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ORIGINAL ARTICLE

THE STRUCTURE OF VISUAL OBJECT PERCEPTION AND PSYCHOLOGICAL DISTANCE IN THE LIGHT OF THE CONSTRUAL LEVEL THEORY BY N. LIBERMAN AND Y. TROPE: A POTENTIAL APPLICATION IN AVIATION PSYCHOLOGY

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Introduction: The aim of the study is to determine the relation between the form of visual presentation of an object and the psychological distance included in the four dimensions (spatial, temporal, social, hypotheticality). The construal level theory by Nira Liberman and Yaacov Trope is used as a theoretical point of reference.

Methods: 400 people participated in the experiment. All distance dimensions were subjected to the same procedure: estimating the percentage value of the extent to which the objects presented in sixty slides (plus a second similarly constructed variant) were related to a specific context determined by the magnitude of psychological distance, in each dimension separately (for example, whether the object came from a shop in Poland or Ireland – small vs. large spatial distance). Six formal features of the visual presentation of an object were manipulated: size, exposed part, level of detail, color, background, technique.

Results: On the basis of the results obtained, it can be concluded that photographs generate less psychological distance than pictures, only in some conditions, determined by the quality of dimensions and stimuli, objects represented in color are associated with greater distance than black-and-white ones; size, exposed part, level of detail and background shape, in most conditions determined by the dimensions of distance and the quality of stimuli, influence the psychological distance significantly, albeit in different ways (different directions of influence).

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Discussion: The hypothesis concerning the mechanism linking the formal features of an object (presented in a visual form) to psychological distance can be illustrated by using the context of the basic distance – the spatial distance at the two poles of which any object can be located, "looked at" from two perspectives –short and long distance, and then extracting those properties which depended on the magnitude of the spatial distance.

Conclusions:
1. Photographs are associated with less psychological distance compared to pictures.
2. Objects presented in color generate a greater distance than those in black and white (in many conditions defined by the dimension of distance and the quality of the stimuli).
3. Size, exposed part, level of detail and background influence the distance in most conditions, but the direction of the influence is not constant – it depends on the specificity of these conditions (on the dimension of distance and the quality of stimuli).
4. The principle of perception of visual objects and psychological distance finds a valuable application in aviation psychology, as a basis for research on general issues of visual situational awareness of a pilot.

Keywords: psychological distance, construal level, form of visual presentation of an object, visual perception

INTRODUCTION

Looking at a painting at a close range, one can see small elements, details, simultaneously not seeing its essence. Looking at the same painting at a certain distance, it is difficult to notice the details, but only then, when one is able to look at the whole canvas, it is possible to discover the most basic element – the main motif. As we approach and distance ourselves from the picture, we perceive it differently. This art-based analogy – both in literal and figurative sense – was used by Nira Liberman and Yaacov Trope to show different ways of perceiving the same reality in the context of different psychological distances [20].

The construal level theory is an attempt to explicate the conditions of qualitatively different representations of the same objects and events within the mind in relation to psychological distance – it defines how psychological distance affects the construal level (and vice versa), and then the way of thinking and behavior, and using a symbolic language, it describes the conditions and consequences of perceiving a fragment of an image vs. the entire image [22].

The construal level, which gives the theory its name, is one of its basic concepts. It is a construct that expresses the way objects and events are represented within the mind. Usually analyzed in a dichotomized form, it is in fact a continuum whose poles are described by low and high construal level [22]. The low construal level includes specific, incidental, peripheral and local features, is context-dependent, inconsistent and poorly structured. The high construal level includes abstract, general, global, central, prototype features, is schematic, simple, internally consistent, structured and not context-dependent [4,10,20,21].

Moving along the continuum from low to high construal level, the number and power of central features – important from the point of view of the object's purpose – increases, while losing, omitting, or ignoring less important features [6,21].

Psychological distance – another theoretical construct important in the CLT, is described by its authors in the following way: "Psychological distance refers to the distance of a stimulus (object or event) from the perceiver's direct experience [3]. This direct experience is defined as falling at a zero-point common to all dimensions, defined by the location – "here", the time – "now", the person – "self" and the existence – "reality". The distance, anchored at a common point, is divided into four dimensions: spatial distance, temporal distance (defining both the distance from the present to the future and from the present to the past), social distance and hypotheticality, which are the tracks that can be used to distance oneself from direct experience towards mental constructs [3,11,20,21].

The term "psychological distance" comprises four forms, which due to their numerous similarities are treated as dimensions of distance and not as completely independent constructs requiring separate explanatory contexts. However, they

have their own individual specific content. They are not clearly translatable, as stated by the authors of the CLT, so that it is impossible to provide a general estimate of how much spatial distance is equivalent to the difference between today and next week [12]. However, the dimensions are interlinked – distancing the object in one modality is transferred to another [3,11,15,18,19].

The basic assumption of the presented theory concerns the relation between psychological distance and the construal level. The distance between the person's direct experience and the stimulus affects the way it is represented, so that as the psychological distance increases, it is more likely that objects or situations will be represented at a higher level. By conditioning the way of representation, distance determines the psychological response to objects or situations in many dimensions: cognitive, affective, behavioral [2,3,10,14,20,22].

Usually, the level of possible influence, as well as our knowledge of a specific object or situation, depends on the psychological distance between us and it. The repetitiveness of the association of the magnitude of distance and level as well as the quality of knowledge leads to its consolidation and excessive generalization, resulting in heuristics [11,13,20].

The research conducted so far shows that the general regularities defined by the CLT are also applicable to the visual presentation of an object. In one study concerning the creation of names for presented visual stimuli, the participants were primed to achieve a high or low level of social power (representation), and then asked to name pictures of unfinished objects. The results obtained indicated a relationship between higher power and image perception in terms typical for a higher construal level, as well as with higher indicators concerning the accuracy of names given. In another experiment, the task was to recognize simple patterns among complex patterns. In the group where a higher construal level was primed, a better distinction was made between primary and secondary features [16].

A greater psychological distance, just like a higher construal level associated with it, favors the perception of the entirety, of the figure. At the same time, it was diagnosed that due to the activation of specific forms of information processing, it may hinder the performance of tasks in which the functions weakened and slowed down by the distance are important. An example of this is the experiment being part of the WISC test carried out in conditions of arousing various distance magnitudes. It transpired that greater psychological distance makes it difficult to perceive details, which was reflected in lower scores obtained in the incomplete pictures sub-test [23].

The visual perception confronted with the reception of words was subjected to theoretical reflection and empirical verification also by researchers. On this plane of comparison, the basic difference between an image and a word concerns the similarity to the represented objects – the images are physically similar to them, while words are not. Pictures are particular, specific like objects, while the meaning of words belongs to a wider category. The specificity of information carriers determines the probable manner of their representation from the very beginning. The "particularization" of the pictures, perceiving similar to the perception of objects, and the connection of this perception with the present time determine the feeling of closeness to what is presented in the visual form. This set of properties favors representing images within the mind at a lower level compared to the representation of words. This was confirmed by experiments in which reactions to images vs. words were compared. The "adaptation" of pictures to what is psychologically close and of words to what is distant was verified within the scope of various dimensions of distance, as well as with the use of various indicators – processing speed and selective attention [1].

In another group of studies on the links between psychological distance and visual perception, the nature of the relationship was checked based on Navon tasks. The participants wrote an essay about their lives tomorrow vs. next year. After using such a manipulation of time distance, the participants were asked to name the presented stimulus, which was a capital letter composed of lowercase letters of another type (e.g. uppercase L composed of lowercase letters h). The obtained results confirmed the hypothesis that a longer time distance favors the perception of capital letters and that temporal proximity facilitates the perception of lowercase letters. Similar conclusions were drawn from similar studies in which other distance patterns were analyzed. Thus, the increase in psychological distance leads to a global perception and the decrease to a fragmented one, to a focus on elements and details.

The authors of the experiment also applied a procedure with reversed direction of the tested impacts. The results obtained indicated the same type of relationships between the analyzed variables. In the conditions of capital letters priming, the participants estimated the spatial, temporal

and social distance as well as the hypotheticality as greater than after emphasizing the lowercase letters [8].

Another experiment in the CLT area, in which visual stimuli were applied, consisted of the evaluation of the exposure time of a series of letters. As in the previously reported studies, the uppercase letters were composed of lowercase letters. During the presentation, the upper or lowercase letters were changed. Specific states of mind were obtained by emphasizing single elements or categories, which activated a lower or higher construal level. The participants generating a higher construal level were convinced that time would pass faster with changes at a global level (capital letters) and those with a lower construal level would be more likely to do so with changes at a local level (lowercase letters). The results obtained confirm the hypothesis of the relationship between the construal level and the quality of perception, more specifically the perception focused on details or the whole [5,9].

In conclusion, a greater psychological distance and a higher construal level direct perception, making it more holistic, while a small distance and a low construal level favor focusing on details. At the same time, the way of perceiving the object as a whole vs. focusing on details proved to be important for the construal level and psychological distance.

Hypotheses

The aim of the experiment was to investigate the relationship between the form of visual presentation of an object and the psychological distance.

The dependent variable in the experiment in question was the psychological distance, appearing in four dimensions: spatial, temporal, social, hypotheticality. The independent variables were the formal features of the visual presentation of objects: size (large vs. small), exposed part (fragmentary vs. whole), detail level (detailed vs. schematic), color (in color vs. black and white), background (with a background vs. without background), technique (as photographs vs. pictures). As can be seen, the independent variables formed 12 levels and the participants estimated the psychological distance on each of them, in each of the four dimensions. The indicator of the dependent variable was the average distance rating at each level of the independent variable.

It was expected that the formal features of the visual presentation of an object: size, exposed part, level of detail, color, background and technique influence the psychological distance within each dimension in a way expressed in the following hypotheses:

H1. Large objects (vs. small objects) generate less psychological distance.

H2. The objects presented in a fragmentary way (vs. the whole ones) generate less psychological distance.

H3. Objects presented in detail (vs. schematically) generate less psychological distance.

H4. Objects presented in color (vs. those in black and white) generate less psychological distance.

H5. Objects presented with a background (vs. those without background) generate less psychological distance.

H6. Objects presented as photographs (vs. pictures) generate less psychological distance.

The hypotheses were tested for each dimension of distance separately under two conditions: when different values of features were assigned to different or the same objects (intra-group and inter-group comparisons). Hence, the experimental conditions were defined by 2 factors: distance dimension (spatial, temporal, social, hypotheticality) and stimulus variant (basic and mirrored) – which resulted in a set of 8 experimental groups.

Due to the editorial requirements for the articles (volume), the report contains selected results of the experiment. A detailed description of the materials, additional hypotheses and full results were presented in the doctoral dissertation of the author [17].

METHODS

Participants

400 people participated in the test – 8 groups, 50 person each. The participants were students of higher education institutions. 75.8% of the participants were women, 24.2% were men. The mean age was 23.810. All participants gave written informed consent to all procedures prior to the study. All procedures were approved by the Institutional Review Board of the Faculty of Christian Philosophy, Warsaw, Poland and have been performed in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans.

Materials and procedure

Two multimedia presentations (basic and mirrored variants) were prepared, containing graphical stimuli to be evaluated and four types of questionnaires.

Photographs of 60 everyday objects were selected. They were divided into six sub-groups, ten photographs each. For each of the sub-groups of photographs, one formal feature was manipulated, creating two variants for each photograph. The size (large vs. small), exposed part (fragment vs. whole), level of detail (detailed vs. schematic), color (in color vs. black and white), background (with background vs. without background), technique (photograph vs. picture) were manipulated.

Two PowerPoint presentations were prepared – one basic and one mirrored. The basic version contained slides from the first half of the image set (objects no. 1-5, 11-15, 21-25, 31-35, 41-45, 51-55) in the first version (large, parts only, detailed, color, with background, photographs) and from the second half of the set (objects no. 6-10, 16-20, 26-30, 36-40, 46-50, 56-60) in the second version (small, whole, schematic, black-and-white, without background, pictures). The order of objects in the presentation was randomized in order to eliminate the influence of grouping stimuli of a common feature.

The second presentation, named the mirrored presentation, contained the same objects as the first, arranged in the same order, but in different, "mirrored" variants. For example, the second slide in the basic presentation is the "sofa – fragment" and in the mirrored presentation the "sofa – whole"; the third slide in the basic presentation is the "wicker basket – black and white" and in the mirrored presentation the "wicker basket – in color".

A questionnaire prepared in four variants was used to evaluate the objects presented in the slides – for each of the dimensions of the distance, separately. In each variant, the task was to estimate where the products presented in the slides came from. Depending on the variant, the participants were informed in the instructions that the displayed objects would come from two sources: Poland and Ireland (spatial distance), from a current offer or from an offer from three years ago (temporary distance), are bought by persons similar or different from the participants in terms of selected characteristics (social distance) and are already available for sale or may be available for sale (hypotheticality). Next to each slide's number, the participant' sheet included a dotted place and a % symbol, where they were supposed to assess how sure (percentage value) they were that the given object, depending on the variant, comes from Poland, from the current offer, was bought by similar people and is already available for sale. Therefore, the questions concerned each time the percentage amount in which an object is associated with a small distance.

For example, in the first variant, where the participants estimated the spatial distance, the title was "From Poland or from Ireland – consumer research". The part of the instruction which suggested different sizes of the spatial distance reads: "Some of the presented products come from a certain retail chain in Poland and some from Ireland. During the presentation of each product, consider which retail chain it comes from (...)". The other three variants of the questionnaire were constructed in a similar way, by manipulating the title and instructions.

Procedure

The study participants were tested in groups during didactic classes at a higher education institution. After a general presentation of the research objective – consumer research, questionnaires were distributed, which were to be filled in during the presentation of the slides containing visual stimuli. The time provided to estimate each of the 60 stimuli was 10 seconds. The study was conducted in eight conditions determined by the crossing of the dimensions of psychological distance (spatial, temporal, social, hypotheticality) and the variant of presentation (basic, mirrored).

RESULTS

The structure of the experiment made it possible to analyze the relationship between the formal features of the visual presentation of objects and the estimation of psychological distance in two planes – intra-group and inter-group.

In the first variant, the dependent variable was analyzed within the group of participants subjected to the same stimuli. Different values of the same features were compared in the presence of different objects. The inter-group comparisons (between the groups subjected to different stimuli) made it possible to determine how a change in the value of a formal feature in the same objects affects the locating at a distance.

Estimation of spatial distance is shown in Figure 1. The intra-group scheme analyses were carried out by means of one-factor analysis of variance with repeated measurement.

The measures of estimation of distance in the scope of particular formal features of objects were compared in pairs.

In the basic variant, the estimation of the spatial distance proved to be sensitive to the manipulation of the following formal features: back-

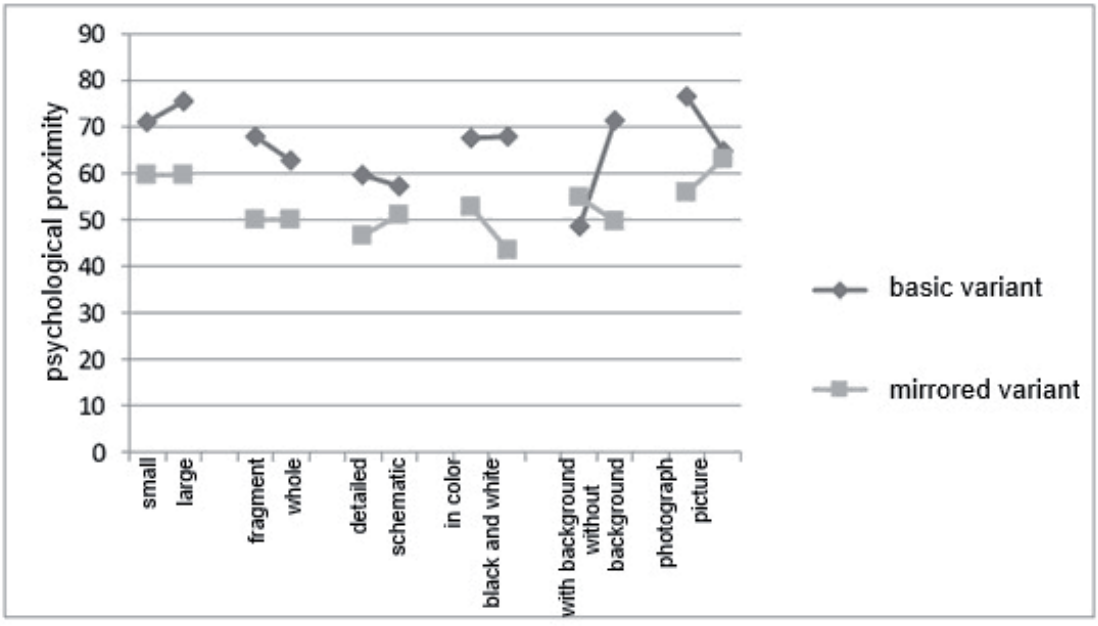

Fig. 1. Estimation of spatial distance (measures of psychological proximity are given; high proximity means short distance).

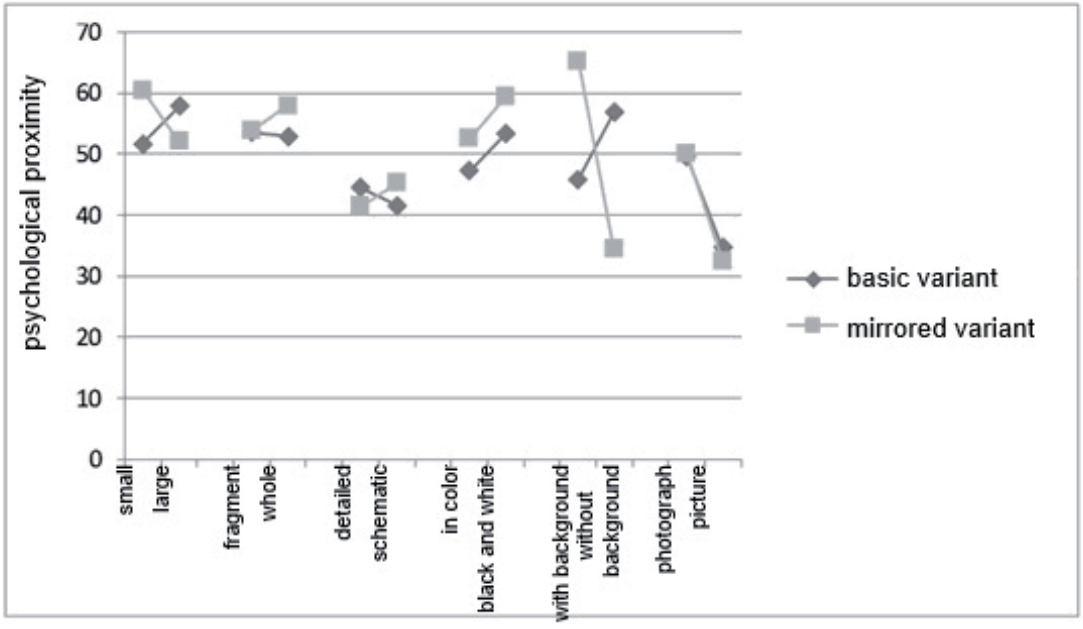

Fig. 2. Estimation of temporal distance (measures of psychological proximity are given; high proximity means short distance).

ground (mean difference=22.69; p<0.000), visual presentation technique (mean difference=11.69; p<0.000), expose part (mean difference=5.34; p<0.019), size (mean difference=4.43; p<0.014).

In the mirrored variant, the assessment of objects in the spatial dimension of psychological distance proved to be dependent on such formal features as: color (mean difference=9.51; p<0.004), technique of visual presentation of an object (mean difference=7.25; p<0.010), background (mean difference=5.13; p<0.023).

Estimation of the temporal distance in both variants of the experiment is shown in Figure 2.

In the basic variant of the experiment, the influence of: visual presentation techniques (mean difference=14.91; p<0.000), background (mean difference=-10.97; p<0.003), color (mean difference=-6.17; p<0.011), size (mean difference=-6.25; p<0.012) was proven to be significant.

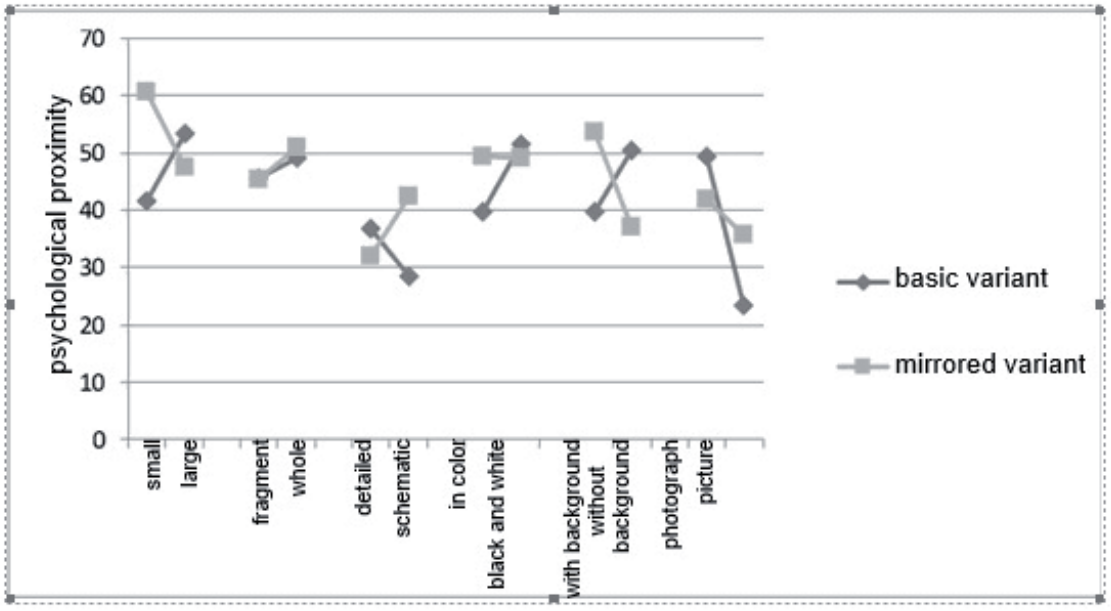

Fig. 3. Estimation of social distance (measures of psychological proximity are given; high proximity means short distance).

In the parallel version of the experiment, a significant influence was associated with the manipulation of the following formal features of an object: background (mean difference=30.99; p<0.000), technique of visual presentation (mean difference=17.53; p<0.000), color (mean difference=6.76; p<0.010), size (mean difference=6.53; p<0.000), exposed part (mean difference=-4.29; p<0.039).

The estimation of social distance is shown in Figure 3.

In the basic variant, significant differences in distance estimation occurred when the following formal features of the perceived objects were manipulated: visual presentation technique (mean difference=25.90; p<0.000), size (mean difference=-12.01; p<0.000), color (mean difference=-11.78; p<0.000), background (mean difference=-10.78; p<0.000), level of detail (mean difference=8.15; p<0.000).

In the mirrored variant, the differences in the estimation of the distance, which reached the level of statistical significance, were related to the following formal features of the visual presentation of an object: background (mean difference=16.64; p<0.000), size (mean difference=13.28; p<0.000), level of detail (mean difference=-10.45; p<0.000), visual presentation technique (mean difference=6.28; p<0.000), exposed part (mean difference=-5.54; p<0.016).

Figure 4 shows the measures of estimating the distance in the hypothetical dimension.

In the basic variant of the experiment, the estimation of psychological distance in the hypothetical dimension proved to be sensitive to manipulations of the following formal features of objects: visual presentation technique (mean difference= 14.34; p<0.000), background (mean difference=-8.85; p<0.000), level of detail (mean difference=6.69; p<0.008), size (mean difference=-4.65; p<0.002). In the mirrored variant, the statistically significant impact was revealed when estimating the distance in the context of the following formal features: level of detail (mean difference+=-20; p<0.000), background (mean difference=17.75; p<0.000), size (mean difference=7.41; p<0.000), color (mean difference=-4.58; p<0.020).

Within the scope of inter-group analyses, for each of the levels of the dependent variable, after separating the data according to the distance dimension criterion, a one-factor analysis of variance with the stimulation factor was applied. The distribution of effects (statistically significant relationships) obtained through the use of this procedure, together with effects obtained as a result of intra-group comparisons, are included in Table 1. Within each cell resulting from the intersection of the distance dimension and a formal feature, up to two statistically significant effects were possible: in intra-group comparison – one for each variant of the study, and in inter-group comparison – for comparison of one value of the feature, e.g. large (from the basic variant and the other small (from the mirrored variant and vice versa), small (from

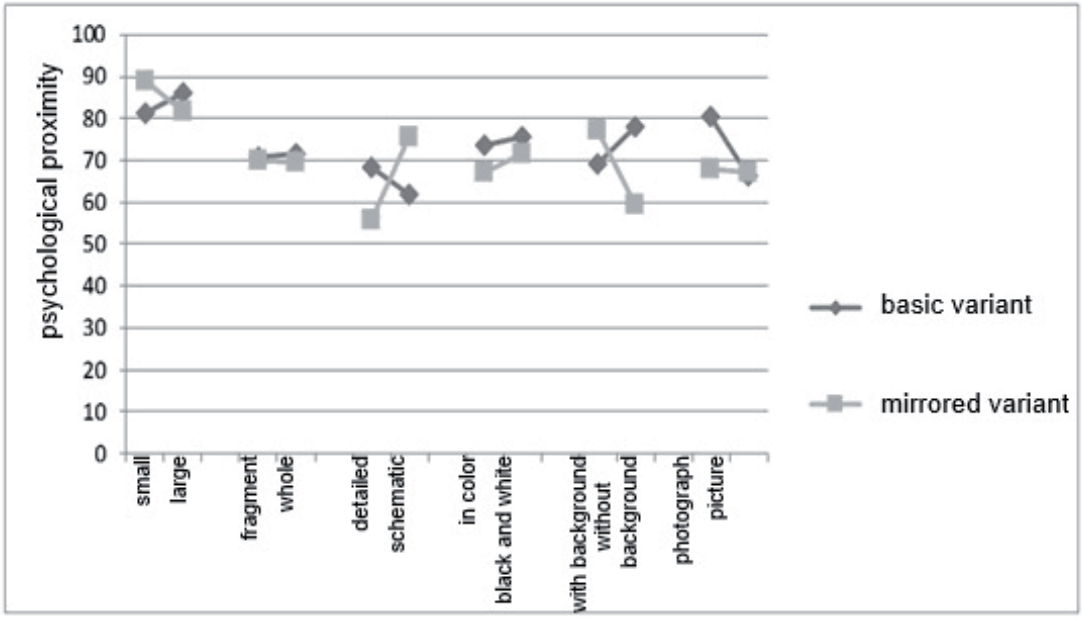

Fig. 4. Estimation of distance in the hypothetical dimension (measures of psychological proximity are given; high proximity means short distance).

the basic variant) and large (from the mirrored variant). In the vast majority of analyzed conditions resulting from the intersection of formal features and the dimension of distance, significant effects occurred. Each of the features proved to be important in shaping psychological distance, although not always in every dimension. Also, all dimensions of the distance proved to be dependent on the influence of formal features of the visual presentation of an object, although some of them were less susceptible to manipulation of certain types of formal features. A large number of significant effects were obtained, but a large portion of them was of an inconsistent nature – the same values of formal features in some conditions significantly favored the perception of psychological distance as small, and in others as large.

DISCUSSION

The main expectation derived from the CLT was that the formal features of the visual presentation of objects influence the perceived psychological distance. The terms used to describe the construal level, relating inter alia to complexity, level of detail, importance of the context, background, structure, are also features of visual presentations and therefore, according to the CLT, should favor

Tab. 1. Comparison of effects related to the influence of formal features of visual presentation of an object on the psychological distance in all dimensions, in the scope of different groups of objects (different comparisons).

	Inter-group comparisons					Intra-group comparisons				
	special distance	temporal distance	social distance	hypotheticality	total	special distance	temporal distance	social distance	hypotheticality	total
size	-	+ -	+ -	+ -	7	+ -		+ -		4
exposed part	+	-	-		3	+ -				2
level of detail			+ -	+ -	4	+ -				2
color	+	- -	-	-	5	+ -	-	-	-	5
background	+ -	+ -	+ -	+ -	8	-	+		+	3
visual presentation technique	+ -	+ +	+ +	+	7	+ -	+ +	+ +	+	7
total	7	9	10	8		11	4	5	3	

+ statistically significant effect; direction consistent with the hypothesis
- statistically significant effect; direction inconsistent with the hypothesis

reception in terms of a certain magnitude of psychological distance [4,10,21].

The hypothesis of the authors of CLT concerning the genesis of the relationship between the construal level and the distance is important in the context of explaining the proposed links between the form of visual presentation of an object and the psychological distance. It is a consequence of generalization, in which the fact that we usually have a different scope and specificity of knowledge about objects and situations close to us, and a different one about psychologically distant situations, becomes a principle that organizes and explains even those situations for which it is not true [20]. Thus, if we have a lot of detailed information about the object, but with little variation in terms of significance, we know a certain context, details, it will probably be associated with less psychological distance (because according to previous experiences, usually this type of knowledge concerned what was close).

Liberman's and Trope's explanation of object or situation knowledge can, by analogy, also be applied to a more direct experience – not only to our presentation of reality in our minds, but also to the objects themselves and perception thereof. The hypothesis concerning the mechanism connecting the formal features of an object (presented in a visual form) with a psychological distance can be illustrated by using the context of the basic distance – the spatial distance at the two poles of which any object can be located, "looked at" from two perspectives – the short and long distance, and then extract those properties which depended on the magnitude of the spatial distance. For example, a person observed from a very close distance seems to be large, fills most of the field of vision, is seen in a fragmentary way, because from a short distance it is impossible to see the whole figure, the person is seen clearly, precisely, in detail (the level of detail also includes the background, the surroundings), many colors, shades clearly delimited within the human figure can be observed; a person seen from a close distance is, by the specificity of such a perspective, perceived as "life-like", realistic, true, certain, specified. On the other side of the analyzed continuum there is a figure observed from a distance – small, seen in the entirety, in low detail, almost monochromatic, blended into an unclear background; due to the lack of details, vivid colors, diverse structures – in a way the person is perceived as unreal, "like painted". The basic properties listed that differentiate the perception of a person from the perspective of a small and large spatial distance are size, exposed part, level of detail, color, background and a certain level of realism defined in the context of own research as a technique of visual presentation of an object. The levels of these formal features, as they are repeatedly combined within experience with their typical spatial distance (e.g. what we see from up close is usually large and from a distance – is small), become associated with it. These links, according to the CLT, are generalized to other dimensions of distance. In conclusion, the CLT-based theoretical justification for the proposed link between the formal features of the visual presentation of an object and the psychological distance is of a two-way nature. It results from the fact that particular levels of features, due to their specificity corresponding to the features of representation, favor the generation of representations of a certain level, which in turn is connected with the corresponding magnitude of psychological distance (e.g. a very detailed object → favors a low construal level – because it is characterized by detail → favors a small psychological distance). In addition, it is a consequence of direct connection of certain levels of features with typical for them magnitudes of psychological distance (e.g. a very detailed object → this is usually how an object is seen from up close → it favors a small spatial distance → it favors a small psychological distance).

These two complementary justifications, relating to Liberman's and Trope's theory, formed the basis for the hypothesis that what was visually presented as large, in a fragmentary way, in detail, as colorful, with a background, in the form of a photograph, is more closely linked to a small psychological distance and what is small, holistic, schematic, black-and-white, without background, pictorial – to a large psychological distance.

This hypothesis is further supported by research in a similar area. It shows that the perception of visual stimuli is susceptible to manipulation in terms of the construal level and that psychological distance was combined with the quality of perception [1,5,8,13,16,23]. These experiments, however, differed from own research in that the visual material presented was rather simple and constant – the formal features of the visual presentation of an object were not manipulated, but only certain properties were brought to attention, investigating the consequences thereof or checking how certain manipulations on variables affected the perception of the same visual stimuli.

In view of the consistent justification of the hypotheses formulated, which refers to the CLT, as well as other studies of a similar area, the results

of the experiment can be described as surprising: usually the same formal properties of the visual presentation of objects, depending on the variant of comparisons (i.e. the quality of visual stimuli), significantly favored the perception of distance as small or large. These discrepancies would not have been evident had only one variant of studying and comparing distances at different levels of formal features been used. In such a case, unambiguous results would have been obtained, most of the time indicating a significant influence of formal features of the visual presentation of an object on the psychological distance; an influence of a specific direction. The results obtained in the additional, mirrored variant, as well as doubling the types of comparisons used (intra-group, inter-group), showed that the conclusions drawn from a single strain of results would significantly distort the real relationships between the analyzed variables.

Both versions of the presentations used in the experiment were prepared on the basis of identical rules. This adequateness of the version of the stimulus material, combined with the assumption that the formal features of the visual presentation of objects with psychological distance deduced from the CLT are relatively independent of the quality of stimuli, led to the expectation that four results describing each of the types of relationships studied within the selected dimension of distance would converge. Contrary to expectations, different directions of influence on psychological distance were diagnosed in terms of size, exposed part, level of detail and background. This does not allow to accept, neither to reject, hypotheses about the relation between the aforementioned formal features of the visual presentation of an object and the psychological distance. It points to the important dependences present in certain conditions, which are strongly modified by additional, undiagnosed factors specific to a given stimulus. A safe conclusion for the discussed issue can be a statement that large vs. small objects, presented fragmentarily vs. as a whole, as detailed vs. schematic, with a background vs. without a background usually combine with different magnitudes of psychological distance, but, to a large extent, it is the additional properties of objects that determine whether the distance is small or large. Learning about these properties would require separate research aimed at manipulating the specificity of the presented stimuli.

A more unequivocal picture of the relationship emerges from the analysis of the role of color in perceiving psychological distance. This feature produced 10 significant effects (out of 16 possible) in all types of comparisons of stimuli in all dimensions, indicating the influence on distance in specific conditions, including 8 consistent in terms of direction, which indicates (contrary to the assumption) the connection of objects in color (vs. those in black-and-white) with a large psychological distance. The relationship of simplified coloring with a larger distance predicted on the basis of CLT, in accordance with the principle of loss of significance of secondary properties for the sake of the basic ones as the distance increases, and also as a result of repeated experiences of seeing many colors up close and a simple color scheme from a distance, proved to be inconsistent with the observed regularities.

The technique of visual presentation of an object was the only feature among those analyzed, which significantly influenced the psychological distance as a whole, and considering each of the dimension of distance, produced as many as 14 out of 16 possible effects, including 12 consistent in terms of direction and with the hypotheses, and these effects occurred in all the dimensions of distance. As expected, the objects presented in the form of a photograph were perceived as related to notions of "here", "now", "our" and "real"; in general, to what is close psychologically. The presentation of the same objects in the form of pictures (although the pictures were very similar to photographs because they were computer-generated and based on those photographs) proved that they were perceived as related to a more distant place, time, further social context and less possible circumstances. It can be concluded that the level of detail, realism, "genuineness" of a photograph fosters psychological closeness when confronted with the "fictitiousness" of a picture, with the fact that it is always a certain representation made by a human being and not (relatively) an unprocessed presentation of an object as it is, with its higher degree of abstractness and with the typical for pictures omission of details. The results of the experiment support the previously presented explanation of the relationship between the form of visual presentation of an object and the psychological distance, referring to the convergence of formal features of visual presentation of an object with those of the representation, which in turn favor a specific psychological distance and a mechanism of perpetuating typical connections between the specificity of perception and distance, especially in the spatial dimension.

Since the experiment was aimed at exploring the area that thus far has been studied only to

a small extent, it provided a large number of results, often inconsistent and difficult to interpret, it would be advisable to continue the research aimed at diagnosing the causes so variated in terms of specificity, and concurrently, the significant impact of particular formal properties of objects (presented in a visual form) on the psychological distance.

CONCLUSION

Photographs are associated with less psychological distance compared to pictures of objects presented in color, which generate a larger distance than those in black and white (in many conditions defined by the dimension of distance and the quality of the stimuli).

Size, exposed part, level of detail and background influence the distance in most conditions, but the direction of the influence is not constant – it depends on the specificity of these conditions (on the dimension of distance and the quality of stimuli).

The principle of perception of visual objects and psychological distance in the light of the construction level theory originally developed by N. Liberman and Y. Trope has a valuable application in aviation psychology, especially in the construction of the visual part of the aircraft cockpit and as a basis for research on general issues of visual situational awareness of pilots [7,24].

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