


Same meaning but different feelings: Different expressions influence satisfaction in social comparisons

Yi Song,^{1,2} Xiaofei Xie^{1,2}  and Hui Zhang^{1,2}

¹School of Psychological and Cognitive Sciences, Peking University, and ²Beijing Key Laboratory of Behavior and Mental Health, Peking University, Beijing, China

The same social comparison information may be expressed in different ways (e.g. ‘I am better than him’ versus ‘he is worse than me’). The results of four studies indicated that the way social comparison is expressed can affect an individual’s satisfaction (i.e. ‘better’ versus ‘worse’). Specifically, in upward comparisons, the expression ‘I am worse than him’ makes individuals feel less satisfied than the expression ‘he is better than me’. In downward comparisons, those who use the expression ‘I am better than him’ are more satisfied than those who use the expression ‘he is worse than me’. The motivation of information processing acted as the mediator.

Key words: direction of comparison, framing effect, social comparison.

Social comparison is common in our daily lives. We compare ourselves with others all the time. At school, we compare ourselves with other students in relation to academic achievement. At work, we compare ourselves with other colleagues in job performance and salary. Social psychologists have long found that human beings never stop these social comparisons (Swencionis & Fiske, 2014). It is an important behaviour in our lives (Buunk, Dijkstra, Bosch, Dijkstra, & Barelds, 2012).

We have two different ways to express social comparison information. For example, we can say ‘I am better than him/her’ or ‘he/she is worse than me’. It can be easily determined that these two comparative statements actually express the same meaning, although their expressions are in different forms. Would the different expressions have different impacts on individuals’ feelings (specifically, satisfaction after knowing the social comparison results)? This is the issue that we want to explore in this study.

In addition to expressing social comparison information from the first person point of view (i.e. ‘I’ or ‘me’) as previously mentioned, we are often told by others what our comparison results are, when they use expressions from the point of view of the second person (i.e. ‘you’). For instance, an employee is compared with other colleagues by his or her bosses. In this circumstance, others would say ‘you are better/worse than him/her’ or ‘he/she is better/worse than you’.

This study aims to explore whether social comparison information with the same meaning but different expressions can influence individuals’ satisfaction. We hypothesize that different expressions can influence individuals’ motivation of information processing, and the motivation affects satisfaction with the comparison result. Furthermore, we assume that the effects exist regardless of whether the social comparison information is expressed from the first person (i.e. ‘I’ or ‘me’) or second person point of view (i.e. ‘you’).

Social comparison

Social comparison was first proposed by Festinger (1954) to emphasize one’s quest for self-knowledge by not only discovering objective information but also comparing oneself with others. Although Festinger’s original theory only focused on the comparison of opinions and abilities, the theory currently has developed into a more varied and complex area of research (see Sulz & Wheeler, 2000). Currently, it can be used to refer to any process in which people compare their characteristics to others (Buunk & Gibbons, 2007).

Based on our relative position to the person with whom we are compared, there are two types of social comparisons. When we compare ourselves with a person who overmatches us, this type of social comparison is an upward comparison (Collins, 1996). In contrast, the comparison with a person who does not match up to us is a downward comparison. This type of comparison can give us priority and maintain our good image (Wills, 1981).

As previously mentioned, the social comparison information of the same meaning can be described in different ways. The different expressions can be illustrated in

Correspondence: Xiaofei Xie, Department of Psychology, Peking University, No. 5 Yiheyuan Road, Beijing 100871, China. Email: xiaofei@pku.edu.cn

Received 10 May 2016; revision 24 February 2017; accepted 28 February 2017

two aspects. First, the order of objects to be compared is different. For example, when we actively compare with someone in an upward comparison, we could say 'he/she is better than me' or 'I am worse than him/her'. The former expression compares others (he/she) to me, and the latter compares me to others. The second difference is the framing of the two expressions. The former expression is a positive framing (i.e. 'better'), while the latter is a negative framing (i.e. 'worse').

Then, do the different expressions of the same comparison information have different impacts on our satisfaction? And if a difference does exist, is it caused by the different orders of objects or by different framings? We will discuss those two aspects in the following sections.

Subject versus referent: Different orders of the objects

When comparing two objects, researchers found that the different orders of the objects would influence judgment of the similarity between the objects. Specifically, if two objects differ in prominence or centrality, people would see less similarity when a more prominent object is compared with a less prominent object than *vice versa*. It is called the direction of comparison asymmetry effect (Tversky, 1977; Tversky & Gati, 1978).

For example, for the two questions 'How similar is he to me?' and 'How similar am I to him?', researchers have found that the former question would make people feel greater similarity between the two subjects of the questions (i.e. 'he' and 'me') (Holyoak & Gordon, 1983; Srull & Gaelick, 1983). The reason for this is that the self ('I/me') is more prominent than others ('he/she'): the self-reference effect demonstrates that an individual processes self-relevant information more deeply than other information (Rogers, Kuiper, & Kirker, 1977), which may be the result of an individual's high sensitivity toward the self (Markus & Wurf, 1987).

Why does the direction of comparison asymmetry effect exist? An explanation comes from the perspective of linguistic pragmatics (e.g. Levinson, 1983; Schwarz, 1994). Linguistic researchers demonstrated that the referent is more prominent, common, and familiar than the target (e.g. Gleitman, Gleitman, Miller, & Ostrin, 1996; Levinson, 1983; Schwarz, 1994). Consequently, in comparative statements, individuals tend to put the more prominent object into the second place, namely as the referent (Bowdle & Gentner, 1997; Tversky, 1977; Tversky & Gati, 1978), which is an acknowledged pragmatic norm that speakers follow implicitly and automatically. If people violate the pragmatic norm (namely, if a clearly less prominent object is placed in the referent position), it may cause uncertainty. When people perceive

a statement as unclear and uncertain, they would make more extreme judgments, such as judging the difference between two objects to be larger, which gives rise to the direction of comparison asymmetry effect (Levinson, 1983; Roese, Sherman, & Hur, 1998; Schwarz, 1994). Although it is commonly referred to as 'direction of comparison asymmetry effect' in the previous literature, we use 'social comparison direction' to express upward and downward comparisons. Therefore, in order to avoid unnecessary confusion about the two 'directions', we refer to this effect as the 'referent effect' in this paper since direction of comparison asymmetry effect is to some extent caused by the influence of the referent.

Previous studies support that individuals use the self habitually as the referent in similarity judgments (Catrambone, Beike, & Niedenthal, 1996; Karyłowski, 1990). That is to say, people prefer the expression 'he/she is better than me' (comparison of others with the self) rather than 'I am worse than him/her' (comparison of the self with others). Therefore when we compare the self with others, the less prominent object 'him/her' is placed as the referent, so the statement would seem uncertain and unclear to individuals.

We propose that if we find the statement more uncertain, we have a stronger motivation to deeply process and comprehend the information, because social comparison information is very important to us. Social comparison is an old evolutionary process and a very strong instinct (Gilbert, Price, & Allan, 1995). Moreover, in many aspects of our social life, evaluations of ourselves matter the most when compared with others (Swencionis & Fiske, 2014). Thus, when the important information is expressed in an unclear and vague way, we have great concerns about it, and a strong motivation to process it.

In summary, compared with the expression 'he/she is better/worse than me', individuals would perceive the expression 'I am better/worse than him/her' as less clear and, thus, have a higher motivation to process the information.

The influence of motivation to process the information on satisfaction

When people have a higher motivation of information processing, how is individual satisfaction affected? We assume that the higher the motivation to process the social comparison information, the more comprehensively and deeply individuals process it. Therefore, individuals would be more affected by the comparison results.

The Elaboration Likelihood Model (ELM) has the potential to support our assumption. The model illustrates

two possible routes to process information: one is the central route, which is used to deliberate points and materials related to the information, and the other is the peripheral route, through which we use limited cognitive resources to process information in a simpler way (Petty & Cacioppo, 1986; Petty & Wegener, 1999). Which route an individual uses depends on one's motivation and capacity (Mick, 1992; Petty & Cacioppo, 1986). Accordingly, people with a higher motivation to process the information would use the central route and, therefore, have deeper and more careful information processing. In that case, social comparison results would have greater impacts on individuals' satisfaction. Specifically, in upward comparisons, if we have strong motivation to process the information, we would feel that we are much worse than others; therefore, our satisfaction with ourselves decreases more. Similarly, in downward comparisons, the higher motivation for information processing would make us think that we are much better than others, so we are more satisfied with ourselves.

Based on the above-mentioned evidence, compared with the expression such as 'he/she is better/worse than me' (as the expresser of the comparison result) or 'he/she is better/worse than you' (as the receiver of the comparison result), the expression 'I am better/worse than him/her' or 'you are better/worse than him/her' is perceived as more uncertain and leads to a higher motivation for individuals to process the social comparison information. Accordingly, individuals would process the information more deeply and carefully, and the social comparison results would have a greater influence on individuals' satisfaction. Therefore, we assume that the referent effect would be:

H1: In upward comparisons, compared with the expression 'he/she is better than me/you' individuals' satisfaction would be lower with the expression 'I am/you are worse than him/her'.

H2: In downward comparisons, compared with the expression 'he/she is worse than me/you', individuals' satisfaction would be higher with the expression 'I am/you are better than him/her'.

H3: The motivation of information processing mediates the relationship between different expressions and satisfaction; specifically, in the same comparison direction (i.e. upward or downward comparison), individuals have higher motivation to process the information with the referent 'him/her' (e.g. 'I am better/worse than him/her') than that with the referent 'me' (e.g. 'he/she is better/worse than me'), and the higher motivation predicts lower satisfaction in upward

comparison (H3a) and higher satisfaction in downward comparison (H3b).

Better versus worse: Different framings

In addition to the referent of the sentence being different in the expressions, there is another difference between the expressions – 'better' or 'worse'. In the next step, we would like to explore another hypothesis: could the difference between 'better' and 'worse' also influence individuals' satisfaction?

The difference between 'better' and 'worse' is one of the famous framing effects (Tversky & Kahneman, 1981) – attribute framing. Attribute framing is the phenomenon that occurs when a determinant attribute of an object or an event is expressed with positive or negative framing and then results in a change in the individual's preference for the object or the event (Levin, Schneider, & Gaeth, 1998). An individual often has a negative bias – the decision maker is influenced both by positive and negative framings but would focus more on negative information relatively – survival requires us to pay urgent attention to possible bad outcomes (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), so bad things would have more of an impact on individuals than good things (e.g. Ito, Cacioppo, & Lang, 1998; Kanouse, 1984; Rozin & Royzman, 2001). Therefore, people would focus more on negative information and also have a higher motivation to process negative information than positive information. Therefore, as we assumed previously, when individuals have a higher motivation for information processing, the social comparison information would have bigger impacts on individuals' satisfaction.

In conclusion, we assume that individuals have a higher motivation to process expressions with negative framings (i.e. 'worse'), and thus negative framings would influence their satisfaction more than negative framings (i.e. 'better'). Therefore, we hypothesize that different framings could affect individuals' satisfaction (i.e. framing effect):

H4: In downward comparisons, compared with the expression 'he/she is worse than me/you', individuals' satisfaction would be lower with the expression 'I am/you are better than him/her'.

Additionally, we assume that an individual's motivation to process the information functions as a mediator, as in Hypothesis 3 we proposed previously.

Which effect is stronger?

Based on our assumptions, if the same comparison information is expressed in different ways, only the subtle

difference in the expression would lead to our different levels of satisfaction. However, which one actually causes the difference in satisfaction – the referent effect or the framing effect?

We can see from our above hypotheses that in upward comparisons, the referent effect and framing effect influence individuals' satisfaction in the same direction (Hypothesis 1). In downward comparisons, however, in Hypotheses 2 and 4, an individual's satisfaction is influenced in the opposite direction. The patterns of the predictions from the two effects are presented in Figures 1 and 2.

As can be seen from Figures 1 and 2, by comparing the impacts of different comparative statements on individuals' satisfaction in downward comparisons, we can find out whether the referent effect or framing effect has influence and, further, which one has a greater impact. For example, if compared with the expression 'he is better than me/you', the expression 'I am/you are worse than him' makes an individual feel more satisfied (i.e. supporting Hypothesis 2), then the results suggest that the referent effect is stronger, or even if the framing effect has an influence, the influence is eliminated by the referent effect.

To the best of our knowledge, the present research is not only the first to consider the competition between the referent effect and framing effect. It is also the first to combine the effects of comparative statements with the motivation to process the information.

The present research

Four studies were conducted to explore whether the referent effect or the framing effect could influence individuals' satisfaction after they know the results of the social comparison.

We conducted two studies (Studies 1 and 2) from the perspective of the expresser of the comparison

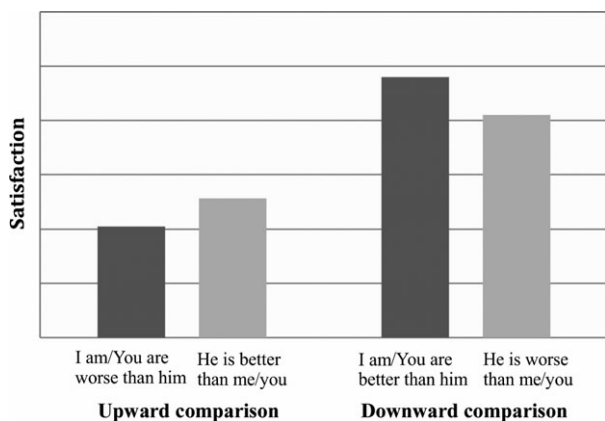


Figure 1 The patterns of the predictions from the referent effect.

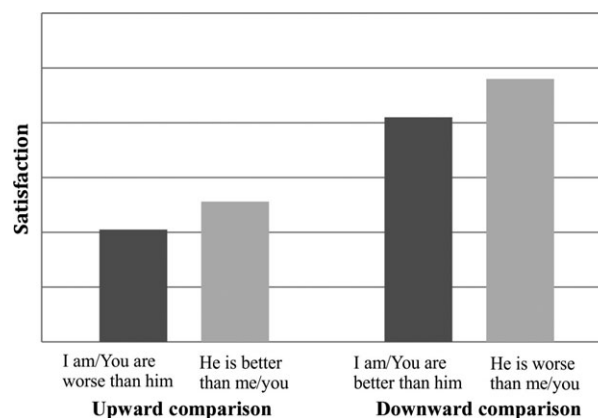


Figure 2 The patterns of the predictions from the framing effect.

information (e.g. 'I am better than him' or 'he is worse than me') and two studies (Studies 3 and 4) from the perspective of the receiver (e.g. 'you are better than him' or 'he is worse than you') to test Hypotheses 1, 2, and 4. Also, we measured individuals' motivation to process the information as the mediator (Studies 2 and 4) to test Hypothesis 3.

Study 1

Method

Participants and design. One hundred and twenty-eight students visiting the library at Peking University participated in our study (55 men, 69 women, 4 did not report their gender, $M_{age} = 21.42$ years, $SD = 2.89$).

The study was a between-group design with two independent variables: social comparison direction (upward comparison versus downward comparison) and subject of the sentence (self versus other). Both of them had two levels, which led to four conditions: 'I am worse than him', 'he is better than me', 'I am better than him' and 'he is worse than me'.

Procedure and materials. Participants were asked to read and imagine a social comparison scenario about interpersonal skills. The scenario instructed participants to picture themselves as a third-year undergraduate who was chosen to be an exchange student to the USA with a classmate – Hua. Then, from this point, there were four conditions with different scenarios. Participants in the 'he is better than me' condition would learn that in five aspects of interpersonal skills (e.g. communicating with strangers), Hua was better than 'me'. Participants in the other three conditions would read 'I am worse than Hua', 'Hua was worse than me', and 'I am better than Hua' respectively, in these five aspects.

Afterwards, participants were asked to copy sentences describing the difference between two individuals. Then, they finished the manipulation check: 'In the scenario, for interpersonal skills, Hua is _____(better/worse) than you (in "he is better/worse than me" conditions)/you are _____(better/worse) than Hua (in the other two conditions).'

Then we measured participant's satisfaction with two questions both on seven-point scales: 'Are you satisfied with your interpersonal skills in the scenario?' (1 = *very unsatisfied*, 7 = *very satisfied*) and 'What is your evaluation of yourself on interpersonal skills?' (1 = *very bad*, 7 = *very good*). The average score of the two questions was used as the dependent variable ($r = .87$). Finally, participants completed demographic information (i.e. gender, age and grade).

Results

Twenty-three participants failed the manipulation check and were excluded, so 105 participants were included in our analyses (37 men, 66 women, 2 did not report their gender, $M_{\text{age}} = 21.41$ years, $SD = 1.85$). A 2 (social comparison direction: upward comparison versus downward comparison) \times 2 (subject of the sentence: self versus other) between-group design analysis of variance (ANOVA) was conducted on participants' satisfaction. The demographic variables were not significantly correlated to the dependent variable, and therefore were excluded from all analyses. Similar results were obtained when they were included in the analyses.

Satisfaction. The results revealed a significant main effect for social comparison direction ($F_{1,100} = 66.20$, $p < .001$, $\eta_p^2 = .40$), showing that satisfaction in downward comparison ($M = 4.80$, $SD = 1.15$) was higher than that in upward comparison ($M = 3.32$, $SD = .85$). The main effect for subject did not reach statistical significance ($F_{1,100} = .60$, $p = .439$, $\eta_p^2 = .006$).

More importantly, a significant two-way interaction existed ($F_{1,100} = 11.72$, $p = .001$, $\eta_p^2 = .11$), as shown in Figure 3. We conducted the simple effect analysis to further analyze this interaction. Results demonstrated that in upward comparison, participants were more satisfied in the 'he is better than me' condition ($M = 3.56$, $SD = .74$) than in the 'I am worse than him' condition ($M = 3.05$, $SD = .91$), $F_{1,46} = 4.62$, $p = .037$, $\eta_p^2 = .09$. However, in downward comparison, the satisfaction in the 'I am better than him' condition ($M = 5.28$, $SD = 1.18$) was significantly higher than in the 'he is worse than me' condition ($M = 4.47$, $SD = 1.02$), $F_{1,54} = 7.57$, $p = .008$, $\eta_p^2 = .12$, supporting Hypotheses 1 and 2 (i.e. referent effect), but not Hypothesis 4 (i.e. framing effect).

Discussion

Study 1 tested our hypotheses in social comparison about interpersonal skills. The result confirmed our assumption that different expressions would affect individual's satisfaction. Moreover, the result in downward comparison suggests that the influence was caused by different referents, but not different framings.

Study 2 aimed to again confirm the referent effect (i.e. Hypotheses 1 and 2) in a different social comparison scenario – academic achievement. Furthermore, we measured individual's motivation to process information as the mediation variable to test Hypothesis 3.

Study 2

Method

Participants and design. One hundred and sixty-eight students from Peking University (71 men, 89 women, 8 did not report their gender, $M_{\text{age}} = 21.82$ years, $SD = 3.05$) participated in our study.

As for Study 1, this study was a between-group design with two independent variables: social comparison direction (upward comparison versus downward comparison) and subject (self versus other).

Procedure and materials. Participants were asked to read and imagine a social comparison scenario about academic achievement. In this scenario, the participant was an undergraduate and chose the same public course with a classmate, Zhang. For the score of the final exam, there were four conditions. Participants in the 'he is better than me' condition would read: 'Zhang got 10 points higher than me'. Participants in the other three conditions would read: 'I got 10 points lower than Zhang',

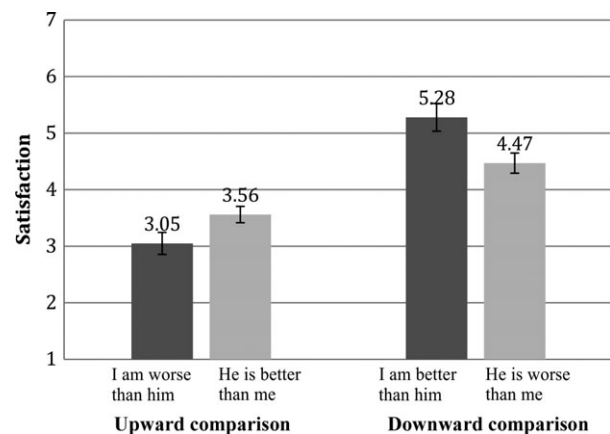


Figure 3 The results of satisfaction in four conditions in Study 1. Bars indicate standard errors.

'Zhang got 10 points lower than me', and 'I got 10 points higher than Zhang', respectively.

Then participants were asked to copy sentences describing the difference between two persons. After that they finished the manipulation check: 'In the scenario, Zhang got _____ points higher/lower than you (in "he is better/worse than me" conditions)/you got _____ points higher/lower than Zhang (in the other two conditions).' Next, participant's satisfaction was measured with two questions: 'Are you satisfied with your exam score in the scenario?' (1 = *very unsatisfied*, 7 = *very satisfied*) and 'What is your evaluation of your exam score?' (1 = *very bad*, 7 = *very good*). We used the average score of the two questions as the dependent variable ($r = .79$).

Afterwards, we measured individual's motivation to process the information with four items from the motivation dimension of the depth of information processing questionnaire (Wolski & Nabi, 2000). The Cronbach's alpha coefficient of the four items was .76. The items were on seven-point scales ranging from '1 = *strongly disagree*' to '7 = *strongly agree*.' The four items were: 'This issue is interesting to me', 'I was interested in the article content', 'I don't find this issue very interesting' (reverse coded), and 'I was motivated to read this article'.

We also measured how difficult it is for participants to imagine the scenario on a seven-point scale (1 = *very difficult*, 7 = *very easy*). Finally, their demographic information was collected (i.e. gender, age, and grade).

Results

Two participants failed the manipulation check, three answered questions carelessly (i.e. rated them identically across items), and one did not complete measures for the dependent variable, so they were excluded from the analyses, which led to a total of 162 participants (68 men, 86 women, and 8 did not report their gender, $M_{\text{age}} = 21.78$ years, $SD = 3.07$). We conducted a 2 (social comparison direction: upward comparison versus downward comparison) \times 2 (subject of the sentence: self versus other) ANOVA. Participants' gender composition differed in the different groups, and therefore was included in the analyses as a control variable. Other variables were neither significantly different in groups nor correlated to the dependent variable, so they were excluded. Whether the variables were controlled or otherwise did not influence the significance of the results.

Satisfaction. There was a significant main effect for social comparison direction, $F_{1,149} = 178.52$, $p < .001$, $\eta_p^2 = .55$, suggesting that people were more satisfied in downward comparison ($M = 5.14$, $SD = .886$) than in

upward comparison ($M = 3.24$, $SD = .96$). The results revealed no significant main effect for subject, $F_{1,149} = .35$, $p = .556$, $\eta_p^2 = .002$.

Crucially, the results yielded a significant two-way interaction, $F_{1,157} = 11.72$, $p = .001$, $\eta_p^2 = .07$, as shown in Figure 4. Further analyses showed that in upward comparison, participants had higher satisfaction in the 'he is better than me' condition ($M = 3.51$, $SD = .94$) than in the 'I am worse than him' condition ($M = 2.95$, $SD = .90$), $F_{1,80} = 7.65$, $p = .007$, $\eta_p^2 = .09$. In downward comparison, however, participants were more satisfied in the 'I am better than him' condition ($M = 5.26$, $SD = .97$) than in the 'he is worse than me' condition ($M = 4.85$, $SD = .80$), $F_{1,78} = 4.45$, $p = .038$, $\eta_p^2 = .054$, which supported our assumption in Hypotheses 1 and 2, but not Hypothesis 4.

Motivation to process the information (mediation). We next tested whether the effect of different expressions on satisfaction is statistically mediated by motivation of information processing. The participant's degree of difficulty to imagine the scenario was correlated with motivation, and therefore was included in the analyses as a control variable.

In upward comparison, as Figure 5 illustrates, the standardized regression coefficient between subject (0 = *the self* and 1 = *other*) and motivation was significant, as was the standardized regression coefficient between motivation and satisfaction. The standardized indirect effect was $(-.30)(-.25) = .08$. Then we used bootstrapping procedures from Hayes (2013) to test the significance of this indirect effect. The 5000-resample bootstrap showed that the unstandardized indirect effect was .45, and the 95% confidence interval (CI) ranged from .0072, .6015, supporting the mediation role of motivation in upward comparison (i.e. Hypothesis 3a).

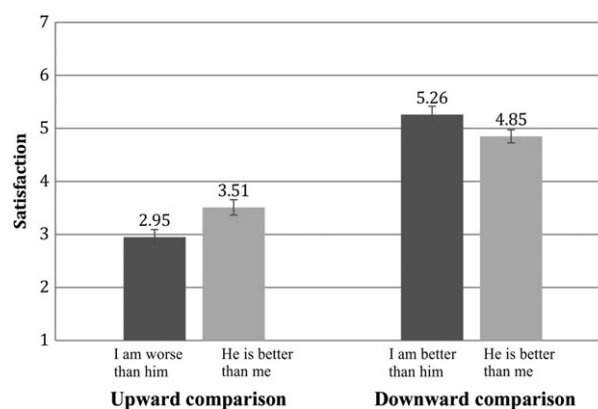


Figure 4 The results of satisfaction in four conditions in Study 2. Bars indicate standard errors.

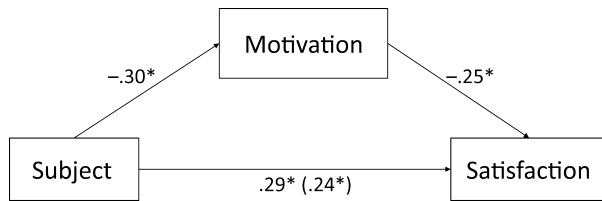


Figure 5 Standardized regression coefficients for the relationship between subject and satisfaction as mediated by motivation to process the information in the upward comparison in Study 2. The standardized regression coefficient between subject and satisfaction, controlling for motivation, is in parentheses. * $p < .05$.

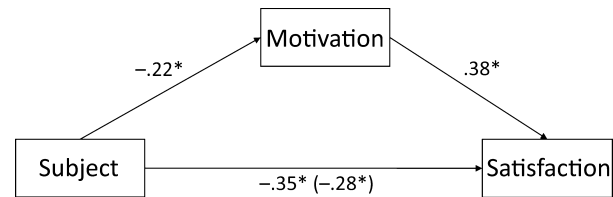


Figure 6 Standardized regression coefficients for the relationship between subject and satisfaction as mediated by motivation to process the information in the downward comparison in Study 2. The standardized regression coefficient between subject and satisfaction, controlling for motivation, is in parentheses. * $p < .05$.

In downward comparison, the standardized indirect effect was $(-.22)(.38) = -.08$ (as shown in Fig. 6). The 5000-resample bootstrap revealed a significant indirect effect of the subject expressions on satisfaction through motivation (unstandardized indirect effect was $-.16$, and 95% CI was $[-.4748, -.0197]$) (i.e. Hypothesis 3b was supported).

Discussion

Study 2 tested our hypotheses in a social comparison scenario of academic achievement. The result again supported Hypotheses 1 and 2, that referent effect could affect individuals' satisfaction. Furthermore, we confirmed the mediation role of motivation to process the information (Hypothesis 3).

Studies 1 and 2 supported our assumptions from the perspective of the expresser of the social comparison result (e.g. 'I am better than him'). Studies 3 and 4 aimed to test whether referent effect can still be effective from the perspective of the receiver of the comparison result (e.g. 'you are better than him' or 'he is worse than you'). In our daily life, telling one's comparison result to others (using 'I/me') and receiving the result from others (using 'you') are both common situations. Previous studies do not strictly distinguish between these two perspectives. For instance, researchers use both 'you' (or 'yourself') and 'I' (or 'myself') in the same material when conveying the comparison information (e.g. Hodges, Bruininks, & Ivy, 2002; Hoorens, 1995). Because the first and the second person points of view are somehow different (e.g. the second-person 'you' may be more objective than the first-person 'I'; Stanghellini & Lysaker, 2007; Varela & Shear, 1999), it is necessary to examine the referent effect separately from two perspectives. However, we assume that the two perspectives did not differ, because the effects of linguistic pragmatics and motivation still exist in the receiver's perspective.

Also, Study 3 was a laboratory study in which the participant completed a task with another participant and actually received the social comparison result between them. With the real comparison, we could more precisely measure their satisfaction after knowing the comparison information.

Study 3

Method

Participants and design. The participants comprised 106 students of Peking University (39 men, 67 women, $M_{\text{age}} = 22.20$ years, $SD = 3.39$) who were recruited through a campus bulletin board system. They received small monetary incentives for participating in the study.

It was a 2 (social comparison direction: upward comparison versus downward comparison) \times 2 (subject of the sentence: self versus other) between-group design. Participants were randomly assigned to one of four conditions: 'you are worse than him', 'he is better than you', 'you are better than him' and 'he is worse than you'.

Procedure and materials. Two participants arrived at the laboratory at the same time. They sat at opposite sides of a table, facing each other. They were told the following: the study aimed to explore the impact of a competitive situation on task performance, they would answer some questions of general knowledge, and they would be paid differently according to their performance. They should complete the task all by themselves and they were not allowed to communicate with each other.

Participants then individually answered 25 questions of general knowledge on a computer without a time limitation. Each question had four options, and only one was correct. After both participants completed the task, the experimenter pretended to check their results on another computer (without participants seeing the

screen). Then the experimenter wrote down the comparison result and handed the paper to participants separately. The information on the paper was 'The correct rate of the other person is 16% higher than you' ('he is better than you' condition), 'The correct rate of you is 16% higher than another person' ('you are better than him' condition), 'The correct rate of another person is 16% lower than you' ('he is worse than you' condition), or 'The correct rate of you is 16% lower than another person' ('you are worse than him' condition).

One of each pair was randomly assigned to one of the four conditions above, and another participant was assigned to a corresponding condition that had a different comparison direction but the same result. For example, if one participant received the comparison result that 'The correct rate of another person is 16% higher than that of you' ('he is better than you' condition), then correspondingly another participant would receive the result that 'The correct rate of another person is 16% lower than that of you' ('he is worse than you' condition).

Then participants completed the manipulation check: 'The correct rate of another person is ____% higher/lower than you' or 'The correct rate of you is ____% higher/lower than another person', which was consistent with the condition they were assigned to. Then we measured participant's satisfaction ('Are you satisfied with your performance in the knowledge test?' and 'What is your evaluation of your performance in the knowledge test?') both on seven-point scales in a similar manner as in Study 1. The average score of the two questions was used as the dependent variable ($r = .78$).

Next, we measured participants' demographic information. Finally, they were debriefed and thanked.

Results

Five participants were excluded from the analyses, because they failed the manipulation check. As a consequence, 101 participants were included in our analyses (35 men, 66 women, $M_{\text{age}} = 21.97$ years, $SD = 3.17$).

A 2 (social comparison direction: upward comparison versus downward comparison) \times 2 (subject: self versus other) ANOVA was conducted. The demographic variables were not significantly correlated with the dependent variable. Therefore, they were not included in the following analyses.

Satisfaction. We found a significant main effect for social comparison direction, $F_{1,97} = 6.99$, $p = .01$, $\eta_p^2 = .067$, suggesting that participants had higher satisfaction in downward comparison ($M = 4.25$, $SD = 1.20$) than in upward comparison ($M = 3.66$, $SD = 1.14$). The main effect for subject did not reach significance, $F_{1,97} = 1.49$, $p = .226$, $\eta_p^2 = .015$.

More importantly, the results showed a significant two-way interaction, $F_{1,97} = 4.40$, $p = .043$, $\eta_p^2 = .07$, as Figure 7 illustrates. Further analyses revealed that in upward comparison, participants were more satisfied in the 'he is better than you' condition ($M = 3.76$, $SD = 1.05$) than in the 'you are worse than him' condition ($M = 3.56$, $SD = 1.23$), but the difference did not reach significance, $F_{1,48} = 3.83$, $p = .54$, $\eta_p^2 = .008$, which failed to support Hypothesis 1. However, in downward comparison, individuals had higher satisfaction in the 'you are better than him' condition ($M = 4.64$, $SD = 1.15$) than in the 'he is worse than you' condition ($M = 3.88$, $SD = 1.14$), $F_{1,49} = 5.53$, $p = .023$, $\eta_p^2 = .101$, which was consistent with Hypothesis 2.

Discussion

Study 3 was conducted in a competitive situation, measuring participants' actual satisfaction after they receive their own comparison result, which is more real and accurate. The results partly supported the referent effect (Hypothesis 2) from the perspective of the information receiver.

However, participants' satisfaction did not differ between the two expressions in upward comparison, which failed to confirm Hypothesis 1, and was also inconsistent with the findings in Studies 1 and 2. Maybe it is because Study 3 was conducted from the perspective of the information receiver, which differs from the perspective of the expresser in Studies 1 and 2. Previous studies have demonstrated that when others express comparison information, people are more self-protective (Lemyre & Smith, 1985; Morse & Gergen, 1970). Furthermore, people in upward comparison make more

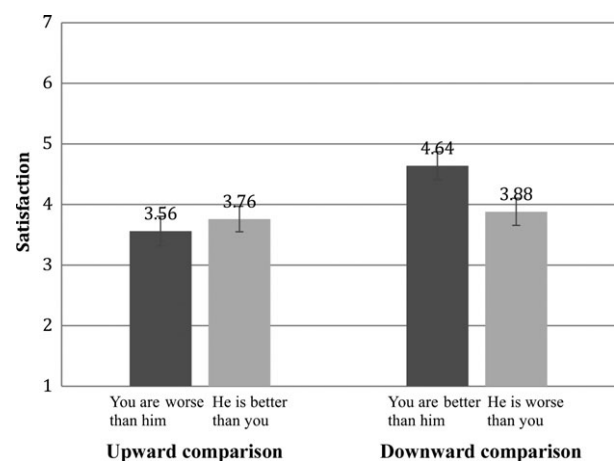


Figure 7 The results of satisfaction in four conditions in Study 3. Bars indicate standard errors.

effort to protect their self-esteem (Diener, 1984; Marsh & Parker, 1984; Morse & Gergen, 1970). Therefore, people may not express their negative feelings too much in upward comparison (e.g. report their dissatisfaction with themselves), in order to self-protect.

Study 4 was conducted to again confirm the results from the perspective of the information receiver. Also, we aimed to measure participants' motivation to test the mediation role.

Moreover, all of the studies outlined so far were conducted in Chinese. Although the Chinese sentence for 'you are better than him' is different from the English sentence (the structure of the Chinese sentence is like 'you than him are better'), Chinese has a similar sentence structure (e.g. the target is in the first place and the referent is second; the target comes earlier than the framing). Therefore, we assumed that the referent effect also exists in English.

Study 4

Method

Participants and design. One-hundred and fifty-nine participants (78 men, 81 women, $M_{\text{age}} = 32.96$ years, $SD = 9.86$) recruited through the online service Mechanical Turk completed the experiment on the internet in exchange for a small payment.

This study was also a between-group design with two independent variables: social comparison direction (upward comparison versus downward comparison) and subject (self versus other), which resulted in four conditions: 'you are worse than him', 'he is better than you', 'you are better than him' and 'he is worse than you'.

Procedure and materials. In a similar manner as Studies 1 and 2, participants were asked to imagine a social comparison scenario. In the scenario, the participant and a colleague, Jason, were evaluated by their boss in an annual performance appraisal. Participants in the 'he is better than you' condition would read that Jason had a better evaluation than 'you'. Participants in the other three conditions would read 'you were worse than Jason', 'Jason was worse than you' and 'you were better than Jason' respectively.

After reading the scenario, participants were asked to complete the manipulation check, the mediation variable (i.e. four items of the motivation to process the information as the same manner as in Study 2, Cronbach's $\alpha = .85$), the dependent variable (two satisfaction items as the same as in Study 3, $r = .87$), two control variables (i.e. participants' degree of difficulty to imagine the scenario, and the importance of annual

performance appraisal in their real life). Finally, we collected their demographic variables.

Results

One participant failed the manipulation check, so there were 158 effective participants left (78 men, 80 women, $M_{\text{age}} = 33.01$ years, $SD = 9.87$). A 2 (social comparison direction: upward comparison versus downward comparison) \times 2 (subject of the sentence: self versus other) ANOVA was conducted. The control variables and demographic variables had no difference between groups, and therefore were excluded from the analyses. Whether or not they were included in the following analyses did not change the significance of the results.

Satisfaction. We found a significant main effect for social comparison direction, $F_{1,154} = 248.59$, $p < .001$, $\eta_p^2 = .62$, indicating that participants had higher satisfaction in downward comparison ($M = 5.77$, $SD = 1.21$) than in upward comparison ($M = 2.64$, $SD = 1.33$). Also, a main effect for subject emerged, $F_{1,154} = 4.00$, $p = .047$, $\eta_p^2 = .025$.

More importantly, the results showed a significant two-way interaction, $F_{1,154} = 4.94$, $p = .028$, $\eta_p^2 = .031$. As we see in Figure 8, in upward comparison, the satisfaction of participants in the 'he is better than you' condition ($M = 2.66$, $SD = 1.13$) and 'you are worse than him' condition ($M = 2.62$, $SD = 1.53$) had no difference, $F_{1,76} = .02$, $p = .89$. As in Study 3, the result failed to support Hypothesis 1. However, in downward comparison, participants had higher satisfaction in the 'you are better than him' condition ($M = 6.19$, $SD = 1.01$) than in the 'he is worse than you' condition ($M = 5.35$, $SD = 1.27$), $F_{1,78} = 10.68$, $p = .002$, $\eta_p^2 = .12$, which again supported Hypothesis 2.

Motivation to process the information (mediation). Next, we tested the mediation role of motivation in the downward comparison. Participants' age was significantly correlated with motivation, and therefore age was included as a control variable in the following analyses.

As shown in Figure 9, the subject (we coded as $0 = \text{the self}$ and $1 = \text{other}$) could predict motivation, $\beta = -.24$, $t = -2.15$, $p = .035$. Furthermore, we found that motivation was positively correlated with satisfaction, $\beta = .40$, $t = 3.80$, $p < .001$. Therefore, the standardized indirect effect was $(-.24)(.40) = -.10$. Then we tested the significance of this indirect effect using bootstrapping procedures. A 5000-resample bootstrapped unstandardized indirect effect was $-.19$, and the 95% confidence interval ranged from $-.5106$, $-.0288$. Thus, the indirect effect was statistically significant (i.e. supporting Hypothesis 3b).

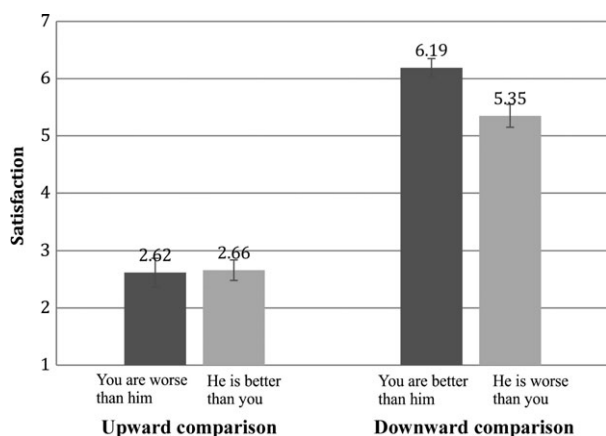


Figure 8 The results of satisfaction in four conditions in Study 4. Bars indicate standard errors.

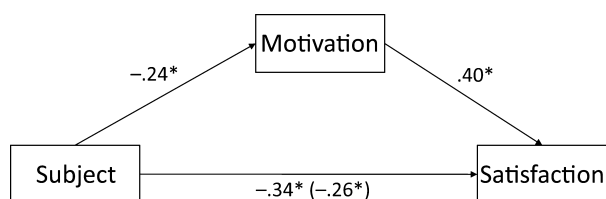


Figure 9 Standardized regression coefficients for the relationship between subject and satisfaction as mediated by motivation to process the information in the downward comparison in Study 4. The standardized regression coefficient between subject and satisfaction, controlling for motivation, is in parentheses. * $p < .05$.

Discussion

Study 4 again replicated the results of Study 3, revealing that the referent effect only existed in downward comparisons from the perspective of the information receiver. Furthermore, the study confirmed that the effect was not only found in Chinese, but in English as well.

General discussion

The results of the four studies showed that different expressions of the same comparison information could affect individuals' satisfaction after they knew the comparison results. Specifically, in downward comparisons, the expression 'I am/you are better than him' makes individuals feel more satisfied than the expression 'he is worse than me/you' (Studies 1–4); In upward comparisons, people subject to the expression 'I am worse than him' were less satisfied than those subject to the expression 'he is better than me' (Studies 1 and 2). Also, the results supported the mediation role of motivation to process the social comparison information (Studies 2 and 4).

To the best of our knowledge, the present research is the first to simultaneously consider both different orders of the objects to be compared (Tversky, 1977) and different framings (Tversky & Kahneman, 1981). Although the framing effect is a widely established effect, based on the results in downward comparison, our study found that direction of comparison asymmetry effect (i.e. what we have called 'referent effect' in this paper) had a greater impact than the framing effect. There may be two possible reasons to explain this: first, studies about language structure have demonstrated that the subject is the most salient in a sentence (Langacker, 1991; Ungerer & Schmid, 2001). That is to say, the salience of the subject would attract individuals' attention, which makes people focus more on the orders of the objects (i.e. I/you versus he/she) rather than the framing (i.e. better versus worse). Second, because we are used to reading a sentence from left to right, the different orders of the objects will be seen earlier and therefore be processed earlier than the framing. The earlier impact of the referent effect would probably influence or suppress the framing effect.

Also, the present research sheds new light on various studies of the effects of different comparative statements since Tversky's (1977) seminal work on this topic. For instance, except for the general self–other similarity judgments mentioned previously (Holyoak & Gordon, 1983; Srull & Gaelick, 1983), previous studies have found asymmetry in other kinds of judgments, such as personal traits (Hodges *et al.*, 2002; Hoorens, 1995; Karyłowski, 1990), optimism for positive future events (Hoorens, 1995), and preference (Houston, Sherman, & Baker, 1989). Also, researchers examined how individuals respond to different statements (Hoorens & Bruckmüller, 2015), such as agreeing more with the opinions (Studies 4, 5, and 7), considering the statements to be true (Study 6).

Our findings differ from these effects in that instead of focusing on individual's judgment and attitude towards the statements, we examined the individual's attitude towards oneself (i.e. the satisfaction with oneself after knowing the comparison result). However, the present study combined the motivation to process the information with the effects of comparative statements. Hoorens and Bruckmüller (2015) found that people used 'more than' statements more often than 'less than' statements, because the latter were harder to process (lower cognitive fluency). However, their study mainly focused on the comparison between two individuals, not the comparison between the self and others. When it comes to the comparative statements including the self, the motivation to process the social comparison may surpass cognitive fluency, because social comparison matters (Swencionis & Fiske, 2014).

Furthermore, the study extends prior studies in the linguistic area into social comparison, further supporting

the effect of cognitive linguistics (Lakoff, 1987; Langacker, 1987). Researchers have long studied the factors that impact social comparison (e.g. Buunk & Gibbons, 2007; Wheeler & Miyake, 1992; Wood, 1989). This study found that a tiny difference in our expression may affect social comparison outcomes, leading to a new research area of social comparison.

In Studies 1 and 2, as the information expresser (i.e. 'I/me'), the difference existed in both upward and downward comparisons. However in Studies 3 and 4, as the information receiver (i.e. 'you'), participants' satisfaction only differed in downward comparison, but not in upward comparison. The reason why we did not find results in upward comparisons may be participants' different perspectives. When individuals are the information receiver, that is to say, when others express social comparison information, people are more self-protective (Lemire & Smith, 1985; Morse & Gergen, 1970). We know that upward comparison can cause negative emotion and lower self-evaluation (Diener, 1984; Marsh & Parker, 1984; Morse & Gergen, 1970; Tesser, Millar, & Moore, 1988). Therefore, in upward comparison, especially when negative information is expressed by others, people may not express their negative feelings too much in an effort to protect their self-esteem. Therefore, participants did not report different levels of satisfaction in upward comparison. Future research may confirm this speculation. Moreover, a recent study found that the status of the referent (whether he/she ranked above or below the average) could influence an individual's evaluation about oneself (Zell, Alicke, & Strickhouser, 2015). Especially in upward comparison, individuals evaluated themselves more favourably when the referent was above average than below average. The interaction between referent effect (i.e. the position of the referent) and the referent status is worth studying. In addition, referent status may account for the lack of effect in upward comparison. Furthermore, a few previous studies use both 'you' (or 'yourself') and 'I' (or 'myself') in the same material when conveying the comparison information (e.g. Hodges *et al.*, 2002; Hoorens, 1995). Because the two expressions are somehow different, the mixed use of 'you' and 'I' should be avoided.

The current findings of this study are of practical significance in relation to how to convey comparison information. For people who overmatch others in social comparison (the downward comparison), the expression 'I am better than him' (from the first-person point of view) or 'you are better than him' (from the point of view of the second person) could give individuals more priority and improve satisfaction. For an individual who is negatively impacted in the social comparison (the upward comparison), a change in strategy by saying 'he is better than me' or 'he is better than you', may make

an individual feel more comfortable and less frustrated. However, instead, if we want to encourage and motivate someone to make more effort, we could use the expression 'you are worse than him' to make one feel less satisfied and thus work harder.

We tested the expresser and receiver of the comparison results in different studies, but we did not compare them. Future research could explore whether the same information expressed by oneself (i.e. first-person 'I') and others (i.e. second-person 'you') could have different influences. Because the second-person 'you' may be more objective than the first-person 'I' (Stanghellini & Lysaker, 2007; Varela & Shear, 1999), difference may exist on the different indicators.

Acknowledgements

This research was financially funded by the General Programs (71172024 & 71472005) and Key Program (91224002) of National Natural Science Foundation of China.

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