



Original Article

Evidence for benefits of argumentation in a Mayan indigenous population

Thomas Castelain^{a,b,c}, Vittorio Girotto^d, Frank Jamet^e, Hugo Mercier^{a,b,*}^a Centre de Sciences Cognitives, Université de Neuchâtel, Neuchâtel, Switzerland^b Institut des Sciences Cognitives–Marc Jeannerod, L2C2, Centre National de la Recherche Scientifique, Lyon, France^c Instituto de Investigaciones Psicológicas, Universidad de Costa Rica, San José, Costa Rica^d Center for Experimental Research in Management and Economics, DCP, University IUAV of Venice, Venice, Italy^e Chart–Cognitions humaine et artificielle, Université de Cergy–Pontoise, Cergy–Pontoise, France

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ABSTRACT

Group discussion improves on individual reasoning performance for a wide variety of tasks. This improvement, however, could be largely specific to members of modern, schooled, affluent Western cultures. In two studies, we observed the same improvement in the members of a traditional population—indigenous Maya from Guatemala. Two features of reasoning can account for this improvement: the myside bias, which precludes individuals from improving their performance on their own, and the ability to soundly evaluate others' arguments, which allows individuals to benefit from group discussions. These two features were observed in the traditional population studied: solitary reasoning performance was marked by the myside bias; individuals were more likely to be convinced by arguments for the correct answer rather than for a wrong answer. Together with previous evidence, the present results strengthen the conclusion that these features are adaptive features of reasoning.

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At least since Descartes, reasoning has generally been understood as a tool of individual cognition: by carefully evaluating and weighing one's reasons, one should arrive at sounder beliefs and better decisions (Descartes, 1637; Kahneman, 2003; Stanovich, 2004). Opposed to this individualistic view, an alternative is that reasoning's main function is social: to find reasons in order to convince others, and to evaluate others' reasons in order to adopt better supported beliefs. The argumentative theory of reasoning (Mercier & Sperber, 2011) is a recent instantiation of this social view of reasoning (for other social views of reasoning, see Baumeister & Masicampo, 2010; Billig, 1996; Gibbard, 1990; Piaget, 1928).

An important result supporting the argumentative theory of reasoning is that, provided minimal conditions are met (e.g. the expression of disagreement, see Janis, 1982), argumentation in the course of group discussion produces sizeable improvements in reasoning performance on a variety of tasks, such as logical, mathematical, and inductive problems (Laughlin, 2011; Moshman & Geil, 1998; Trouche, Sander, & Mercier, 2014), work related tasks (Mercier, 2011c), forecasting (Mellers et al., 2014; Rowe & Wright, 1999), and school tasks (Mercier, 2011b; Slavin, 1995; Smith et al., 2009). The argumentative theory suggests that the gap in performance between individual reasoning and reasoning in discussion stems from a combination of two features of reasoning. The first is the myside bias (or confirmation bias):

individuals overwhelmingly produce reasons for their preferred opinions (Mercier, *in press*; Nickerson, 1998). As a result, reasoning rarely allows the lone reasoner to correct mistaken intuitions. Instead, the myside bias can lead to overconfidence (Koriat, Lichtenstein, & Fischhoff, 1980) and polarization (Tesser & Conlee, 1975). The second feature is reasoning's ability to soundly evaluate others' arguments, rejecting weak arguments and accepting strong enough ones (Hahn & Oaksford, 2007; Petty & Wegener, 1998). In a discussion group members only provide arguments for their side, but they also evaluate each other's arguments. They change their minds when the arguments are good enough, which usually means changing their mind for the best.

These features of reasoning, along with the gap in reasoning performance they seek to explain, could be a peculiarity of WEIRD (Western Educated Industrialized Rich Democratic) cultures. These cultures, in which the research mentioned above has been conducted, differ from other cultures on a number of traits (Henrich, Heine, & Norenzayan, 2010). In particular, participants from WEIRD cultures are sometimes at the far end of the distribution—for instance in terms of individualism (Henrich et al., 2010). Schooling, which is comprehensive in WEIRD cultures but absent from many other cultures, can exert a profound influence on cognition, for instance through the acquisition of literacy (Dehaene, 2009) and numeracy (Dehaene, 1999; Gordon, 2004).

Regarding reasoning and argumentation, WEIRD cultures have a series of traits that, while not necessarily specific to these cultures, might conspire to create the features mentioned above. Compared to many other cultures, members of Western cultures: (1) have long put a higher value on argumentation in their institutions, from science to law or

* Corresponding author. Centre de Sciences Cognitives, Université de Neuchâtel, Rue Pierre à Mazel 7, 2000 Neuchâtel, Switzerland.

E-mail address: hugo.mercier@unine.ch (H. Mercier).

politics (Lloyd, 1996; Peng & Nisbett, 1999; especially compared to Eastern cultures, see Becker, 1986; Nakamura, 1964); (2) put relatively less stress on face-saving and social harmony (Kim & Markus, 1999; Oetzel et al., 2001), which might allow for more confrontational and open debates (Mercier, Deguchi, Van der Henst, & Yama, 2015); (3) adopt a different parenting style in which children tend to argue more with adults: they question more freely their decisions, and receive more explanations—although this difference seems to be restricted to the middle and upper classes (Chouinard, Harris, & Maratsos, 2007; indeed, they talk more with adults generally, Hart & Risley, 1995; Heath, 1983). All of these factors might make argumentation a cognitive skill particularly valued in participants from WEIRD cultures.

The myside bias might be a cognitive response to a specific cultural environment in which argumentation is highly valued and it is particularly important to be able to defend one's point of view. Two other traits might help explain the existence of a myside bias in WEIRD cultures. First, in WEIRD cultures, individuals are confronted with a variety of choices, values, and worldviews. In such cultures, it makes sense to anticipate having to defend one's choices, since it is likely that one will encounter people who have made different choices (Schwartz, 2004). Second, many of these choices mostly have a symbolic value, so that it arguably matters more to make a decision that is socially acceptable than an intrinsically good decision. For instance, reasoning has been shown to lead customers towards products they enjoy less, but which allow them to be perceived more positively by others (Thompson & Norton, 2008; for review, see Mercier & Sperber, 2011). Even socially consequential choices, such as voting, might mostly have a symbolic value (Sears, Lau, Tyler, & Allen, 1980). The symbolic value of voting, and of political opinions more generally, might help explain why voters in WEIRD cultures have a consistent myside bias when reasoning about politics: it matters more that they have arguments to justify their opinions than that they make otherwise sound opinions (Kahan et al., 2012; Taber & Lodge, 2006).

WEIRD cultures thus seem to have a number of traits that favor the development of argumentative skills, traits which in turn might favor the emergence of a myside bias. In order to test whether these cultural traits partly or entirely account for the relevant features of reasoning—the efficiency of argumentation and the deficiencies of solitary reasoning—it is necessary to study reasoning and argumentation in a population that does not share these cultural traits. We first argue that a broad type of cultures—which we will call, in an ad-hoc fashion, traditional cultures—differs in many relevant ways from WEIRD cultures. Then we will argue that the population to which the participants recruited here belong, the K'iche' Maya in Guatemala, share these traits.

Here we define traditional cultures as the human groups which are the broad opposite of WEIRD cultures: small-scale groups which are not Western, educated, industrialized, or rich (note that many human groups would thus fall between WEIRD and traditional cultures as so defined). The fact that these cultures are not Western means that they do not share the hypothetical Western values which cast argumentation in a positive light (although they might hold other values to the same effect, see, e.g. Gluckman, 1967). Regarding lack of education (in the sense of formal schooling), one of its most relevant consequences is a reluctance to engage in hypothetical thinking. Experiments conducted in several unschooled populations have revealed that most of their members fail to complete even very simple hypothetical reasoning tasks (Cole, Gay, Glick, & Sharp, 1971; Luria, 1976; Scribner, 1977). This reluctance to engage in hypothetical thinking could hinder argumentation, since argumentation often relies on hypotheticals. Besides the lack of schooling, education also differs in traditional societies in other ways. Of particular relevance here is that parenting in traditional populations conforms to the pattern observed outside of middle and upper middle class WEIRD populations: relatively little talk addressed to children, and in particular a very small number of exchanges requiring reasons and explanations (Gauvain, Munroe, & Beebe, 2013). Because members of traditional cultures, compared to members of WEIRD cultures, might

value argumentation less, be more reluctant to engage in hypothetical thinking, and are not trained to argue early on, they might be less likely to develop the argumentative skills evidenced in the members of WEIRD cultures.

We argued above that the members of WEIRD cultures—particularly in the middle and upper middle classes—are faced with a great variety of choices, and that many of these choices are in large part symbolic. The choices facing members of traditional cultures differ in both respects. As a rule, members of these cultures have far fewer choices: far fewer (if any) products to buy, far fewer (if any) choices of occupation, far fewer (if any) choices of places to live, far fewer (if any) choices of religion, far fewer (if any) choices of people to befriend, etc. (see, Lévi-Strauss, 1966). This relative lack of choice suggests a lighter burden of justification. Members of traditional cultures might thus have less use of a myside bias which would help them defend their choices. Moreover, it has been argued that members of traditional cultures make more life and death decisions than members of WEIRD cultures (Diamond, 2012). Contrary to the members of WEIRD cultures, members of traditional cultures do not live only in a human created environment in which many natural dangers are eliminated (e.g. predation) or drastically reduced (e.g. many pathogens). This is reflected in the lower life expectancy in traditional cultures compared to WEIRD cultures (e.g. Gurven & Kaplan, 2007). It is thus plausible that for most decisions, intrinsic value matters more than symbolic value for the members of traditional cultures relative to members of WEIRD cultures. As a result, the myside bias could be disadvantageous for the former, as it leads to intrinsically worse decisions, and advantageous for the latter, as it leads to easier to defend symbolic decisions.

On the whole, it is thus plausible that members of traditional cultures, relative to members of WEIRD cultures, reason in a way that is more practical (see Luria, 1976; Medin & Atran, 2004) and more in line with the predictions of the individualistic view of reasoning. Relative to members of WEIRD cultures, members of traditional cultures might suffer less from the myside bias, and thus be more efficient solitary reasoners, while benefitting less from argumentation.

In light of the evidence available, the relevant traits of traditional cultures mentioned above appear to be present in the K'iche' Maya who participated in the present experiments. The K'iche' are a preliterate Maya Amerindian group living in rural areas of Guatemala. Men are mainly subsistence farmers and women do household maintenance work. They are obviously not Western, and there is no evidence that their culture puts a particular value on argumentation. The participants in our experiments had received no schooling as children and were in the process of receiving a very moderate amount of schooling as adults. The pattern of interactions with the children seems to follow the pattern typically found outside of middle and upper classes in WEIRD cultures. A study of the interactions between K'iche' adults and children revealed that most of the utterances adults address to children are imperative and very few are questions (Pye, 1986). There is thus little opportunity for argumentative exchanges between children and adults. Overall, the K'iche' do not seem to enjoy any of the cultural traits that might make WEIRD cultures particularly congenial to argumentation.

Like other small-scale societies relying on substance farming, the K'iche' face fewer choices than members of WEIRD cultures. Few products are available for purchase, and they have very little money to purchase them with (UNDP, 2010a, 2010b). The choice of occupation and place to live is extremely restricted (UNDP, 2010a, 2010b, 2012, 2014). Moreover, the environment is harsher than that faced by most members of WEIRD cultures (for instance 94% of the population in the relevant district—Sololá—lacks food security, see INE, 2011, p. 29; UNDP, 2010a; UNFPA, 2014). The risk of disease and early death is much higher (INE, 2011; UNDP, 2010a; UNFPA, 2014). A myside bias might thus be less adaptive in such an environment than in that of WEIRD cultures.

The improvement in performance yielded by argumentation, the myside bias which explains poor solitary performance, and the

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