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Effects of "hotspots" as a function of intrinsic neighborhood attractiveness

Christophe Blaison [a, *, 1], Mario Gollwitzer [b, 3], Ursula Hess [a, 2]

[a] Humboldt-Universität zu Berlin, Berlin, Germany
[b] Philipps-University, Marburg, Germany

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ABSTRACT

Would the positive effect of an urban park differ as a function of whether it is located in Beverly Hills or in South-Central? Would the negative effect of a noisy highway in Beverly Hills differ from its effect in South-Central? The present research investigates how changes in intrinsic neighborhood attractiveness modify the effects of intensely valenced locations – i.e., positive or negative "hotspots." In two experiments, participants rated the attractiveness of target locations situated at increasing distance from a positive or a negative hotspot, within a neighborhood that is itself intrinsically attractive or unattractive. The results show that salient intrinsic neighborhood attractiveness mattered irrespective of the distance to a positive hotspot whereas for a negative hotspot it showed an effect only farther away. We conclude that intense negative influence propagates in the same way irrespective of the intrinsic neighborhood attractiveness whereas intense positive influence dissipates quicker with increasing distance in unattractive neighborhoods.

1. Introduction

Our affective system is crucial to adaptive decision making (Damasio, 1994; Schwarz & Clore, 1983). In geographical space, affect works like a compass pointing towards places that appeal and away from places to avoid. Appealing places elicit positive affect and are deemed attractive whereas places to avoid elicit negative affect and are deemed unattractive (Peters, Västfjäll, Gärling, & Slovic, 2006; Slovic, Finucane, Peters & MacGregor, 2007; Wyer, Clore, & Isbell, 1999). Hence, how people evaluate places allows us to predict their movement in geographical space. On the one side, people evaluate places based on intrinsic properties. For example, they may find a new home attractive because it contains the desired number of rooms or because the building looks attractive. Geographical space, on the other side, renders locations dependent on each other such that nearby locations are more related than more distant ones (Tobler, 1970). Therefore, people may also derive the value of a location from its position within the larger spatial context. For example, irrespective of its intrinsic properties, a location's value is likely to decrease the closer it is to an unattractive location. However, researchers only recently began to investigate the way people derive a location's value from its position within the spatial context.

1.1. Affective judgment in spatial context

Blaison and Hess (2016) proposed that locations in a spatial context that elicit strong affective reactions, like an unsafe housing block or a nice park, have the most influence within a given spatial context. They showed that these affective "hotspots" have assimilative as well as contrastive effects on the evaluation of the surroundings. Hotspots influence the evaluation of the proximal area in the same direction (assimilation effect) whereas farther away the evaluation is drawn in the opposite direction (contrast effect). For example, in one study a landfill decreased the average rent people were ready to pay for an apartment located in the proximal area by approx. 25% (assimilation effect) whereas farther away the landfill increased the average rent by approx. 19% (contrast effect; Blaison & Hess, 2016; Study 3). A similar pattern of results emerged for an unsafe housing block or a nuclear power plant when the participants were asked how they would feel about living at increasing distance from these hotspots. The emergence of an influence or a contrast effect further away depends on people's belief about how far the influence of a hotspot reaches into the neighborhood (i.e., the size of its "gradient of influence"). When the spatial context contained a hotspot with a large gradient of influence, such as a

* Corresponding author. Department of Psychology, Humboldt-Universität zu Berlin, Rudower Chaussee 18, 12489 Berlin, Adlershof, Germany.
E-mail address: christophe.blaison@hu-berlin.de (C. Blaison).
[1] Department of Psychology, Humboldt-Universität zu Berlin.
[2] Department of Psychology, Humboldt-Universität zu Berlin.
[3] Department of Psychology, Philipps-University Marburg.

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nuclear power plant, it decreased the attractiveness of the neighborhood across a greater distance than when the spatial context contained a hotspot with a shorter gradient of influence, such as an unsafe housing block (Blaison & Hess, 2016, Study 4). The size of the area people take into account in their evaluation also has an effect. In larger spatial contexts, as when a hotspot is embedded into a large neighborhood, hotspots have larger gradients of influence than in smaller spatial contexts (Blaison & Hess, 2016, Study 5 and 6). In all, Blaison and Hess (2016) demonstrated how the distance to a hotspot, the belief about the hotspot's gradient of influence and the size of the spatial context under consideration all interact to influence people's evaluation of target locations.

1.2. Goal of the present research

To isolate the effect of hotspots, Blaison and Hess (2016) studied how they influenced neighborhoods that felt intrinsically neutral. Thus, it is unknown how the effects of hotspots unfold when surrounded by intrinsically attractive or unattractive neighborhoods. Would changes in intrinsic neighborhood attractiveness modify the negative effect of an unsafe housing block or the positive effect of an urban park? The present research investigates how changes in intrinsic neighborhood attractiveness modify the influence of positive and negative hotspots. For this we need to study the way people combine the evaluative information about the distance that separates a target location from a hotspot and the information about the intrinsic attractiveness of the neighborhood. To do so, we will apply theoretical tools from the social cognitive research on impression formation.

1.3. Weighting and integration of evaluative information from the environment

First it is useful to frame the problem with the help of a concrete situation that has become mundane. Imagine that Mary is looking for a new home because she got a new job in a distant city. Like nine out of ten Americans, she will call up a real-estate website (National Association of Realtors, 2015) which will present her property offers mapped on a satellite view (c.f., market leaders like Zillow.com, Realtor.com, or Trulia.com). While browsing the map, her attention may be drawn to a public park (she appreciates parks very much) or the shape of the buildings in the surrounding neighborhood. In one scenario she finds the neighborhood attractive because the housing blocks are sparsely built with wealthy looking buildings and a lot of vegetation (Hull & Harvey, 1989; Sheets & Manzer, 1991), whereas in another she finds the neighborhood unattractive because the housing blocks are densely packed with grey and monotonous buildings lacking any vegetation. There are property offers marked close to the park and others farther away. She has no other information because she is new to this city. In this simple situation, her choice may be based on the evaluation derived from the distance to the park (i.e., the less distance the better), on the evaluation derived from the intrinsic attractiveness of the neighborhood (the nicer the buildings the better), or on a combination of both. The question is whether she will favor one kind of information over the other as well as how she will combine them.

We know from social cognitive research on impression formation that some information weighs more on judgments than other information (Fiske & Taylor, 1991; Moskowitz, 2005; Wyer & Carlston, 1979; Wyer & Srull, 1994). Two features in particular lend more weight to information: salience and informativeness. Something is salient when it pops-out from the background because it is prominent, noticeable or unexpected. As such, salient information is more likely to grab attention and get "at the forefront of one's conscious thought" (Higgins, 1996, p. 156). This property gives salient information an advantage in influencing people's perception, judgment and behavior. Importantly, some things may be naturally prominent whereas others become salient by comparison to a certain context (i.e., *comparative distinctiveness*; Higgins, 1996). For instance, an explosion is always salient whereas the tic-tac of a clock or undesired stomach rumblings become salient only in a quiet environment. The second feature that lends more weight to information is its informativeness, i.e., its diagnostic value for the successful pursuit of one's goals (Fiske, 1980; Skowronski & Carlston, 1987). It makes sense to pay more attention to useful information. In this respect, negative information weighs more than positive information. To avoid the negative has priority over pursuing the positive because negative consequences can eventually lead to death, which terminates any options. In contrast, there is no such absolute repercussion for missing opportunities: other opportunities are bound to show up again soon. It makes thus evolutionary sense for living organisms to attend to negative information more than to positive information. This asymmetric weighting of negative and positive information is commonly referred to as *negativity bias* or *negativity effect* (Anderson, 1965; Baumeister, Bratslavsky, Finkenauer & Vohs, 2001; Cacioppo & Berntson, 1994; Fiske, 1980; Kahneman & Tversky, 1979; Lewicka, Czapinski & Peeters, 1992; Peeters, 1971; Peeters & Czapinski, 1990; Rozin & Royzman, 2001). Informativeness is also related to evaluative intensity. Irrespective of valence, people will give more weight to intense information (Fiske, 1980) because it signals high goal relevance. Against the background of milder information it is also more salient. Salience and informativeness are thus often positively correlated.

How does this play into Mary's decision? A park, for instance, should weigh heavily on her choice because it is salient in two ways: it has a distinctive shape compared to the surroundings and she rates it as an extremely positive feature. By contrast, the intrinsic attractiveness of the neighborhood tends to fade into the background. Even more so as intrinsic neighborhood attractiveness is irrelevant for Mary's purpose, given that all the offers she is looking at stem from the same neighborhood. Distance to the park is more informative in that respect as it varies between offers. For all these reasons, the evaluative information that Mary derives from the distance to the park is likely to carry more weight in her decision than the evaluative information she derives from intrinsic neighborhood attractiveness.

Once Mary has weighed the information she must combine it to arrive at a judgment. According to information integration models of impression formation (Anderson, 1981a, 2008; Wyer & Carlston, 1979), people form impressions by applying a simple algebraic rule, like averaging, to the piecemeal information that is currently accessible to them. For example, when people are asked to form a global evaluation of person A who possesses two moderately and two extremely positive traits, or person B who possesses only two extremely positive traits, they generally like person B more than person A (Anderson, 1965, 1981a; see also; Kralik, Xu, Knight, Khan, & Levine, 2012; Seta, Haire, & Seta, 2008; Weaver, Garcia, & Schwarz, 2012). Applied to our concern, Mary would thus simply average the evaluative information while giving more weight to the distance to the park than to intrinsic attractiveness of the neighborhood. As a consequence, a robust effect of distance to the hotspot (preference decreasing with distance) should emerge in any case whereas the emergence of an effect due to intrinsic neighborhood attractiveness (preference higher in the attractive than in the unattractive neighborhood condition) is less certain. Yet, intrinsic neighborhood attractiveness may sometimes have more impact. For instance, Mary may widen her search to other neighborhoods, and these neighborhoods may have different levels of attractiveness. Yet, we know that information becomes more salient when it has comparative distinctiveness in a given context (Higgins, 1996). Thus, intrinsic neighborhood attractiveness should become more salient when Mary compares neighborhoods. In these circumstances, Mary's decision should entail both a robust effect of distance to the park *and* a robust effect of intrinsic neighborhood attractiveness.

The effect of intrinsic neighborhood attractiveness could be stronger farther away from the hotspot. As influence is more intense at closer distance from the hotspot, people are likely to put more weight on the effect of the hotspot than on intrinsic neighborhood attractiveness at shorter distance; neighborhood attractiveness has more effect farther away than close by. Therefore, an interaction between intrinsic attractiveness of the neighborhood and the distance to the hotspot could emerge. Moreover, this effect could come to play more distinctly when neighborhood attractiveness is highly salient (i.e. comparatively distinctive), which possibility would entail an interaction between intrinsic neighborhood attractiveness, distance and comparative distinctiveness. We call this hypothesis "*influence hypothesis*."

In the case where the hotspot is negative (rather than a park, an unsafe housing block for instance), the effect of distance should show increasing preference with increasing distance. Another difference with the positive hotspot scenario is that a negative hotspot carries extra weight due to the negativity bias. Thus, the presence of a negative hotspot may weigh so heavily on judgment that intrinsic neighborhood attractiveness fails to weigh in the balance even when it has comparative distinctiveness. In Mary's case, the presence of a negative hotspot might be so relevant to her that she is likely to disregard any other evaluative information from the environment other than distance to it. This should be less the case in presence of a positive hotspot because people are biased to give less importance to positive information. Therefore, the influence hypothesis evoked above (intrinsic neighborhood attractiveness effect is less likely closer to the hotspot especially when comparative distinctiveness is high) may more readily apply when the hotspot is negative than when it is positive. The classic work about goal gradients is directly relevant in this respect. Goal gradients describe the notion that animals and humans alike expend increasingly more effort to approach a goal or to avoid an anti-goal the closer the (anti-)goal (e.g., Brown, 1948; Miller, 1959). Gradients of avoidance, however, are steeper than gradients of approach. Indeed, Brown (1948) showed that when rats where put down increasingly closer to a reinforced location, they expanded increasingly more energy to escape a negatively valued location than to approach a positively valued location. Similarly, closer to the hotspot, Mary's motivation to escape the influence of an unsafe housing block could grow larger than her motivation to live near a park. This amounts to say that the asymmetry in weightings between positive and negative influence increases closer to the hotspots (see also Peeters & Czapinski, 1990: "weights accorded to negative stimuli should exceed those accorded to equally intense positive stimuli as the stimuli are more intense", p. 43). By necessity, the difference of likelihood of an effect of intrinsic neighborhood attractiveness at proximity of a positive or negative hotspot (i.e., less likely for a negative hotspot than for a positive hotspot) grows larger the closer to the hotspots. We will call "*influence asymmetry*" this hypothesis because it is as if intense negative influence had more inertia than intense positive influence. As the influence asymmetry hypothesis constitutes a qualification of the more general influence hypothesis described in the previous paragraph, it should entail an interaction between intrinsic neighborhood attractiveness, distance and the valence of the hotspot, which interaction could play out more or less distinctly as a function of the comparative distinctiveness of intrinsic neighborhood attractiveness.

In line with the negativity bias, one could further predict that distance to the hotspot would weigh less in certain conditions. For instance, as positive information weighs less than negative information, people could care less about the benefits provided by a positive hotspot's proximity when the neighborhood is intrinsically unattractive. If this were true, then the decrease in preference as a function of distance to the positive hotspot should be slower (i.e., the slope shallower) in the unattractive neighborhood condition and the difference in preference between the levels of intrinsic neighborhood attractiveness should be more blatant the closer one gets to the positive hotspot. If we ignore any influence or influence asymmetry effect, the distance effect in the high and low intrinsic neighborhood attractiveness conditions should be more similar in the case of a negative hotspot because being located farther away from an extremely negative hotspot gains in attractiveness, irrespective of whether one considers an appealing neighborhood or not. We call this prediction the "*slope hypothesis*."

To sum up so far, different scenarios could emerge: a) a robust effect of distance for both positive and negative hotspot conditions, except maybe in the positive hotspot condition within an unattractive neighborhood (slope hypothesis), b) larger effect of intrinsic neighborhood attractiveness farther away than close to the hotspots, especially when intrinsic neighborhood attractiveness is comparatively distinctive (influence hypothesis), and finally c) the influence hypothesis is more likely for a negative than for a positive hotspot, especially when intrinsic neighborhood attractiveness has comparative distinctiveness (influence asymmetry hypothesis).

At this stage it is necessary to mention that intrinsic neighborhood attractiveness may influence the evaluation of the hotspot themselves; not only the converse. Mary could devalue a positive hotspot for being located in an unattractive neighborhood. Due to the negativity bias, unattractive surroundings likely weigh heavily enough to negatively influence Mary's evaluation of the positive hotspot, especially when intrinsic neighborhood attractiveness is salient. Would Mary conversely see a negative hotspot in a more positive light if it was surrounded by an attractive neighborhood? This is less certain – again due to the negativity bias. This last set of predictions is compatible with unpublished results that show that negative hotspots can influence the evaluation of nearby positive hotspots negatively whereas there is no evidence to support the contrary (Blaison, Gebauer, Gollwitzer, Schott, & Hess, 2016). As the negativity bias bears consequences on the evaluation of the hotspots themselves, we call this hypothesis "*evaluation asymmetry*."

One issue here is that evaluation asymmetry and influence asymmetry produce similar patterns of results but for different reasons. According to evaluation asymmetry, Mary rates the park less positively within the negative neighborhood and consequently its potential for positive influence is lower than in the attractive neighborhood. The unsafe housing block on the other hand holds the same potential for negative influence irrespective of neighborhood attractiveness. Provided the influence hypothesis is correct, there will be no effect of neighborhood attractiveness in proximity of the unsafe housing block whereas it will "seem" to come into play in proximity of the park. However, this effect will not be due to the fact that positive influence grabs Mary's attention less than negative influence (influence asymmetry hypothesis), but to the fact that, contrary to the unsafe housing project, the park is devalued in the unattractive neighborhood compared to the attractive neighborhood (evaluation asymmetry hypothesis). Therefore, we need to test both the evaluation and the influence asymmetry hypotheses to disentangle the processes behind the results.

In conclusion, it is apparent that the interplay between hotspots and intrinsic neighborhood attractiveness gives rise to different hypotheses which are difficult to predict *a priori*. We conducted two experiments to test the various outcomes. The first experiment manipulated the nature of the hotspot (negative or positive), the intrinsic attractiveness of the neighborhood (attractive or unattractive buildings) and its comparative distinctiveness (low or high). The second experiment was meant to replicate, generalize and resolve ambiguities in the results obtained in the first experiment.

2. Experiment 1

Like Mary, participants in Experiment 1 saw survey views of (fictitious) neighborhoods (see Fig. 1). One group of participants saw a neighborhood with a pleasant looking park with ponds whereas a different group saw a neighborhood with an unsafe housing block (both hotspots occupied an equivalent surface on the ground). Previous research showed that these two hotspots elicit evaluations of similar intensity (i.e., Blaison & Hess, 2016; Blaison et al., 2016). Furthermore, one half of the participants saw a neighborhood made up of attractive buildings whereas the other half saw a neighborhood made up of unattractive buildings. The attractive buildings were less densely packed and had more vegetation than the unattractive buildings (Hull & Harvey, 1989; Sheets & Manzer, 1991). Comparative distinctiveness was manipulated such that one half of the participants rated places located in a different neighborhood in addition (i.e., the reference neighborhood): when the target neighborhood with the hotspot was attractive, the reference neighborhood (which contained no hotspot) was unattractive, and *vice versa*. Each participant was asked how pleasant it would feel to live at increasing distance from the hotspot (see Fig. 1). We also assessed how the participants felt about the hotspots themselves to disentangle the effect of evaluation and influence asymmetry. Finally, we thought that comparative distinctiveness should elicit a contrast effect such that the ratings of the attractive and unattractive neighborhood become more polarized (Bless & Schwarz, 2010; Schwarz & Bless, 1992, 2007). To check the success of the manipulation, we included a control condition where participants saw one (low comparative distinctiveness) or two (high comparative distinctiveness) neighborhoods without any hotspots.

2.1. Method

2.1.1. Participants and design

A total of 500 observations were collected online via Amazon's Mechanical Turk.[4] To ensure high quality data, we selected workers that had accomplished a minimum of 100 Mechanical Turk tasks (i.e., "hits") with a requester satisfaction rate of 95%.[5] Eleven individuals participated in more than one experimental condition, thus we kept only the data for their first participation, resulting in $N = 489$ participants (268 women, all U.S. residents, mean age $= 33.81$ years, $SD = 11.72$). The participants were randomly assigned to a 3 (hotspot: positive, negative, no hotspot = control) x 2 (intrinsic neighborhood attractiveness: unattractive or attractive) x 2 (comparative distinctiveness of neighborhood attractiveness: low or high) x 8 (distance: hotspot location + 7 locations at increasing distance) mixed design with the last factor as within-subjects factor.

2.1.2. Stimuli and procedure

Realistic survey views of fictitious neighborhoods were created with the PC-game Simcity 4 (Maxis, 2003; see Fig. 1).[6] Distance 0 was occupied by the hotspot: an urban park or an unsafe housing block. The other target locations to rate extended from Distance 1 to 7 or Distance 1 to 17 as a function of the condition (see Fig. 1). To make sure that the unsafe housing block was visually salient and that it was threatening to participants, we chose a building that was taller than the rest and we added the symbol of a gun and a syringe to indicate that this housing block was "rife with violence and drug trafficking." In contrast, to make sure that the park would be perceived positively, it was described as "nice, not too crowded nor too empty, just as you like it." To manipulate intrinsic neighborhood attractiveness, we either used Simcity 4's wealthy residential buildings set (lots of vegetation, low density, attractive buildings) or the poor residential buildings set (no vegetation, high density, unattractive buildings) (see Fig. 1). The neighborhoods were presented full-screen such that the characteristics of the buildings were sufficiently visible.

In the low comparative distinctiveness condition, the participants first rated "How pleasant or unpleasant [it] would feel to spend a few hours" in the unsafe housing block or in the park (Distance 0),[7] using the valence scale (nine-points; 1 = very unpleasant to 9 = very pleasant) of the Self-Assessment Manikin (SAM; Bradley & Lang, 1994; see Appendix A). The participants were then asked "How pleasant or unpleasant would it be to live about there?" for each Distance from 1 to 7 with the SAM valence scale. For each rating, a white arrow indicated which target location to rate. The target locations from Distance 1 to 7 were rated in different random orders for each participant.

For the high comparative distinctiveness condition, the participants first rated the hotspot at distance 0. Then, they rated places located in both the target and the reference neighborhood (Distance 1 to 7 and Distance 11 to 17, see Fig. 1). The instructions stated that the two neighborhoods were "much more distant in real life than on the depiction" and that "the depiction was chosen for convenience purposes only." A thick dotted line separated the two neighborhoods to emphasize their independence. For each rating, a white arrow indicated which block to rate. Except for Distance 0, the target locations from Distance 1 to 17 were rated in different random orders for each participant. The analyses will focus on the ratings at Distance 0 to 7 because they are central to our purpose.

Finally, the location of the unsafe housing block and the park at the left or at the right end of the target neighborhood was counterbalanced across participants and two different arrangements of unattractive or attractive buildings were used. Participants in the control condition saw identical neighborhoods, except without any hotspot. The hotspots were replaced such that the area was indistinguishable from the rest. The control participants rated identical target locations as the experimental participants, except the one that otherwise contained the hotspot.

2.2. Results

We first checked whether the comparative distinctiveness manipulation succeeded. Contrasting the buildings of the target neighborhood with those of the reference neighborhood should

[4] Mechanical Turk is a valid source of high quality data (Behrend, Sharek, Meade, & Wiebe, 2011; Germine et al., 2012; Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010; but see; Crump, McDonnell, & Gureckis, 2013). Furthermore, it allows the collection of large samples that are more diverse than student panels (Berinsky, Huber, & Lenz, 2012). Finally, several studies showed that Mturkers are as much or more attentive and honest than student panels (Behrend et al., 2011; Hauser & Schwarz, 2016; Paolacci et al., 2010).

[5] An identical selection rule was used in all experiments. No worker participated more than once in the experiments.

[6] Authorization from Electronic Arts to manipulate and use stimuli derived from Simcity 4 for non-commercial purpose was obtained (March, 2015).

[7] Asking the participants how it feels to live in the public park would have made no sense. Unpublished data sets from our laboratory indicate that the ratings about spending a few hours inside the hotspot correlates highly and positively with the question about living in the adjacent blocks.

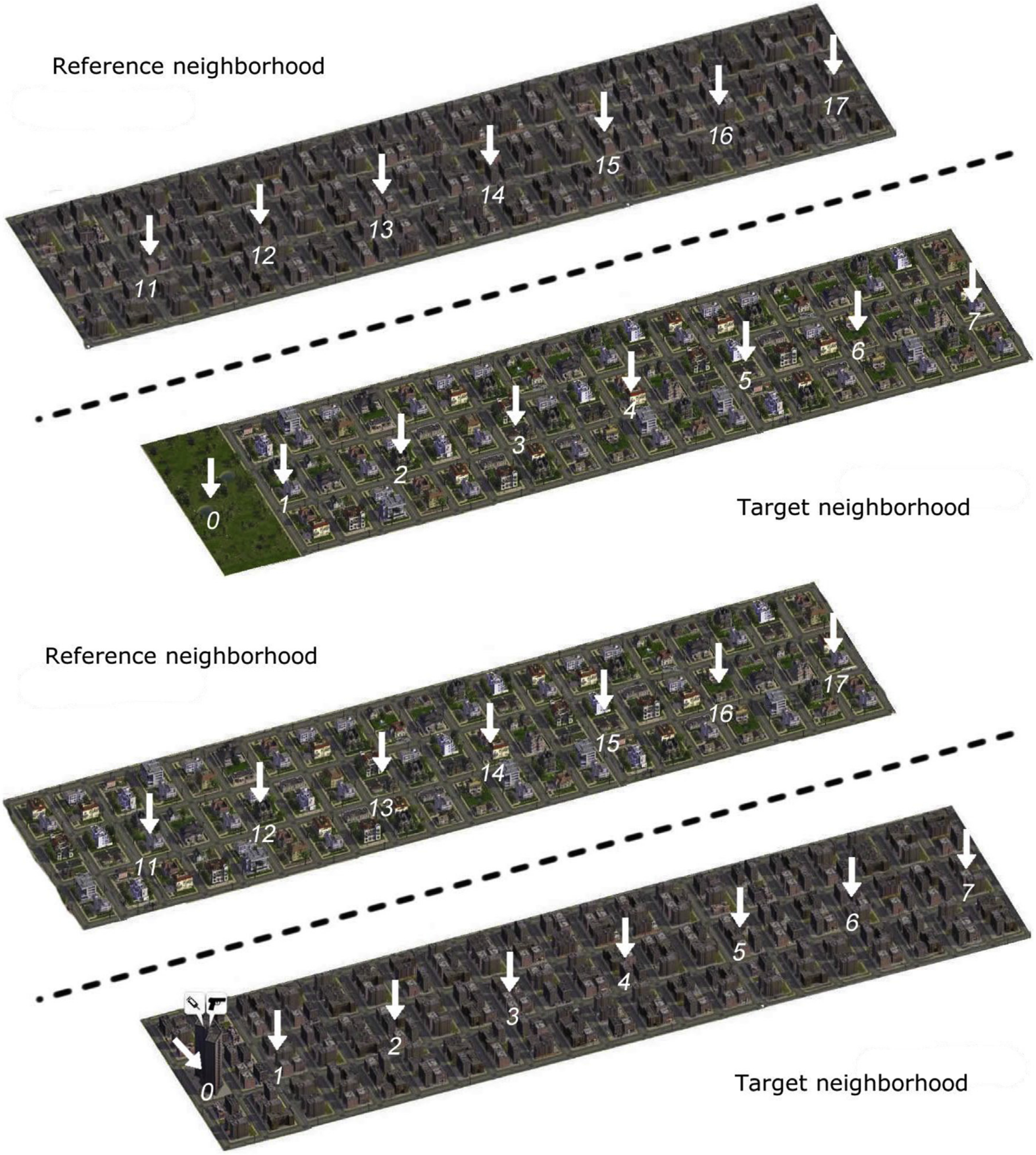

Fig. 1. Sample of stimuli used in Experiment 1. Upper panel: stimulus shown in the park condition (see left extremity of the target neighborhood) when comparative distinctiveness was high. Lower panel: stimulus shown in the unsafe housing block condition (see left extremity of the target neighborhood) when comparative distinctiveness was high. The white arrows mark the locations that were rated by the participants. The stimuli for the low comparative distinctiveness condition were the same except that no mention of a reference neighborhood was made. All analyses are based on Distance 0 to 7. The stimuli were in color. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

render building attractiveness more salient such that the difference in perceived pleasantness between the attractive and the unattractive neighborhood condition is greater in the high than in the low comparative distinctiveness condition. We conducted a 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) x 7 (distance) mixed design ANOVA on the pleasantness ratings in the control condition. For all the analyses we used the Greenhouse-Geisser correction when the sphericity assumption was violated. We rounded the corrected degrees of freedom to the nearest integer. As expected, the results showed a significant main effect of neighborhood attractiveness, $F(1,163) = 84.65$, $p < 0.001$, $\eta^2_p = 0.34$, that was moderated by a significant neighborhood attractiveness x comparative distinctiveness interaction effect, $F(1,163) = 33.00$, $p < 0.001$, $\eta^2_p = 0.17$ (see Fig. 2).[8] Simple effects analyses revealed a significant attractiveness effect in both comparative distinctiveness conditions although the effect was stronger in the high, $M_{unattractive} = 3.36$, 95% CI [2.88, 3.83], $M_{attractive} = 6.85$, 95% CI [6.38, 7.32], $F(1,81) = 107.43$, $p < 0.001$, $\eta^2_p = 0.57$, than in the low comparative distinctiveness condition, $M_{unattractive} = 4.80$, 95% CI [4.33, 5.27], $M_{attractive} = 5.61$, 95% CI [5.17, 6.05], $F(1,82) = 6.21$, $p = 0.015$, $\eta^2_p = 0.070$. Thus, the

[8] There was also an unexpected, nearly significant, distance x neighborhood attractiveness interaction effect $F(4, 728) = 2.29$, $p = 0.051$, $\eta^2_p = 0.01$, that will not be discussed further here.

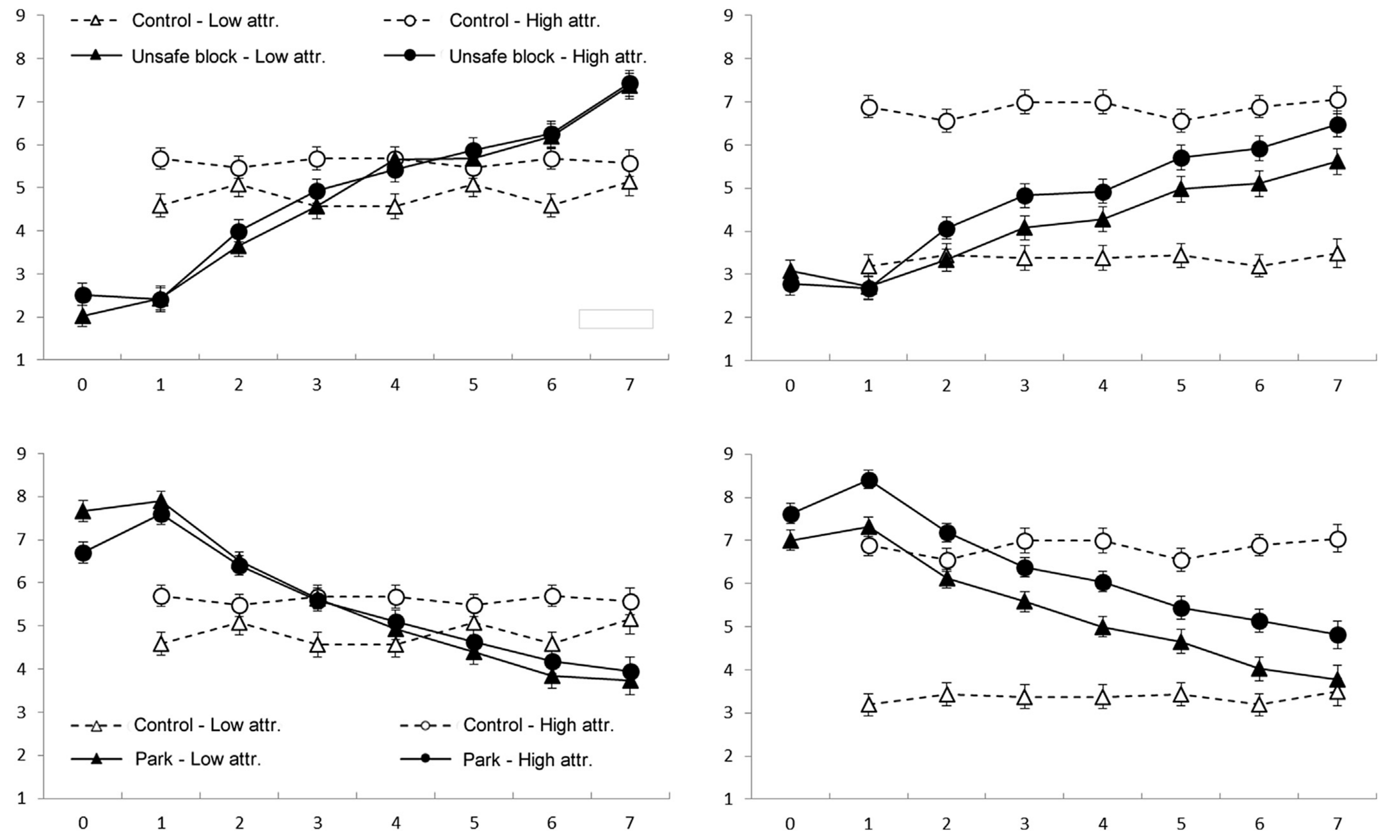

Fig. 2. Pleasantness ratings as a function of hotspot (unsafe housing block or park), intrinsic neighborhood attractiveness (low or high), salience of neighborhood attractiveness (low or high), and distance (Experiment 1). The first row depicts the results for the unsafe housing block; the second row depicts the results for the park. The hotspots are located at Distance 0. The main analyses concern Distance 1 to 7. The error bars represent SEs.

comparative distinctiveness manipulation succeeded.[9]

Next we will focus on the pleasantness ratings for Distance 1 to 7. As the predictions are complex, it is useful to recapitulate them here in detail. We first predicted a robust effect of distance for both positive and negative hotspots, except perhaps in the positive hotspot condition within an unattractive neighborhood (slope hypothesis). As the positive and negative hotspots have opposite effects with increasing distance, we expected a distance $\times$ hotspot interaction (D x H) or, for the slope hypothesis, a neighborhood attractiveness x distance $\times$ hotspot interaction effect (NA x D x H).

Second, the influence hypothesis states that intrinsic neighborhood attractiveness is especially likely to play out further away from the hotspots and when intrinsic neighborhood attractiveness is highly salient. Support for the influence hypothesis should thus entail a neighborhood attractiveness x distance (NA x D) or a neighborhood attractiveness x distance x comparative distinctiveness interaction effect (NA x D x CD). Finally, the influence asymmetry hypothesis qualifies the influence hypothesis by stating that intrinsic neighborhood attractiveness is less likely to play out in proximity of a negative hotspot than in proximity of a positive hotspot. Therefore, support for the influence asymmetry hypothesis should entail a neighborhood attractiveness x distance x hotspot (NA x D x H) or a neighborhood attractiveness x distance x hotspot x comparative distinctiveness interaction effect (NA x D x H x CD). As influence asymmetry is expected to be driven by a few cells within a design containing many (i.e., the locations in proximity of the negative hotspot or these same locations when intrinsic neighborhood attractiveness is comparatively distinct), support for influence asymmetry may be masked by the overall interaction tests. We predict that, if it exists at all, influence asymmetry is most likely to occur at Distance 1.

We conducted a 2 (hotspot: park or unsafe housing block) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) x 7 (distance) mixed ANOVA on participants' pleasantness ratings. The results are summarized in Table 1 and Fig. 1. The effect of distance was supported because the results showed a distance $\times$ hotspot interaction effect (D x H in Table 1). Simple effects analyses confirmed that there is a strong main effect of distance both in the park, $F(3, 513) = 184.05$, $p < 0.001$, $\eta^2_p = 0.54$, and in the unsafe housing block condition, $F(4, 576) = 204.03$, $p < 0.001$, $\eta^2_p = 0.56$, which are in the expected direction. As Fig. 1 suggests, the slope hypothesis was not supported because no significant NA x D $\times$ H

[9] Note that this pattern of results is not due to participants' different interpretation of the anchors of the SAM scale as a function of comparative distinctiveness. A similar pattern was obtained with a more objective criterion. Two hundreds and two participants (Mturk; all U.S. residents; 102 women; mean age = 36.13, $SD = 11.66$) were randomly assigned to a 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) x 7 (distance) mixed design. The participants were asked how much rent in dollars they would be willing to pay for a 750 Sq Ft apartment with 1 bedroom and 1 bath that was located at Distance 1 to 7 (Blaison & Hess, 2016). The rent was minimum 300 $. The results showed a significant main effect of neighborhood attractiveness, $F(1, 198) = 11.71$, $p < 0.001$, $\eta^2_p = 0.06$, and a significant neighborhood attractiveness x comparative distinctiveness interaction effect, $F(1, 198) = 7.03$, $p = 0.009$, $\eta^2_p = 0.03$. Simple effects analyses revealed that neighborhood attractiveness had no significant effect in the low comparative distinctiveness condition, $M_{unattractive} = 524.74$ $, 95% CI [479.97, 569.52], $M_{attractive} = 543.71$ $, 95% CI [495.76, 601.66], $p = 0.61$, whereas it had an effect in the high comparative distinctiveness condition, $M_{unattractive} = 422.92$ $, 95% CI [375.75, 470.10], $M_{attractive} = 572.19$ $, 95% CI [530.19, 614.18], $p < 0.001$. Thus, the results support the notion that the change in the evaluation of the neighborhoods as a function of comparative distinctiveness is situated at the representation level, not at the response level.

Table 1
Hotspot x neighborhood attractiveness x comparative distinctiveness x distance analysis of variance (ANOVA) on participants' pleasantness ratings at Distance 1 to 7 (Exp. 1).

	Df	*F*	*p*	η^2_p
Between subjects				
Hotspot (H)	1	18.59	<0.001	0.06
Neighbor. attractiveness (NA)	1	9.64	0.002	0.03
Comp. distinctiveness (CD)	1	0.15	0.68	0
H x NA	1	0.29	0.59	0
H x CD	1	9.51	0.002	0.03
NA x CD	1	6.16	0.01	0.02
H x NA x CD	1	0.40	0.53	0
Error	312			
Within subjects				
Distance (D)	4	1.98	0.11	0.01
D x H	4	391.92	<0.001	0.56
D x CD	4	2.41	0.06	0.01
D x CD x H	4	6.13	<0.001	0.02
NA x D	4	0.94	0.43	0
NA x D x CD	4	0.18	0.93	0
NA x D x H	4	0.75	0.55	0
NA x D x H x CD	4	0.98	0.41	0
Error	1099			

interaction effect emerged. Comparative distinctiveness had an effect because a significant neighborhood attractiveness x comparative distinctiveness interaction emerged (NA x CD in Table 1). Simple effects analyses showed that neighborhood attractiveness has no significant effect in the low comparative distinctiveness condition, $F(1, 155) = 0.24$, $p = 0.62$, $\eta^2_p = 0$, whereas it has a significant effect in the high comparative distinctiveness condition, $F(1, 163) = 13.03$, $p < 0.001$, $\eta^2_p = 0.07$. More importantly, neither the influence nor the influence asymmetry hypotheses were supported because there were no significant NA x D or NA x D × CD interaction effects (influence hypothesis) and no significant NA x D x H or NA x D x H × CD interaction effects (influence asymmetry hypothesis). Nevertheless, we predicted that if influence asymmetry exists in accordance with the theory, it should at least emerge when the analysis is restricted to Distance 1. Therefore, we conducted an NA x H x CD ANOVA on the pleasantness ratings at Distance 1. As expected, the results showed a small but significant NA x H × CD interaction effect, $F(1, 313) = 3.74$, $p = 0.05$, $\eta^2_p = 0.01$. Simple effects analyses revealed no difference between the effect of neighborhood attractiveness in the positive or negative hotspot conditions (NA × H interaction effect) in the low comparative distinctiveness condition, $F(1, 152) = 0.27$, $p = 0.60$, $\eta^2_p = 0$, whereas a significant NA × H interaction effect emerged in the high comparative distinctiveness condition, $F(1, 161) = 4.68$, $p = 0.03$, $\eta^2_p = 0.03$. When neighborhood attractiveness was salient and the hotspot was negative, the ratings at Distance 1 were similar in the intrinsically attractive and unattractive neighborhood conditions, $M_{\text{attractive}} = 2.72$, 95% CI [2.20, 3.26] and $M_{\text{unattractive}} = 2.68$, 95% CI [2.16, 3.21]. In contrast, the pleasantness ratings were significantly higher in the attractive than in the unattractive neighborhood in the positive hotspot condition, $M_{\text{attractive}} = 8.42$, 95% CI [7.91, 8.93] and $M_{\text{unattractive}} = 7.31$, 95% CI [6.79, 7.84]. At least for locations situated next to the hotspots, the evidence thus supports the influence asymmetry hypothesis.[10]

Finally, we investigated whether the influence asymmetry result could be explained by evaluation asymmetry. To do so, we conducted a 2 (hotspot: park or unsafe housing block) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) mixed ANOVA on the pleasantness ratings of the hotspots (i.e., at Distance 0). The results showed a significant hotspot x neighborhood attractiveness x comparative distinctiveness interaction effect, $F(1, 314) = 11.12$, $p < 0.001$, $\eta^2_p = 0.03$. Simple effects analyses revealed that there was no significant effect of neighborhood attractiveness on the evaluation of the unsafe housing block, all *F*s < 2.15, all *p*s > 0.15. For the park, a significant neighborhood attractiveness x comparative distinctiveness interaction effect emerged, $F(1,159) = 11.04$, $p = 0.001$, $\eta^2_p = 0.07$. The participants in the low comparative distinctiveness condition found it significantly more pleasant to spend some time in the park with the unattractive neighborhood, $M = 7.66$, 95% CI [7.19, 8.13], than in the one of with the attractive neighborhood, $M = 6.70$, 95% CI [6.22, 7.18] ($p = 0.006$). In contrast, participants in the high comparative distinctiveness condition preferred spending some time in the park with the attractive neighborhood, $M = 7.62$, 95% CI [7.16, 8.10], than in the one with the unattractive neighborhood, $M = 7.00$, 95% CI [6.52, 7.47] ($p = 0.07$). In sum and at least for the high comparative distinctiveness condition, the results tend to support the evaluation asymmetry hypothesis. The implications for the interpretation of the influence asymmetry hypothesis will be discussed next.

2.3. Discussion

Overall the results were in line with general principles of social cognition which predict that the weight people attach to information is a function of salience and informativeness. First, the effect of distance to the hotspot on the participants' ratings (i.e., increased/decreased preference with increasing distance to a negative/positive hotspot) was accompanied by an effect of intrinsic neighborhood attractiveness (i.e., general preference for the intrinsically attractive rather than unattractive neighborhood) only when neighborhood attractiveness was made salient by comparative distinctiveness. Thus, salience resulted in increased weight for intrinsic neighborhood attractiveness, as expected by the theory. One problem with this interpretation, however, is that compared to the salient neighborhood attractiveness condition, the ratings hardly differed between the unattractive and the attractive neighborhood when neighborhood attractiveness was not salient. One could argue that instead of the lack of weight due to low comparative distinctiveness, the lack of difference in attractiveness resulted in a lack of effect of neighborhood attractiveness in the low comparative distinctiveness condition. This reasoning questions the validity of our intrinsic neighborhood attractiveness operationalization. One could counter-argue that the small perceived difference in neighborhood attractiveness resulted from the small weight that neighborhood attractiveness had on the participants' judgment. In the low comparative distinctiveness condition, participants may have taken hardly any account of intrinsic neighborhood attractiveness because it was irrelevant for discriminating between the target locations. This amounts to a situation where there is no information about intrinsic neighborhood attractiveness; people then tend to respond with the middle-point of the pleasantness scale (Blaison & Hess, 2016; Study 1, 2 and 5). We suggest that a similar phenomenon occurred in the low distinctiveness condition of Experiment 1. According to this view, the results are not due to a faulty operationalization but to the different weight the participants attached to intrinsic neighborhood attractiveness in the two salience conditions.

Even in unfavorable conditions (i.e., when the hotspot was positive and the neighborhood unattractive; see slope hypothesis), the effect of distance to the hotspot was much stronger than the effect of intrinsic neighborhood attractiveness. This result confirms the importance of hotspots for understanding place evaluation in spatial context (see also Blaison & Hess, 2016). The effect of intrinsic neighborhood attractiveness was further qualified by the valence of and the distance to the hotspot. Whereas intrinsic neighborhood

[10] We performed a similar analysis for Distance 2 to 7. No significant NA x H × CD interaction emerged.

attractiveness had an effect everywhere when the hotspot was positive, it had no effect in the proximal surroundings of a negative hotspot. This result seems to support the influence asymmetry hypothesis and not the influence hypothesis.

The results also supported the evaluation asymmetry hypothesis: when comparative distinctiveness was high, the park was seen as less attractive in the unattractive neighborhood than in the attractive one whereas the unsafe housing block was unaffected by neighborhood attractiveness. As we emphasized that evaluation asymmetry can mimic the effects of influence asymmetry, it is difficult to conclude about the genuine presence of influence asymmetry. Yet, it may be equally difficult to conclude about the genuine presence of evaluation asymmetry. As stated above, evaluation asymmetry could result from the negativity bias such that unattractive neighborhoods are more likely to devalue positive hotspots than attractive neighborhoods are likely to increase the value of negative hotspots. However, rather than stemming from a psychological bias, the results could also stem from some rational considerations along the lines of "a park is more open to influence because it is a public space where neighbors hang out" (Newman, 1972). As people often associate poverty with crime (e.g., Gans, 1995; Parisi, 1998; Sampson & Raudenbush, 2004), a park may appear less safe within an unattractive poor neighborhood than elsewhere. An un-confounded test of the evaluation asymmetry hypothesis as well as of the influence asymmetry hypothesis requires therefore a positive hotspot that is less permeable to the influence of neighborhood attractiveness than a public park.

3. Experiment 2

Experiment 2 was similar to Experiment 1 except that we replaced the negative hotspot with a busy highway and the positive hotspot with the home of a liked celebrity. The home of a celebrity is private, i.e., less open to external influence, and there is evidence that it has positive influence equivalent to a public park (Blaison et al., 2016). Thus, if the results from Experiment 2 are similar to Experiment 1, they support the evaluation asymmetry hypothesis. If the evaluation of the celebrity home remains unchanged irrespective of the level of intrinsic neighborhood attractiveness it will in turn invalidate the evaluation asymmetry hypothesis and allow the un-confounded test of the influence asymmetry hypothesis.

3.1. Method

3.1.1. Participants and design

A total of 320 observations were collected online via Amazon's Mechanical Turk. Seven individuals participated in more than one experimental condition, thus we kept only the data for their first participation, resulting in $N = 313$ participants (161 women, all U.S. residents, mean age $= 35.43$, $SD = 12.05$). The participants were randomly assigned to a 2 (hotspot: positive or negative) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) x 8 (distance) mixed design with the last factor as within-subjects factor.

3.1.2. Stimuli and procedure

Experiment 2 used identical neighborhoods as in Experiment 1. However, the unsafe housing block and the public park were replaced by a highway and by the home of liked celebrity (see Fig. 3). The highway was described as "very busy and polluted." The home of the liked celebrity was presented as "a mansion surrounded by a private park." The rest of the procedure was identical to Experiment 1.

3.1.3. Results and discussion

We first verified whether the data supported the evaluation asymmetry hypothesis. For this, we conducted a 2 (hotspot: positive or negative) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) ANOVA on the pleasantness ratings at Distance 0 (i.e., the location of the hotspots). As expected, and in contrast to Experiment 1, no effect involving neighborhood attractiveness emerged significantly, all $Fs < 1.27$, all $ps > 0.26$. As the evaluation of the hotspots was independent of neighborhood attractiveness, the evaluation asymmetry hypothesis was unsupported in Experiment 2. The supporting evidence for evaluation asymmetry found in Experiment 1 was thus likely due to the susceptibility of public places to negative social influence. The fact that the celebrity home was unaffected by neighborhood attractiveness suggests that hotspots weigh more on judgment than more diffuse properties like neighborhood attractiveness, even when these diffuse properties are made salient. Future research should confirm this hypothesis.

To test the influence asymmetry hypothesis, we conducted a 2 (hotspot: celebrity home or highway) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) x 7 (distance) mixed ANOVA on participants' pleasantness ratings at Distance 1 to 7. The results are summarized in Table 2 and Fig. 2. As in Experiment 1, a hotspot $\times$ distance interaction (D x H in Table 2) emerged. Simple effects analyses showed strong main effects of distance both in the celebrity home, $F(2, 343) = 77.97$, $p < 0.001$, $\eta^2_p = 0.33$, and in the highway condition, $F(3, 435) = 170.76$, $p < 0.001$, $\eta^2_p = 0.53$. As in Experiment 1, a significant neighborhood attractiveness x comparative distinctiveness interaction emerged (NA x CD in Table 2). As expected, simple effects analyses showed that neighborhood attractiveness has no significant effect in the low comparative distinctiveness condition, $F(1, 149) = 2.49$, $p = 0.12$, $\eta^2_p = 0.02$, whereas it has a significant effect in the high comparative distinctiveness condition, $F(1, 160) = 22.86$, $p < 0.001$, $\eta^2_p = 0.13$. The influence hypothesis was supported because a significant NA $\times$ D interaction emerged (NA x D x CD did not). However, this influence hypothesis was qualified by supporting evidence for the influence asymmetry hypothesis. Indeed, a significant NA x D x H $\times$ CD interaction effect emerged. To follow up on this interaction, we conducted two NA x D x H ANOVAs separately for the high and the low comparative distinctiveness conditions. The results showed no significant NA x D $\times$ H interaction effect in the low comparative distinctiveness condition, $F(3, 394) = 0.50$, $p = 0.66$, $\eta^2_p = 0$, whereas this interaction emerged significantly in the high comparative distinctiveness condition, $F(3, 403) = 5.34$, $p = 0.002$, $\eta^2_p = 0.03$. Thus, there was no support for the presence of influence asymmetry in the low comparative distinctiveness condition whereas influence asymmetry was supported in the high comparative distinctiveness condition. For each distance in the high comparative distinctiveness comparison we then conducted an NA x H ANOVA. As predicted, there was a significant NA $\times$ H interaction effect at Distance 1, $F(1, 157) = 5.64$, $p = 0.02$, $\eta^2_p = 0.04$. Simple effects analyses revealed no effect of neighborhood attractiveness in the highway condition, $M_{unattractive.} = 3$, CI 95% [2.38, 3.62], $M_{attractive.} = 2.78$, CI 95% [2.17, 3.39], whereas the ratings where significantly higher in the high than in the low attractiveness condition when the hotspot was a celebrity home, $M_{unattractive.} = 6.43$, CI 95% [5.85, 7.00], $M_{attractive.} = 7.64$, CI 95% [7.04, 8.24].

No significant NA $\times$ H interaction emerged at further distances. Thus, as in Experiment 1, influence asymmetry emerged in the proximal area of the hotspots when neighborhood attractiveness was salient by comparative distinctiveness. In contrast to Experiment 1, we can conclude that negative influence weighed more than positive influence because there was no confounding

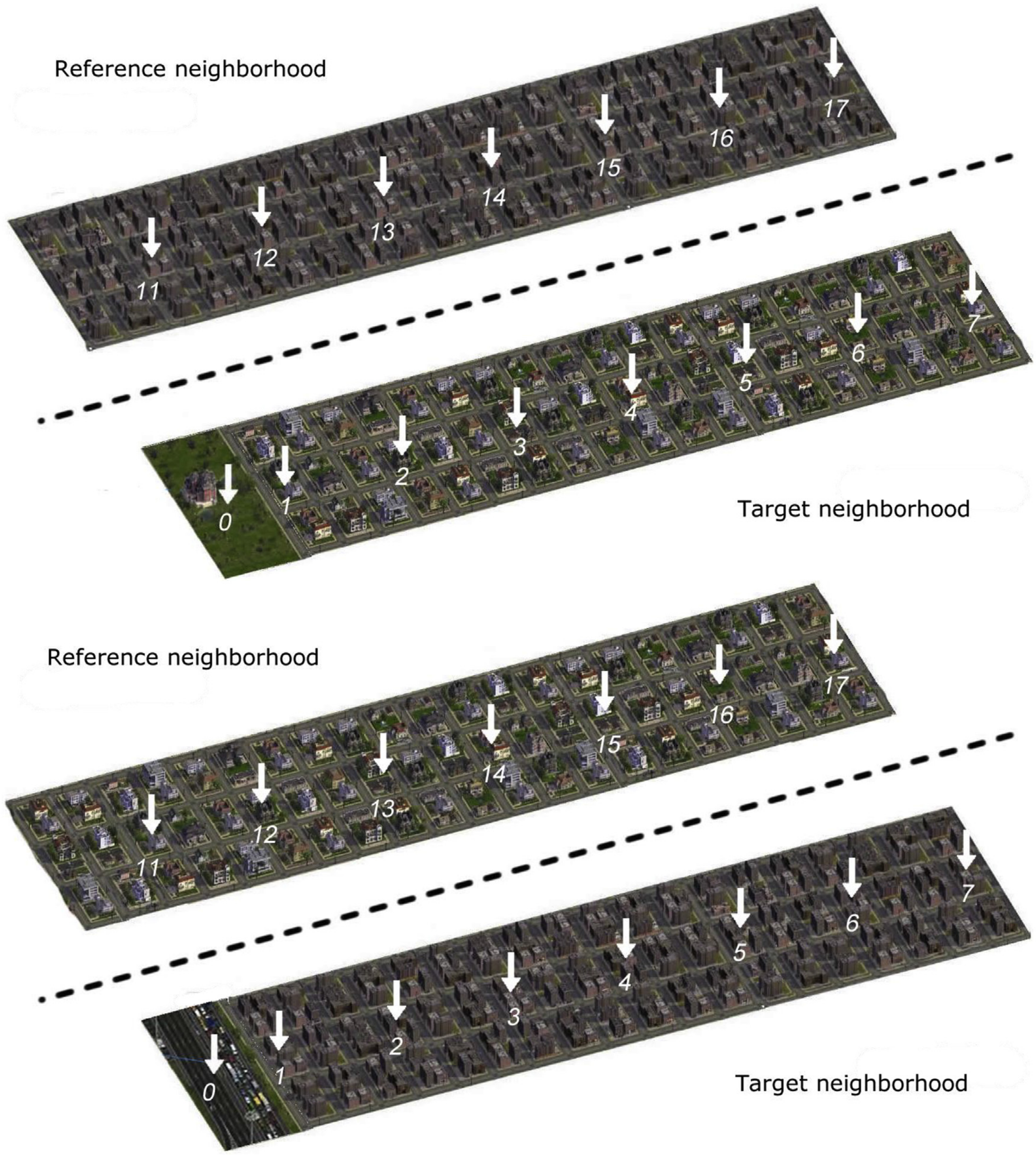

Fig. 3. Sample of stimuli used in Experiment 2. Upper panel: stimulus shown in the celebrity home condition (see left extremity of the target neighborhood) when comparative distinctiveness was high. Lower panel: stimulus shown in the highway condition (see left extremity of the target neighborhood) when comparative distinctiveness was high. The white arrows mark the locations that were rated by the participants. The stimuli for the low comparative distinctiveness condition were the same except that no mention of a reference neighborhood was made. All analyses are based on Distance 0 to 7 only. The stimuli were in color. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

evaluation asymmetry.[11]

Finally, the slope hypothesis was again not supported. Although the NA x D × H interaction emerged significantly in the high comparative distinctiveness condition, simple effects analysis revealed a significant NA × D interaction in the negative hotspot condition, $F(3, 201) = 7.40$, $p < 0.001$, $\eta^2_p = 0.09$, whereas the interaction was not significant in the positive hotspot condition, $F(2, 182) = 0.50$, $p = 0.64$, $\eta^2_p = 0.01$, which suggests that the effect of distance to the positive hotspot was similar in both the intrinsically attractive and unattractive neighborhood. This last result is incompatible with the slope hypothesis which predicts a smaller distance effect in the unattractive than in the attractive neighborhood.

[11] Note that an interpretation in terms of influence asymmetry is flawed if the celebrity home is less intensely positive than the highway is intensely negative (Peeters & Czapinski, 1990; Rozin & Royzman, 2001). To test whether the hotspots are similarly intense, we recoded the ratings of the highway such that higher scores indicate greater negativity. Then we conducted a 2 (hotspot: positive or negative) x 2 (intrinsic neighborhood attractiveness: low or high) x 2 (comparative distinctiveness: low or high) ANOVA on these recoded scores. If there is an intensity difference then an effect of hotspot should emerge. The results showed a significant hotspot x comparative distinctiveness interaction effect, $F(1, 305) = 3.76$, $p = 0.05$, $\eta^2_p = 0.01$. However, simple effects analysis revealed no intensity difference between the hotspots for each level of comparative distinctiveness, both $ps > 0.12$ (the descriptive tendency is in the unexpected direction). Thus, difference in evaluative intensity between the celebrity home and the highway cannot account for the results.

Table 2
Hotspot x neighborhood attractiveness x comparative distinctiveness x distance analysis of variance (ANOVA) on participants' pleasantness ratings at Distance 1 to 7 (Exp. 2).

	Df	*F*	*P*	η^2_p
Between subjects				
Hotspot (H)	1	11.85	0.001	0.04
Neighbor.attractiveness (NA)	1	21.42	<0.001	0.07
Comp.distinctiveness (CD)	1	1.04	0.31	0
H x NA	1	0.53	0.47	0
H x CD	1	3.27	0.07	0.01
NA x CD	1	7.83	0.01	0.03
H x NA x CD	1	0.22	0.64	0
Error	302			
Within subjects				
Distance (D)	3	19.56	<0.001	0.06
D x H	3	257.24	<0.001	0.46
D x CD	3	0.84	0.46	0
D x CD x H	3	6.13	<0.001	0.02
NA x D	3	3.55	0.02	0.01
NA x D x CD	3	0.67	0.55	0
NA x D x H	3	1.72	0.17	0.01
NA x D x H x CD	3	3.80	0.01	0.01
Error	807			

4. General discussion

The present research builds on previous work that showed how negative hotspots affected the evaluation of neutral neighborhoods (Blaison & Hess, 2016). It compares how changes in intrinsic neighborhood attractiveness modifies the effect of positive and negative hotspots. This issue boils down to understanding how people combine the intrinsic value of places with the value these places derive from the spatial context. We applied fundamental notions from social cognition like evaluative information integration, information weight and the negativity bias.

The influence of the hotspots across distance weighed the most on participants' judgment. Irrespective of intrinsic neighborhood attractiveness, pleasantness ratings went up with increasing distance from negative hotspots whereas they went down for positive hotspots. Intrinsic neighborhood attractiveness mattered only when it was made salient through comparative distinctiveness. In this case, changes in neighborhood attractiveness deflected the influence elicited by the hotspots such that the pleasantness ratings were higher in an attractive neighborhood than in an unattractive one. This general tendency did not apply everywhere. In contrast to positive influence, negative influence weighed so heavily on the judgment of targets in proximity of negative hotspots that intrinsic neighborhood attractiveness became irrelevant even when it was comparatively distinctive. We can thus conclude that intense negative influence has more inertia than intense positive influence because it is less deflected by changes in the intrinsic attractiveness of the surroundings. These changes sometimes even influenced the evaluation of the hotspot itself. An urban park was seen as less attractive in a highly salient unattractive neighborhood than in an attractive one. Susceptibility of public places to negative social influence most likely accounts for this result. The fact that the evaluation of a private kind of positive hotspot, like the home of a celebrity, was unaffected by changes in intrinsic neighborhood attractiveness (just like negative hotspots) suggests that the properties of hotspots weigh more heavily on judgment than properties that are distributed over larger areas like intrinsic neighborhood attractiveness.

4.1. Implications and further directions

The fact that intense negative influence has more inertia than intense positive influence (i.e., the influence asymmetry hypothesis) is an extension of the negativity bias into the realm of influence effects. This finding is in line with the negativity bias found in the contagion literature (e.g., Rozin, Markwith, & McCauley, 1994; Rozin, Millman, & Nemeroff, 1986; Rozin, Nemeroff, Wane, & Sherrod, 1989), which investigates how positive or negative objects influence the evaluation of target objects by brief contact. In general, negative objects have more contagious power than positive objects (Rozin & Royzman, 2001). Here we show that the negativity bias (as evidenced in the influence asymmetry hypothesis) occurs also in an urban context and, importantly, that it dissipates as influence decreases with the distance. In the future, it would be interesting to explore whether influence asymmetry occurs also in the proximal area of less intensely positive and negative hotspots.

A different implication of influence asymmetry is that the positive capital that represents a positive hotspot can be said to dissipate more quickly with distance in an unattractive than in an attractive area. In contrast, and at least in the proximal area, the reservoir of annoyance or threat that represents a negative hotspot dissipates similarly irrespective of the intrinsic attractiveness of the neighborhood. One of the consequences is that the loss of value endured by intrinsic attractive areas in proximity of a negative hotspot is greater than the gain of value obtained by intrinsic unattractive areas at proximity of a positive hotspot. In the eyes of an observer, a negative hotspot would thus do more damage to the image of proximate locations in Beverly Hills than a positive hotspot would improve the image of proximate locations in South Central. This reasoning can be followed further. When the results are compared to the ratings in the control condition at a descriptive level, Figs. 2 and 4 suggest that negative hotspots are much more harmful to attractive neighborhoods than to unattractive ones. Indeed, the more distant locations of unattractive neighborhoods even “benefit” from a contrast effect that makes these places look nicer in comparison to places that are located closer. In comparison, intrinsically attractive neighborhoods suffer from negative influence only, without benefiting from a positive contrast effect. Figs. 2 and 4 suggest also that positive hotspots benefit unattractive neighborhoods more than attractive ones. Unattractive neighborhoods benefit from the positive influence without suffering the consequences of a contrast effect that would make some places look less attractive than baseline. In contrast, the benefit of a positive hotspot for attractive neighborhoods is more mixed with some positive influence and some negative contrast. The results suggest the intriguing conclusion that unattractive neighborhoods benefit from hotspots irrespective of valence whereas attractive ones do not to the same degree. Caution commands to cut short this analysis here. A full understanding of the results using this relative perspective needs a dedicated research program in the future.

4.2. Limitations

To draw clear conclusions, we created a simplified version of reality that allowed the manipulation of a few factors while controlling the variation of many others. To what extent do the results then apply to real life? A first issue is whether the process of information integration itself would generalize to more naturalistic circumstances. Indeed, some researchers have questioned the ecological validity of information integration studies in the past, especially in the domain of person perception (Wyer & Carlston, 1979). One may thus wonder whether the raised issues in that domain also affect the present research. According to the critics, information integration studies of person perception artificially induce the processing of personality information as discrete, independent units, which, the critics argued, tend to favor a process of algebraic integration. For example, participants generally see a

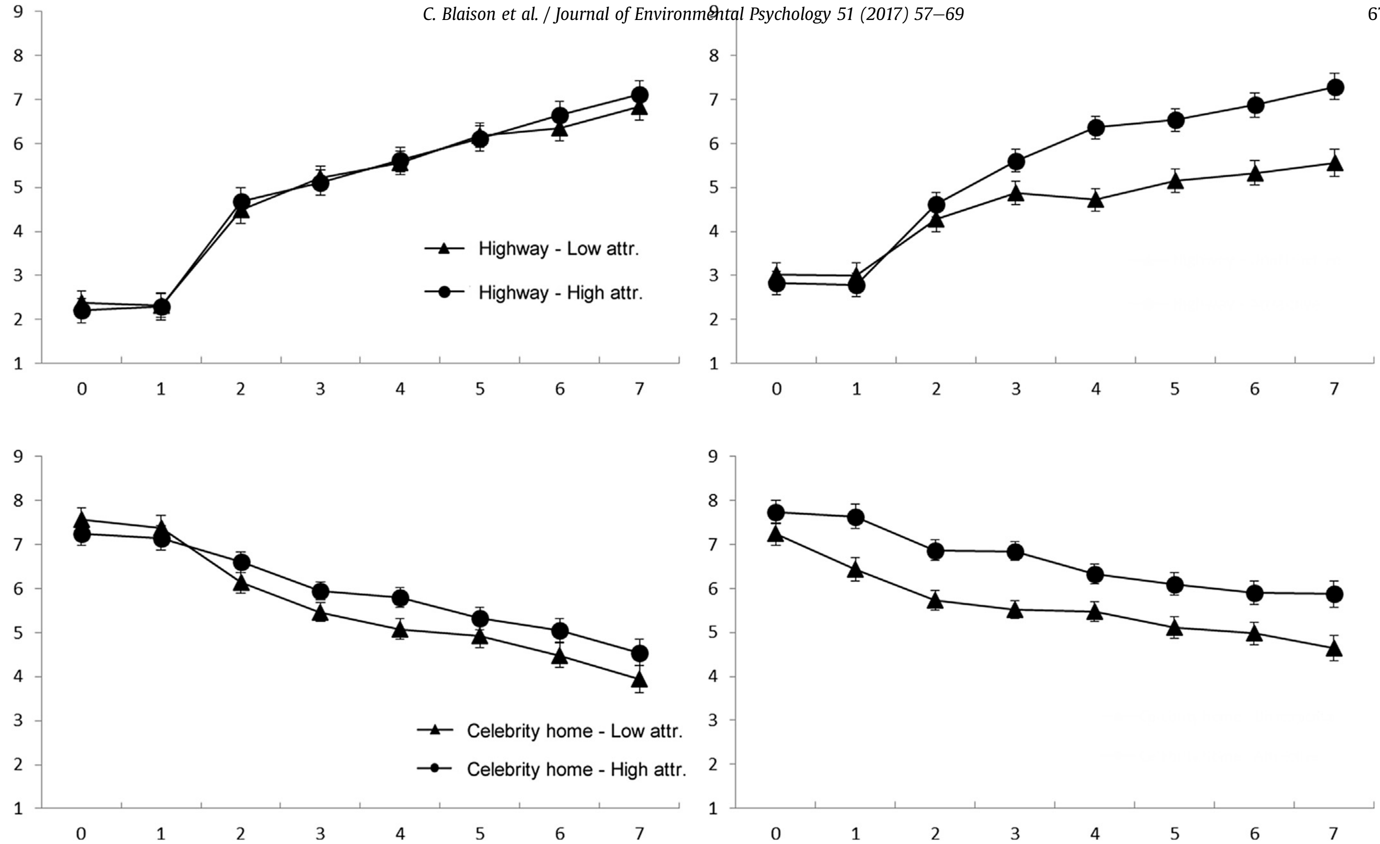

Fig. 4. Pleasantness ratings as a function of hotspot (highway or celebrity home), intrinsic neighborhood attractiveness (low or high), comparative distinctiveness (low or high), and distance (Experiment 2). The first row depicts the results for the highway; the second row depicts the results for the celebrity home. The hotspots are located at Distance 0. The test of the evaluation asymmetry hypothesis concerns the ratings at Distance 0. The test of the influence asymmetry hypothesis concerns the ratings at Distance 1 to 7. The error bars represent SEs.

list of verbal information about a person and they are instructed to treat the information elements with equal importance as well as to ignore inconsistencies (Marshall, Kwai-Choi Lee, & Yee Sum, 1995; Wyer & Carlston, 1979). In real life, they argue, people usually infer personality from behavior, which appears as an integrated whole. Furthermore, the specific configuration of attributes and their mutual relationship activates stereotypic or schematic knowledge stored in long-term memory that may color people's global impression more than the algebraic integration of isolated information (Asch, 1946; Wyer & Carlston, 1979). In sum, although the critics acknowledge that algebraic information integration naturally occurs when information actually pertain to multiple sources, they question whether the methodology used in information integration studies of person perception artificially creates the phenomenon (Wyer & Carlston, 1979).[12]

As far as the present research is concerned, we doubt that such a problem dramatically affected the results. As Mary's case illustrates, people actually do evaluate multiple locations as simulated in the present research quite frequently. Moreover, we did not force participants to process the information separately. On the contrary, distance and intrinsic neighborhood attractiveness were integrated in the survey-views, which suggests that participants extracted and processed the information as discrete units by themselves. The experimental situation encountered by our participants was thus far less artificial than in the person perception domain. Therefore, we believe that our study ranks among the numerous laboratory studies of information integration – outside of the domain of person perception – that showed adequate ecological validity in the past (for reviews see Louviere, 1988; Levin, Louviere, Schepanski, & Norman, 1983).

Even though the information integration process that occurred here also occurs in real life, the particular outcomes may differ because the "information field" differs between the experimental situation and real life (Anderson, 1981b; Levin et al., 1983). Variables that were ignored in the present research may change the importance people accord to distance to the hotspot or to intrinsic neighborhood attractiveness. For example, these factors may weigh less on judgment when some property's price is unusually attractive. It may be such a good price that distance to a hotspot or intrinsic neighborhood attractiveness end up mattering less (e.g., property offers in areas undergoing a gentrification process). Alternatively, intrinsic neighborhood attractiveness may weigh more on judgment than distance to the hotspot when someone is immersed into the neighborhood because proximal information (e.g., building attractiveness) has generally more emotional resonance than more distant information (the hotspot) (Peters et al., 2006; Slovic et al., 2007; Trope & Liberman, 2010). A different possibility is that people's appraisal of the hotspots change with familiarity. For example, a negative hotspot may appear less negative to neighbors because familiarity promotes positive feelings (Zajonc, 1968) or habituation (Helson, 1964). Distance to the negative hotspot may matter less to neighbors because it has less impact on their well-being. For all these reasons, the specific outcomes obtained here may not duplicate exactly in real life situations that involve factors that were voluntarily ignored in the present research. Nevertheless, the fundamental principles of processing of evaluative information illustrated here should play a similar role in any situation where people judge places. Thus, we hope that the example provided here will inspire future research to explore place

[12] Newer models of person perception integrate both views (Brewer, 1988; Fiske & Neuberg, 1990; Kunda & Thagard, 1996).

evaluation in other, more complex, spatial settings.

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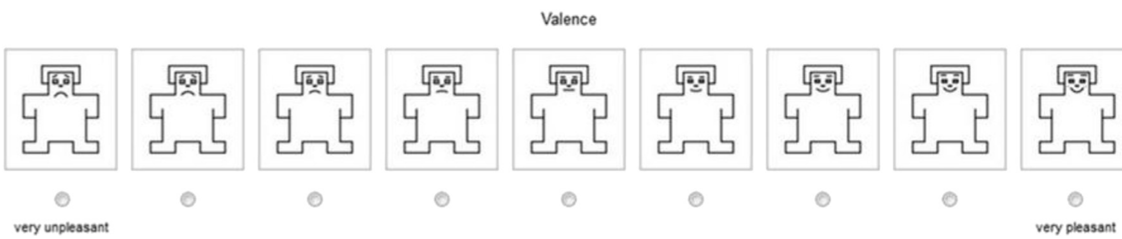
Appendix A

Valence scale inspired from the SAM valence scale.



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