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The Under– and Overestimation Effects in Comparative Judgments – Assimilation and Contrast Mechanisms

The aim of the studies presented in this paper was to propose a new explanation of under– and overestimation effects in comparative judgments. The fundamental assumption of this new interpretation is that in comparative judgments ("the object X in comparison with the object Y" type) the target is contrasted with the comparison standard when the compared objects seem generally dissimilar and assimilated to the standard when the objects seem generally similar. In a series of three studies students were asked to compare the chances of certain events occurring to two objects (self vs. classmate vs. the average person). The direction of comparison was manipulated. Generally, when the more salient object was compared to the less salient object, irrespective of the valence of the events, the overestimation effects occurred only in case of frequent events and the underestimation effects only in case of rare events. The reversal of direction of comparisons yielded the clear reduction of comparative bias.

Keywords: *comparative bias, asymmetry effect, assimilation, contrast*

The literature on unrealistic optimism (Weinstein, 1980; see also Weinstein & Lachendro, 1982; Hevleg-Larsen & Shepperd, 2001) has been dominated by a motivational interpretation of comparative bias that people typically make while estimating chances of experiencing desirable and undesirable events. The classic findings show that when people compare own chances of experiencing certain events with the chances of others (usually defined as "*an average person*"), they tend to overestimate own chances of experiencing positive events (e.g., buying a house, living past 80) and underestimate own chances of experiencing negative events (e.g., heart attack before age 40, having a drinking problem). This tendency has been interpreted as unrealistic optimism because the accurate comparison would require people to assess their chances for both types of events as similar to those of an average person. The underlying assumption is that the decisive factor influencing the direction of the comparative bias is the desirability of the events. Therefore, most explanations have emphasized the egocentric character of bias in comparative probability assessments, and motivational, rather than cognitive character of the underlying mechanisms (Weinstein, 1980; Weinstein & Lachendro, 1982; see also Chambers & Windschitl, 2004).

Recent research, however, stirred a new discussion about the nature of comparative bias when a rather surprising pattern of results has been found after the frequency of the events was taken into account in the analyses (Chambers, Windschitl, & Suls, 2003; Cypryańska & Krejtz, 2005; Kruger & Burrus, 2004). For example, students were asked to compare their own and an average person's (attending the same course) chances of owning a car (common and desirable event) vs. owning an airplane (rare and desirable event) or catching flu in next four years (common and undesirable event) vs. catching flu in the next two weeks (rare and undesirable event). Interestingly, when the frequency and desirability of the events were combined, people rated own chances as higher in the case of common events (*an overestimation effect*) and lower in the case of rare events (*an underestimation effect*), regardless of the desirability of the events (Kruger & Burrus, 2004; see also Chambers et al., 2003; Cypryańska & Krejtz, 2005). Thus, it has been frequency rather than desirability of the events that played a vital role in the formation of comparative bias.

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These findings suggest that the nature of comparative bias underlying unrealistic optimism might be cognitive rather than motivational.

Cognitive Explanation of the Comparative Bias

Kruger and Burrus (2004; see also Chambers et al., 2003) propose cognitive explanation of the overestimation and underestimation effects found in their studies. They assume that when people compare own chances of experiencing an event with those of an average person, they tend to focus overly on their own chances of experiencing this event and insufficiently on the chances of others. They fail to realize that if their own chances of experiencing an event (e.g., owning a car) are high, the chances of others may be just as high. If they ignore this latter fact, they are likely to overestimate their comparative likelihood of experiencing an event not because it is desirable, but because it is common. This explanation leaves, however, an important question pending: why people focus on their own chances when comparing own chances to those of others? Several answers have been proposed.

Egocentrism and Focalism

Kruger and Burrus (2004) and Chambers et al. (2003) suggest that people focus primarily on own chances of experiencing an event because of *cognitive egocentrism* i.e. a tendency to concentrate on one's own point of view and take self-knowledge as a point of reference when making comparative judgments. People focus excessively on self-predictions (and disregard predictions for others) because of the greater accessibility of self-representation (Chambers et al., 2003; Kruger & Burrus 2004). In this vein, numerous studies show that self-representations are among the most accessible representations that people possess and people usually have more information about themselves than others (Dunning & Hayes, 1997; Kruger, 1999).

Focalism provides an alternative explanation of excessive concentration on self in comparative judgments. Kruger and Burrus (2004; also Chambers et al., 2003) define focalism as a tendency to give greater weight to and are more likely to assess evidence in support of focal rather than non-focal hypothesis (see also Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000; Windschitl, Kruger, & Simms, 2003). The focal hypothesis is determined by the target designated by the comparative question: the comparative evaluation is run from the perspective of the first of the objects being compared. Thus, self-relevant information receives greater weight in self vs. other comparisons not because of the greater availability of self-relevant information, but because the self is the target of the comparison (it appears first in the comparative question).

In order to answer the question whether the self taken as a point of reference for the comparisons because it is more accessible (egocentrism) or because it appears first in the comparative question (focalism), Kruger and Burrus (2004) manipulated the direction of comparisons. In one condition participants were asked to compare themselves with others, in another they were asked to compare others to themselves. If egocentrism underlies the effects, the comparative bias should appear regardless of the direction of comparison. However, if focalism is the proper explanation of the effects, the under– and overestimation effects in favour of self should appear when participants are asked to compare self to others, but the effects should be reversed when others are compared to self. The actual results revealed an *asymmetry in comparative judgments* of probability of events. The typical under- and overestimation effects were observed when self was compared to others, whereas when the direction of the comparison was reversed the comparative bias disappeared. Kruger & Burrus (2004; see also Chambers et al., 2003) concluded that both egocentrism and focalism underlie comparative biases but they did not explain how the two mechanisms operate.

Are Egocentrism and Focalism Adequate Explanations?

There are reasons to think that the cognitive explanations proposed by Kruger and Burrus (2004; also Chambers et al., 2003) may not offer a valid account of the processes underlying the bias in the probability comparisons. The focalism hypothesis as proposed by Kruger and Burrus (2004) cannot be accepted without reservations. It is not sufficiently clear why the target of comparison becomes the object of the focal probability hypothesis regardless of cognitive accessibility of the target and the standard of the comparison. The research clearly indicates that objects or events become the focus of attention when people have greater knowledge about them i.e. when their representations are more accessible than others (Fox & Levav, 2000; Wilson et al., 2000).

Additional doubts are cast by the research that looks at the role of the level of abstraction in social comparisons. In his vein, Alicke, Klotz, Breitenbecher, Yurak and Vredenburg (1995) show, that comparative bias is clear when comparisons are made with an abstract, average person (*high level of abstraction of comparisons)* but they decrease as the concreteness of standard (an object to whom the self is compared) increases (e.g., becomes a concrete person) (see also Perloff & Fetzer, 1986). These results point to an important role that the accessibility of the representation of the standard of comparison plays in the comparative bias. The studies reported by Kruger and Burrus (2004) did not control for the concreteness of the standard of the probability comparisons, however, results indicating that comparative bias decreases (or disappears) when comparisons are made with a concrete person would

undermine the validity of the focalism interpretation. Thus, it is important to examine whether the focalism hypothesis holds for comparisons of self to concrete others.

Abstraction of the standard of comparison seems to be equally important for sustaining the egocentrism hypothesis. The tendency to focus on the self while making the probability comparison may, of course, stem from greater accessibility of the information about self. However, this tendency can also be influenced by a limited access to available information about the group (an average others), due to its high abstractness (Alicke et al., 1995). In addition, comparisons to an abstract group give advantage not only to self but also to other singular objects that are by definition more concrete than the group. Information about concrete, singular objects is organized in more cohesive and structured schemas and is therefore more accessible (easier and faster to retrieve) than information about an abstract group (McConnell, Sherman, & Hamilton, 1997; see also Hamilton & Sherman, 1996). Indeed, studies in which comparative judgments concerned features (e.g., friendliness, intelligence) rather than probability of events, confirm that the comparative bias is similar when self and a singular, social object is compared to an abstract group's average (Klar & Giladi, 1997; Klar, 2002). Thus, if it is the greater cognitive accessibility of singular objects that underlies biased probability comparisons, the explanation offered by the egocentrism hypothesis is clearly too narrow.

Overview of the present studies

The primary goal of the present studies is to test the cognitive explanations of the under- and overestimation effects in order to disentangle the role of egocentrism and focalism in the comparative judgment. Study 1 aims at demonstrating that cognitive egocentrism does not fully explain bias in comparative judgment. Study 2 aims at demonstrating limited accuracy of the focalism explanation. Study 3 aims at testing an alternative explanation of the under- and overestimation effects based on Tversky's feature matching model (Tversky, 1977) and Mussweiler's selective accessibility model (Mussweiler, 2003). The studies used a similar procedure where participants (secondary school students) were asked to complete a questionnaire in which the probabilities of various events were compared. The events differed in frequency (rare vs. medium vs. common) and desirability (undesirable vs. desirable). The only difference between the studies was the type of compared objects. In addition, Study 3 manipulated the direction of comparisons.

Study 1

Study 1 was conducted in order to demonstrate the limitations of the egocentrism account of the under- and overestimation effects in comparative judgment regarding event probabilities. The aim of the study was to show that the under- and overestimation effects apply not only to self but both to self and a singular peer compared to an abstract reference group.

Method

Participants. Eighty six secondary school students participated in this study (48 women and 38 men).

Materials. All participants responded to a questionnaire containing comparisons of a set of 24 events. The events differed in frequency (rare vs. medium vs. common) and desirability (undesirable vs. desirable). The perceived frequency of the events was assessed in a pilot study conducted among 354 Polish students in which participants responded to a question: *"How many out of 1000 typical Polish secondary school students encountered the following events?"*. The questionnaire included the events perceived as rare (up to 100 people out of 1000), or very common (700 or more people out of 1000), as well as events with "medium frequency" (between 300 and 400 people out of 1000). The list below names all events included in the final questionnaire.

Rare undesirable: contracting HIV in a hospital; becoming blind; being imprisoned; being hit and injured by a meteorite.

Medium undesirable: developing cancer; breaking a limb in the next few years; being involved in a dangerous car crash; misfortune happening in the next few months.

Common undesirable: getting a cold during the next winter; quarrelling with a member of family or a close friend at least once in the following year; becoming a subject of an unpleasant gossip at least once in the following year; being bitten by a mosquito following summer.

Rare desirable: being offered a part in a movie by a famous director met accidentally in the street; finding a couple of 100 PLN bills in the street; going for a wonderful journey around the world within the next few years; winning the lottery.

Medium desirable: maintaining proper body weight in the next 10-20 years; reaching old age in health; experiencing an unexpected financial improvement in the following year; having healthy children in the future.

Common desirable: having a pleasant social meeting in the following year; accidentally meeting a liked person in the following year; something pleasant happening within the next few months; having one of dreams coming true.

Procedure. Participants in group I (n = 44) were asked to make the "self vs. group" comparisons: *"Try to compare*

Table 1
Comparative judgments depending on desirability and frequency of events and target of comparison (Study 1).

Desirability of events:	Undesirable			Desirable		
Frequency of events:	Rare	Medium	Common	Rare	Medium	Common
The self relative to group average[a]						
M	-.59	.22	.77	-.79	.18	.82
SD	1.44	1.09	1.31	1.27	1.14	1.41
t(43)	2.73**	1.38	3.90***	4.14***	1.05	3.88***
The peer relative to group average[a]						
M	-.63	.07	.54	-.78	-.02	.65
SD	1.31	.88	1.41	1.82	.91	1.86
t(41)	3.11**	t < 1	2.51*	2.79**	t < 1	2.27*

Note. The statistical significance of differences from 0 („the chances of self/peer the same as those of the average") was tested (0 indicates lack of comparative bias).
[a] The positive scores indicate that the chances of self/peer are assessed as higher than those of the group (overestimation effects), while negative scores indicate that the chances of self/peer are assessed as lower than those of the group (underestimation effects). * p < .05. ** p < .01. *** p < .001.

yourself with an average student of the second grade in your school, who is of the same sex as you. In comparison to an average student, how do you asses the chances that the following events will happen to you? (in other words, decide if your chances are smaller, the same or greater than those of other students)". In group II participants (n = 42) were asked to make the "peer vs. group" comparison i.e. compare one member of the class to an average student of the school: *"Think about one person from your class, of the same sex as you, whose name comes after yours in your class's attendance journal. Now try to compare this person to an average student of the second grade in your school"* (etc. as in the first group). The comparative probability was assessed on a 9 grade scale: from -4 (*definitely smaller*) through 0 (*the same*) to +4 (*definitely greater*).

Results

A 2 (desirability of events: desirable vs. undesirable) x 3 (frequency: common vs. medium vs. rare) x 2 (singular target of comparisons: self vs. classmate) ANOVA for mixed designs with desirability and frequency as within-participants factors revealed a significant main effect of the frequency of events, M_{common} = 0.70 vs. M_{medium} = 0.11 vs. M_{rare} = -0.70, $F(2, 168) = 53.38$, $p < .001$, $\eta^2 = 0.388$. The differences between mean comparisons are significant at least at $p < .05$ (Bonferroni test). Importantly, the analyses did not reveal a significant main effect of singular target, $F(1, 84) < 1$. Mean comparative estimates of particular categories of events are similar regardless of the type of singular target (Table 1).

For frequent events (both desirable and undesirable) the chances of a singular target (self or a classmate) are estimated as higher than the chances of an average person (the overestimation effect), and for rare events they are estimated as lower (the underestimation effect). There is no comparative bias in estimation of chances of the medium frequency events.

Discussion Study 1

Results of Study 1 reveal that the under- and overestimation effects appear not only when self is compared to an average person but also when a singular, concrete social object different than self (a classmate) is compared to an abstract, average person. These results indicate that the egocentrism account (Chambers et al., 2003; Kruger & Burrus, 2004) does not explain the whole range of bias comparative judgment. Importantly, comparisons discussed here concern an abstract, average person as the standard of comparison. As such obtained results corroborate the Singular-Target-Focus theory expectations (Klar & Giladi, 1997). According to this theory the mere singularity of an object decides that the attention is directed to the object compared to an abstract group (or an average, hypothetical representative of the group). Klar and Giladi (1997), as Kruger and Burrus (2004) see the comparative bias as a result of excessive focus on chances ascribed to a singular object and insufficient focus on chances of an abstract group. Although this interpretation is more general than the egocentrism account of the comparative bias, it does not sufficiently explain the obtained results. Most importantly, according to the Singular-Target-Focus theory, people should always focus more on a singular member in the peer vs. group comparisons. Thus, the under- and overestimation effects should appear always in favour of the singular member regardless of the direction of comparisons (member vs. others or other vs. member). Clearly, this is not the case as indicated, for example, by the results obtained by Kruger and Burrus (2004; also Chambers et al., 2003).

Table 2
Comparative judgments depending on desirability and frequency of events and standard of comparisons (Study 2).

Desirability of events:	Undesirable			Desirable		
Frequency of events:	Rare	Medium	Common	Rare	Medium	Common
The self relative to the typical student[a]						
M	-.70	.09	.79	-.69	-.03	.96
SD	1.04	.85	1.31	1.17	1.17	1.24
t(38)	4.18***	t < 1	3.78**	3.67**	t < 1	4.82***
The self relative to the friend[a]						
M	.11	.22	.68	-.19	-.08	.17
SD	1.01	.88	1.12	1.04	1.07	.78
t(38)	t < 1	1.66	3.91***	1.22	t < 1	1.43

Note. The statistical significance of differences from 0 („the chances of self the same as those of the standard of comparisons") was tested (0 indicates lack of comparative bias).
[a] The positive scores indicate that the chances of the self are assessed as higher than those of the standard of comparisons (overestimation effects), while negative scores indicate that the chances of the self are assessed as lower than those of the standard (underestimation effects). * p < .05. ** p < .01. *** p < .001.

Study 2

The purpose of the second study was to demonstrate the limitations of the focalism explanation of the comparative bias. According to the focalism account, attention should always be paid to target of the comparison, regardless of cognitive accessibility of either the target or the standard of the comparison. Thus, it should be expected that the under- and overestimation effects should appear when self is compared to any other object, an average person or a singular object, provided it is the target of comparison.

In order to point out to comparisons for which this assumption does not work we conducted the study with two experimental conditions. In the first condition participants (n = 39) were asked to make self vs. group comparisons (like in Study 1). In the second condition participants (n = 42) were to compare themselves to a friend. If focalism is accurate, the under- and overestimation effects should be found in both conditions. However, if the underlying cognitive mechanism is different – based on cognitive accessibility of the compared objects we should find the overestimation effect when accessible and concrete self is compared to the less accessible and abstract average person but not when self is compared to concrete and accessible friend.

Method

Participants. Eighty one secondary school students participated in this study (49 women and 32 men).

Materials and procedure. The same set of events as in Study 1 was used. Participants in one group (n = 39) were asked to make the "self vs. an average student" comparisons: "*Try to compare yourself with typical student of the second grade in your school, who is of the same sex as you"* (etc. like in the Study 1). Another group of participants (n = 42) was asked to compare the self with a friend: "*Try to compare yourself with your high-school friend of the same sex".*

Results

The obtained results reveal a pattern that does not confirm focalism account. The under- and overestimation effects were found only for the self vs. group comparisons (Table 2). However, they are much smaller or completely disappear when self is compared to a concrete, social object i.e. a friend.

Discussion Study 2

Thus, the results obtained in Study 2 undermine the accuracy of focalism explanation of the comparative bias. They clearly demonstrate that the comparative bias depends not only on whether a given object is the target of the comparison, but also the degree to which both compared objects (target and standard) are cognitively accessible. The under- and overestimation effects are found in the self vs. group comparisons but they disappear when the abstractness of the standard of comparison decreases, i.e. when an abstract 'average person' becomes a concrete member of the group.

The results of the presented studies suggest that neither egocentrism nor focalism account provides a sufficient explanation of the cognitive mechanisms underlying the comparative bias. The scope of the egocentrism account is narrow since the comparative bias holds not only for self but also for another singular objects (e.g. classmate) compared to analogical reference group i.e. an unidentified, average person. Results showing that comparative bias disappears when self is compared to a friend undermine

accuracy of the focalism perspective. Neither of the two interpretations accounts for this asymmetry effect in comparative bias. Kruger and Burrus (2004; also Chambers et al., 2003) suggest that cognitive accessibility of self-representation (egocentrism account) and direction of comparisons (focalism) may play a role when considered together, but they do not provide a clear answer as to how these factors may shape the formation of the comparative bias. We propose an alternative explanation of the under- and overestimation effects in comparative judgment.

Comparative Judgments as Similarity-Dissimilarity Testing

The egocentrism and focalism hypotheses share a common assumption that while making the comparative judgment people start from independent assessment of the chances of the object X and the object Y and only subsequently they juxtapose the assessments in order to make the comparison. It is assumed that assessment for each object is made independently of the context provided by another object and objectivity of the comparison is biased by a tendency to focus on the estimates for one of the compared objects (self or target designated by the comparative question) without considering assessment for the second object. However, can we reliably assume that people estimate chances of an object separately, regardless and independent of another other?

We propose that comparing probability of an event happening to different social objects (”the chances of object X in comparison with the chances of the object Y are higher, lower or equal” type) is similar to testing similarity-dissimilarity hypothesis about two objects on a given dimension. This perspective allows us to propose a new explanation of the *asymmetry effect* in comparative judgments of probability of events. According to the *feature matching model* of Tversky (1977) the judgments of similarity are not symmetrical because they are directional. Since the target of comparison draws attention more than the standard of comparison, the properties of the target have a stronger influence over the similarity assessment (the assessment of similarity decreases with the increase of the number of specific and unique features of the target). In addition, the direction of the asymmetry of the comparisons is determined by the relative salience of the compared objects. The relative salience of an object is determined by its complexity, novelty, exceptionality or specificity. The basic hypothesis that can be derived from the Tversky’s model (1977) is that less salient objects seem more similar to more salient objects whereas more salient objects seem different from less salient objects. For example, since the cognitive representation of self is more complex and contains more specific features than the representation of

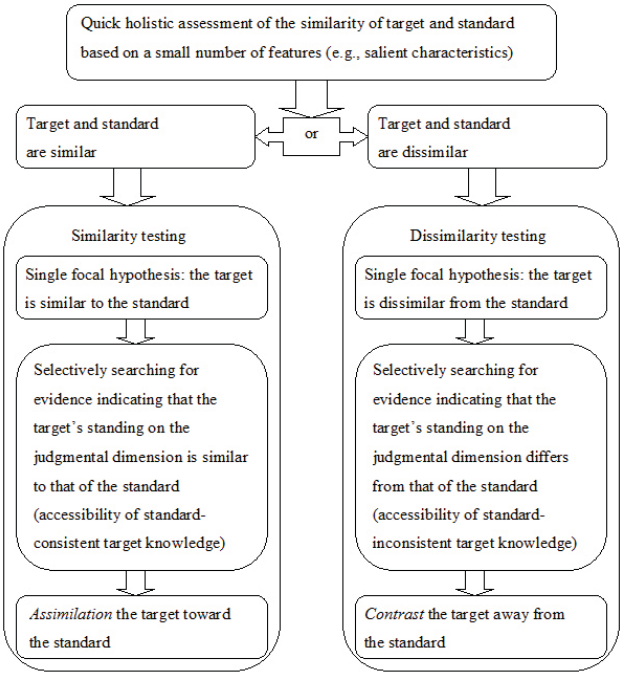

Figure 1. The selective accessibility mechanism proposed by Mussweiler (2003).

others (an average other, in particular), self compared to an average other is seen as exceptional, unique and therefore different. However, when less salient, indistinct, average person is compared to complex and well-defined self, he or she is likely to be seen as similar to self because his or her representation is less specific (Srull & Gaelick, 1983; see also Codol, Jarymowicz, Kaminska-Feldman, & Szuster-Zbrojewicz, 1989; Tversky & Gati, 1978).

We propose that the similarity/dissimilarity assessment of two objects may play a vital role in initial evaluation of accessibility (focal hypothesis) which focuses attention when comparative assessments within a probability dimension are made. This process might be described by the *selective accessibility model* proposed recently by Mussweiler (2003) and presented by Figure 1. According to selective accessibility model when the Object X (target of comparison) is compared to the Object Y (standard of comparison) the process of comparative evaluation is focused, at its very initial steps, on testing two plausible hypotheses: “the target is similar to the standard” vs. “the target is dissimilar from the standard”. The choice of one of the options depends on perceived general similarity of the target and the standard (*holistic assessment of target-standard similarity*). Importantly, the selected hypothesis is tested by focusing on hypothesis-consistent evidence (see also Klayman & Ha, 1987). Similarity testing selectively increases the accessibility of standard-consistent target knowledge and eventually leads to the *assimilation* of the target to the standard. Dissimilarity testing selectively increases the accessibility of standard-inconsistent target knowledge and leads to *contrasting* the target and the standard.

Using the Mussweiler's model (2003) we propose that the general assessed similarity between target and standard determines whether the cognitive process will follow the path of confirming the similarity (assimilating standard to target) or dissimilarity hypothesis (contrasting the target from the standard). Based on the assumptions of Tversky (1977) it can be expected that the choice of the path of the hypothesis testing will depend on the relative salience of the objects and the direction of comparison. The dissimilarity hypothesis should be tested when the more salient object is compared to the less salient object (e.g., self in comparison to the group) resulting in contrasting the objects and the under- and overestimation effects. When less salient object is compared to more salient one, the similarity hypothesis testing should be initiated and assimilation of the objects should result in decreasing comparative biases. In such a case the comparative bias should disappear.

Importantly, the asymmetry in probability judgment should appear only when the salience of the compared objects is different. Srull & Gaelick (1983) suggest that relative salience of compared objects changes when self is compared to a concrete and well known person instead of the abstract and ill-defined average person. In such a case asymmetry effects should disappear (see also Tversky, 1977). In other words, it is expected that as the discrepancy of relative salience of the target and standard of comparison decreases, the under- and overestimation effects in comparative judgment should decrease (assimilation should dominate contrasting).

Study 3

Study 3 was designed in order to test the predictions of the proposed model explaining the cognitive mechanism of the comparative bias. We expect that when the more salient object is compared to the less salient object e.g. self vs. an average person (traditional direction of comparisons), the under- and overestimation effects in favour of the more salient object should appear. These effects are expected to be the largest when self is compared to an abstract, average person from a reference group and they should decrease as the discrepancy in relative salience of compared objects decreases. Thus, they are expected to be smaller when a concrete classmate is compared to an average person and drop or even disappear when self is compared to a concrete classmate. The under- and overestimation effects are expected to totally disappear when the less salient object is compared to the more salient object (reversed direction of comparisons i.e. an average person is compared to self or a peer and a peer compared to self).

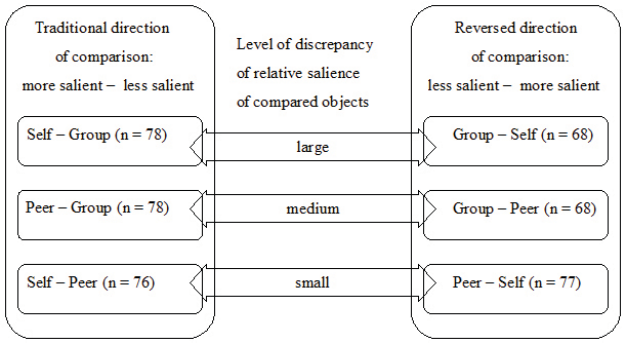

Figure 2. Design of Study 3.

Method

Participants. The study was conducted among 445 secondary school students (249 women and 196 men).

Materials and procedure. All participants assessed the same set of events as in the previous studies. In study 3 comparative judgments were made between three pairs of objects of different relative salience: self vs. an average person; a classmate vs. an average person; self vs. a classmate). Then the direction of comparisons was changed. The design of the study is illustrated by Figure 2.

Results

The results fully confirm our expectations. A 2 (desirability: negative vs. positive) x 3 (frequency: common vs. medium vs. rare) x 2 (direction of comparison: traditional vs. reversed) x 3 (type of compared objects) ANOVA for mixed designs with desirability and frequency as within-participants factors revealed significant interaction of frequency and direction of comparison and type of compared objects, $F(4, 878) = 7.58$, $p < .001$, $\eta^2 = 0.03$.

The under- and overestimations effects appeared for traditional direction of comparisons, when more salient objects were compared to less salient objects (both in rare and common events the mean assessments are significantly different from 0 at least on a level $p < .01$) (Figure 3). The reversal of the direction of the comparisons yielded the reduction of comparative bias. The underestimation effect was found only when an average person was compared to self, $t(67) = 4.48$, $p < .001$. However, this effect is significantly weaker than the same effect in the traditional direction of comparisons, when self is compared to an average person, $t(144) = 3.62$, $p < .001$.

It has been also demonstrated that the under- and overestimation effects are stronger when self is compared to an average person than when an average person is compared to self. They are also smaller when the comparisons are made between classmate and an average person and they drop even lower when self is compared to a concrete

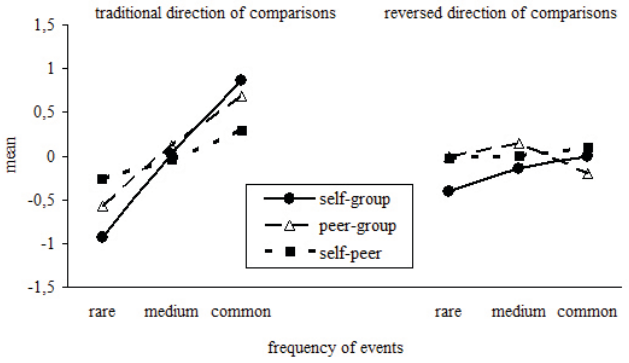

Figure 3. Interaction of frequency with direction of comparison and type of compared objects (Study 3).
Note. Independently of direction of comparisons the positive scores indicate that the chances of the more salient object are assessed as higher than those of the less salient object (overestimation effects), while negative scores indicate that the chances of the more salient object are assessed as lower than those of the less salient object (underestimation effects).

classmate. The differences between mean comparisons for conditions (type of compared objects) are statistically significant at least at $p < .05$, for frequent and rare events as indicated by the analysis of contrasts.

General Discussion

The studies presented in this paper provide evidence that the egocentrism and focalism hypotheses (Chambers et al., 2003; Kruger & Burrus, 2004) do not sufficiently and accurately explain the formation of the comparative bias in probability judgment. We propose a new and more comprehensive explanation of the cognitive mechanism underlying the comparative bias. Studies show that the under- and overestimation effects appear not only when self is compared to an average person but also when a singular, concrete person is compared to an average person (Study 1). This finding discredits the egocentrism hypothesis. We also show that the under- and overestimation effects are found in the self to an average person comparisons but they disappear when an abstract 'average person' becomes a concrete member of the group (Study 2). This result undermines the validity of focalism hypothesis

According to the explanation we propose, the under- and overestimation effects emerge during a selective dissimilarity hypothesis testing, in which the target of comparison is contrasted from its standard. The dissimilarity hypothesis testing occurs when a more salient object (e.g., self, a concrete person) is compared to a less salient one (e.g., an average person). On the other hand, the assimilation of the target to the standard of comparison appears when the less salient object is compared to the more salient one. In such a situation the decrease in comparative biases is observed. The similarity hypothesis testing and assimilation also takes place when compared objects have similar cognitive accessibility.

The presented interpretation develops the focalism account in that it assumes that the comparative judgment can be seen as a process of testing two complementary hypotheses. However, differently than the focalism perspective, we assume that these hypotheses do not refer to two independent probabilities being compared (for the target and for the standard of comparisons). Instead, they refer to similarity or dissimilarity of the probabilities of the events happening to the target and the standard of comparison. Furthermore, the explanation proposed here specifies the role of the direction of comparisons and cognitive accessibility of compared objects in formation of comparative bias. It is proposed that the role of these two factors should be considered simultaneously. In comparison to other theoretical models attempting at explaining comparative bias in probability judgment, the model we propose in this paper offers a general explanation of the observed effects and introduces a much wider range of conditions in which the bias in probability comparisons occurs.

The proposed contrast/assimilation mechanism requires, of course, further verification. Several hypotheses can be derived from the proposed model. For example, we assumed that contrasting of the target and standard of comparison takes place when a more salient and accessible object is compared to a less accessible one. Absolute judgments of probabilities of events happening to a certain object (i.e. not in comparison to a standard e.g. „What are the chances of an object X?" and „What are the chances of an object Y") should change after contrasting resulting from such a comparison takes place ("What are the chances of an object X in comparison to the chances of an object Y"). Differences in absolute ratings for both the object X and the object Y after such a comparative judgments should be greater than in control conditions in which no comparative judgment is made. Differently, this should not be the case when the less salient object is compared to the more salient one. We assumed that in this situation the process of assimilation of evaluations for a target to those of a standard takes place. This process leads to reduced difference in evaluations of compared objects. We should, therefore, expect that the differences in absolute evaluations after such comparative judgments should be smaller than in control conditions.
The pattern of comparative bias should change also when attention is intentionally directed towards similarity or dissimilarity testing. One way in which this can be done is by manipulating the research instruction. For example, participants can be prompt to similarity testing by the instruction: „Is the chance of the event A happening to object X similar to the chance of the same event A happening to the object Y" vs. „ Is the chance of the event A happening to object X different to the chance of the same event A happening to the object Y").

In addition, the assumption about the role of different salience of compared objects needs further verification. Comparisons of self to an average person and a concrete to an average person, we propose a continuous dimension of relative salience of compared objects. This approach is partly supported by other concepts such as the idea of entitativity (Hamilton & Sherman, 1996). Introducing the continuum of salience brought about interesting results and allowed for more general analysis of observed relationships. Verification of validity of this approach requires however further studies.

Further studies are clearly needed in order to verify all aspects of the model proposed here. Importantly this model provides a number of important hypotheses that can be submitted for experimental verification.

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