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Change of social value orientation affected by the observed mimical expression of the interaction partner¹

Introduction

Since the development of the first concept of social value orientations² which are currently defined by a significant proportion of researchers as fixed patterns of the inter-situational variability of preferences as to how to allocate resources^{3 4} between the self and another person^{3 4}, numerous researches have been carried out in this field. It has been proven, *inter alia*, that the orientations are a very important factor modifying the perception

¹ This article is a fragment of the following article: J. Lewczuk, *The link between social value orientations and the interaction partner's emotional facial expression as regards the perception of other individuals' traits and a change in the observer's social value orientation*, in: „E-methodology. The International Scientific Journal” 2014 nr 1. This is also continuation and supplementation of research described in the article: J. Lewczuk, *Evaluating the characteristics of partner interaction based on his facial emotional expression and depending on the social value orientation of the observer*, in: „Studia z Teorii Wychowania” 2016 nr 4(17). Therefore, some parts of the chapters: introduction, definition of social orientations, method are identical to the content of the indicated article published in „Studia z Teorii Wychowania” in 2016 because in the current study the same method was used as in the study described in the previous article („Studia z Teorii Wychowania” Tom VII: 2016 NR 4(17)). The repetition of certain content is justified by the convenience of the reader, without having to refer him to the previous article.

² D. Messick, C. McClintock, *Motivational basis of choice in experimental games*, in: „Journal of Experimental Social Psychology” 1968 nr 4.

³ J. Grzelak, *Preferences and cognitive processes in interdependence situations: a theoretical analysis of cooperation*, in: V. Derlega, J. Grzelak (ed.), *Cooperation and helping behavior. Theory and research*, New York Academic Press, 1982.

⁴ J. Grzelak, *Współzależność społeczna. [Social interdependence]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, GWP, Gdańsk 2003, vol. 3.

and evaluation of a situation and a partner^{5 6 7}. On the other hand, factors influencing a change in the preference was discovered^{8 9 10 11 12}.

Detailed inquiries of this paper is to concern a possible change in the social value orientation under the influence of the type of a facial expression being worn by an interaction partner (happiness, anger). Focusing on the facial expression arises from the fact that it is considered, on the basis of numerous researchers (conducted by, *inter alia*,^{13 14 15}), to be the most important channel of nonverbal communication, which operates most autonomously and, most often, is sufficient by itself for the information being provided to be accurately interpreted. The use of expressions of happiness and anger in own research for the experimental manipulation arises from the fact that those modalities of emotion have received, in the cross-cultural

⁵ H. Kelley, A. Stahelski, *Social interaction basis of cooperator's and competitor's beliefs about others*, in: „Journal of Personality and Social Psychology” 1970 nr 16.

⁶ W. Liebrand, R. Jansen, V. Rijken, C. Suhre, *Might over morality: Social values and the perception of other players in experimental games*, in: „Journal of Experimental Social Psychology” 1986 nr 22.

⁷ D. Sattler, N. Kerr, *Might versus morality explained: Motivational and cognitive interpersonal orientation*, in: „American Journal of Sociology” 1991 nr 71.

⁸ J. C. Abric, J. P. Kahan, *The effects of representations and behaviour in experimental games*, in: „European Journal of Social Psychology” 1972 nr 2.

⁹ P. G. Swingle, A. Santi, *Communication in non-zero-sum games*, in: „Journal of Personality and Social Psychology” 1972 nr 23.

¹⁰ H. Hamburger, M. Guyer, J. Fox, *Group size and cooperation*, in: „Journal of Conflict Resolution” 1975 nr 19.

¹¹ B. Latane, S. Nida, *Ten years of group size and helping*, in: „Psychological Bulletin” 1981 nr 89.

¹² J. Grzelak, E. Ossewska, D. Wyszogrodzki, K. Bobrowski, *3 less than 2? A negative effect of the number of allocation participants on prosocial orientations*, in: „Polish Psychological Bulletin” 1994 nr 25.

¹³ D. Doliński, *Ekspresja emocji. Emocje podstawowe i pochodne [Expression of emotions. Basic and secondary emotions]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, Gdańskie Wydawnictwo Psychologiczne, Gdańsk 2003, vol. 2.

¹⁴ C. Biele, *Spostrzeganie twarzy u ludzi i zwierząt [Perception of the face in humans and animals]*, in: „Studia Psychologiczne” 2002 nr 40.

¹⁵ R. Ohme, *Podprogowe informacje mimiczne. Ujęcie psychologii eksperymentalnej [Subliminal facial information. From the perspective of experimental psychology]*, Wydawnictwo Instytutu Psychologii PAN, Warszawa 2003.

studies^{16 17 18}, the highest indicators of recognition accuracy, and is also due to the great accuracy in determining the social value orientation of a person who is displaying those particular modalities of emotion on his/her face¹⁹.

Definition of social value orientations

The authors of the earliest classifications of social value orientations²⁰ initially introduced four basic motives (orientations) for which a definition was developed, namely the fixed preferences about how to allocate outcomes (resources) between the self and a partner. Those preferences may take a form of efforts to maximise: own gains (individualism), the partner's gains (altruism), own advantage over the partner (competition), and the combined own and partner's gains (cooperation). The Charles Graham McClintock's model as extended²¹ to include a total of eight social value orientations still emphasised the fixed nature of the preferences. The subsequent years of interest in the issue of orientations have resulted in a major theoretical postulate being proposed, which dealt with the interactive nature of the resource allocation preferences. The existence of a number of situational factors affecting the orientations was indicated²², while emphasizing at the same time that the individual orientation pattern in different situations was stable and typical of a given individual. For example, where person A exhibits less competitive behaviour while being in a confrontation with a partner enjoying considerable prestige than while being in a situation where he/she is facing

¹⁶ P. Ekman, E. Sorenson, W. Friesen, *Pan-cultural elements in the facial displays of emotions*, in: „Science” 1969 nr 164.

¹⁷ P. Ekman, W. Friesen, *Constants across cultures in the face and emotion*, in: „Journal of Personality and Social Psychology” 1971 nr 17(2).

¹⁸ H. Friedman, *The interactive effects of facial expressions of emotion and verbal messages on perceptions of affective meaning*, in: „Journal of Experimental Social Psychology” 1979 nr 15.

¹⁹ G. Shelley, M. Page, P. Rives, E. Yeagley, D. Kuhlman, *Nonverbal communication and detection of individual differences in social value orientation*, in: R. Kramer, M. Bazerman, A. Tenbrunsel (ed.), *Social decision making: Social dilemmas, social values, and ethical judgments*, Psychology Press, New York 2009.

²⁰ D. Messick, C. McClintock, *Motivational basis of choice in experimental games*, in: „Journal of Experimental Social Psychology” 1968 nr 4.

²¹ D. Griesinger, J. Livingstone, *Toward a model of interpersonal motivation in experimental games*, in: „Behavioral Science” 1973 nr 18.

²² J. Grzelak, *Preferences and cognitive processes in interdependence situations: a theoretical analysis of cooperation*, in: V. Derlega, J. Grzelak (ed.), *Cooperation and helping behavior. Theory and research*, New York Academic Press, 1982.

up to a partner of a similar status, the difference will occur in each situation where person A is in an interaction with partners having different levels of social prestige. Hence, the individual's preferences are determined by both the orientations (configuration of orientations) and the situational factors²³.

Therefore, a proportion of researchers are currently inclined to define the social value orientations as fixed patterns of the inter-situational variability of preferences as to how to allocate resources between the self and other persons²⁴. In the light of this definition, the assessment of social value orientations is, therefore, not universal: individuals being cooperative in certain spheres (e.g. in social relationships) may be competitive in other spheres (e.g. in their professional life). Social value orientations are thus dependent on the situation²⁵, and the main factors resulting in the same person being able to change his/her outcome allocation preferences include, *inter alia*: the number of persons, the mode of representing results, the effect of instructions, the effect of information on the other person's strategy, and the opportunity for communication²⁶. In the light of the above data, it is difficult to divide people into „pure” individualists, altruists, cooperators etc.; actually, it is assumed that each person's orientation is characterized by the adopted indicators determining the intensity of particular orientations. Therefore, each person exhibits a certain, most pronounced orientation being supplemented by a set of several others. Depending on the situation, the person starts exhibiting either behaviour associated with the dominant orientation or behaviour typical of the other ones. Therefore, in certain extreme situations an individualist (an individual with the prosself orientation being dominant) may exhibit altruist behaviour, while in other situations e.g. competitive ones. However, in most situations this individual will behave in accordance with his/her dominant prosself orientation.

Models of social value orientations differ in the number and type of orientations. Quite often, one may find in the literature on the subject an empirically and theoretically justified division of orientations into *prosocial* (referred to by van Lange as *cooperative*) which include cooperative, altruistic and maximin orientations (the latter being a preference for maximizing the lowest outcome regardless of whose the outcome is (Schulz, 1968, quoted

²³ J. Grzelak, *Współzależność społeczna. [Social interdependence]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, GWP, Gdańsk 2003, vol. 3.

²⁴ Ibidem.

²⁵ Ibidem.

²⁶ M. Mazur, *Orientacje społeczne [Social value orientations]*, in: M. Lewicka, J. Grzelak (ed.), *Jednostka i społeczeństwo [An individual and the society]*, GWP, Gdańsk 2002.

from²⁷), and *proself* (referred to by van Lange as *egoistic*) being represented by individualistic and competitive orientations²⁸ cf. also²⁹. The nature of the division of social value orientations into *prosocial* and *proself* has already been emphasized by Kelley and Thibaut who argued that individuals transform the representation of a specific situation of social interdependence in accordance with their own social motives³⁰ by either adopting the *egoistic motivation* i.e. pursuing maximum own outcomes while ignoring the partner's outcomes, or being guided by the *prosocial motivation* i.e. searching for good outcomes for both oneself and the partner(s).

In summary, social value orientations may be treated as either individual, generalized inclinations to exercise particular types of control, or states of needs evoked on an *ad hoc* basis in a particular situation^{31 32}.

A change in the orientation depending on the facial expression being observed

In accordance with the definition of social value orientations, which considers the variability thereof depending on the external characteristics of the situation, researches have been carried out on the factors affecting the preferences for resource allocation. Those factors included one being the most significant from the point of view of the investigations conducted under own research, namely the information on the interaction partner. The image of the interaction partners affects our attitude towards this person and,

²⁷ J. Grzelak, *Współzależność społeczna. [Social interdependence]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, GWP, Gdańsk 2003, vol. 3.

²⁸ P. van Lange, *What People Look for in Others: Influences of the Perceiver and Perceived on Information Selection*, in: „Personality and Social Psychology Bulletin” 2000 nr 26.

²⁹ D. Rutkowska, A. Szuster, (ed.). *O różnych obliczach altruizmu [About the various faces of altruism]*, Wydawnictwo Naukowe SCHOLAR, Warsaw 2008.

³⁰ H. Kelley, J. Thibaut, *Interpersonal Relations: A theory of interdependence*, Wiley, New York 1978.

³¹ J. Grzelak, *Kontrola, preferencje kontroli, postawy wobec problemów społecznych [Control, preferences of control, attitudes towards social problems]*, in: M. Lewicka, J. Grzelak (ed.), *Jednostka i społeczeństwo [An individual and the society]*, GWP, Gdańsk 2002.

³² The author of this paper is inclined to favour the latter definition, and has been examining, in addition assess the characteristics of the interaction partner, also the variability of orientations under the influence of various facial expressions being displayed by an interaction partner – the results of these analyzes are not presented in this article, but they are available in: J. Lewczuk, *The link between social value orientations and the interaction partner's emotional facial expression as regards the perception of other individuals' traits and a change in the observer's social value orientation*, in: „E-methodology. The International Scientific Journal” 2014 nr 1, p. 45-72.

consequently, our social value orientations. The information that the partner is a cooperator evokes a cooperative attitude towards him/her³³, similarly to a message that this person possesses the same orientation as we do^{34 35}. Other researches have shown that we are more willing to cooperate with persons of whom we know that they are moral³⁶ or have authority³⁷.

Signals of the emotions being felt by the interaction partner, flowing from the key channel of nonverbal communication, undoubtedly constitute information which may be immediately processed into a specific assessment of the interaction partner's intentions, and thus, possibly, affect our social value orientation. Reaction to another person's emotional face is a range of various processes – not only perceptual and cognitive but also emotional and behavioural. Observation of an expression results in it being linked with behavioural categories determining the future behaviour of the sender (e.g. an expression of anger – attack, happiness – affiliation), which in turn affects the future behaviour of the receiver, and his/her motivation for approaching, avoidance, isolation, and the quality of mutual interactions³⁸. Research as conducted by Grzegorz Pochwatko and Joanna Sweklej³⁹, concerning the specificity of behavioural reactions (approaching – distancing) with regard to the facial communication of emotions, indicated that photographs showing the expression of happiness triggered a smaller distance in relation to the stimulus than photographs showing the expression of negative emotions.

³³ J. Abric, J. Kahan, *The effects of representations and behaviour in experimental games*, in: „European Journal of Social Psychology” 1972 nr 2.

³⁴ H. Kaufman, *Similarity and cooperation received as determinants of cooperation rendered*, in: „Psychomic Science” 1967 nr 9.

³⁵ L. Tornatzky, P. Geiwitz, *The effects of threat and attraction on interpersonal bargaining* in: „Psychomic Science” 1968 nr 13.

³⁶ P. van Lange, W. Liebrand, *On perceiving morality and potency: Social values and the effects of person perception in a give-some dilemma* in: „European Journal of Personality” 1989 nr 3.

³⁷ J. Grzelak, *Homo economicus uspołeczniony? Motywacyjne i poznawcze uwarunkowania działania w interesie społecznym. [Homo economicus socialized? Motivational and cognitive determinants of acting in the public interest]*, in: „Studia Psychologiczne” 1988 nr 26.

³⁸ E. Dolata, *Psychologia poznawania twarzy i ich ekspresji [Psychology of recognizing faces and their expressions]*, Trans Humana, Białystok 2001.

³⁹ G. Pochwatko, J. Sweklej, *Automatyczne powiązanie afektu z reakcjami typu zbliżanie się – oddalenie. Dystans względem zdjęć z ekspresją mimiczną emocji podstawowych [Automatic linking of the affect with reactions of the type: approaching – distancing. Distance in relation to photographs depicting a facial expression of basic emotions]*, in: „Studia Psychologiczne” 2003 nr 41(4).

Intuitive inference of intentions on the basis of someone's self-presentation finds support in other empirical reports directly referring to social value orientations – self-presentation affects the social value orientations of the sender of messages⁴⁰ – since the nature of facial expressions being displayed by a person (and being indicative of his/her orientation) inclines one to activate an appropriate attitude and action towards this person, which is expressed through specific social value orientations of the receiver of messages.

Since the cooperative tendencies are evoked in us by other cooperators whom we apparently recognize by the happy facial expression, it is likely that observation of a positive facial expression being displayed by the interaction partner will evoke prosocial tendencies towards him/her. In turn, in accordance with the so-called *evolutionary stable strategy*⁴¹ in a form of the “tit-for-tat” reaction, similarly to cooperation inducing cooperation, egoistic behaviour is very likely to induce a reciprocal, non-cooperative choice. Therefore, where a partner displays (as in own research) a negative facial expression of anger, by no means suggesting in this manner a tendency for cooperation, he/she is thus likely to undermine the other party's willingness to cooperate.

Method

The research was carried out via the Internet according to the experimental scheme; it allowed the determination of a change in a social value orientation, depending on the facial expression being observed.

The following techniques were applied in the research: a version of the Ring Measure of Social Values, as modified by Michael Kuhlman⁴², for the measurement of social value orientations, and photographs of a man (as obtained from the set of unpublished materials of M. Kuhlman⁴³) displaying expressions of happiness, anger and neutrality on his face, for the performance of an experimental manipulation.

⁴⁰ J. Iedema, M. Poppe, *The Effect of Self-Presentation on Social Value Orientation* in: „The Journal of Social Psychology” 2001 nr 134(6).

⁴¹ Ł. Wojciechowski, *Ewolucyjne widzenie altruizmu – od redukcjonizmu do...* [*The evolutionary perception of altruism – from reductionism to...*], in: D. Rutkowska, A. Szuster (ed.), *O różnych obliczach altruizmu*. [*About the various faces of altruism*], Wydawnictwo Naukowe SCHOLAR, Warszawa 2008.

⁴² D. Kuhlman, *Neutron study*, unpublished materials, University of Delaware, USA 2007.

⁴³ The materials were obtained courtesy of M. Kuhlman, professor at the University of Delaware, 2007.

In the research, the following variables were used:

independent variables:

- social value orientations
- the type of a facial expression being displayed (the intra- and interpersonal factor)

dependent variables:

- a change in the social value orientation depending on the facial expression being observed.

Tools for the measurement of variables. Indicators.

Method of the measurement of the independent variable: social value orientations.

For the measurement of social value orientations, a version of the Ring Measure of Social Values⁴⁴, as modified by M. Kuhlman. In this method, the respondents made 12 choices between three options (A, B and C), with each option presenting a specific distribution of points between self (You) and the Person in the photograph (Fig. 1). An accurate and rather complex method of the analysis of results as obtained using the Ring Measure of Social Values is provided in a paper written by the author of this technique⁴⁵.

⁴⁴ W. Liebrand, *The effect of social motives, communication and group size on behaviour in a N-person multi-stage mixed-motive game*, in: „European Journal of Social Psychology” 1984 nr 14.

⁴⁵ W. Liebrand, C. McClintock, *The ring easmure of social values: a computerized procedure for assessing individual differences in information processing and social value orientation*, in: „European Journal of Personality” 1988 nr 2.

Figure 1. An example of one of the offers in the modified Ring Measure of Social Values, in the version involving the distribution of points between self and the person in the photograph.

You receive 50	The person in the photograph receives -86
You receive 70	The person in the photograph receives -70
You receive 60	The person in the photograph receives -79

Source: Materials of M. Kuhlman (2007).

Using the tool as described, two types of indicators of social value orientations were developed:

- 1) a general indicator: *orientation on the self* (I) and *orientation on the others* (he)
- 2) specific indicators: *dominant social value orientations*: competition, individualism, cooperation, altruism.

Method of the measurement of the independent variable: the type of a facial expression being displayed.

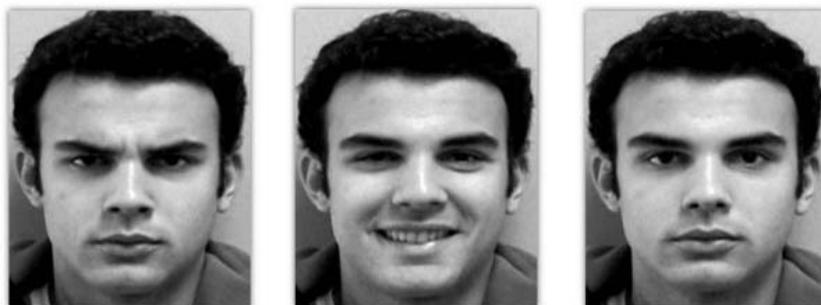
Under the research procedure, a type of manipulation was applied which involved a change in the emotional expression being displayed on the face of a person with whom the respondent is in a situation of social interdependence, and distributes points being important for both parties. For this purpose, photographs of a man were used (having been selected from a couple of dozen of photographs of human faces (from Kuhlman's collection), tested for the lack of ambiguity of the facial expressions being presented (a study as conducted by Kuhlman's team^{46 47}), and chosen due to the appearance of the face being typical of a Polish citizen (studies for the purpose of the paper by Hubert Jakubiec, MSc⁴⁸) and on the basis of opinions of competent judges), presenting facial expressions of anger, happiness and neutrality (Fig. 2).

⁴⁶ D. Kuhlman, *Photon study*, unpublished materials, University of Delaware, USA 2006.

⁴⁷ D. Kuhlman, *Photon study*, unpublished materials, University of Delaware, USA 2007.

⁴⁸ H. Jakubiec, *Czy istnieją uniwersalne gatunkowo i stabilne w czasie cechy fizyczne twarzy człowieka zdradzające jego orientację społeczną?* [Are there any universal (in terms of the species) and stable over time, physical features of a human face that reveal his/her social value orientation?], unpublished MSc thesis, Faculty of Psychology at the University of Warsaw, Warsaw 2008.

Figure 2. Photographs of a man displaying expressions of anger, happiness and neutrality, as used in the research.



Source: Materials of M. Kuhlman (2007).

The photograph of a person displaying a neutral expression (who was presented in the research as a partner for the distribution of points being important to both parties) was shown to all respondents, while for the purpose of bringing about a change in the image of the partner concerned, a proportion of the respondents were shown a photograph of the same man with a smiling face, and the remaining respondents were shown a photograph of him displaying the facial expression of anger.

Respondents

The research was carried out entirely via the Internet on a random address sample of Polish residents, with the use of an application especially developed for the purposes of the research, which was put up on the website: www.badanie.ankieta.pl for the duration of the experiment. A computer system selected, by drawing of lots, a several tens of thousands of mail addresses (from the so-called mailing list), to which information on the opportunity to participate in the research, including a link to the research, was sent. The respondents willing to participate in the research visited the indicated website and followed the instructions. They were informed that the research contributed to the development of Polish science in psychology area, concerned the perception of people. Respondents were encouraged to participate in the research with the possibility of being provided with collective feedback.

In total, over 2000 persons participated in the research, yet only 972 persons met the eligibility criteria for being included in analyses. A considerable proportion of respondents discontinued their participation in the research even before having completed the first task, or at a stage where it was not possible to collect sufficient data for performing analyses. The time of

the beginning and end of the research was controlled using a filter rejecting persons filling in the questionnaire too quickly (in less than five minutes, which is only enough for mechanical checking of randomly selected answers) and too slowly (in more than 40 minutes – such an amount of time creates a risk of the occurrence of a pause between completing particular tasks, and thus a significant disturbance to the manipulation effect). The average amount of time for completing the task was 15–20 minutes.

Ultimately, the group of respondents consisted of 972 persons, including 603 women and 293 men (in 76 cases, no data on the participants' sex was available). The respondents' age fell within the range of 10–77 years, with the average age of 26 years. The sample included 136 persons aged below 18 years.

The course of research

The research was individualized and consisted of 2 parts. Both of parts required that points be distributed between the self and the person as seen in photographs in a situation where the person concerned displayed, on one occasion, a neutral expression on his face, and on another occasion the same person displayed one of the basic emotions.

Deliberately, the respondents had no opportunity to return to the previously displayed screens (yet they could return to the instructions). Making use of a computer and a specially developed application for the purposes of the research is, in this case, very helpful, since the researcher can acquire the certainty that the amounts of time spent by respondents for viewing the photographs were not too long or too diverse. Certainly, due to the Internet-based access to the research, there is a possibility that the same person may be willing to participate in the research many times. In practice, however, it should be assumed that during the subsequent visit to the research website, that person will not complete the entire set of tasks but only view the screens being of interest to him/her, and thus will not be included in analyses.

In the first part of the research, all participants were shown (in a rotational order) photographs of the same man who, on one occasion, displayed a neutral facial expression, and on another occasion displayed one of two basic emotions (happiness, anger). The respondents were therefore assigned (randomly) to one of 4 subgroups which differed in both the order of exposure of facial expressions, and the type of a basic emotion being presented:

- 1st subgroup of respondents: 1. exposure of a neutral facial expression
2. exposure of a facial expression of happiness,

2nd subgroup of respondents: 1. exposure of a neutral facial expression
2. exposure of a facial expression of anger,

3rd subgroup of respondents: 1. exposure of a facial expression of happiness
2. exposure of a neutral facial expression,

4th subgroup of respondents: 1. exposure of a facial expression of anger
2. exposure of a neutral facial expression.

In order to intensify the impact of a facial expression on the receiver of the message, both the exposure of a neutral facial expression and the specific basic emotion were presented three times. The photographs showing the face displaying one specific emotional modality only differed in the borders (which prevented the viewer's impression that the same photograph was being viewed; at the same time, a pilot study using the presented material indicated no differentiating effect of the type of photograph border on either the reception of the modality of the emotion being presented or the perception of the person in the photograph). The respondents viewed each photograph for approx. 4 seconds following the previously given instruction that they do not need to remember any details but only take a look at the photograph.

After having viewed a series of 3 photographs, the respondents distributed points (being important to both parties) between the self and the person as seen a moment ago in the pictures, using a modified version of the Ring Measure of Social Values.

Subsequently, the respondents were to assess (during a pause) the attractiveness of 3 advertisements, using a scale. All the advertisements were in a form of photographs of products, and included a written content either recommending a given commodity or informing of a certain campaign. Little known advertisements showing no human faces had been deliberately selected, so that their contents did not interfere with the facial expressions used in the experimental manipulation.

The next part involved the presentation of photographs of the face of the man known from the first part of the research, with the facial emotional expressions being appropriately changed (depending on the subgroup). The instruction preceding the presentation of photographs, and the duration of the exposure, were the same as in the first part. After that, another measurement of social value orientations was carried out using the same tool as in the first part of the research (a modified Ring Measure of Social Values). In this way, the respondents' social value orientations were determined, which were under the influence of the observed partner's facial expression in the situation of social interdependence.

Hypotheses

Hypothesis I. The type of a facial expression of a basic emotion (happiness vs anger) being presented affects both the diversity of the indicators *orientation on the self* and *orientation on the others*, and the distribution of the groups of the *dominant social value orientations* before and after the experimental manipulation.

I.1 The impact of a facial expression of happiness results in an increase (in relation to the impact of the neutral expression) in both the indicator *orientation on the others* and the number of changes in orientations from prosself to prosocial ones (cooperation and/or altruism), while the impact of a facial expression of anger results in a decrease (in relation to the impact of the neutral expression) in both the indicator *orientation on the others* and the number of changes in orientations from prosself to prosocial ones (cooperation and/or altruism).

Presentation of results

Results of the Kolmogorov–Smirnov test indicated that the distribution of both the variables being the general indicators of social value orientations (*orientation on the self* vs *orientation on the others*) and the perception of emotions was significantly different ($p < 0.001$) from a normal distribution. In view of the above, in order to achieve the statistical correctness, appropriate non-parametric tests were mainly used for analyses, although in verifying certain hypotheses analyses were carried out using also parametric tests (e.g. ANOVA), which, however, had a status of exploratory analyses or analyses further confirming the hypotheses being verified, in order to achieve a greater correctness using mainly non-parametric tests.

The manipulation stimulus in each group of the dominant social value orientations was interpreted in accordance with the assumptions, and thus rendered the manipulation effective (Wilcoxon test; $p < 0.05$).

Results of analyses for hypothesis I: on the impact of the manipulation (positive vs negative) on the change in the general indicators of orientations and the distribution of groups of the dominant social value orientations.

As regards the predictions as included in hypothesis I, there was a diversity of the indicators of the *orientation on the others* (no diversity of the *orientation on the self* was revealed) and the distribution of groups of the dominant social value orientations before and after the experimental manipulation, depending on the type of a basic facial emotional expression being

presented (happiness vs anger). As for the negative manipulation, there was a more than two-fold decrease in the orientation on the others than for the positive manipulation.

The directional predictions as articulated in hypothesis I.I were confirmed in relation to the negative manipulation which was followed by a decrease in the *orientation on the others* (Table 6) and a decrease (at a level of the category of orientations) in the total number of altruists ($\text{Chi}^2(9) = 101.703$ at $p < 0.001$; Cramér's $V = 0.358$ at $p < 0.001$), and partially (since only at a level of the category of orientations) in relation to the positive manipulation which was followed by the observed general increase in the number of altruists ($\text{Chi}^2(9) = 341.218$ at $p < 0.001$; Cramér's $V = 0.436$ at $p < 0.001$).

Table 1. Comparison of the degree of the *orientation on the others* between the first and second measurement⁴⁹ in the case of the negative (-) manipulation (Wilcoxon test)

	Measurement 1		Measurement 2		W-statistics	Significance of the W-test
	Average value	Standard deviation	Average value	Standard deviation		
Orientation on the others	19.35	35.31	13.75	37.22	-2.975	0.003

Source: Own research.

A supplement to the results for hypothesis I.I, concerning the changes within the category of social value orientations, was the results indicating significant diversity of the transfers of cooperators to the group of altruists, depending on the type of manipulation. In the case of the positive (+) manipulation, significantly more transfers of cooperators to the group of altruists were observed than with the negative (-) manipulation, $\text{Chi}^2(1) = 4.673$ at $p < 0.05$. On the other hand, the results being significant at a level of the statistical tendency indicated that the (+) manipulation resulted in more cooperators and altruists than the (-) manipulation, and the (-) manipulation resulted in more individualists than the (+) manipulation.

The other diversities as expected according to hypothesis I, the direction of which was not foreseen, occurred at a level of the statistical tendency

⁴⁹ The intra-object factors (the type of a facial expression being displayed – a neutral face vs face expressing a basic emotion) were measured in a randomized manner; however, prior to the analyses, they were reorganized to the following pattern:

^{1st} measurement = exposure of a neutral face

^{2nd} measurement = exposure of a face expressing a basic emotion (depending on the manipulation group: happiness vs anger).

and indicated that in the case of the (+) manipulation, the indicator of the *orientation on the self* decreased (in relation to the values from the first measurement), and increased in the case of the (-) manipulation.

Analysis of the changes in the general indicators of orientations under the influence of both types of manipulation, as carried out within each of the four groups of the dominant social value orientations (which, in such a form, was not the subject of hypothesis I but seems to be an interesting detailed expansion thereof), demonstrated that individualists (in the case of the positive manipulation) and cooperators (in the case of the negative manipulation) operated in accordance with the predictions as articulated in hypothesis I.I in terms of the impact of the type of manipulation on the change in the *orientation on the others* (Table 2 and 3).

Table 2. Comparison of the indicators of the orientation on the others between the 1st and 2nd measurement in the case of the positive (+) manipulation in the group of persons with the individualistic orientation being dominant (Wilcoxon test).

	Measurement 1		Measurement 2		W-statistics	Significance of the W-test
	Average value	Standard deviation	Average value	Standard deviation		
Orientation on the others	0.41	11.63	0.53	21.88	-0.127	0.014

Source: Own research.

In the case of the (+) manipulation, the indicator of the *orientation on the others* significantly increased in the group of individualists.

Table 3. Comparison of the indicators of the *orientation on the others* between the 1st and 2nd measurement in the case of the negative (-) manipulation in the group of persons with the cooperative orientation being dominant (Wilcoxon test)

	Measurement 1		Measurement 2		W-statistics	Significance of the W-test
	Average value	Standard deviation	Average value	Standard deviation		
Orientation on the others	51	21.57	37.5	32.2	-4.244	0.000

Source: Own research.

In the group of cooperators, in the case of the (-) manipulation, the indicator of the *orientation on the others* decreased significantly in the second measurement (in relation to the first measurement).

Conclusions

The obtained results provided evidence for the existence of the effect of a change in the social value orientation depending on the interaction partner's facial expression. In general, a negative expression triggered a definitely greater decrease in the orientation on the interaction partner (as compared with a positive expression), greater focus on the self (at a level of the statistical tendency) and, therefore, a decrease in the altruistic behaviour, while a positive expression on the partner's face triggered a (close to significance) decrease in the orientation on the self, and an increase in the prosocial behaviours. As for the group of altruists, the sign of the facial expression being observed differentiated the number of shifts between groups of social value orientations: in the case of a manipulation using a positive expression, the number of altruists increased, while a manipulation using anger resulted in a decrease in the number of altruists. The manipulation also significantly differentiated the number of transfers of cooperators to the group of altruists – a positive manipulation triggered more transfers of cooperators to the group of altruists than a manipulation using a negative expression.

While commenting on the methodology of research, it is worth noting that for the purpose of the experimental manipulation, the emotional expressions being most accurately recognized in researches as carried out by Paul Ekman and Wallace Friesen⁵⁰, namely happiness and anger, were deliberately used, which lent maximum credence to the accurate recognition of the modalities of emotions by respondents. The choice of the expression of anger out of the negative emotions was additionally dictated by the reports that the sight of an angry face triggered an exceptionally strong emotional arousal (the so-called maximum amplitude when measuring the brain's action potential)⁵¹. This is supposed to significantly increase the probability of the perceptible impact of a manipulation stimulus on the respondents. However, when planning future researches to continue the empirical exploration of the

⁵⁰ P. Ekman, W. Friesen, *Constants across cultures in the face and emotion*, in: „Journal of Personality and Social Psychology” 1971 nr 17(2).

⁵¹ E. Dolata, M. Czerniawska, *Czy widzisz to, co ja czuję; czy czujesz to, co ja widzę – dylematy komunikacji opartej o ekspresję mimiczną [Can you see what I am feeling?; can you feel what I am seeing? – Dilemmas about the communication based on facial expressions]*, in: „Annales Universitatis Mariae Curie-Skłodowska” 2005 nr 16(76).

subject being raised in this paper, it is worth considering the introduction of manipulations using other modalities of the basic emotions as well.

A methodologically debatable issue is the fact that the respondents were shown a photograph of one man displaying various facial expressions. Such a situation has its advantages, since it allows one to compare reactions to particular facial expressions without the interference of various types of human faces. On the other hand, however, the choice of no less than a man's face may be considered as odd – the author of the research was influenced by the information that the positive expressions are predominant in women (as compared with men), and that women are classified in the group of the “weaker sex”, which may result in a more frequent manifestation of cooperative behaviour towards women. Moreover, there are more cooperators among women than among men, and we tend to respond to cooperation with cooperation. However, one question which remains unanswered is whether or not the obtained relationships between the perception of facial emotional expressions and social value orientations would have differed significantly if the model had been a woman?

Another important aspect is the nature of the facial emotional expression being presented i.e. whether it is posed or spontaneous. In the research, the first type was used intentionally since, particularly in a situation where a facial expression was to be an unambiguous manipulation stimulus, the researcher was keen on it being interpreted as accurately as possible. On the other hand, according to E. Dolata⁵², posed facial expressions are recognized very well, while the spontaneous ones are not. The author is aware of the questionable ecological validity of the material being in a form of static, posed photographs of facial expressions, and recognizes the legitimacy of planning researches with the use of techniques enhancing the naturalness of the expressions being presented by models (e.g. allowing one to encompass the dynamics of expression, being the key determining the intensity of an affect, and the truthfulness or falseness of an expression), or even arranging and analysing real situations involving an interaction of two persons. However, one needs to be aware, while implementing the above idea, that the range of stimuli affecting the observer of expressions will expand from exclusively facial expressions and include pantomimic expressions and the entire context of the situation, since in the everyday interactions with people, we draw conclusions about their emotions also using contextual factors, other

⁵² E. Dolata, *Psychologia poznawania twarzy i ich ekspresji* [Psychology of recognizing faces and their expressions], Trans Humana, Białystok 2001.

than the facial expressions, which are found in other nonverbal behaviour (gestures, body movements, the direction of the look, acoustic information as contained in the speech, tone, and nonverbal vocalization), or what we know of a given person. Therefore, the use of static photographs of faces in own research significantly simplified the stage of operationalization of variables and analysis of the results, and allowed the drawing of very preliminary, general conclusions which, however – where one is willing to ponder on the perception of another human in situations of social interactions – undoubtedly need to be supplemented by more detailed researches also taking account of non-facial factors.

References:

- Abrie J., Kahan J., *The effects of representations and behaviour in experimental games*, „European Journal of Social Psychology” 1972 nr 2, p. 129-144.
- Biele C., *Spostrzeganie twarzy u ludzi i zwierząt [Perception of the face in humans and animals]*, „Studia Psychologiczne” 2002 nr 40, p. 5–25.
- Dolata E., *Psychologia poznawania twarzy i ich ekspresji [Psychology of recognizing faces and their expressions]*, Trans Humana, Białystok 2001.
- Dolata E., Czerniawska M., *Czy widzisz to, co ja czuję; czy czujesz to, co ja widzę – dylematy komunikacji opartej o ekspresje mimiczne [Can you see what I am feeling?; can you feel what I am seeing? – Dilemmas about the communication based on facial expressions]*, „Annales Universitatis Mariae Curie-Skłodowska” 2005 nr 16(76), p. 347–351.
- Doliński D., *Ekspresja emocji. Emocje podstawowe i pochodne [Expression of emotions. Basic and secondary emotions]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, Gdańskie Wydawnictwo Psychologiczne, Gdańsk 2003, vol. 2, p. 351–367.
- Ekman P., Friesen W., *Constants across cultures in the face and emotion*, „Journal of Personality and Social Psychology” 1971 nr 17(2), p. 124–129.
- Ekman P., Sorenson E., Friesen W., *Pan-cultural elements in the facial displays of emotions*, „Science” 1969 nr 164, p. 86–88.
- Friedman H., *The interactive effects of facial expressions of emotion and verbal messages on perceptions of affective meaning*, „Journal of Experimental Social Psychology” 1979 nr 15, p. 453–469.
- Griesinger D., Livingstone J., *Toward a model of interpersonal motivation in experimental games*, „Behavioral Science” 1973 nr 18, p. 73–78.
- Grzelak J., *Preferences and cognitive processes in interdependence situations: a theoretical analysis of cooperation*, in: V. Derlega, J. Grzelak (ed.),

- Cooperation and helping behavior. Theory and research*, New York Academic Press, 1982, p. 97-127.
- Grzelak J., *Homo economicus uspołeczniony? Motywacyjne i poznawcze uwarunkowania działania w interesie społecznym. [Homo economicus socialized? Motivational and cognitive determinants of acting in the public interest]*, „*Studia Psychologiczne*” 1988 nr 26, p. 5-30.
- Grzelak J., *Kontrola, preferencje kontroli, postawy wobec problemów społecznych [Control, preferences of control, attitudes towards social problems]*, in: M. Lewicka, J. Grzelak (ed.), *Jednostka i społeczeństwo [An individual and the society]*, GWP, Gdańsk 2002, p. 131-149.
- Grzelak J., *Współzależność społeczna. [Social interdependence]*, in: J. Strelau (ed.), *Psychologia. Podręcznik akademicki [Psychology. University textbook]*, GWP, Gdańsk 2003, vol. 3, p. 125-145.
- Grzelak J., Ossewska E., Wyszogrodzki D., Bobrowski K., *3 less than 2? A negative effect of the number of allocation participants on prosocial orientations*, „*Polish Psychological Bulletin*” 1994 nr 25, p. 223–240.
- Hamburger H., Guyer M., Fox J., *Group size and cooperation*, „*Journal of Conflict Resolution*” 1975 nr 19, p. 503-531.
- Iedema J., Poppe M., *The Effect of Self-Presentation on Social Value Orientation*, „*The Journal of Social Psychology*” 2001 nr 134(6), p. 771-782.
- Jakubiec H., *Czy istnieją uniwersalne gatunkowo i stabilne w czasie cechy fizyczne twarzy człowieka zdradzające jego orientację społeczną? [Are there any universal (in terms of the species) and stable over time, physical features of a human face that reveal his/her social value orientation?]*, unpublished MSc thesis, Faculty of Psychology at the University of Warsaw, Warsaw 2008.
- Kaufman H., *Similarity and cooperation received as determinants of cooperation rendered*, „*Psychomic Science*” 1967 nr 9, p. 73-74.
- Kelley H., Stahelski A., *Social interaction basis of cooperator's and competitor's beliefs about others*, „*Journal of Personality and Social Psychology*” 1970 nr 16, p. 66-91.
- Kelley H., Thibaut J., *Interpersonal Relations: A theory of interdependence*, Wiley, New York 1978.
- Kuhman D., *Photon study*, unpublished materials, University of Delaware, USA 2006.
- Kuhman D., *Photon study*, unpublished materials, University of Delaware, USA 2007.
- Latane B., Nida S., *Ten years of group size and helping*, „*Psychological Bulletin*” 1981 nr 89, p. 308-324.

- Liebrand W., McClintock C., *The ring easmure of social values: a computerized procedure for assessing individual differences in information processing and social value orientation*, „European Journal of Personality” 1988 nr 2, p. 217-230.
- Liebrand W., *The effect of social motives, communication and group size on behaviour in a N-person multi-stage mixed-motive game*, „European Journal of Social Psychology” 1984 nr 14, p. 239-264.
- Liebrand W., Jansen R., Rijken V., Suhre C., *Might over morality: Social values and the perception of other players in experimental games*, „Journal of Experimental Social Psychology” 1986 nr 22, p. 203-215.
- Mazur M., *Orientacje społeczne [Social value orientations]*, in: M. Lewicka, J. Grzelak (ed.), *Jednostka i społeczeństwo [An individual and the society]*, GWP, Gdańsk 2002, p. 117-130.
- Messick D., McClintock C., *Motivational basis of choice in experimental games*, „Journal of Experimental Social Psychology” 1968 nr 4, p. 1-25.
- Ohme R., *Podprogowe informacje mimiczne. Ujęcie psychologii eksperymentalnej [Subliminal facial information. From the perspective of experimental psychology]*, Wydawnictwo Instytutu Psychologii PAN, Warszawa 2003.
- Pochwatko, G., Sweklej, J., *Automatyczne powiązanie afektu z reakcjami typu zbliżanie się – oddalenie. Dystans względem zdjęć z ekspresją mimiczną emocji podstawowych [Automatic linking of the affect with reactions of the type: approaching – distancing. Distance in relation to photographs depicting a facial expression of basic emotions]*, „Studia Psychologiczne” 2003 nr 41(4), p. 43–66.
- Rutkowska D., Szuster A., (ed.). *O różnych obliczach altruizmu [About the various faces of altruism]*, Wydawnictwo Naukowe SCHOLAR, Warszawa 2008.
- Sattler D., Kerr N., *Might versus morality explained: Motivational and cognitive interpersonal orientation*, „American Journal of Sociology” 1991 nr 71, p. 179-186.
- Shelley G., Page M., Rives P., Yeagley E., Kuhlman D., *Nonverbal communication and detection of individual differences in social value orientation*, in: R. Kramer, M. Bazerman, A. Tenbrunsel (ed.), *Social decision making: Social dilemmas, social values, and ethical judgments*, Psychology Press, New York 2009, p. 147-169.
- Swingle P. G., Santi, A. (1972). *Communication in non-zero-sum games*, „Journal of Personality and Social Psychology” 1972 nr 23, p. 54-64.

- Tornatzky L., Geiwitz P., *The effects of threat and attraction on interpersonal bargaining*, „Psychomic Science” 1968 nr 13, p. 125-126.
- van Lange P., *What People Look for in Others: Influences of the Perceiver and Perceived on Information Selection*, „Personality and Social Psychology Bulletin” 2000 nr 26, p. 206-219.
- van Lange P., Liebrand W., *On perceiving morality and potency: Social values and the effects of person perception in a give-some dilemma*, „European Journal of Personality” 1989 nr 3, p. 209-225.
- Wojciechowski Ł., *Ewolucyjne widzenie altruizmu – od redukcjonizmu do...* [*The evolutionary perception of altruism – from reductionism to...*], in: D. Rutkowska, A. Szuster (ed.), *O różnych obliczach altruizmu*. [*About the various faces of altruism*], Wydawnictwo Naukowe SCHOLAR, Warszawa 2008, p. 21-45.

Zmiana orientacji społecznej pod wpływem obserwowanej ekspresji mimicznej partnera interakcji

Kwestie poruszone w tym artykule dotyczą możliwej zmiany orientacji społecznej obserwatora pod wpływem określonego wyrazu emocjonalnego postrzeganego na twarzy innej osoby. Artykuł wpisuje się w nurt badań nad związkiem między orientacjami społecznymi, a percepcją emocjonalnej ekspresji mimicznej.

Badanie reprezentatywne typu „*omnibus*” przeprowadzono w schemacie eksperymentalnym za pośrednictwem Internetu (N = 972). Wykorzystywane narzędzia to: zmodyfikowana wersja Metody Kołowej Liebranda do pomiaru orientacji społecznych; zdjęcia ekspresji mimicznych (radość, złość, neutralna) do manipulacji eksperymentalnej.

W świetle uzyskanych danych można po raz pierwszy mówić o orientacjach społecznych jako wymiarze podatnym na zmianę pod wpływem obserwowanej ekspresji mimicznej. Wskazano na zróżnicowanie wskaźników *orientacji na innych* oraz rozkładu grup dominujących orientacji społecznych sprzed i po manipulacji eksperymentalnej, zależnie od rodzaju prezentowanej mimicznej ekspresji emocji podstawowej (radość vs złość). Kierunkowe przewidywania uzyskały potwierdzenie w odniesieniu do manipulacji negatywnej (ekspresją złości), po której nastąpiło zmniejszenie się *orientacji na innych* i zmniejszenie się ogólnej liczby altruistów, natomiast w wyniku manipulacji pozytywnej (ekspresją radości) zaobserwowano ogólny wzrost liczby altruistów. Pozostaje to w zgodzie z charakterystyką przewidywań, iż obserwacja pozytywnego wyrazu twarzy wyzwala tendencje prospołeczne,

natomiast obserwacja negatywnego wyrazu twarzy osłabia tendencje prospołeczne.

Słowa kluczowe: orientacje społeczne; prospołeczność; *orientacja na siebie/ orientacja na innych*; zmienność orientacji społecznych; Kołowa Metoda Liebranda; ekspresje mimiczne.

Change of social value orientation affected by the observed mimical expression of the interaction partner

The issues addressed in this paper relate to a possible change in the observer's social value orientation under the influence of a specific emotional expression being perceived on another individual's face. The paper fits into the trend in the research into the link between social value orientations and the perception of a facial emotional expression.

An „*omnibus*” type representative survey was carried out according to the experimental scheme, entirely via the Internet (N = 972). The following tools were used: for the measurement of social value orientations, a modified version of the Ring Measure of Social Values; for the experimental manipulation, photographs of facial expressions (happiness, anger, neutrality).

In the light of the data obtained, one may, for the very first time, speak of social value orientations as of a dimension being susceptible to a change under the influence of a facial expression. A diversity of the indicators of the *orientation on the others* was shown, as well as of the distribution of the groups of the dominant social value orientations before and after the experimental manipulation, depending on the type of a basic facial emotional expression being presented (happiness vs anger). Directional predictions were confirmed with regard to the negative manipulation (expression of anger) which was followed by a reduction in the *orientation on the others* and a reduction in the total number of altruists, while the positive manipulation (expression of happiness) resulted in a general increase being observed in the number of altruists. It remains in line with the trend in predictions that observation of a positive facial expression triggers prosocial tendencies, while observation of a negative facial expression undermines prosocial tendencies.

Keywords: social value orientations; prosociality; *orientation on the self/ orientation on the others*; variability of social value orientations; Ring Measure of Social Values; facial emotional expressions.