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Cognitive Consequences of Novelty and Familiarity:

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Abstract

Two experiments examine whether frequency of exposure influences level of construal. Using subliminal presentation, participants were exposed to neutral, unknown letters 0, 5, 15, or 40 times, and a typical mere exposure effect was found on evaluation. However, we hypothesized and showed in Experiment 1 that novelty enhances Gestalt-like, global perception, whereas familiarity bolsters detail-oriented, local perception. Furthermore, in Experiment 2, we demonstrated that participants generated more abstract solutions for items presented less frequently. These results support a Construal Level Theory (Liberman, Trope, & Stephan, 2007) contention that distance from direct experience is associated with high construal level and global processing. It seems that in order to prepare for novel events, people automatically engage in higher levels of construal. New information needs to be integrated into existing knowledge structures in order to be understood, and abstract categories and global processing may support the process of understanding.

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Construal level theory (CLT; Liberman & Trope, 1998; Trope & Liberman, 2003) proposes that psychological distance, defined as the *extent of deviation from direct experience* in time, space, social distance or a hypothetical state (Liberman, Trope, & Stephan, 2007), changes people's responses to events by altering their mental representations of those events. The greater the psychological distance, the more likely events are to be construed on a higher level, which means that they are represented in terms of more abstract features that convey the perceived essence of the events (high-level construals) rather than in terms of more concrete, contextual, and incidental details of the events (low-level construals).

CLT predicts that details about concrete, incidental and secondary aspects of events, including the context in which they occur, are more available for proximal than for distal stimuli: "we know less about the more distant future and the more distant past, we know less about more remote places, we know less how the world would have been with more remote (i.e., less probable and more difficult to imagine) alternatives in reality. In all those cases, lack of knowledge about the more remote entities, people, events, places, alternatives – requires representing them more abstractly than proximal entities." (Liberman et al., 2007, p. 353).

Because of this natural co-occurrence, an association between distance and construal level may become over-generalized, causing people to continue using high-level construals when thinking about distal stimuli and low-level construals when thinking about proximal stimuli, even when the information about both types of stimuli is the same.

In an extensive research program, Liberman and Trope have adduced ample evidence for their general notion. To give an example, in one of their studies (Liberman & Trope, 1998, Study 1), participants were asked to imagine themselves engaging in various activities (e.g., reading a book) either "tomorrow" or "next year" and to describe these activities. It was found that whereas participants used more abstract descriptions in the distant future condition (e.g., "I read it because it broadens my horizons"), they used more concrete descriptions (e.g., "I read it by flipping pages") in the proximal distance condition. Similar effects have been found on more basic, perceptual levels. For example, Liberman and Förster (2008) asked participants to think about the same event happening tomorrow or a year from now. Afterwards, they assessed participant's perceptual processing (see Navon, 1977), which showed that participants attended more to the global (the Gestalt) and less to the local (the details) features of a stimulus set when they were primed with more distal events.

Conceptually similar effects on level of construal have also been demonstrated with other dimensions of psychological distance – with spatial distance (Fujita, Henderson, Eng, Trope, & Liberman, 2006), hypotheticality (Wakslak, Trope, & Liberman, 2006), and social distance (Liberman, Trope, & Stephan, 2007; Smith & Trope, 2006) – thus pointing to the fact that all distances have a common psychological basis. According to CLT this common thread is *lack of experience: "*…anything that is not currently experienced by me, here and now is psychologically distant" (Liberman & Förster, 2008).

So far, however, CLT has only assumed a relation between lack of experience and level of construal, but has never tested it directly. We will fill this void by manipulating

the frequency of experience with formerly unknown stimuli and test its effects on construal level independent of any mentioning of social, spatial or temporal distance or hypotheticality. We believe that thereby we test the assumption *underlying* CLT: that lack of experience enhances level of construal. Furthermore, novelty is usually defined as "anything that has not been experienced in the past" and thus, we will for the first time investigate consequences of novelty on level of construal.

Overview of the Experiments

We exposed participants to neutral, unknown letters 0, 5, 15, or 40 times. The stimuli were presented subliminally, in order to rule out demand or any other conscious strategic effects. Afterwards, in an allegedly unrelated study, we assessed construal level using both perceptual and conceptual tasks, predicting that detailed processing would increase with number of exposures. We also expected to replicate the typical mere exposure effect (i.e., increased liking with number of exposures) which seems to appear even when stimuli are presented out of consciousness (Kunst-Wilson & Zajonc, 1980). Based on former research, we expected an inverted U function, demonstrating boredom effects after many repetitions (Bornstein, 1989).

Experiment 1

Method

Participants. 29 undergraduates took part in a set of experiments and received 14 Euro for their participation. There were no gender effects. The design was one-factorial, comparing 4 different Exposure conditions (0, 5, 15, 40) within participants; the main dependent variables were attention to global versus local features (see below) and liking.

Procedure. First, participants were asked to do an alleged "attention task" which was in fact the mere exposure manipulation. Participants were told that brief flashes would appear on the screen at unpredictable places and times and they had to indicate as quickly and accurately as possible whether the flash appeared on the right or the left side of the screen by pressing certain designated keys. For each trial, a fixation cross appeared for 500 ms, followed by a forward mask for 13 ms, then a letter for 10 ms, then a backward mask for 26 ms, and finally a gray square with colored dots on it. The task contained 9 items that were presented either 5, 15, or 40 times. Letters were counterbalanced with respect to frequency of exposure between participants and order of presentation was randomly assigned.

After this exposure period, a mood questionnaire was administered controlling for diverse discrete emotions, followed by a *global/local task* (See Gasper, 2004; Fig. 1) that was introduced as an alleged "visual matching task". Participants had to decide as quickly as possible by pressing one of two designated keys on a computer whether a target letter looked more like one of two sample items presented. The target was a Hebrew letter (e.g., ב) made of other unknown small letters (e.g., ג) and the samples were large letters made of the same letters (e.g., sample 1, ג made of ג and sample 2, ב made of ב). Three targets had been formerly presented for 5 times, three had been presented for 15 times, three for 40 times, and three were never presented. We controlled for size of local features (20 X 20 mm; 10 X 10 mm) and position of the samples (left and right). These factors were counterbalanced and produced no effects. The global form always measured 58 mm X 58 mm. Four different sets of items with different letters were construed; this between-participants factor did not produce any significant effects. We also added ten training

trials that were not analyzed and sped up the procedure in order to prevent for more strategic effects. A 500 ms sign announced the beginning of each presentation, which was followed by a 100 ms black screen, followed by a 100 ms presentation of one of the items. A 1 s inter stimulus interval occurred subsequently to a response, or after 2 s if no response occurred. Number of global choices out of trials served as the dependent measure of global processing.

During debriefing, none of the participants reported that they had perceived any letter in the mere exposure task.

Results

Global Matches. Missing values (less than 1%) did not differ across conditions. An ANOVA for repeated designs showed that amount of global matches declined gradually with number of repetitions: (*Mzero* = 10.03, *SD* = 1.84; *Mfive* = 8.97, *SD* =1.80; *Mfifteen* = 8.03, *SD* = 2.57; *Mforty* = 6.79, *SD* = 2.77), $F(3,84) = 11.76$; $p < .0001$. Simple contrast analyses revealed that zero differed from five presentations: $t(28) = 2.18$; $p < .04$; five differed from fifteen presentations: $t(28) = 2.18$; $p < .04$; and fifteen differed from forty presentations: $t(28) = 2.07$; $p < .05$.

Liking. We replicated the typical mere exposure effect, in that frequency of exposure increased liking for up to fifteen presentations (*Mzero* = 2.70, *SD* = .95; *Mfive* = 3.15, *SD* = 1.06; *Mfifteen* = 4.55, *SD* = 1.95), however after forty repetitions an opposite trend occurred (*Mforty* = 3.83, *SD* = .81), $F(3,84) = 12.14$; $p < .0001$. Simple contrasts: zero versus five presentations: $t(28) = 2.11$; $p < .05$; five versus fifteen presentations: $t(28) = 3.51$; $p < .01$; fifteen versus forty presentations: $t(28) = 2.02$; $p = .05$.

Additional analyses. In additional correlation analyses, we did not find significant relations between liking and global processing in any of the exposure conditions, all *r*s < .18; *p*s > .51. There were no mood effects, *F*s <1, and when mood was entered as a covariate into the main analyses reported above, no mediation by affect was found.

To sum up, the study showed that the more often participants were exposed to unknown stimuli, the more likely they showed a detail oriented processing style. In addition, we were able to replicate the typical inverted U function of mere exposure on liking. Both effects seemed to be independent from another. Could a similar effect be replicated with a more conceptual task?

Experiment 2

Experiment 2 was a conceptual replication with a generation task. Here, participants were asked to invent meanings for the Hebrew letters that were formerly presented or not. Abstractness of solutions served as the main dependent variable.

Method

Participants. 37 undergraduates participated in the study. There were no gender effects. The design was a 4 (Exposure: 0, 5, 15, 40) factorial, with abstractness of solutions and liking of the letters as the dependent variables.

Procedure. The first phase of the experiment was exactly the same as described above. After the mere exposure manipulation we showed participants printouts of the target letters and asked them first how much they liked each of them. Next, we presented the same letters printed in a different order on a separate sheet and asked them to imagine that this letter constitutes a word in a different language and to write down what they thought this might be. As in Experiment 1, during debriefing, none of the participants reported having seen the letters in the mere exposure task.

Results

Abstractness and Valence of Solutions. Two independent raters evaluated all generated responses with respect to valence (*How positive or negative is the solution*?; from *1* = *very negative* to *7* = *very positive*; interrater reliability: $r = .87$) and abstractness (*How abstract or concrete is the solution*?; from *1*= *very concrete* to *7* = *very abstract*; interrater reliability: $r = .85$).

An ANOVA for repeated designs comparing the four exposure times with average abstractness ratings revealed that generation became more concrete with amount of exposures (*Mzero* = 3.58, *SD* = 1.05; *Mfive* = 3.19, *SD* = .97; *Mfifteen* = 2.87, *SD* = .93; *Mforty* = 2.49, *SD* = 1.13), $F(3,108) = 13.52$; $p < .0001$. Simple contrasts: zero versus five presentations: $t(36) = 2.18$; $p < .04$; five versus fifteen presentations: $t(36) = 2.04$; $p < .05$; fifteen versus forty presentations: $t(36) = 2.56$; $p < .02$.

A similar analysis with average valence ratings was not significant, $F(3,108) = 1.68$; $p > .17$; *Mzero* = 4.18, *SD* = .55; *Mfive* = 3.96, *SD* = .43; *Mfifteen* = 3.96, *SD* = .53; *Mforty* = 4.03, *SD* = .38.

Liking. As in Experiment 1, we replicated the mere exposure effect (*Mzero* = 3.30, *SD* = 1.48; *Mfive* = 3.86, *SD* =1.44; *Mfifteen* = 4.45, *SD* = 1.29), with the exception of forty repetitions, which instead led to a reduced liking compared to fifteen presentations (*Mforty* = 3.81, *SD* = 1.19), $F(3,108) = 6.99$; $p < .0001$. Simple contrasts: zero versus five presentations: $t(36) = 2.18$; $p < .04$; five versus fifteen presentations: $t(36) = 2.04$; $p < .05$; fifteen versus forty presentations: $t(36) = 2.56$; $p < .02$.

Additional analyses. We examined correlations between the liking ratings, abstractness and valence scores for each of the exposure conditions separately. We did

not find any significant relation between liking and abstractness, all *r*s < .19; *p*s > .26; liking and valence, all *r*s < -.22; *p*s > .19; or abstractness and valence, all *r*s < .27; *p*s > .10. Thus, again, it seems that these variables might bear unrelated, producing independent effects. Moreover, moods were not affected and did not mediate the above results, as covariance analyses indicate.

Final Remarks

Two experiments using perceptual and conceptual tasks of construal level suggest that lack of exposure or novelty increases high level construals relative to familiarity or frequent exposure: we thus collected strong support for CLT's notion that deviating from direct experience increases high level construals. We also found a typical mere exposure effect; however, it was independent from the effect on processing styles. Note that whereas the graph of the mere exposure effect indicated an inverted U function, concreteness increased linearly. In other words, it did not matter whether an item was relatively liked (15 exposures) or not (0 or 40 exposures): concreteness still increased with number of repetitions.

The paper is the first that shows a relation between construal level and novelty/familiarity, and further research is needed to examine whether the effects generalize to other novel events. Would for example framing a task or an object as new or meeting a stranger immediately trigger high level construals (as is predicted by Fiske & Neuberg, 1990)? Furthermore, one may wonder whether such effects could flip around when the object of novelty is threatening and causes aversive arousal or anxiety. Emotion theories predict that local processing is suitable for dangerous situations, in that it enables focusing on the potential threat and thereby enhances the likelihood of dealing

and eventually eliminating or escaping from it (see Förster & Higgins, 2005; Fredrickson, 1999; Friedman & Förster, 2008; Schwarz & Bless, 1991). Thus, in case novelty triggers negative moods, a more detail-oriented or local processing style may be activated. In our experiments, however, no indication for mood as a potential mediator for the effects was found.

Mere lack of experience triggered global processing, and the link "when novel – then global processing" seems to be over-learned one, since participants not only seemed to be unaware of whether the item had been presented frequently or not, they did not even know whether it had been presented at all.

One may speculate why people would automatically adopt a more global processing style upon perception of novel cues. It could be argued that new information needs to be integrated into existing knowledge structures in order to be understood. For example, when seeing a preview of a new film, one might wonder whether it is a drama or a documentary before considering specifics of the plot. More abstract categories are broader, and, naturally, more inclusive. If one tries to integrate a new target and is uncertain about the kind of category that would best fit it, it would be functional to activate many broad categories. A global processing style and abstract thinking support this inclusion process.

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Figure captions

Figure 1. Example trial of the global/local task used in Experiment 1.

Figure 2. Mean liking scores and average number of selected global matches by exposure condition.

Figure 3. Mean liking scores, valence scores, and abstraction scores by exposure condition.

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Figure 1

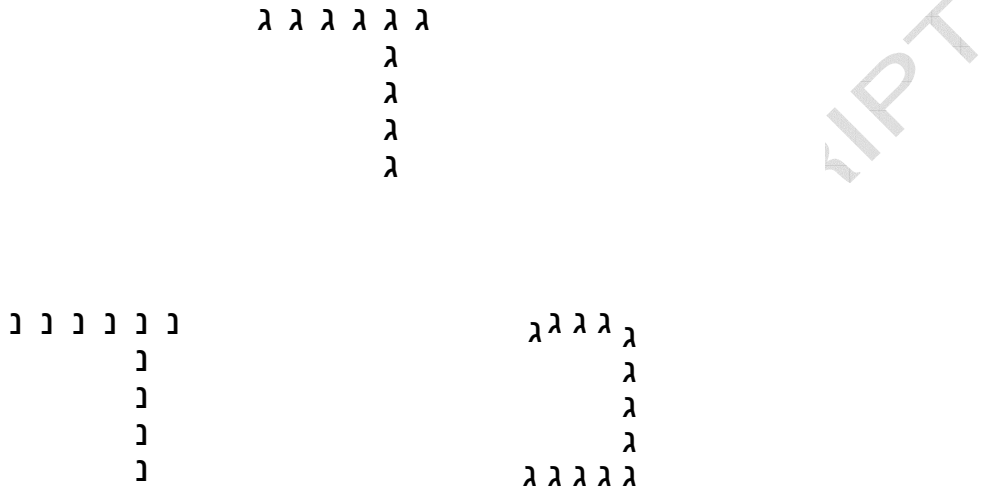
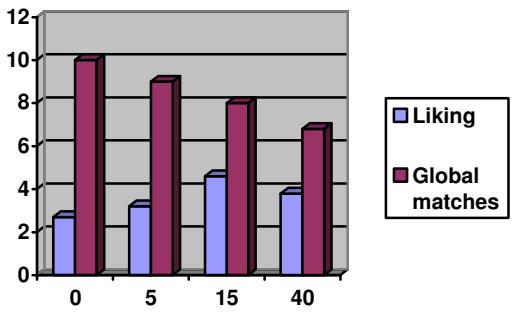
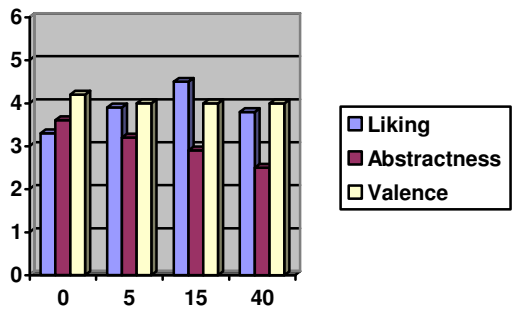


Figure 2



- **Frequency of exposure**

Figure 3



- **Frequency of exposure**