Wiggins & Chrisopherson, 2019; Shrout & Rogers, 2018), as it can prevent questionable research practices and the publication of false results or fabricated data, which in turn generated credence (Open Science Collaboration, 2015).

To counter this trend and generate more evidence for the fundamental prospects of CLT, Swedish researchers have founded the construal level International Multilab Replication Project (CLIMR, n.D.), which fosters international collaboration and aims to replicate studies from four of the most cited papers in CLT, one for each distance dimension. In reaction to this initiative, study 1 of this paper replicates a study by Henderson et al. (2006; study 1).

Spatial Distance, Construal Level Theory, and Social Judgment

Drawing on the central propositions of CLT, Henderson et al. (2006) concluded that if psychological distance affects construal level, this effect ought to extend to social judgments. In particular, increasing psychological distance ought to generate social judgments that rely on abstract and schematic representations. Henderson et al. (2006) examined this conjecture in four studies. Drawing on schema research (Markus et al., 1985; Cohen & Ebbesen, 1979), which suggests that individuals with an activated schema divide streams of actions into fewer meaningful sections, Henderson et al. (2006) introduced a new task into the framework of CLT (study 1) to measure construal level, namely segmentation of continuous behavior (Newtson, 1973). They instructed their sample of $N = 86$ students attending New York University (63% female) to view a video that suppositionally took place at a camping trip for teenagers either located on the East Coast near New York (close condition) or on the West coast (distant condition). In the video (developed by Heider & Simmel, 1944), three shapes, two triangles and a circle, move around and against each other. Participants were tasked to divide the video into sequences of meaningful action by pressing the space bar on their keyboard. Participants allotted to the spatially distant condition divided the action sequence into fewer units than those allotted to the spatially proximal condition, indicating that spatial distance affects how individuals divide sequences of actions (Henderson et al., 2006). This confirms the assumption that psychologically distant actions are represented more abstractly and schematically and supports the assumption that the effect of psychological distance on construal level extends to social judgments.

In further studies built upon the insights gained from the study described above (study 1), Henderson et al. (2006) found more support that psychological distance affects the information upon which individuals rely to form (social) judgments. In particular, when increasing psychological distance high-level information, such as general tendencies and trends as well as more stable, dispositional characteristics, becomes more important. Analogically, low-level information, such as peripheral details and characteristics specific to a situation, become more important when psychological distance is reduced. In simpler terms, when judging events that take place further away, we form schematic and abstract representations and base our judgments on high-level construals. When forming high-level

construals, information content is reduced and the focus lies on the central meaning. Situation specific details are omitted. When judging events close to ourselves, we form more concrete representations and base our judgments on low-level construals, which include details and subordinate, contextual information. Thus, spatial distance can cause individuals to perceive, represent, and judge events differently via level of construal. According to Henderson et al. (2006), psychological distance and CLT, therefore, may contribute to explaining judgment biases, such as correspondence bias (see Gilbert & Malone, 1995) and stereotyping. McCrea et al. (2012) tested this inference and found that enhancing abstract thinking increases stereotyping of the self and of others by fostering more general categorization and reliance on central aspects and core meanings of actions, events, and even people (Liberman & Trope, 2009). Thus, replicating the findings by Henderson et al. (2006) serves not only to substantiate a proposition fundamental to CLT, namely the relationship between spatial psychological distance and construal level, but also to corroborate the association of psychological distance, construal level, and social judgments.

Psychological Distance, Construal Level Theory, and Processing

While it is worthwhile and important both to investigate the basic propositions of CLT and to replicate findings within the field of CLT to generate support and increase credence of CLT, factors that might impact or influence the effect of psychological distance ought to be examined. Prior research suggests that psychological distance and its effect on construal level is influenced by various factors, such as emotional intensity (Van Boven et al., 2010), mode of perception (Liberman & Förster, 2009a), virtuality and tangibility (Darke et al., 2016) as well as cognitive fluency, including linguistic fluency (Alter & Oppenheimer, 2008). Consequently, CLT needs to accommodate for such factors and researchers ought to investigate to what extent and under which circumstance these factors affect psychological distance and construal level to refine CLT, explore its limitations, and extend its applicability and practical relevance. Establishing the nature and impact of confounding and related factors, moreover, can help explaining why replications of findings within CLT fail and help understanding the nature of psychological distance and construal level more thoroughly.

Within the framework of CLT, psychological distance has been closely associated with processing and processing modes. These links, however, go beyond the connection of

psychological distance and abstract processing. Soderberg et al. (2015), for instance, argue that processing style might influence the effect of psychological distance on the construal level. They argue that effortful processing might enhance the effect on distance on the construal level, i.e., the more effort individuals spend on processing cues regarding psychological distance, the more strongly it will affect the construal level. Evidence for this suggestion is provided by Park (2010) who found that participant's representations are more abstract when they elaborate temporally distant cues more thoughtfully than those of individuals who engage in less effortful processing. For spatial distance, Liberman & Förster (2009a) found that global processing enhanced estimated psychological distance, while the opposite held true for local processing. Likewise, psychological distance affects whether objects are locally or globally perceived (Liberman & Förster, 2009b). These findings substantiate the claim that CLT and processing are closely related in various manners.

Other research focuses on the role of processing mode, particularly the relationship between psychological distance, construal level, and visual or verbal processing. Amit et al. (2009) suggest a close relationship between words and high-level construals as well as pictures and low-level construals. They argue that visual and verbal information are fundamentally different (see also Wyer et al., 2008), even though the same information might be conveyed by both verbal and visual means. You can read about an event, such as a concert, in a magazine or you can look at a picture or watch a video taken at the concert. The article will, most likely, provide basic information and report the central, most relevant aspects, such as the artist, venue, time, and date of the event. Peripheral, less central details will be omitted. A video or picture, on the contrary, will include contextual and goal-irrelevant features, such as the color of the shirt of a random audience member. This example illustrates the similarities of visual information and low-level representations as well as of verbal information and high-level construals.

Amit et al. (2009) extend these basic assumptions. They found that visual information is processed faster when representing psychologically close objects, while verbal information is processed faster when representing psychologically distant objects. However, processing is slower when visual information is presented with psychologically distant stimuli or verbal information with proximal stimuli. Based on these findings, they conclude that pictures best

represent stimuli that are psychologically close to the individual, while words best represent objects and events that are psychologically distant (Amit et al., 2009). In accordance with these findings, Amit et al. (2013) found that people prefer pictures in communication with psychologically close others and words in communication with distant subjects.

More evidence for the relationship between visual/verbal processing, psychological distance, and construal level is provided by Yan et al. (2016). For the temporal distance dimension (experiment 1), they found that increasing psychological distance increased the likelihood of verbal processing, while decreasing distance was associated with visual processing and they suggest that people process proximal information visually and distant information verbally. In a second experiment, they extended these findings to the social dimension and found that distant stimuli foster verbal processing, while proximal stimuli were more likely to induce visual processing. Additionally, they found support for their hypothesis that induced processing mode mediates the relationship between psychological distance and construal level (experiments 2 and 3), for both for the social and temporal dimensions. Moreover, they found that when the induced processing mode and psychological distance were incongruent (i.e. visual and distant; verbal and close), the effect of processing mode replaced the effect of psychological distance on the construal level (experiments 3, 4, and 5). Particularly, the results of studies 3 and 4 and their implications are highly relevant for research within CLT because CLT does, as of now, not include references to various processing modes, such as verbal and visual processing, in its conceptualization and has not integrated factors that might buffer, impede, or reverse the effect of psychological distance on the construal level and vice versa.

Study 2 of this paper extends the findings by Yan et al. (2016) to the context of social judgment and to the spatial dimension of psychological distance to gather more support for the role of processing mode within the field of CLT. In particular, I aimed to investigate the effect of (in)congruence of processing mode and spatial psychological distance on social judgment to increase theoretical understanding of CLT and its limitations.

Study 1: Spatial Distance and Social Judgment (Replication)

As mentioned above, Henderson et al. (2006) investigated the effect of spatial psychological distance on segmentation of a sequence of continuous action. Drawing on CLT,

they assumed that spatially distant events are represented on a higher level of construal than spatially close events, which results in judgments based on more abstract and schematic representations. In study 1 of their paper (Henderson et al., 2006), they found support for this conjecture. Participants allotted to the spatially distant condition divided the action sequence into fewer units than those allotted to the spatially proximal condition (10.09 vs. 14.41, Mann–Whitney $U = 694.00$, $Z = 2.00$, $p = .05$, Cohens $d = .53$, 95% $CI [.09, .97]$; d as communicated by CLIMD (n.D.) who obtained it from Soderberg et al. (2015)), indicating that spatial distance affects how individuals divide sequences of actions (Henderson et al., 2006). To generate more support and credence for their findings, study 1 of the present paper replicated their study. Matching the hypothesis by Henderson et al. (2006), I hypothesized that a sequence of continuous behavior will be segmented into more and narrower units when the action is located at a spatially near site, while increasing spatial distance will lead to fewer and broader segments.

Method

Participants

The appropriate sample size was calculated using G*Power for $\alpha = .05$ and power = .80. Based on the findings by Henderson et al. (2006), I conducted my calculations under the assumption of a medium effect (Cohens $d = .53$) (see CLIMR, n.D.), which lead to a required sample size of $n = 90$ participants. The original study collected data in university labs and CLIMR (n.D.) instructed the participating labs and researchers to conduct their respective studies in university labs, which made data collection in the laboratory of the University of Vienna highly desirable. Moreover, there are general advantages of collecting data in university labs, such as higher degrees of controllability of external factors and internal validity that apply to research in the field of CLT, in particular because psychological distance and construal level might be easily affected by external factors (e.g., Alter & Oppenheimer, 2008; Liberman & Förster, 2009a; Van Boven et al., 2010; Darke et al., 2016). Due to the COVID-19 crisis and ensuing restrictions and health and safety concerns, testing in the university labs, however, was not feasible. Thus, I decided to collect data online, which meant that participants could not be recruited from the university's student pool. Due to the nature of the study, only participants currently located in Vienna were suited for

participation. As a result of these restrictions and requirements, participants were recruited online via various social media channels. In particular Facebook groups specifically aimed at Viennese people and students were used for recruiting purposes. Thus, the sample is a convenience sample. Because the tasks included in the study could be more easily completed on a computer or laptop rather than on mobile phones, participants were instructed to access the study on a computer or laptop. Participants received no incentives, monetary or other, for participation. Data was collected between December 13th 2020 and January 15th 2021.

A total of 203 persons participated in the survey. Participants who were not located in Vienna at the time of data collection (74 participants) and participants with insufficient German skills (3 participants) were screened out directly during the study. Moreover, participants who answered one or more of the comprehension checks incorrectly (15 participants), did not fill out the survey completely (2 participants), or failed to complete the segmentation task (4 participants) were excluded. This resulted in a final sample of $N = 105$ participants (73.3% female), aged 19 to 72, $M = 28.97$, $SD = 9.510$. Among those, 49 participants (46.7%) were randomly assigned to the spatially close condition (57.3% female; $M = 28.04$, $SD = 8.665$) and 56 participants to the spatially distant condition (78.6% female; $M = 29.79$, $SD = 10.199$). Since the data for study 1 was collected simultaneously with the data for study 2, which required a slightly bigger sample size, the sample is larger than calculated.

Procedure and Materials

The design and measures of the study were identical to the original study by Henderson et al. (2006) and followed the instructions of CLIMR (n.D.). Figure 1 shows the procedure of study 1. Materials were provided in English by CLIMR (n.D.) and independently translated from English to German using back-to-back translation to ensure semantic accuracy. Prior to the data collection, the study was pre-registered and an ethics approval was obtained from the Institutional Review Board (IRB) of the University of Vienna (IRB number: 2020/S/015). Participants accessed the study online via a link distributed on various social media platforms.

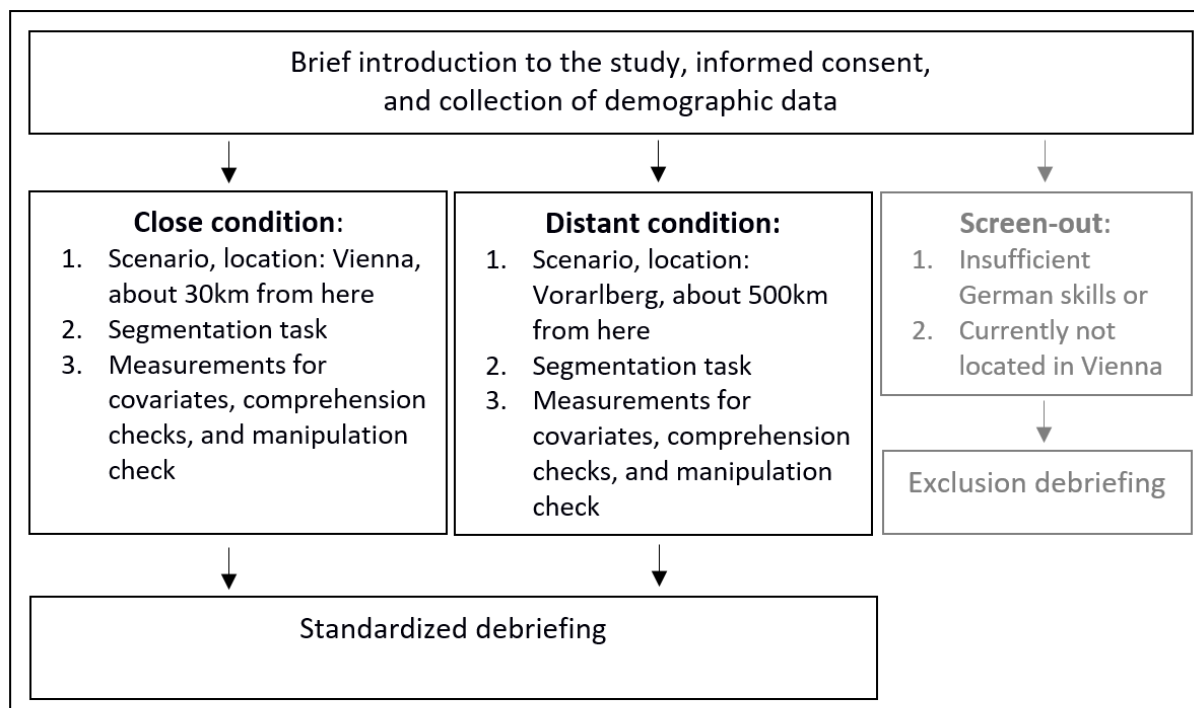


Figure 1. Procedure of study 1.

Informed Consent, Introduction, and Collection of Demographic Information.

Through standardized on-screen instructions, participants were informed that participation was voluntary, that data would be treated anonymously and in accordance with the DSGVO, and that they could discontinue participation at any time without having to state a reason and without negative consequences. Moreover, they received a brief introduction to the study. Because the data for study 1 and study 2 were collected simultaneously, participants were told that they were to solve a puzzle task and/or divide a short video into sequences of action, ostensibly to assess reactions to a cartoon video. After consenting to these terms, demographic data (age and gender) was collected. Moreover, information regarding the participants' German language skills and their current location was collected. Participants with insufficient German language skills and participants currently not in Vienna were directly screened out.

Allocation to Condition and Presentation of the Scenario. Next, participants were randomly assigned to two groups (group 1: spatially distant and group 2: spatially proximate). Participants were instructed to imagine that they were newly employed by a film production firm and that they were tasked to view a cartoon video currently in production. They were informed that the cartoon was only a rough sketch and that the

protagonists were drawn as shapes instead of people. The cartoon ostensibly depicted three teenagers and participants were instructed to envision a scene in which these teenagers interact with each other near a cabin at a summer camp. The presented scenarios were identical in both conditions, except the location. Participants in the proximate condition were told that the summer camp was located “near Vienna, about 30 km from here”, while participants in the distant condition were told that the camp was situated “in Vorarlberg, about 500 km from here.”

Segmentation Task. After the scenario was presented, participants were given specific instructions regarding the task. They were instructed to watch the video carefully and to segment it into meaningful actions by pressing “N” on their keyboards whenever one meaningful unit of action ended and a new unit of action began. Participants received no instructions regarding the appropriate number and length of segments. Next, participants viewed a 76s long silent video developed by Heider & Simmel (1994) that features the movements of two triangles and a circle. Research confirms that when viewing the video most people (except for people with autism or Asperger’s) create a social plot (Klin, 2000; Heider & Simmel, 1944), i.e., imagine social interaction.

Post-Task Survey Including Measurements for Confounding Variables, Comprehension Checks, and a Manipulation Check. After finishing the task, participants answered further questions to assess possible confounding variables. On a 7-point Likert Scale participants indicated their knowledge regarding summer camps (1 item ranging from 1: *not very knowledgeable* to 7: *very knowledgeable*). Two more items assessed how difficult it was for participants to imagine the social event (camping trip) as a real life event (ranging from 1: *not very difficult* to 7: *very difficult*; one item reversed). These two items were later combined and averaged to form an index of difficulty ($r = .885, p < .00$). Two more items were included as comprehension checks asking what the video depicted and where it took place. One further item assessed psychological distance towards the location at which the video took place, i.e., how distant/close the location felt.

Debriefing. Lastly, participants received information about the true nature of the study in the form of a standardized debriefing text on their screen.

Results

Main Analysis

Matching the analysis of Henderson et al. (2006), the mean number of key presses was analyzed. A larger number of key presses indicates more and shorter units, while a smaller number of key presses indicates fewer and broader units. While testing the prerequisites for a t-test for independent samples, 4 outliers were excluded from further analysis. Because the number of key presses was not normally distributed in the distant condition, as assessed by the Shapiro-Wilk-Test, $p < .05$, a Mann-Whitney-U-Test was used to assess group difference. Contrary to the expectations, there was no significant difference regarding the number of key presses between the spatially distant versus spatially close condition, i.e., participants in the spatially distant condition did not divide the video into fewer units than in the spatially close condition as expected ($M = 7.29$ key presses in the close condition versus $M = 7.74$ in the distant condition, Mann-Whitney $U = 1169.500$, $Z = -.332$, $p = .750$).

Analyses of the Manipulation Check and Confounding Variables

Further analysis revealed that psychological distance, as assessed by one item (how close/distant does the location at which the video took place feel), was not significantly related to the number of key presses, $r = .072$, $p = .480$, even though participants in the spatially close condition felt significantly closer to the location at which the video took place ($M = 2.40$, $SD = 1.802$) than participants in the spatially distant condition ($M = 4.67$, $SD = 1.530$), $p < .00$. However, there was a significant difference regarding how difficult it was for participants to imagine the events in the video as a real life event, $95\%-CI[.179, 1.602]$, $t(97) = 2485$, $p = .015$. In particular, participants in the spatially close condition reported less difficulties in imagining the scenario as a real life event ($M = 5.067$, $SD = 1.802$) than participants in the spatially distant condition ($M = 4.176$, $s = 1.754$). However, perceived psychological distance and difficulty regarding imagining the video as a real life event did not correlate, $r = -.174$, $p = .086$. Additionally, difficulty regarding imagination of the scenario and number of key presses were not related, $r = .048$, $p = .637$. There was no significant difference between the groups regarding participants' knowledge about summer camps, $p = .549$.

Discussion

Drawing on CLT (Liberman & Trope, 2003, 2010), study 1 of this paper investigated how spatial psychological distance affects social judgment, i.e., whether individuals judge social behavior differently when it is spatially further removed from themselves. In particular, I examined how individuals divided a continuous sequence of action (i.e., a video) depending on the location of the event (i.e., how far removed from the individuals the event occurs). I hypothesized that individuals would divide the video ostensibly depicting a social event, into more, shorter units of meaningful action when the event was located at a close location (i.e., press the key more often), while individuals would divide the video into fewer, broader units when the events was located at a distant location. These assumptions were based on CLT, according to which a psychologically removed stimulus leads to mental representations on a more abstract level, while a close stimulus leads to more concrete, detail-oriented mental representations or construals. The study constitutes a replication of an influential study by Henderson et al. (2006), which has to date not been replicated despite being referenced numerous times, and aimed to gather further evidence for the basic assumptions of CLT.

I tested the aforementioned hypothesis to replicate the findings by Henderson et al. (2006) within an experimental design with two groups, wherein spatial psychological distance was manipulated via the location of the action sequence (close condition: Vienna, about 30km away; distant condition: Vorarlberg, about 500km away). Results indicate that there are no differences between the spatially distant and spatially close groups regarding number of units, even though participants in the close condition felt closer to the location than participants in the distant condition. This means that individuals did not divide the video differently whether the event in the video felt spatially close to themselves or more distant, indicating that spatial psychological distance does not affect social judgment as predicted. This additionally means that the original findings by Henderson et al. (2006) could not be successfully replicated.

Because of the large number of studies that showed a relationship between psychological distance and construal level in general (see Soderberg, 2015), and spatial psychological distance in particular (for an overview see Henderson et al., 2011), it seems

unlikely that there is no such relationship between perceived distance and construal level. Moreover, the established link between psychological distance and social judgments (e.g. Luguri et al., 2012; McCrea et al., 2012) renders it unlikely that the effect of psychological distance and construal level would not extend to social judgments. Other factors might explain the absence of an effect more satisfactorily. In particular, differences between the original and the present study ought to be examined to determine why a medium effect was detected in the original but not in the present study.

Differences in distance between the close and distant locations in the original and the present study might have affected participants' responses. Even though psychological distance was manipulated almost exactly as in the original study (Henderson et al., 2006), the locations were adapted to the sample. Participants in the original study were students attending New York University and the events in the video took place either on the "East Coast [of the United States of America], about 3 miles away" (Henderson et al., 2006) or "on the West Coast [of United States of America], about 3,000 miles away," (Henderson et al., 2006) amounting to an objective distance of almost 5000 km between the locations. Data for the present study was collected in Vienna, Austria. Consequently, an unspecified site "near Vienna, about 30 km from here" was chosen as the proximate location and an unspecified location in "Vorarlberg, about 500 km from here" was chosen as the distal location. Hence, the objective distance in the present study only amounted to 470 km. It seems feasible that this difference in distance might have affected participants' responses. Due to Austria's relatively small size, generating a distance within national borders nearing the distance in the original study is impossible. Choosing a similar distance as in the original study, moreover, would be inappropriate because it would result in the distant location being located far outside of Austria, which might affect psychological distance. However, choosing a closer site, i.e. near Vienna, about 5 km away, to induce maximum distance might have been more appropriate.

Moreover, the present study provided participants with more precise information regarding the location, while the distant location in the study by Henderson et al (2006) was not specified, which might have added another layer of psychological distance. Hypothetical psychological distance refers to the certainty of an event. Refraining from providing

participants with precise information regarding the location might entail added uncertainty. When an event ostensibly takes place at an unknown or unspecified location, it might appear less certain and more distant. While sparse research indicates that perceived distance on one dimension reduces the sensitivity to distance on another dimension (Maglio et al., 2013), the possibility of a cumulative effect of several distance dimension cannot be eliminated as of now, even if the second distance dimension adds less additional distance. Consequently, the unspecified location in the original study (Henderson et al., 2006) might have increased psychological distance, while no such effect occurred during the present study.

Despite these differences, participants allotted to the close condition felt significantly closer to the location of the video than those allotted to the distant condition, suggesting that the manipulation at least possesses the capability of generating the expected effect. (Spatial) psychological distance refers to the perceived distance rather than an actual objective distance, i.e. how far removed from the self an object feels rather than it actually is. Liberman and Förster (2009a), for instance, found that a difference in perception mode (global versus local) affects individuals' distance estimations. Moreover, it has been well established that increasing psychological distance on one dimension increases perceived distance on other dimensions (for the spatial dimension see Sungur et al., 2019; Stephan et al., 2010), which adds evidence to the assertion that perceived distance is of more relevance than objective distance. While it can be clearly determined that the objective distance in the present study was smaller than in the original study, it cannot be resolved whether the perceived distance was similar or smaller. Consequently, it remains unclear whether the perceived difference in the present study was strong enough to elicit an effect similar in size to the effect in the original study. In particular, it seems feasible that an effect resulting from a rather mild manipulation, such as in the present study, would generate a smaller effect only discernible within a larger sample. However, in the present study there is a weak trend contrary to the expected direction, with participants dividing the video into slightly more units in the distant condition than in the close condition, suggesting that differences regarding the manipulation cannot satisfactorily explain participants' responses.

Another difference between the original study by Henderson et al. (2006) and the present study relate to the mode of data collection. Henderson et al. (2006) collected data in labs of the New York University, while data for the present study was collected online. Online data collection might have affected participants' responses because it might have affected perceived psychological distance. Darke et al. (2016) investigated the effect of both the presence or absence of a physical retail shop and the spatial distance of retail shops on psychological distance. In accordance with CLT, they found that physically distant retailers were perceived as more psychologically distant than local retailers. However, physically distant retailers were perceived as less psychologically distant than online retailers, arguably because online retailers are less tangible than physical retail shops. Darke et al.'s (2016) results corroborate the results by Benedicktus (2008) who found the same effect and additionally demonstrated that increasing an online retailers' tangibility can reduce psychological distance. It seems feasible that inviting participants into the university lab increases tangibility and certainty of the study, while participating in an online study increases psychological distance.

Moreover, the COVID-19 crisis and ensuing regulation regarding physical distancing might have further affected participants' responses. At the time of data collection, restrictions due to COVID-19 were fairly strict in Vienna and social gatherings, such as the video in the study ostensibly depicted, were prohibited. This might have affected as how probable participants perceived the event and scenario to be. It seems plausible that this affected participants' estimation of likelihood more strongly in the close condition because participants were likely more familiar with restrictions in Vienna. Moreover, information regarding restrictions ensuing COVID-19 were probably more available for this location and thus, it is more likely that this information was recalled more readily when thinking about an event taking place in Vienna than when thinking about an event taking place in Vorarlberg.

Next to the reasons explaining why the results by Henderson et al. (2006) could not be replicated, differences between the two groups regarding difficulty in imagining and visualizing the scenario as a real-life event ought to be discussed. Contrary to the results by Henderson et al. (2006), in the present study, participants in the close condition reported less difficulty in imagining and visualizing the scenario than participants in the distant

condition. Because randomization ought to minimize group differences, other factors must explain this difference. Research suggests a relationship between psychological distance and processing. Amit et al. (2009), for instance, associate pictures, or visual information, with proximal stimuli and words, or verbal information, with distant stimuli, arguably because visual information shares characteristics of low-level construals and verbal information with high-level construals. In particular, they found that visual information is processed more quickly when representing (socially) close stimuli, while verbal information is processed more quickly when representing (socially) distant stimuli. It seems probable that this relationship of visual processing and psychological proximity extends to visualization and imagination. Thus, visual information, such as a video, might be more easily processed, and thus, visualized as a real life event, when psychological distance is reduced, i.e., when the actions depicted in the video take place close to the self rather than further away. The smaller sample of the original study (Henderson et al., 2006) might explain why such an effect was not detected in their study. Future studies ought to investigate the relationship between (visual) processing and psychological distance and further examine whether psychological proximity or concrete thinking enhances processing of visual stimuli, performance regarding visual tasks, as well as visual imagination.

The aforementioned limitations of the present study as well as differences between the original (Henderson et al., 2006) and present study might explain the absence of an effect. Further, they highlight the importance of replication studies to investigate whether effects can be observed repeatedly, in different contexts, and among varying samples. The large scale replication project (CLT, n.D.) currently in process, which focuses on four of the most influential studies in the field of CLT, will possibly shed more light on the effect of psychological distance on construal level and, in particular, on social judgment and might clarify whether the results by Henderson et al. (2006) can be successfully replicated within a larger and more diverse sample.

Study 2: Psychological Distance, Congruent Processing Mode and Social Judgment

Research suggests that the relationship between psychological distance and construal level might be affected by further factors, such as processing mode. In particular, the influence of verbal/visual processing mode is of relevance because visual and verbal stimuli

are closely related to construal level. While verbal stimuli are closely associated with a high construal level, visual stimuli closely relate to a low construal level (Amit et al., 2009). Moreover, congruence of processing mode and psychological distance (i.e., verbal and distant; visual and close) might enhance the effect of psychological distance on construal level, whereas an incongruence (i.e., verbal and close; visual and distant) might buffer this effect (cf. Yan et al., 2016).

The present study aims to gather further evidence for the aforementioned assertions, test them for the spatial distance dimension, and extend existing insight of the relationship between processing mode, psychological distance, and construal level to social judgment. Within an experimental design, I tested whether incongruence of induced processing mode and perceived spatial psychological distance buffers the effect of psychological distance on construal level as assessed via number and length of segments in a segmentation task, while congruence enhances the effect. I hypothesized that induced verbal processing mode buffers the effect of psychological closeness on social judgment, i.e. a sequence of continuous behavior will be divided into fewer, broader segments by participants in the incongruent condition (induced verbal processing and spatially close location) than in the congruent condition and the control group. Analogously, I hypothesized that the action sequence would be divided into more, narrower units by participants in the congruent condition (induced visual processing and spatially close location) than in the incongruent condition and the control group. Moreover, I hypothesized that participants in the control group will divide the video into more, narrower units than in the incongruent condition, but into fewer, broader units than in the congruent condition.

Method

Participants

The necessary sample size was calculated using G*Power for $\alpha = .05$ and power = .80. Based on the findings by Yan et al. (2016), I conducted my calculations under the assumption of a medium effect ($f = .25$), which lead to a required sample size of $N = 158$ participants. As in study 1, participants with insufficient German language skills and participants who were not currently in Vienna were excluded. Data for study 2 was collected simultaneously as data for study 1 and, consequently, the same restrictions in answer to the COVID-19 crisis

applied. Therefore, recruitment and participation took place online. Participants were recruited via the same channels and during the same time (December 13th 2020 until January 15th 2021) as the participants for study 1. As in study 1, the sample of study 2 is a convenience sample.

A total of 334 persons participated in the study. Participants who were not located in Vienna at the time of data collection (115 participants) and participants with insufficient German language skills (1 participant) were directly screened out during the study. Moreover, participants who answered one or more of the comprehension checks incorrectly (39 participants), did not fill out the survey completely (9 participants), or failed to complete the segmentation task (9 participants) were excluded. Even though I specified in the preregistration that participants who failed to find at least half of the items in the puzzle assigned to them would be excluded, participants who failed to find at least half of the items were not excluded. This decision was made because of the large number of participants that had to be excluded on other grounds. Number of figures found was not related to number of key presses, $r = .062$, $p = .657$. However, number of words found was related to number of key presses, $r = .338$, $p = .019$. This relationship will be discussed thoroughly later on. The

Table 1.

Sample characteristics of the three subsamples.

		Congruent condition	Incongruent condition	Control group
Sample Size	N	57	56	49
	Share of the sample	35.2%	34.6%	30.2%
Gender	Male	15.8%	23.2%	32.7%
	Female	82.5%	76.8%	67.3%
	Non-binary	1.8%	0.0%	0.0%
Age	Mean M	29.70	26.30	28.04
	Standard deviation SD	8.726	7.546	8.665

final sample consisted of $N = 162$ participants (75.9% female, 23.5% male, and .6% nonbinary), aged 18 to 66, $M = 28.02$, $SD = 8.387$. Table 1 shows the distribution of participants to the three conditions and sample descriptives for each subsample.

Procedure and Materials

Apart from the task inducing processing mode (visual versus verbal processing mode), the procedure of study 2 follows the design of study 1. Figure 2 gives an overview of the conditions and the procedure of study 2. Prior to data collection, the study was pre-registered and an ethics approval was obtained from the Institutional Review Board (IRB) of the University of Vienna (IRB number: 2020/S/015). Afterwards, the study was distributed online via various social media channels.

Informed Consent and Introduction to the Study. Through standardized on-screen instructions, all participants were informed that participation is voluntary, that their data

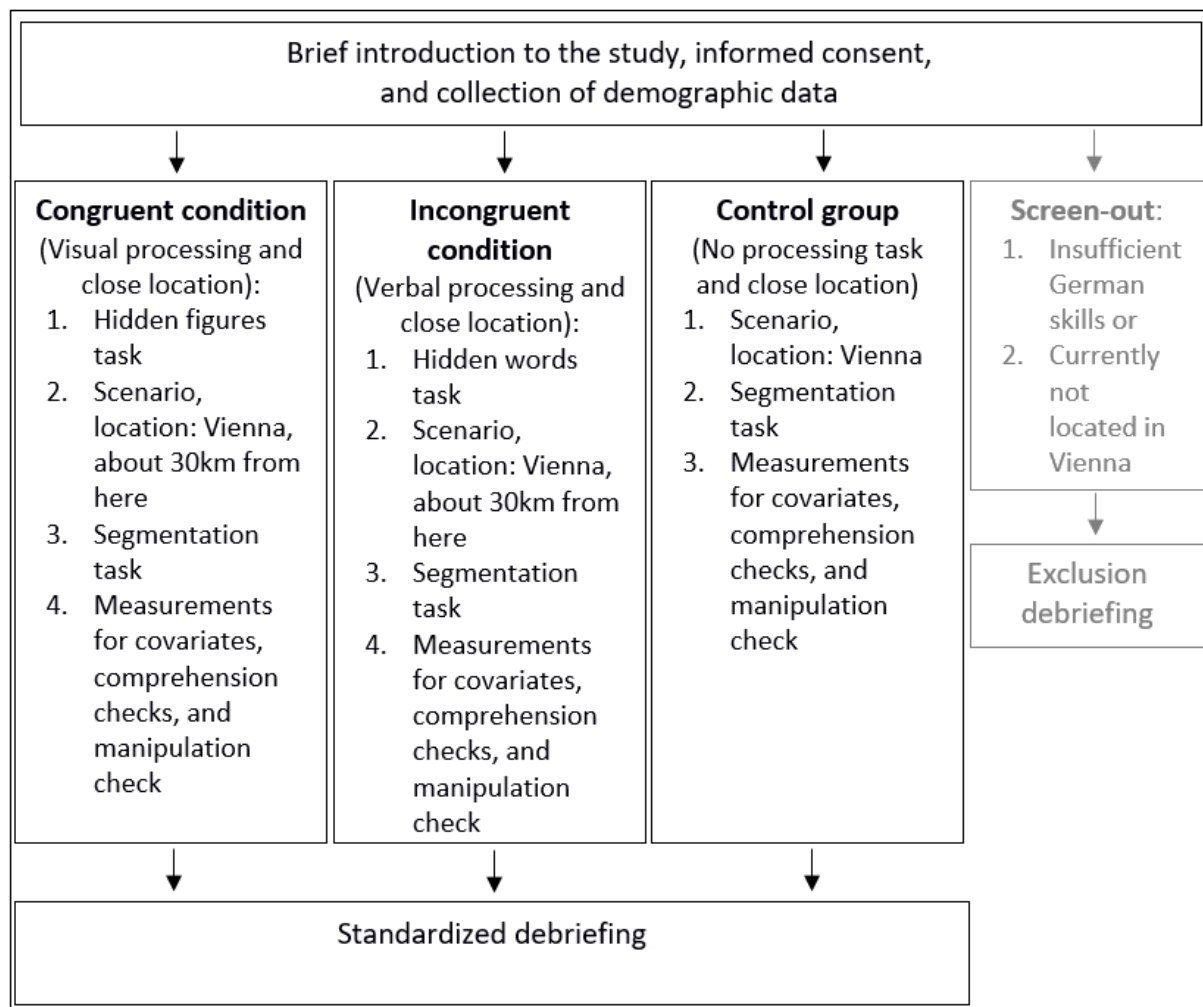


Figure 2. Procedure of study 2.

would be treated anonymously and in accordance with the DSGVO, and that they could discontinue participation at any time without having to state a reason and without negative consequences. Moreover, they received a brief introduction to the procedure. Participants were told that they were to solve a puzzle task and/or divide a video into sequences of action, ostensibly to assess reactions to a cartoon video.

Allocation to Conditions and Collection of Demographic Information. After consenting to these terms, participants were randomly allocated to three groups (group 1: visual processing condition, group 2: verbal processing condition, group 3: no induced processing mode/control group). Group 3 is identical with group 2 of study 1 (close condition). Further, demographic data (gender, age) was collected. Moreover, information regarding German language skills and place of living was gathered because participants with insufficient German language skills as well as participants currently not located in Vienna were not suited for participation.

Inducement of Processing Modes. Participants in the conditions 1 and 2 next solved puzzle tasks designed to induce either a verbal or visual processing mode. Following the procedure of Yan et al. (2016), participants in the visual processing condition were instructed to solve a hidden figures puzzle to induce a visual processing mode, while participants in the verbal processing condition were asked to solve a hidden words task to induce a verbal processing mode. The original materials were obtained from Yan in October 2020 and match the tasks used by Yan et al. (2016) who based theirs on materials by Jiang et al. (2008, cited in Yan et al., 2016). The hidden figures puzzle was used without modification and consists of a picture in which 11 small figures are embedded. Only the descriptions of the small figures were translated into German. The hidden words required participants to search for 11 hidden words in a matrix of letters task. The task was created anew and in German but adhered to the original material with regards to the number of words, the size of the matrix (20x20 letters), and denotation of the included words.

Presentation of the Scenario. After completion of the puzzle task, participants in groups 1 and 2 proceeded to the second part of the study. Participants in the control group immediately proceeded to the second part of the study without previously solving a puzzle task. All participants were presented the same scenario, which matched the scenario in

study 1. They were told to imagine that they had been newly hired by a film production company and that they were supposed to judge a short cartoon video still in production. They were informed that the video was only a rough sketch and that the main characters were drawn as shapes rather than as people. They were instructed that the video showed two triangles and one circle that were moving around and against each other and that they should imagine a scene between three teenagers moving around near and inside a cabin at a summer camp. Participants in all groups were told that the camp was located near Vienna, about 30 km from the city.

Segmentation Task. Next, participants received specific instructions regarding the task. They were instructed to divide the video into meaningful units of action by pressing “N” on their keyboard whenever one meaningful action ended and a new one began. They did not receive information regarding the appropriate number or length of units. Participants then viewed Heider and Simmel’s (1944) silent video (76s) and performed the task.

Post-Task Survey Including Measurements for Confounding Variables, Comprehension Checks, and a Manipulation Check. Afterward, participants answered the same control questions as in study 1 regarding the difficulty of imagining the scenario and their knowledge about summer camps in general. The two items assessing difficulty in imagining the scenario as a real life event were once again averaged to one index of difficulty ($r = .886, p < .00$). Additionally, they answered the same comprehension and manipulation check items as participants in study 1 (i.e. what did the video depict, where did the event take place, how close/distant does Vienna feel).

Debriefing. Lastly, participants received information about the true nature of the study in the form of a standardized debriefing text on their screen.

Results

Main Analysis

As in study 1, the number of key presses was analyzed as a measure of construal level and social judgment. A larger number of key presses and, consequently, number of units in which participants divided the action sequence indicates shorter units, while a smaller number of key presses indicates broader, longer units. While testing prerequisites for ANOVA, 14 participants were excluded from further analysis due to extreme values. Because

homoscedasticity was not given in all groups, assessed using Levene's Test ($p < .05$), the more robust Welch-ANOVA was interpreted to assess differences between the 3 groups. Contrary to expectations, the number of key presses did not differ significantly between the groups, Welch's $F(2, 2.314)$, $p = .104$. However, means revealed that there is a slight tendency towards the expected results with fewer key presses among participants in the incongruent (verbal and close) condition ($M = 6.56$, $SD = 2.946$) than the control group ($M = 7.60$, $SD = 2.902$) and the congruent group (visual and close) ($M = 7.72$, $SD = 2.804$).

Analyses of the Manipulation Check and Confounding Variables

Further analyses revealed that the number of key presses and perceived psychological distance, i.e., felt closeness of Vienna, were not related, $r < .000$, $p = .997$, i.e., the perceived distance of Vienna did not influence into how many units the video was divided. The groups differed with regard to psychological distance, i.e., felt closeness of Vienna, $F(2, 145) = 4.983$, $p = .008$. Tukey post-hoc tests revealed that there was a significant difference between the congruent and incongruent groups ($-.840$, $CI[-1.65; -.03]$, $p = .040$) with participants in the congruent group reporting that Vienna feels further away ($M = 3.34$, $SD = 1.775$) than the incongruent group ($M = 2.50$, $SD = 1.571$). Additionally, the congruent group differed significantly from the control group ($-.999$, $CI[.19; .181]$, $p = .012$) with participants in the congruent group reporting that Vienna felt further away ($M = 3.34$, $SD = 1.775$) than in the control group ($M = 2.34$, $SD = 1.785$). No group differences regarding knowledge of summer camps were detected, $F(2, 145) = 1.777$, $p = .173$, and regarding difficulty imagining the video as a real life event, $F(2, 145) = .316$, $p = .729$. As stated above, the number of words found in the hidden words puzzle task was significantly related to number of key presses, $r = .338$, $p = .019$, meaning that those participants who found more words in the puzzle divided the video into more units. The number of figures found in the hidden words puzzle task did not significantly correlate with number of key presses, $r = .062$, $p = .657$. In general, participants found more words ($M = 9.67$, $SD = 1.230$) than figures ($M = 7.62$, $SD = 2.555$). Neither the number of words nor number of pictures found in the puzzle were related to psychological distance, i.e. how close Vienna felt to the participants, $r = .071$, $p = .630$ and $r = .066$, $p = .637$ respectively.

Discussion

The present study investigated the effect of (in)congruence of processing mode and spatial psychological distance on social judgment to extend findings by Yan et al. (2016) who associated visual processing with psychological closeness and verbal processing with psychological distance. Moreover, they found that an incongruence of psychological distance and processing mode can buffer the effect of psychological distance on construal level and even reverse the effect, indicating that the effect of processing mode can overshadow the effect of psychological distance and determine construal level. The present study aimed to extend their findings to another dimension of psychological distance, namely spatial psychological distance, and to investigate this effect in the realm of social judgment. In particular, I examined whether an induced verbal processing mode paired with a close stimulus would overshadow the effect of the psychological closeness, whereas an induced visual processing mode paired with a close stimulus would enhance the effect of the close stimulus. I hypothesized that individuals with an induced visual processing mode would divide an action sequence ostensibly depicting a social event taking place close to the individual into more, shorter units than individuals whose processing mode was not manipulated and individuals with an induced verbal processing mode. Analogically, I assumed that individuals with an induced verbal processing mode would divide the action sequence into fewer, broader units than individuals whose processing mode was not manipulated and individuals with an induced visual processing mode. The number of key presses was used to estimate the length and number of units of meaningful action.

The aforementioned assertions were tested within an experimental design with three groups (group 1: congruence of induced processing mode and psychological distance: visual processing mode and spatial closeness of the location, group 2: incongruence of induced processing mode and psychological distance: verbal processing mode and spatial closeness of the location, group 3: control group: no induced processing mode and spatial closeness of the location). Analysis revealed that participants across all three conditions did not differ with regards to the number of units, and thus, the hypotheses were not confirmed. This means that participants with a visual processing mode did not divide the video differently than those with a verbal processing mode or no induced processing mode. However, the

data revealed a trend toward the expected direction with participants in the verbal condition dividing the video into slightly fewer units than in the visual condition and control group.

A weakness of the software used to generate the study might have affected participants' responses. This applies mainly to the visual task. Contrarily to the study by Yan et al. (2016), the software used to design the present study did not allow for participants to indicate which words/figures they found directly in the puzzle. In the verbal condition participants were asked to write the words they found into a text field without giving them any indication which words were hidden in the puzzle. In the visual condition, however, it was necessary to show the hidden figures to participants to enable them to search for them. Participants were asked to indicate which figures they found from a list of the items. Even though participants did not receive any bonus, financial or other, for finding more items, the possibility of dishonesty due to social desirability cannot be eliminated and it is at least theoretically possible that participants indicated that they found more items than they actually did. Moreover, participants who lacked proper motivation might have chosen to disregard the instructions and simply indicate that they found a certain number of items without actually trying to solve the puzzle properly. Consequently, it is possible that participants did not properly engage with the task, and thus, the tasks might not have induced the processing modes as strongly as in the study by Yan et al. (2016). It seems probable that the effect of processing mode would have been stronger among participants who spent more time engaging with the task, thought more thoroughly about the task, and processed the information from the tasks more effortfully. Consequently, the effect observed in the present study might have been considerably smaller than in the original study and maybe too small to be detected within the sample of the present study.

Contrary to this assumption, participants who found more words in the hidden words puzzle divided the video into more, shorter units. This apparent contrast might have emerged due to differences regarding motivation and attention. Participants who found more words might have not only engaged more with the task, and thus were more strongly manipulated regarding the processing mode. Instead, those participants might have been more eager to complete the tasks and perform well. This effect of increased motivation might have extended to the segmentation task and participants eager to perform well might

have also paid more attention to the video and the individual movements of the shapes to divide the video more precisely. These assumptions, however, cannot be extended to participants in the congruent (visual) group because there was no such relationship between the number of units and the number of figures found.

Participants in the present study differed with regard to how close Vienna, the location of the event in the video, felt to them. In particular, participants assigned to the congruent (visual) condition reported that Vienna felt further away to them than participants assigned to the incongruent (visual) condition and in the control group. Because participants were randomly allocated to the groups, which should minimize group differences, these differences cannot have existed prior to the study, but must have been caused by the tasks involved in the study. The conditions differed only regarding the processing task. While participants in the incongruent condition solved a hidden words puzzle and the participants in the control group solved no additional task, participants in the congruent condition solved a hidden figures puzzle. This task involved finding small figures that were embedded in a larger picture. This task was designed to foster visual processing, which in turn ought to result in a concrete, low-level mindset. Due to the bidirectional relationship between construal level and psychological distance (Liberman & Trope, 2009; Liberman et al., 2002), this should have, if anything at all, decreased the perceived psychological distance to Vienna.

However, the nature of the picture used in the hidden figure puzzle task might explain this apparent contradiction. The picture (cf. appendix) shows three monkeys inside what appears to be a hut. The monkeys are grouped around a table and are eating bananas. Two of the monkeys are standing on chairs. The third monkey is crouching beneath the table. In the background there are bamboo decorations and a picture on the wall showing a man, apparently dresses for an expedition, posing in sunshine and standing on what appears to be a tropical island overgrown with palm trees. A window on the right offers the view of the ocean and more palm trees. Even though the visual task might have induced visual processing regardless of its contents, the contents likely convey a considerable amount of psychological distance to a Central European based person. Firstly, the tropical setting (i.e., palm trees, monkeys, and the ocean) most likely conveyed spatial psychological distance.

Secondly, the rather unfamiliar, unexpected, and unlikely scene (i.e., monkeys grouped around a table) probably increased perceived psychological distance on the hypothetical dimension. Thirdly, the scene appears to take place in warm, sunny weather, which might increase temporal psychological distance for the participants as they completed the survey during wintertime in Austria.

Increased psychological distance in the congruent condition might have affected the relationship between visual processing and the number of units into which the video was divided. I assumed that a congruent pairing of processing mode and psychological distance, i.e., visual processing mode and psychological proximity, would enhance the effect of psychological proximity on social judgment. Because the participants felt more distant to Vienna, however, the visual prime most probably did not affect the participants' responses to the segmentation task accordingly and thus, explains why the number of units into which the video was divided does barely differ between the congruent condition and control group. While the number of key presses and units barely differ between the congruent condition and the control group, there is a slightly larger difference between the incongruent group and the other two conditions, suggesting that there might be an effect of incongruence of processing mode and psychological distance on social judgment.

In contrast to study 1 of this paper, participants in the present study did not differ regarding difficulty of imagining the scenario as a real life event. If my assertion that difficulty of imaging the scenario is increased by increasing psychological distance applies (as argued in the discussion of study 1), however, participants in the congruent condition ought to have experienced more difficulties because they perceived Vienna to be further away than participants in the other conditions. However, these participants completed the visual task (hidden figures task), which might have increased their receptiveness for visual stimuli. This, in turn, might have counterbalanced the effect of the increased perceived distance on difficulty of visualizing the scenario during the segmentation task. Thus, increased (decreased) psychological distance might, in fact, increase (decrease) performance in visualization and imagination tasks. This assertion, however, needs to be tested more thoroughly in future studies.

Even though several factors might explain why there was no significant difference between the conditions, they cannot generate satisfactory insight into which role visual and verbal processing as well as (in)congruence of processing mode play within CLT. Further studies need to solve the problems which have affected the present study and focus on determining which factors influence the relationship between processing mode, visual and verbal processing, psychological distance, and construal level. In particular, it seems paramount to replicate the findings of Yan et al. (2016). Moreover, the present study suggests that at least verbal processing could, under the right circumstances, buffer the effect of psychological distance on construal level. This assertion needs to be investigated further to determine additional factors relevant to the theoretical conceptualization of CLT.

General Discussion

The two studies of this paper aimed to investigate the basic propositions of CLT and its limits. Study 1 constitutes a replication of an impactful study by Henderson et al. (2006), which helped establish the relationship between spatial psychological distance and construal level and extended the effect of psychological distance to social judgments. I assumed that psychological distance, which leads to more abstract thinking, would generate social judgments that rely on more schematic and abstract representations. Study 2 of this paper aimed to add more evidence to the link between visual and verbal processing and psychological distance to contribute to the basic understanding of CLT and explore factors that might buffer or enhance the effect of psychological distance on construal level. In particular, I hypothesized that congruence of processing mode and psychological distance, i.e., an induced visual processing mode paired with a proximate stimulus, would enhance the effect of psychological distance, while an incongruence of processing mode and psychological distance, i.e., an induced verbal processing mode paired with a proximate stimulus, would buffer the effect of psychological distance. Although the hypotheses of both studies could not be confirmed, the present paper yielded valuable insights, particularly into the limitations of CLT.

Firstly, the present studies both highlight the importance and relevance of replication studies. Despite being conceptually central to empirical research to verify research and new insights across contexts, replication studies are rare (Makel et al., 2012) and rarely published

(Bardi & Zentner, 2017; Wiggins & Chrisopherson, 2019). This holds true within the field of CLT (CLIMR, n.D.). CLT has been widely applied in different fields (cf. above) based on the assumption that its basic propositions hold true because prior studies confirmed the proposed relationships between the various dimensions of psychological distance and construal level, even though these studies had not been replicated yet. Replications of studies investigating the basic propositions, such as the study by Henderson et al. (2006), which was replicated in the first study of the present paper, however, raise questions regarding the stability, consistency, and appropriateness of generalization of results of single studies to the general population and, particularly, to other contexts. Both studies presented in the present paper show that psychological distance and its effects are greatly affected by contextual factors and that results cannot be easily transferred to other settings. Additionally, this conclusion is of relevance to research which focuses on determining factors that impact psychological distance perceptions and their effects. Possible confounding variables, such as type of device, mode of data collection, and possible distractions, need to be taken into consideration when designing studies to prevent an undesired influence. In particular, the present studies highlight the importance of more thorough examination of the effect of virtuality on psychological distance.

Moreover, the present studies raise the question of external validity of research in the field of psychological distance. As previously mentioned, results were most likely strongly affected by contextual factors, such as mode of data collection (online rather than in a laboratory), involuntary evocations, or reduction of psychological distance by materials and circumstances, e.g., time and place of data collection. Prior research suggests that psychological distance is influenced by various factors. Not only can evocations of psychological distance on one dimension increase psychological distance on other dimensions, but emotional intensity (Van Boven et al., 2010), mode of perception (Liberman & Förster, 2009a), virtuality and tangibility (Darke et al., 2016) as well as cognitive fluency, including linguistic fluency (Alter & Oppenheimer, 2008), might also increase or decrease psychological distance. Moreover, findings by Yan et al. (2016) suggest that the effect of psychological distance on construal level can even be reversed by inducing an incongruent processing mode. Outside the university laboratory, such factors can hardly be controlled

and thus, authors need to be careful when drawing attention to practical implications and giving advice to managers and politicians, for instance, without considering other factors that can affect the relationship between psychological distance and its effects on decision making, evaluation, and attitudes. Instead, such factors need to be acknowledged and examined as was done, for instance, by Sacchi et al. (2016) who included level of emotional arousal as well as specific cognitive mindsets into their argumentation.

Particularly, cognitive mindsets and processing modes ought to be considered. Research highlights the effect of global versus local processing (Sacchi et al., 2016; Liberman & Förster, 2009a) as well as visual versus verbal processing (Yan et al., 2016) and presentation (Amit et al., 2009). Because study 2 of the present paper could not confirm the assumption that congruent processing enhances the effect of psychological distance, while incongruent processing buffers it, further studies ought to reexamine the interaction of psychological distance and visual and verbal processing in different contexts to determine its effects and limitations. However, the results of the present study still draw attention to the possible effect of verbal and visual processing. Individuals' mindsets as well as the presentation of information might affect the effectiveness of psychological distance manipulations both in experiments and in its practical application in marketing, for instance. Next to the effect of processing mode, researchers ought to examine the effect of presentation style, i.e., visual or verbal presentation of information, on psychological distance and construal level to uncover whether presenting information verbally/visually can increase or decrease psychological distance. This might have major implications, for instance, for marketers who have to choose whether to present information verbally or visually.

Limitations

Data for both studies of the present paper were collected online. While online data collection has become increasingly popular in recent years due to technological advances and due to advantages unique to online data collection, such as convenience for both participants and researchers and accessibility of larger and more heterogeneous samples, researchers have expressed concern regarding the quality of online data as compared to data collected in laboratories (Hydock, 2018; Clifford & Jerit, 2014; Birnbaum, 2004). Hydock

(2018), for instance, asserts that dishonesty regarding personal information is more pronounced among participants online, particularly to get access to studies that are only open for participants who fulfil certain criteria. He concludes that financial gain is the motivator for this dishonesty. While certain criteria were defined and communicated openly as exclusion criteria in the present study, participants received no incentives, and thus, dishonesty regarding participants' location and German language skills is most likely negligible. Moreover, the risk of multiple submissions as mentioned by Birnbaum (2004) was avoided on account of software design.

Online data collection, however, entails possible disadvantages that might have affected participants' responses in the present studies, such as reduced attentiveness or motivation. In study 1, participants might have paid less attention to the instruction of the study, in study 1 particularly to the information regarding the location of the summer camp, than in the original study. Clifford & Jerit (2014) found in an experimental study that participants did not greatly differ regarding attention whether they participated in an online or lab study. However, even minor differences regarding attention, which cannot definitely be excluded from consideration, might gravely affect the effects of psychological distance. At least one study (Park, 2010) suggests that psychological distance affects evaluation only when individuals engage in effortful processing or thoughtful consideration of psychological distance. If participants in the present study, paid less attention to the information that was devised to manipulate psychological distance (study 1), they presumably processed the information less thoughtfully and thus, were less affected by the manipulation. Similarly, participants in study 2 who were less attentive might have completed the puzzle tasks less thoroughly.

More important than differences regarding attention, however, are potential differences regarding disturbances and distractions. While Clifford & Jerit (2014) found no significant differences regarding attention, participants who completed their survey online reported more distractions than those who participated in the laboratory. In particular, participants in the online survey reported to be disrupted more because of using their mobile phones, browsing the internet and talking to other persons. Moreover, a fairly large portion reported watching TV or listening to music while participating in the study. Some

online studies, particularly surveys, might not be gravely impacted by disturbances. However, experiments and studies that require participants' attention and concentration, such as studies measuring response times (Chetverikov & Upravitelev, 2016) might be affected more strongly. The segmentation task in the present study required participants to pay close attention to the movement of the shapes to identify meaningful action sequences and segment the video accordingly. Disturbances during this task might have affected participants' responses gravely and thus, might account for the lack of an effect.

Another weakness of online data collection particular to the present study is that the segmentation task was more suited to be completed on a computer or a laptop than on a mobile device. Because it was, unlike in the original study by Henderson et al. (2006) and due to software issues, not possible to collect information regarding key presses while participants watched the video in full-screen mode, participants had to start the video and then click into a text field beneath the video, wherein the key presses were recorded. Using a computer or laptop, this did not affect participation gravely. However, when accessing the study on a mobile phone, the video would automatically be shown in the full-screen mode, which made it impossible for participants to click into the text field to track their key presses. Participants were asked to participate using a computer or laptop. However, it cannot be guaranteed that none of the participants used their mobile devices regardless of the instructions. These participants might have indicated how often they have pressed the key only after watching the video. Consequently, their responses would be estimates rather than accurate numbers, which might be affected by biases. Unfortunately, it was not accessed which devices participants used to participate in the study, which means that it was not possible to control for a potential influence of device type.

Conclusion

The present paper followed CLIMR's (n.D.) call to replicate studies fundamental in the field of CLT (cf. study 1) and, in a second study, aimed to add evidence to conclusions drawn by Yan et al. (2016) whose results indicate that the effect of processing mode can overshadow the effect of psychological distance on construal level. While study 1 investigated the effect of psychological distance on social judgment, study 2 investigated the role of processing modes within this relationship. Even though the hypotheses of both

studies could not be confirmed, the studies presented in this paper highlight the importance of replications and add evidence to the assertion that psychological distance can be easily affected by various contextual factors, such as virtuality. Findings suggest that external factors ought to be carefully considered both when designing studies in the field of CLT and when drawing practical applications based on research within CLT. Importantly, the rise of social media and online communication necessitates further investigation of the effect of virtuality on psychological distance. Moreover, the effect of processing mode and (in)congruence of processing mode and psychological distance warrants further investigation because of its potential practical implication for marketing and communication.

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Appendix

A. Abstracts

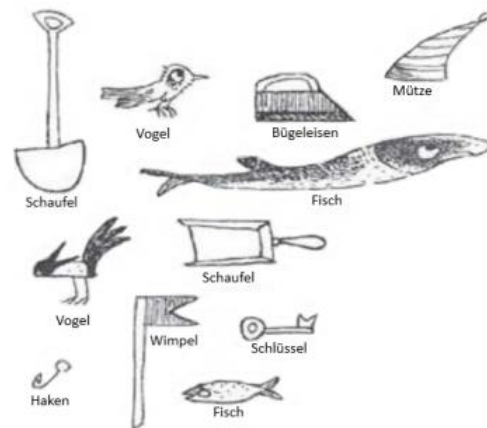
a. Abstract (English)

According to Construal Level Theory, objects and events that feel close, or are psychologically close, are represented on a concrete low-level of construal, while objects and events that feel distant, or are psychologically distant, are represented an abstract, or high-level of construal. Across two studies, the effect of spatial psychological distance on social judgment and the role of processing mode (visual versus verbal) were investigated. Firstly, in a replication of a study by Henderson et al. (2006) and using a segmentation task, it was examined whether increased spatial psychological distance generates social judgments that rely on schematic and abstract representations. Secondly, the role of visual and verbal processing was investigated. In particular, it was investigated if congruence of psychological distance and processing style strengthens the effect of psychological distance on social judgment (via level of construal) and whether incongruence buffers this effect. Neither study yielded significant results. However, the present studies highlight the importance of replication studies and necessity of investigating factors that impact or affect psychological distance and its effect on construal level, such as virtuality and processing mode.

b. Abstract (German)

Gemäß der Construal Level Theory werden Objekte und Ereignisse, die sich nah anfühlen, oder psychologisch nahe sind, als konkrete Construals auf einem niedrigen Niveau repräsentiert, während Objekte und Ereignisse, die sich weit weg anfühlen, oder psychologisch entfernt sind, als abstrakte Construals auf einem höheren Niveau repräsentiert. In zwei Studien wurde der Effekt von räumlicher psychologischer Distanz auf die Beurteilung sozialen Verhaltens und die Rolle von Verarbeitungsmechanismen (visuell versus verbal) untersucht. Zunächst wurde in einer Replikation einer Studie von Henderson et al. (2006) und mit Hilfe einer Segmentationsaufgabe untersucht, ob erhöhte räumliche psychologische Distanz Beurteilungen sozialen Verhaltens erzeugt, die auf schematischen und abstrakten Repräsentationen basieren. Im Weiteren wurde der Effekt von Verarbeitungsmechanismen auf diese Beziehung untersucht. Im Speziellen wurde

untersucht, ob Kongruenz zwischen Verarbeitungsmechanismus und psychologischer Distanz den Effekt von psychologischer Distanz auf die Beurteilung sozialen Verhaltens verstärkt (über das Construal Level) und ob Inkongruenz diesen Effekt abschwächt. Die Ergebnisse beider Studien waren nicht signifikant. Trotzdem betonen die Studien die Bedeutung von Replikationsstudien und verdeutlichen die Notwendigkeit, Faktoren zu untersuchen, die psychologische Distanz und ihren Effekt auf Construal Levels beeinflussen, wie beispielsweise Virtualität und Verarbeitungsmechanismen.

B. Materials**a. Hidden Figures Puzzle**

b. Hidden Words Puzzle

T	D	N	R	H	D	L	B	E	K	O	F	V	O	L	L	N	H	E	Q
L	R	P	L	H	P	U	S	P	C	J	C	M	T	D	Q	W	D	P	P
E	A	E	V	G	G	B	O	Y	B	O	X	R	U	G	D	A	O	W	R
M	M	R	W	N	W	R	E	G	I	E	R	U	N	G	G	B	L	K	O
B	A	F	A	E	S	N	T	D	V	Y	P	I	S	E	B	O	E	L	K
S	P	E	F	E	V	G	I	C	N	B	X	G	J	W	F	W	Z	T	K
J	I	K	R	X	N	F	W	N	R	A	V	A	D	J	T	J	U	W	Z
E	I	T	Ü	R	J	E	R	W	X	F	M	B	U	D	T	N	H	N	Q
Z	F	J	H	F	H	W	R	M	S	O	X	X	V	I	P	V	Z	J	I
M	E	H	L	F	E	R	P	G	Y	S	P	H	E	D	N	I	S	Q	A
R	R	C	I	A	S	X	R	E	I	E	F	V	D	R	I	G	S	Q	U
B	M	D	N	S	Q	P	E	N	U	S	N	E	A	H	K	K	H	L	J
I	K	P	G	U	N	R	R	S	I	I	C	J	F	U	O	Y	G	Z	K
U	R	E	F	M	M	L	K	U	X	O	R	H	X	G	N	T	U	I	Z
P	E	V	Z	U	E	J	B	G	A	E	D	P	G	W	T	F	T	M	H
I	W	X	B	R	K	X	Z	C	R	N	B	L	K	O	R	P	V	I	Y
T	W	K	U	M	S	S	C	H	A	U	F	E	L	L	O	T	A	L	B
H	H	K	T	E	E	E	G	S	C	W	U	Z	M	C	L	S	C	K	F
R	F	S	W	L	S	X	A	R	B	E	I	T	E	N	L	U	F	T	T
L	E	U	Q	N	H	T	G	U	Y	W	M	C	G	D	E	I	A	F	A