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SOCIAL PSYCHOLOGY | RESEARCH ARTICLE

Pragmatic inferences and self-relevant judgments: The moderating role of age, prevention, focus, and need for cognition

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Abstract: Three studies examined the influence of type of scale on self-relevant judgments and the moderating role of age, prevention, focus, and need for cognition. Participants were randomly assigned to a bipolar or a unipolar scale condition in all three studies. Results from study 1 with a representative sample of the adult population of Mexico showed that participants evaluated themselves more positively on a bipolar than a unipolar scale. Age did not moderate this relationship. Results from studies 2 and 3 also showed a significant influence of type of scale on self-relevant judgments. Prevention focus and need for cognition did not moderate the relationship between type of scale and self-relevant judgments. The theoretical and applied implications of our results were discussed.

Subjects: Applied Social Psychology; Social Cognition; Social Psychology

Keywords: context effects; assimilation; contrast; scale use; situated cognition

1. Introduction

It is a psychological truism that human judgments are context dependent. How successful one has been in life depends not only on the specific achievements one has obtained, but also on the pragmatic meaning one makes of the response scale (Uskul, Oyserman, Schwarz, Lee, & Xu, 2013). Continuing with the increased attention given to the situated nature of cognition as a result of pragmatic inferences, we conduct three experiments to examine the effect of type of scale on judgments about the self among participants from a collectivistic culture of honor such as Mexico (study 1, study 2, and study 3). In addition, we also test for the moderating role of age, prevention, focus, and need for cognition on the relationship between type of scale and self-relevant judgments (studies 1,



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Rogelio is the José Cuervo professor of marketing at Universidad Anahuac México Norte. Rogelio uses models of situated cognition to understand how people make judgments. The results from this investigation are a part of line of research that has examined context effects in a wide variety of judgments including satisfaction with life, brand, and football players' evaluations, among others. This line of research and the results from this investigation have implications for social psychology, public opinion, and market research.

PUBLIC INTEREST STATEMENT

Public opinion, market research, and social psychology use questionnaires to collect information. Our research sheds light on how individuals use scales to answer questions, which might have implications for designing better questionnaires and obtaining more valid and reliable information. Our results suggest that, when answering questions, individuals make inferences about the meaning of numbers in the scale and adjust their thinking accordingly. Our results are consistent with the idea that judgments are not stored in memory, but rather generated on the spot. Our findings also suggest that the judgments of individuals are more malleable than we often assume when collecting information.

2, and 3). We use the inclusion/exclusion model (Bless & Schwarz, 2010) as our guiding framework. We first review the main concepts postulated by the inclusion/exclusion model before discussing the role of age, prevention, focus, and need for cognition.

2. Context effects: the inclusion/exclusion model

The inclusion/exclusion model has devoted a great deal of attention to examining three filters hypothesized to influence judgments: relevance, representativeness, and conversational norms. Responses to survey questions represent one type of judgment. The focus of our investigation is on the filter of conversational norms (Bless & Schwarz, 2010), which has been used to explain, among other things, order of question effects (Puente-Díaz, 2011, 2014) and response scale use (Uskul et al., 2013). This filter suggests, among other things, that individuals go beyond the literal meaning when answering a question by inferring the pragmatic meaning of the numeric options of a scale. Thus, when answering a question about how successful one has been in life on a scale with negative and positive numbers, a bipolar scale, the pragmatic meaning of negative numbers, might not only be a lack of success but the presence of significant failures as well (Schwarz, Knauper, Hippler, Noelle-Neumann, & Clark, 1991). Pragmatic inferences, however, can be affected by variables known to influence processing capacity, style, and motivation (Bless & Schwarz, 2010) because in order for individuals to be active meaning-makers, they need to have enough working memory capacity (younger vs. older adults), engage in a detailed oriented as opposed to an abstract processing style (prevention as opposed to promotion focus), and have the motivation to process the pragmatic meanings of different scales (need for cognition). Hence, in three studies, we examine the influence of type of scale on self-relevant judgments and the moderating role of age, prevention, focus, and need for cognition. We first review some key studies on scale use before turning our attention to the role of age, prevention, focus, and need for cognition as possible moderators.

3. Empirical investigations

We are able to locate several investigations that examined response scale use. In one of the first investigations conducted more than 20 years ago, researchers examined the influence of type of scale on judgments of success among participants from Germany (Schwarz et al., 1991). Results showed that participants evaluated their success in life more positively when using a bipolar scale, from -5 to +5, than when the response scale had only positive numbers, a unipolar scale. The authors suggested that negative numbers were interpreted as evidence of failure and not as evidence of lack of success, leading to higher ratings when using the bipolar scale.

Some of the same researchers (Schwarz & Hippler, 1995) demonstrated the robustness of their findings when examining the influence of type of scale on evaluations of politicians using different modes of administration, mail survey vs. telephone interview, among participants from Germany. The results showed that politicians obtained better evaluations when the response scale was bipolar than when the scale was unipolar.

Building on these findings, another investigation conducted a conceptual replication to examine the influence of type of scale on judgments of personal and parental success and the success of strangers and the moderating role of cultural mindsets (Uskul et al., 2013). Results showed that participants from collectivistic cultures of honor (e.g. Turkey) and from individualistic cultures (e.g. USA) rated their own success and the success of their parents more positively when using the bipolar scale. Conversely, participants from Confucian-based collectivistic cultures (e.g. China) were insensitive to type of scale. Regarding the judgments of strangers, the results showed a type of scale effect for Chinese and Americans only, lending evidence to the hypothesized interaction between cultural mindset, type of scale, and target of judgment.

This investigation makes at least two significant contributions. First, it shows that scale use changes as a function of cultural mindset. Second, it partially fills a void in the field by conducting research on scale use among participants from a collectivistic culture of honor (Uskul, Oyserman, & Schwarz, 2010). However, this investigation has one important limitation. Even though this investigation filled

a void in the field by examining the influence of type of scale among participants from a collectivistic culture of honor, it used a sample of convenience, *college students*, which limits our ability to generalize the implications of the results. Since scales are used in a wide variety of studies, including market and public opinion research where generalizability is extremely important, we decide to conduct a conceptual replication in study 1 among a representative sample of the adult population of a collectivistic culture of honor such as Mexico. While we believe it is important to test the implications of type of scale with representative samples of the adult population, we also acknowledge that the possible contribution is marginal. Hence, we test for the moderating effect of age and conduct two more experiments testing for the moderating role of prevention, focus and need for cognition. Our goal is to test for three moderators that can be conceptualized as imperfect indicators of information processing capacity (age), style (prevention, focus), and motivation (need for cognition).

4. Age as a moderator

In their literature review of the state of the art of context effects, Bless and Schwarz (2010) focus on variables known to influence processing capacity, style, and motivation as possible moderators. Age could be conceptualized as an indicator of more or less processing capacity since it is well-established that working memory capacity declines with age (Salthouse, 2009). Two investigations that conducted meta-analysis or tested the effects of age with samples of participants from individualistic cultures (Knäuper, 1999; Knäuper, Schwarz, Park, & Fritsch, 2007) found that age moderated context effects. A possible explanation for these results is that as people get older, working memory capacity declines. Working memory capacity is needed in order to make pragmatic inferences (Knäuper et al., 2007). Since study 1 uses a representative sample of the adult population, we are able to test for the moderating effects of age as an indirect, imperfect proxy of information processing capacity.

5. Regulatory focus: prevention, focus as a moderator

Since self-regulatory focus influences information processing styles, it has been proposed as a moderator of pragmatic inferences (Bless & Schwarz, 2010). Regulatory focus theory (Higgins, 1997) suggests that there are two kinds of self-regulatory systems: one that focuses individuals on their responsibilities and safety, prevention, focus, and another one that focuses individuals on their aspirations and accomplishments, promotion focus. Relating self-regulation systems with processing styles, recent developments on self-regulatory mechanisms suggest that a promotion focus might be related to more global, broad oriented type of processing and that a prevention focus might be related to a more local, detailed oriented type of processing (Forster & Higgins, 2005). Global vs. local processing styles also lead to differences in the attention given to the common ground needed to make pragmatic inferences. Consistent with these predictions, two studies found promotion/prevention focus to facilitate/hinder global/local processing (Forster & Higgins, 2005). Since being able to make pragmatic inferences about the type of scale requires paying attention to the possible implications of having a scale with only positive numbers or a scale with negative and positive numbers and self-regulatory focus influences processing style, it follows that promotion/prevention focus might act as moderators of the relationship between scale use and self-relevant judgments. However, the effect of self-regulatory focus on scale use, to our knowledge, has not been widely explored. Hence, study 2 tries to address this limitation by testing for the moderating role of prevention focus, a variable known to lead to a more detailed oriented type of processing, which might facilitate pragmatic inferences.

6. Need for cognition as a moderator

As suggested by Bless and Schwarz (2010) in their discussion of moderators of pragmatic inferences, need for cognition is also a possible moderator since it influences processing motivation. Specifically, need for cognition is an individual difference variable that reflects one's tendency to engage and enjoy information processing (Cacioppo & Petty, 1982). Relating one's information processing motivation with scale use, individuals could make shallow interpretations of the meaning of positive and negative numbers on a scale or they could actively process and infer the possible meanings of negative numbers and choose to avoid the negative side of the scale when answering self-relevant

questions. Since need for cognition captures individual differences in the amount of motivation people have to process information, including making pragmatic inferences of the numbers on a scale, it follows then that it might act as a moderator on the relationship between type of scale and self-relevant judgments. We test this possibility in study 3.

Understanding scale use as an indicator of pragmatic inferences can have important applied implications. First, self-reports are still the most popular way of collecting data. Understanding how individuals make sense of questions and scales can help design better and more reliable assessments. Second, testing and obtaining empirical evidence on the malleability of judgments might help us have more realistic expectations about how individuals actually answer questions in surveys.

In sum, the purpose of the present investigation is twofold. First, we examine the influence of type of scale on self-relevant judgments among a representative sample of the adult population of a culture of honor such as Mexico and among college students from the same culture. Second, we examine, based on a recent integration of context effects (Bless & Schwarz, 2010), the moderating role of age, prevention, focus, and need for cognition on the relationship between type of scale and self-relevant judgments. We propose the following four hypotheses:

- (1) Participants would judge themselves more positively when using the bipolar than when using the unipolar scale (studies 1, 2, and 3).
- (2) The influence of type of scale on self-relevant judgment would only hold at lower levels of age (study 1).
- (3) Participants would judge themselves more positively when using the bipolar than when using the unipolar scale only at high levels of prevention focus (study 2).
- (4) Participants would judge themselves more positively when using the bipolar than when using the unipolar scale only at high levels of need for cognition (study 3).

7. Participants, design, and procedure study 1

The study was conducted with a systematic random sample of 651 (278 females and 373 males; ages 18 or older, $M = 41.71$, $SD = 16.48$) citizens of Mexico with a telephone line. Participants were randomly assigned to one of the two conditions. The same questions were answered in both conditions. The first condition was labeled (the label was only assigned for the sake of clarity in describing the method) as the “bipolar scale condition” and the second as the “unipolar scale condition.”

Bipolar scale condition: In this condition, participants were asked three questions assessing: (1) how successful they have been in their lives, (2) how honest they have been in their lives, and (3) how good their reputation has been. The questions were intended to measure positive attributes related to the self and we referred to the mean of these three questions as self-relevant judgments ($\alpha = .86$). All questions were answered on a scale from -5 (not successful at all, not honest at all, and not very good) to $+5$ (very successful, very honest, and very good).

Unipolar scale condition: In this condition, participants answered the same three questions. However, they answered the questions on a scale from 0 to 10 with the same semantic labels. Thus, the only difference between the two conditions was the numbers used in the scale. Last, participants also completed a demographic section with questions about their age, sex, and income.

7.1. Results: study 1

We had one independent variable (type of scale) and one dependent variable (mean for self-relevant judgments); hence, we conducted a one-way analysis of variance (ANOVA). Results showed a significant effect of the experimental manipulation, $F(1, 600) = 145.26$, $p < .001$, $M_{\text{bipolar}} = 8.87$, $SD = 1.32$ vs. $M_{\text{unipolar}} = 7.58$, $SD = 1.28$, Cohen's $d = .99$. Results showed a large effect size of type of scale. To test for the moderating effects of age, we first centered age, created the interaction term between

age and type of scale, and then regressed self-relevant judgments on type of scale and age. The overall fit of the model was significant, $R^2 = .21$, $F(2, 597) = 79.78$, $p < .001$. Examination of the individual parameters revealed a significant influence of type of scale, $\beta = .44$, $p < .001$, and age, $\beta = .12$, $p < .001$. Second, we regressed self-relevant judgments on type of scale, age, and the interaction between type of scale and age. The overall fit of the model was significant, $R^2 = .21$, $F(3, 597) = 53.18$, $p < .001$. Examination of the individual parameters revealed that the interaction between type of scale and age was not significant, $\beta = -.07$, $p = .65$, failing to provide evidence for the moderating role of age.

7.2. Brief discussion: study 1

In study 1, we were able to replicate the scale effect found in previous investigations with a representative sample of the adult population of Mexico, which increased the generalizability of the results found in previous investigations. Participants evaluated themselves more positively when using a bipolar than a unipolar scale, supporting hypothesis 1. The effect of type of scale was not moderated by age, failing to support hypothesis 2. Age did have a positive effect on self-evaluation, which meant that as people get older, they tend to make positive evaluations of the self. After testing for the moderating effect of a variable known to influence information processing capacity, we conducted another experiment examining the moderating role of a variable known to influence information processing style: prevention focus.

8. Participants, design, and procedure study 2

Participants were 232 (163 females and 69 males; ages 18–27, $M = 20.52$ years and $SD = 1.34$) college students from a private university in the Mexico City area. Students received extra credit for their participation. Participants were randomly assigned to one of the same two conditions as study 1.

Positive and negative number condition: In this condition, participants were asked three questions assessing: (1) how successful they have been in their lives, (2) how honest they have been in their lives, and (3) how important has been the legacy they have left in their lives on a scale from -5 (not successful at all, not honest at all, and not important at all) to $+5$ (very successful, very honest, and very important). The questions were also, as in study 1, intended to measure positive attributes related to the self and we referred to the mean of these three questions as self-relevant judgments ($\alpha = .67$). Similar questions have been used in previous investigation to examine the influence of scale type on self-relevant judgments (Uskul et al., 2013).

All positive number condition: In this condition, participants answered the same three questions. However, they answered the questions on a scale from 0 to 10 with the same semantic labels. Thus, the only difference between the two conditions was the numbers used in the scale.

In both conditions, after answering the first three questions, participants completed a demographic and regulatory focus questionnaire (Higgins et al., 2001). This questionnaire is an 11-item measure designed to assess promotion and prevention focus pride; yet, we only measured prevention focus. The questionnaire uses a five-point scale. Validation studies have shown that the questionnaire has good psychometric properties such as factorial validity and internal consistency (Higgins et al., 2001). The coefficient of internal consistency for the prevention focus scores was $\alpha = .70$.

8.1. Results: study 2

We had one independent variable (type of scale) and one dependent variable (mean for self-relevant judgments); hence, we conducted a one-way analysis of variance (ANOVA). Results showed a significant effect of the experimental manipulation, $F(1, 232) = 8.99$, $p = .003$, $M_{bipolar} = 8.41$, $SD = .87$ vs. $M_{unipolar} = 8.03$, $SD = 1.08$, Cohen's $d = .39$. Results showed a medium effect size of type of scale.

To test for the moderating effects of prevention focus, we first centered prevention focus, created the interaction term between prevention focus and type of scale, and then regressed self-relevant

judgments on type of scale and prevention focus. The overall fit of the model was significant, $R^2 = .22$, $F(2, 227) = 32.31$, $p < .001$. Examination of the individual parameters revealed a significant influence of type of scale, $\beta = .20$, $p < .001$, and prevention focus, $\beta = .43$, $p < .001$. Second, we regressed self-relevant judgments on type of scale, prevention focus, and the interaction between type of scale and prevention focus. The overall fit of the model was significant, $R^2 = .23$, $F(3, 227) = 22.24$, $p < .001$. Examination of the individual parameters revealed that the interaction between type of scale and prevention focus was not significant, $\beta = .38$, $p = .18$, failing to provide evidence for the moderating role of prevention focus.

8.2. Brief discussion: study 2

We found a significant influence of type of scale on self-relevant judgments, providing further support for hypothesis 1. Yet, we failed to find significant support for hypothesis 3. The effect of type of scale held regardless of the levels of prevention focus. Prevention focus did have a positive relationship with self-evaluation, suggesting that as participants are more aware of their responsibilities and duties, they tend to view themselves more positively. In study 3, we tested for need for cognition as a moderator of the relationship between type of scale and self-relevant judgments (Bless & Schwarz, 2010).

9. Participants, design, and procedure study 3

Participants were 280 (200 females and 80 males; ages 18–25, $M = 20.42$ years and $SD = 1.44$) college students from a private university in the Mexico City area. Participants were randomly assigned to one of the same two conditions as in studies 1 and 2.

Positive and negative number condition: In this condition, participants were asked three questions assessing: (1) how much success they have had in their lives, (2) how likeable they think they are, and (3) how sincere they think they are in their actions on a scale from -5 (nothing, not likeable at all, and not sincere at all) to $+5$ (very much, very likeable, and very sincere). The questions were also, as in studies 1 and 2, intended to measure positive attributes related to the self and we referred to the mean of these three questions as self-relevant judgments ($\alpha = .61$).

All positive number condition: In this condition, participants answered the same three questions. However, they answered the questions on a scale from 0 to 10 with the same semantic labels. In addition to the three questions explained above, participants also completed the need for cognition questionnaire (Cacioppo, Petty, & Feng Kao, 1984; $\alpha = .78$ for the current study).

9.1. Results: study 3

We had one independent variable (type of scale) and one dependent variable (mean for self-relevant judgments); hence, we conducted a one-way analysis of variance (ANOVA). Results showed a significant effect of the experimental manipulation, $F(1, 279) = 8.60$, $p = .004$, $M_{\text{bipolar}} = 8.86$, $SD = .72$ vs. $M_{\text{unipolar}} = 8.58$, $SD = .88$, Cohen's $d = .35$. Results showed a medium effect size of type of scale.

To test for the moderating effects of need for cognition, we first centered need for cognition, created the interaction term between need for cognition and type of scale, and then regressed self-relevant judgments on type of scale and need for cognition. The overall fit of the model was significant, $R^2 = .08$, $F(2, 279) = 12.12$, $p < .001$. Examination of the individual parameters revealed a significant influence of type of scale, $\beta = .20$, $p < .001$, and need for cognition, $\beta = .23$, $p < .001$. Second, we regressed self-relevant judgments on type of scale, need for cognition, and the interaction between type of scale and need for cognition. The overall fit of the model was significant, $R^2 = .08$, $F(3, 279) = 8.11$, $p < .001$. Examination of the individual parameters revealed that the interaction between type of scale and need for cognition was not significant, $\beta = .15$, $p = .68$. Hence, we did not have support for the moderating role of need for cognition (see Table 1 for a summary of results from all three studies).

Table 1. Descriptive statistics and effect sizes for all three studies

	Unipolar scale				Bipolar scale				ES
	Mean	SD	CI	n	Mean	SD	CI	n	
Study 1	7.58	1.28	7.43–7.73	283	8.87	1.32	8.72–9.01	318	.99
Study 2	8.03	1.08	7.84–8.23	116	8.41	.87	8.26–8.58	116	.39
Study 3	8.58	.88	8.43–8.73	141	8.86	.72	8.74–8.98	139	.35

Note: ES denotes effect size.

9.2. Brief discussion: study 3

We found strong support for the role of type of scale on self-relevant judgments. We failed to find support for the moderating role of need for cognition. Hence, hypothesis 4 was not supported. Need for cognition did have a positive relationship with self-evaluation, suggesting that as individuals enjoy the act of thinking, they tend to rate themselves more positively.

10. General discussion

Across the three experiments, we found strong support for the role of type of scale on self-relevant judgments. Participants from a collectivistic culture of honor such as Mexico avoided the use of the negative side of a bipolar scale resulting in more positive judgments when using a bipolar vs. a unipolar scale. While we used the standard approach of testing for the null hypotheses, we made an effort to report effect sizes and confidence intervals for each analysis, which helped us conclude that the effect size of type of scale ranged from medium to large (Cumming, 2012). We failed to find support for the moderating influence of age, prevention, focus, and need for cognition as proxies of information processing capacity, style, and motivation. The theoretical and applied implications of our results are discussed.

11. Theoretical implications

Pragmatic inferences have implications for different research areas including social judgments and survey responding. As correctly stated by Uskul and colleagues (2010), most investigations on survey responding have been conducted with participants from individualistic and Confucian-based collectivistic cultures. Yet, recent investigations conducted by Uskul and colleagues (2013) with college students and our investigation with a representative sample of the adult population of Mexico and with college students showed that bipolar scales led to more positive self-relevant judgments. Hence, the effect of type of scale on self-relevant judgments found by Schwarz and colleagues more than 20 years ago was consistent across participants from different cultures and age groups. Last, it is worth noting that the strongest effect size for the influence of type of scale was found among the representative sample of the adult population of Mexico.

It is often disappointing and frustrating to report non-significant results. Null results are subject to different interpretations which leave researchers with a limited ability to make significant conclusions. However, we would like to argue that it was important to test for the moderating influence of age, prevention focus, and need for cognition as proxies of information processing capacity, style, and motivation for one main reason. Theoretical developments such as the integration of context effects in the inclusion/exclusion model (Bless & Schwarz, 2010) require researchers to continue exploring boundary conditions of the proposed effects. The accumulation of significant and null effects coming from several empirical investigations would allow researchers, in the long run, to continue improving and refining their theoretical developments. Our results only represent a few data points suggesting that age, prevention, focus, and need for cognition do not influence the effect of type of scale on self-relevant judgments. More research would be needed to definitively conclude that these three moderators or other variables falling under the processing capacity, style, and motivation umbrella do not influence pragmatic inferences. However, these null results are needed in order to accumulate enough evidence to approach a possible conclusion.

One possible explanation for our null results coming from the inclusion/exclusion model is that the impact of some moderators can be substantial if making pragmatic inferences requires detailed attention, but negligible when pragmatic inferences are easy to make. It could be that making pragmatic inferences about the meaning of negative numbers on a scale is a relatively easy task; hence, age, prevention, focus, and need for cognition might have a negligible effect on this task. Future research is needed to explore this possibility.

12. Applied implications

Despite some criticism, self-reports remain as one of the most popular ways to collect data. When designing a questionnaire, researchers have to make several decisions including the type of scale (Krosnick & Presser, 2010). Our results showed that participants made different pragmatic meanings when the scale had negative and positive numbers than when it only had positive numbers. Our findings were consistent with other investigations (Schwarz & Hippler, 1995; Schwarz et al., 1991; Uskul et al., 2013), lending evidence to the usefulness of situated models of cognition (Smith & Semin, 2007). From an applied perspective, our results cannot determine which numeric representation of scales researchers should use. Yet, our results could shed some light on the assumptions researchers make about respondents. In other words, researchers should assume that respondents are active meaning-makers who constantly adjust their thinking to the context. Interpretation of scale numbers is just one of the many attributes of questionnaires where respondents can make pragmatic inferences.

13. Limitations and future directions

Our investigation had several limitations. First, we were only able to use a representative sample of the adult population in study 1 and relied on a sample of convenience for studies 2 and 3. Given that pragmatic inferences could have implications for survey responding in market and public opinion research where issues of representativeness are crucial, future research might want to test for the moderating role of variables known to influence information processing style and motivation with representative samples. Second, our failure to find a significant influence of age, prevention, focus, and need for cognition might be due to our decision of measuring all three constructs as something static (age) or as individual difference variables. Future research could use experimental manipulations to increase/decrease information processing capacity and motivation or induce a more detailed oriented mindset in order to examine the effects of type of scale on self-relevant judgments.

In sum, we found strong support for the influence of type of scale on self-relevant judgments. Participants evaluated themselves more positively when using a bipolar than a unipolar scale. These effects were robust enough in that they were present across all three experiments, regardless of participants' information processing capacity, style, or motivation to make pragmatic inferences.

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Competing interests

The authors declare no competing interest.

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