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Interpretation of Probability Phrases in Intergroup Relations Effects of Context and Prior Beliefs

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Abstract

In this study we analyzed how people interpret probability phrases in the area of intergroup relations, testing how prior beliefs and the context in which probability phrases are embedded affect their interpretation. Participants were 180 Italians. Prior beliefs about increase and decrease of immigration were measured; then, participants read eight sentences that included probabilistic pronouncements embedded in two different contexts: increase and decrease of immigration. Results indicated that the interpretation of probability terms is variable both between and within people; moreover, prior beliefs influenced this interpretation.

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Keywords: Probability Phrases, Intergroup Relations, Immigration, Prior Beliefs;

1. Introduction

Interpretation of probability terms (e.g., *likely*, *unlikely*) has been studied in various fields, such as medical intervention (e.g., Politi, Han, & Col, 2007), or climate change (e.g., Budescu, Broomell, & Por, 2009). Results showed that there is considerable variability in the interpretation of probability phrases between individuals (Karelitz & Budescu, 2004; for a review, see Budescu & Wallsten, 1995). Also within each individual there is variability, but it is lower than between individuals (Budescu & Wallsten, 1985; Mullet & Rivet, 1991). Indeed, individuals tend to interpret in a relatively stable way probability phrases (Budescu, Weinberg, & Wallsten, 1988). Various factors might affect the width of the probability intervals (Wallsten, 1990); among these, some studies investigated effects of context on the interpretation of qualitative expressions of uncertainty (Wallsten, Fillenbaum, & Cox, 1986).

In this study we analyzed how people interpret probability phrases in intergroup relations, testing how context, in which probability phrases are embedded, affects their interpretation. We hypothesized that people should

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interpret the same phrase in different way according to social context in which phrases are embedded. We also hypothesized that the individual variability in the interpretation of same phrase across context would depend on prior beliefs. Staring from anchoring-and-adjustment heuristic (Tversky & Kahneman, 1974), according to which one strategy for estimating unknown quantities is to start with information that people know and then adjust them until an acceptable value is reached, it is possible to hypothesize that also the interpretation of probability terms could be influenced by prior beliefs (see also, Fox & Irwin, 1998).

2. Context of the study

Immigrants in Italy on 1st January 2010 were 4,235,059, that is the 7% of total residents (ISTAT, 2012). Compared with 1st January 2009, the number of immigrants increased by 343,764 units (+8.8%), a very high increase, although lower than in the two previous years: 494,000 in 2007 (+16.8%) and 459,000 in 2008 (13.4%). The 49.3% of immigrants came from Eastern European countries. The 60% of immigrants live in the North, the 25.3% in the Centre and the remaining 13.1% in the South of Italy.

Regarding Italians' attitude towards immigrants, various studies indicated that Italians have a slightly positive attitude (Capozza, Trifiletti, Vezzali, & Favara, 2012) and wish that immigrants should maintain some aspects of their culture and also adopt important features of the majority culture (Barrette, Bourhis, Capozza, & Hichy, 2005; Di Marco, Hichy, & Sapienza, 2012; Sapienza, Hichy, Guarnera, & Di Nuovo, 2010).

3. Method

3.1. Participants

Participants were 180 Italians (mean age = 26.79, *SD* = 7.93; 44 males and 129 females, 7 participants did not indicate the gender) who responded to a posting on various social networks.

3.2. Procedure

Participants first completed eight items designed to measure their beliefs about increase and decrease of immigration (e.g. "I am quite sure that immigration will increase/decrease"). Participants answered on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The score of items concerning the decrease of immigration has been reversed. The reliability of this scale was high (Alpha = .90).

Next, participants read eight sentences that included probabilistic pronouncements regarding increase (four sentences) and decrease (four sentences) of immigration. Each sentence included one of four probability terms: "It is *very likely*/*likely*/*unlikely*/*very unlikely* that during the next years immigration will *increase*/*decrease*". For each sentence, participants provided their best estimate of probability by sliding a cursor along a slider ranged from 0% to 100%.

4. Results and discussion

Results of this study confirmed those of previous studies (Budescu & Wallsten, 1995; Fox & Irwin, 1998; Lipkus, 2007; Budescu et al., 2009), indicating that there is a wide range in the interpretation of probability terms (for all terms responses were ranged from 0% to 100% except for very unlikely and likely in the context of increase of immigration, that were ranged from 0% to 97% and from 4% to 100%, respectively). Regarding differences in the interpretation of probability terms on the basis of context, a MANOVA with a two-level factor (context: increase vs. decrease of immigration) and four dependent variables (the four probability terms) was carried out [multivariate effect was significant, $F(4,176) = 2.96$, $p < .001$, $\eta 2 = .40$; moreover, all univariate

effects were significant, Fs (1,179) > 30.88, ps < .001, η2s > .15]. Results displayed in Table 1 showed that the same term was interpreted differently on the basis of context: probability estimates of very unlikely and unlikely were lower in the context of increase of immigration than in the context of decrease of immigration; on the contrary, probability estimates of likely and very likely were higher in the context of increase than in the context of decrease of immigration. Moreover, analyzing separately percentage attributed to each term in the two contexts, one can infer that in the context of increase on immigration, participants assigned a different percentages to each term [ts (179) > 2.37, ps < .02]; on the contrary, in the context of decrease of immigration participants assigned the same percentage to each term [ts (179) < 1.81, ns].

Table 1. Mean, standard deviation, minimum, and maximum of probability terms in the context of increase and decrease of immigration

	Increase of immigration		**Decrease of immigration**	
	Mean	S.D.	Mean	S.D.
Very unlikely	36.05	30.08	52.85	34.57
Unlikely	31.65	24.25	51.72	30.65
Likely	68.72	18.02	47.02	24.75
Very Likely	77.83	18.83	50.35	31.47

Regarding prior belief, results showed that participants believed that immigration would increase (M = 5.56, D.S. = 1.04), this result is in line with actual Italian situation, in which immigration is increasing (ISTAT, 2012). In order to test effects of prior beliefs, a MANCOVA with a two-level factor (context: increase vs. decrease of immigration), four dependent variables (the four probability terms), and a covariate (prior beliefs) was carried out. Results showed that the main effect of prior beliefs was not significant (F < 1); however, the interaction between context and prior beliefs was significant [F (4,175) = 6.88, p < .001, η2 = .14]; moreover, the effect of context, still significant, was reduced [F (4,175) = 2.83, p = .03, η2 = .06]. These results indicated that prior beliefs influenced the interpretation of probability terms; indeed, correlations between prior belief and probability terms showed that prior beliefs negatively correlated with very unlikely and unlikely in the context of increase of immigration and with likely and very likely in the context of decrease of immigration (rs > -.18, ps < .02); on the other hand, prior beliefs positively correlated with unlikely in the context of decrease of immigration and with likely and very likely in the context of increase of immigration (rs > .14, ps < .05). No correlation was found between prior beliefs and very unlikely in the context of decrease of immigration.

Results of this study confirmed the variability of the interpretation of probability terms between people, even in a highly meaningful social context such as immigration. In addition, they show that people interpreted in different way the same term, according to the context in which it is embedded, and that these differences depend on prior beliefs. We recommended to use numeric rather than verbal expressions, also in the context of intergroup relations.

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