# Referring to Logic to Assess the Peoples' Rationality

## Reflections on Selected Cases in the History of the Social Sciences

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#### Abstract

To what extent have social scientists referred to logic to assess the peoples' rationality since the beginning of the 20<sup>th</sup> century? And what has "logic" meant for them? In order to address these issues, I study more particularly how Lucien Lévy-Bruhl defined his notion of "prelogical mentality" and how Edward Evans-Pritchard, Peter Winch, and David Bloor argued about the issue of the Azande's rationality, depending on what logic meant for them.

Keywords: Rationality, Logic, Azande, Lévy-Bruhl, Evans-Pritchard.

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## **Referring to Logic to Assess the Peoples' Rationality** Reflections on Selected Cases in the History of the Social Sciences

#### Claude Rosental

To what extent have social scientists referred to logic to assess the peoples' rationality since the beginning of the 20<sup>th</sup> century? What has "logic" meant for them? How did these meanings impact their assessment?

In order to address these issues, I will study more particularly how social scientists have assessed the Azande's rationality. The Azande<sup>2</sup> are an ethnic group of North Central Africa.<sup>3</sup> The assessment of their rationality has generated a famous, heated debate among human and social scientists for almost a century. Contributions to this debate create an ideal corpus to start addressing the issues I have raised.

I would like to show that participants in the debate have often relied on basic or ancient views on logic, while logic as a scientific discipline has undergone major changes in terms of objects and approaches throughout the last century. Their diverging representations of logic have led them to assess the Azande's behaviors in different ways. At the same time, authors have often proved to be reluctant to people the world with irrational minds on the basis of their views on logic.

First, I will briefly analyze a set of representations of logic that participants in the debate have mobilized in their writings. I will then focus on how Evans Pritchard, Peter Winch, and David Bloor have argued about the issue of the Azande's rationality, depending on what logic meant for them. I will show in particular how Evans-Pritchard opposes Levy-Bruhl's theory of primitive mentality in this respect.

#### Social scientists' views on logic

The views that participants in the debate have on logic tend to portray this discipline as a static field of knowledge. Several authors refer to representations of logic close to those developed in the Antiquity and until the end of the 19<sup>th</sup> century. In particular, ancient syllogisms appear to have been perceived as central, stable or even immutable logical objects.

<sup>&</sup>lt;sup>2</sup> Plural of "Zande" in the Zande language.

<sup>&</sup>lt;sup>3</sup> Azande live primarily in the northeastern part of Congo, in south-central and southwestern part of Sudan, and in southeastern Central African Republic.

This view stands in stark contrast with the radical changes of approaches that logic as a discipline has undergone in the past century.

In some writings, "logic" appears to refer to a single and all-encompassing theory, although logicist approaches were abandoned at the beginning of the 1930s. Besides, some authors seem to equate logic with a few principles like the principle of contradiction. Other authors adopt propositionalist views on logic. In these views, logic is equated with a calculus on propositions. Still, other authors develop an inferentialist representation of logic. In this framework, logic consists in warranting valid inferences within the realm of discourse.

For many social scientists, logic seems to rely on a limited set of notions including: logical "laws" or "rules," inference, deduction, logical necessity, logical structure, and formal reasoning.

In the writings that convey these terms, definitions of the latter are often vague or missing. It is then difficult to identify their precise meaning. Sometimes, these terms appear to have several meanings in the very same text. Shifts in the meaning may be observed from one paragraph to the other. This is particularly true for the notion of "formal reasoning." Now, one cannot deny that some writings convey quite sophisticated and precise views on logic.

Furthermore, authors have diverse views of the nature of logic. According to some of them, logic is part of the psychology of reasoning. According to others, the matter of logic is language and logic may be likened to principles that govern how statements may be articulated. For other social scientists still, logic is synonymous with abstract and inescapable principles of reasoning.

In order to go beyond this first analysis, it is now interesting to thoroughly study the views and uses of logic in selected writings. For this purpose, I will start with Evans-Pritchard's *Witchcraft, Oracles and Magic Among the Azande*.

#### Equating "being logical" with "being coherent"

In this book devoted to the study of Zande culture, Evans-Pritchard uses a quite loose view on logic.<sup>4</sup> Logic refers essentially to a notion of coherence. Being logical means

<sup>&</sup>lt;sup>4</sup> E. E. Evans-Pritchard, *Sorcellerie, oracles et magie chez les Azandé*, Paris, Gallimard, 1972.

endorsing coherent ways of thinking and acting.<sup>5</sup> As for the notion of coherence, it refers principally to the absence of contradiction.<sup>6</sup> However, Evans Pritchard does not invoke the existence of some principle of contradiction, nor of some logical principle. He merely and briefly evokes "logical norms" on which science is supposed to be based.<sup>7</sup>

This view on logic allows Evans-Pritchard to consider that the Azande think logically.<sup>8</sup> Indeed, the ways the Azande think appear fully coherent to him.<sup>9</sup> This assessment is based on the fact that Evans Pritchard spots no contradiction in their reasoning. In his view, in order to highlight contradictory arguments among the Azande, Westerners would have to artificially attribute to them opposed statements. Or Westerners would have to ignore essential elements that guide the Azande's arguments and actions.<sup>10</sup> At any rate, do Azande appear rational to Evans-Pritchard?

In order to assess the rationality of this people, the anthropologist takes other elements into account. He actually makes his mode of assessment as well as his views on logic more explicit in other writings. These writings were published in the 1930s in the *Bulletin of the Faculty of Arts* of the University of Egypt.<sup>11</sup> In these articles, Evans-Pritchard criticizes Levy-Bruhl's theory of primitive mentality, and in particular he challenges the idea that primitives could not think logically.

Before we investigate Evans-Pritchard's claims further, it is worth having a look at Levy-Bruhl's views expressed in *Primitive Mentality*.<sup>12</sup> Levy-Bruhl envisions logic as a set of logical principles which, first and foremost, include the principle of contradiction, also called the law of contradiction.<sup>13</sup> He does not give a definition of this law, nor does he provide much detail about the other principles to which he refers. However, he appears to view logic as belonging to the realm of processes of thoughts. He links logic and its principles with habits that are deeply rooted in Western thought, to the point that these have become its necessary

<sup>&</sup>lt;sup>5</sup> *Ibid.*, p. 389.

<sup>&</sup>lt;sup>6</sup> *Ibid.*, p. 391.

<sup>&</sup>lt;sup>7</sup> *Ibid.*, p. 38.

<sup>&</sup>lt;sup>8</sup> *Ibid.*, p. 113.

<sup>&</sup>lt;sup>9</sup>*Ibid.*, p. 371.

<sup>&</sup>lt;sup>10</sup> *Ibid.*, pp. 56-59, 606, 607.

<sup>&</sup>lt;sup>11</sup> See in particular E. E. Evans-Pritchard, "Lévy-Bruhl's Theory of Primitive Mentality," in *Bulletin of the Faculty of Arts*, University of Egypt, 1934. E. E. Evans-Pritchard, "Science and Sentiment," in *Bulletin of the Faculty of Arts*, University of Egypt, 1934.

<sup>&</sup>lt;sup>12</sup> L. Lévy-Bruhl, *La mentalité primitive*, Paris, PUF, 1947.

<sup>&</sup>lt;sup>13</sup> On the evolution of Levy-Bruhl's claims, see G. E. R. Lloyd, *Pour en finir avec les mentalités*, Paris, La Découverte, 1993, p. 34.

conditions<sup>14</sup>. Levy-Bruhl invokes the specificity of European languages to explain this deeprootedness. He thereby refers to Steensby who claims that European languages are more appropriate for "processes of logical thinking" than "primitive" languages.<sup>15</sup>

Based on this view of logic, Levy-Bruhl refers to the principle of contradiction to build his notion of pre-logical thinking. He defines this way of thinking as being "most often indifferent to contradiction."<sup>16</sup> In this framework, "the principle of contradiction does not govern the links between representations as it does for us."<sup>17</sup> In other words, pre-logical thinking refers to a way of thinking which *tolerates* contradictions, or which does not *systematically* apply the principle of contradiction.<sup>18</sup> Levy-Bruhl uses this definition to challenge missionaries who view primitives who do not adhere to principles of the Gospel as lacking of logic.<sup>19</sup>

He uses this view on logic, as well as examples of contradictory representations, to depict primitives as beings endowed with limited reasoning capacities. However, Levy-Bruhl does not simply invoke their occasional violation of the law of the excluded middle to talk about their limited reasoning capacities. He also refers to their mystical representations, to their limited capacity of grasping causal relations, as well as to their intuitive, based on flair and poorly conceptual, way of thinking.<sup>20</sup> In other words, Levy-Bruhl refers to logic, but also to many other elements to assess the peoples' rationality.

By comparison, Evans-Pritchard refers above all to a notion of coherence when he uses the term "logic" in the papers he published in the *Bulletin of the Faculty of Arts* of the University of Egypt. However, he also attributes another meaning to this word. He refers to the capacity of producing accurate inferences, however valid the assumptions from which they are drawn.

Now, Evans-Pritchard does not explain what "inference" means for him. Nevertheless, it appears that this object belongs to the realm of mental processes in his view. This is a crucial fact since, according to the anthropologist, primitives have mental capabilities which

<sup>&</sup>lt;sup>14</sup> Lévy-Bruhl [1947], op. cit., pp. 47-48, 135.

<sup>&</sup>lt;sup>15</sup> *Ibid.*, pp. 505-506.

<sup>&</sup>lt;sup>16</sup> *Ibid.*, p. 85.

<sup>&</sup>lt;sup>17</sup> *Ibid.*, p. 99: "Le principe de contradiction n'exerce pas le même empire sur les liaisons des représentations que sur celles des nôtres."

<sup>&</sup>lt;sup>18</sup> *Ibid.*, pp. 42, 104, 106-107, 135, 153, 522.

 <sup>&</sup>lt;sup>19</sup> *Ibid.*, pp. 13-14: "Mais l'incapacité de comprendre un enseignement évangélique, et même le refus de l'écouter ne sont pas à eux seuls une preuve suffisante de l'aversion pour les opérations logiques."
<sup>20</sup> *Ibid.*, pp. 49-50, 86-89, 242-243, 468, 516-519.

are identical to those of the Westerners. Therefore, according to Evans-Pritchard, primitives are able to produce accurate inferences, and thus, to think logically.

Consequently, for the anthropologist, primitives cannot be portrayed as being irrational for lacking logic. Undoubtedly, Evans-Pritchard claims that mystical views of the world held by primitives do not conform to the reality and are not objective in general. But he makes a distinction between an ability to produce a coherent reasoning on the basis of valid or even invalid assumptions and a capacity to produce objective representations. For Evans-Pritchard, the first ability characterizes logical thinking while the second is typical of scientific thinking.<sup>21</sup>

In Evans-Pritchard's objectivist view, primitives are logical. Their system of representations may result from valid inferences and be coherent like in the Zande case, although these representations are not scientific, since mystical forces do not exist.

In so doing, Evans-Pritchard disagrees with Levy-Bruhl. In his view, one cannot invoke the lack of logic or of logical specificity to depict non-Westerners as irrational, to attribute them limited reasoning skills, or to describe their ways of thinking as less elaborate than those of the Westerners.

Evans-Pritchard's arguments have generated long and important debates. Participants in the debates have mobilized different views on logic to reassess the rationality of non-Westerners, and especially of the Azande. In order to illustrate this point, let us study Peter Winch's criticisms addressed to Evans-Pritchard in a paper entitled "Understanding a Primitive Society," published in 1964.<sup>22</sup>

#### Some rather unconstraining formal rules

Like Evans-Pritchard, Winch does not portray the Azande as irrational for their lack of logic. As a matter of fact, he does not consider them less rational than Westerners. Besides, Winch criticizes Evans-Pritchard's notion of lack of objectivity. According to Winch, claiming that Zande views do not conform to reality is highly problematic.<sup>23</sup>

<sup>&</sup>lt;sup>21</sup> Evans-Pritchard [1972], op. cit., p. 38.

<sup>&</sup>lt;sup>22</sup> P. Winch, "Understanding a primitive society," *American Philosophical Quarterly*, Vol. 1, Nr. 4, 1964, pp. 307-324.

<sup>&</sup>lt;sup>23</sup> *Ibid.*, pp. 308-309.

Winch does not dismiss the idea that there is a reality that exists independently of human representations. However, he argues that it is not obvious for an individual who belongs to a given culture to decide whether or not an assertion expressed in the framework of another culture conforms to reality. Winch thinks that Evans-Pritchard especially underestimates some issues that Wittgenstein addressed regarding the peculiarities of the languages in which we express our representations of reality.<sup>24</sup> "Conforming to reality" is not such a plain criterion to be used to distinguish between rational and irrational thinking when no logical incoherence is at stake. In particular, this notion is of no help to claim that a primitive system of representations is irrational, like in the Zande case.

According to Winch, a primitive system of representations based on magic, as in the Zande case, represents a universe of discourse that is no less coherent than that of Western science. By and large, beliefs and practices are equally rational in both cases.

Indeed, Winch believes that all methods developed in the name of science should not be viewed a priori as rational.<sup>25</sup> He also thinks that Westerners, like Azande people, do not resort to one single type of causality for all their behaviors and reasoning.<sup>26</sup>

So, if Winch does not use the notion of "representations conforming to reality" to assess Zande rationality, does he share Evans-Pritchard's appraisal of the logical nature of Zande thinking? Does he have the same views on logic and on how to link rational thinking with logical skills?

First of all, Winch's views on logic are quite different from those held by Evans-Pritchard. They are of formalistic and propositionalist natures. "Logic" refers above all to a notion of formal consistency of a set of rules and assertions.<sup>27</sup> Although Winch does not give much detail about this notion, he seems to link it with a lack of contradiction. At the same time, Winch refers to the work of a few contemporary logicians and philosophers of logic such as Russell and Wittgenstein.<sup>28</sup>

His representations of logic thus tend to be more circumscribed than those of Evans Pritchard. Winch links this domain with a set of issues that are specific to Western culture,

<sup>&</sup>lt;sup>24</sup> *Ibid.*, p. 313. See L. Wittgenstein, *Tractatus logico-philosophicus*, London, Routledge, 1990. L. Wittgenstein, *Philosophical investigations*, Oxford, Blackwell, 1953.

<sup>&</sup>lt;sup>25</sup> Winch [1964], op. cit., p. 309.

<sup>&</sup>lt;sup>26</sup>*Ibid.*, p. 320.

<sup>&</sup>lt;sup>27</sup> *Ibid.*, p. 318.

<sup>&</sup>lt;sup>28</sup> *Ibid.*, p. 314.

and especially Western science, which are foreign to Zande culture. Therefore, he does not claim like Evans-Pritchard that the Zande way of thinking relies on the same logic as that of Westerners. In other words, although he does not challenge the consistency of the Zande way of thinking, he does not either link this way of thinking with a set of Western theoretical issues that in his eyes define the field of logic.

In this framework of analysis, the articulation of peoples' rationality with the issue of logical thinking is assessed anew. According to Winch, Westerners are unable to view rules in a given culture as rational when these are not formally consistent.<sup>29</sup> Indeed, there are some limitations for any individual belonging to a given culture to grasp other forms of rationality in other cultures. As part of these limitations, it is impossible for Western authors and their readers to renounce formal consistency. According to Winch, the formal consistency of rules of reasoning and behavior is not only an inescapable criterion of rationality for Westerners. It is also a necessary condition for descriptions to be intelligible to Westerners.<sup>30</sup>

One may think that this argument leads Winch to claim that Westerners may not view Azande people as rational. But Winch does not draw this conclusion. Indeed, he claims that the requirement for formal consistency in the rules of reasoning and behavior is but a light constraint.

He argues that this requirement partly determines the truth values of propositions, like in the framework of propositional calculus. But it does not determine them entirely. These truth values are also linked to the truth values that are assigned to initial statements used in the calculus.<sup>31</sup> Furthermore, Winch claims that many arguments may always be used in order to explain why two apparently contradictory rules or propositions are in fact compatible.<sup>32</sup> Seeming contradictions may well vanish once the meaning and the application of the context of rules and propositions are properly investigated.<sup>33</sup> This applies in particular to the case of Zande culture.

It is now clear why logic, understood as a set of Western rules of formal consistency, plays a limited role in assessing peoples' rationality in Winch's views.<sup>34</sup> According to Winch, this assessment should not rely on an inappropriate confrontation of the rules of the society

<sup>&</sup>lt;sup>29</sup> *Ibid.*, p. 318.

<sup>&</sup>lt;sup>30</sup> *Ibid.*, pp. 307, 312.

<sup>&</sup>lt;sup>31</sup>*Ibid.*, p. 318.

<sup>&</sup>lt;sup>32</sup> *Ibid.*, p. 312.

<sup>&</sup>lt;sup>33</sup> *Ibid.*, p. 318.

<sup>&</sup>lt;sup>34</sup> *Ibid.*, p. 315.

investigated and those of the analyst's, even if they were of a logical nature.<sup>35</sup> Winch believes that in order to appraise its coherence, the Zande way of thinking has been confronted with the rules of Western logic in an inappropriate manner. In his view, the rules of the culture investigated and the contexts in which they apply should be fully understood in order to check their consistency.<sup>36</sup>

Winch's analysis has been challenged by other readers of Evans-Pritchard. In his book Knowledge and Social Imagery, David Bloor criticizes both Winch's and Evans-Pritchard's claims, based on different views of logic and on its utility for assessing the peoples' rationality.<sup>37</sup>

### Portraying logic as being subjugated to institutions and circumvented by informal thinking

According to David Bloor, both Winch and Evans-Pritchard grant a power to logic which it does not possess. This power consists in being able to jeopardize an institution like Zande witchcraft. This would happen if the members of the society investigated perceive a logical problem in the way the institution works. Bloor then claims that Winch and Evans-Pritchard explain the stability of Zande witchcraft as an institution in two different ways. According to Bloor, Evans-Pritchard believes that Zande people have institutionalized a logical error, or have at least been relatively blind to it. For Bloor still, Winch states that Zande logic is fundamentally different from Western logic.

I just presented my reading of Evans-Pritchard. It differs from Bloor's reading and there is no need to insist on it. However, it is interesting to analyze Bloor's views of logic, and how the author uses them to challenge Evans-Pritchard's and Winch's analysis.

Knowledge and Social Imagery conveys views on logic that in many respects can be compared to the Ancient Greeks' approaches of the discipline. Bloor insists on taking the dynamics of logical thinking into account. However, how he conceives these dynamics appears to be quite limited and very distant from the evolution that logic as a discipline has undergone since the beginning of the 20<sup>th</sup> century.

<sup>&</sup>lt;sup>35</sup> *Ibid.*, p. 317. <sup>36</sup> *Ibid.*, pp. 319, 321.

<sup>&</sup>lt;sup>37</sup> D. Bloor, Sociologie de la logique. Les limites de l'épistémologie, Paris, Pandore, 1982.

Bloor likens logic to syllogisms, and to notions of formal reasoning and rules of inference about propositions.<sup>38</sup> His view of logic is above all of a propositionalist nature. Bloor appears to conceive the dynamics of logical thinking as the ways in which rules adopted by a given society change over time. However, the syllogistic nature of these rules appears to remain immutable.

In fact, Bloor does not depict logic as a scientific discipline, but as something which is uniformly distributed in every society. Within a given society, logic is everyone's business. It is collectively regulated. It provides the principles of reasoning and behavior of everyday life, and also of all scientific disciplines in the Western world. In other words, Bloor links logic with the institutional framework of reasoning which is adopted by each society.<sup>39</sup> Consequently, the matter of logic cannot be reduced to a psychology of reasoning, although Bloor evokes logical thinking.

In order to draw such a homogenous picture, Bloor himself translates various kinds of statements into logical ones. For instance, "the whole is greater than the sum of its parts" is not treated as prose, but as a syllogism that Bloor himself produces while translating this statement.<sup>40</sup>

Now how can Bloor claim that logic has so little power over the fate of institutions if he believes it is so present in each society? Bloor thinks that logical rules and propositions do not really constrain the production of reasoning, the collective management of behaviors, and the working of institutions. Indeed, in his view, the link between a rule and a case that is supposed to be governed by it must always be created. The application of a rule or of a formal reasoning in a given instance may be easily circumvented thanks to adequate informal arguments, if it threatens the stability of an institution to which people are attached.

Inspired by Mill's theory, Bloor claims that logic does nothing but record common forms of reasoning within a given society. Its main function is of a mnemonic and accounting nature.<sup>41</sup> Citing Wittgenstein, he adds that logical necessity and moral necessity are of the same nature. According to Bloor, we are constrained by some forms of reasoning in the same

<sup>&</sup>lt;sup>38</sup> *Ibid.*, p. 151.

<sup>&</sup>lt;sup>39</sup> *Ibid.*, pp. 162-163.

<sup>&</sup>lt;sup>40</sup> *Ibid.*, p. 152. This approach may be compared to Stark's treatment of this statement as a "purely formal" proposition. See W. Stark, *The Sociology of Knowledge*, London, Routledge, 1958, p. 163.

<sup>&</sup>lt;sup>41</sup> Bloor [1982], op. cit., pp. 148-149, 151.

way as we have to consider certain forms of behavior as being legitimate, since we take certain ways of life for granted.<sup>42</sup>

But according to Bloor, the informal always circumvents the formal. Formalism is nothing but a way of presenting a reasoning. It cannot be the founding principle of the latter. Reasonings in reality go from the particular to the particular by applying past cases to current cases. They do not go from the general to the particular by applying general rules to particular cases. That's why it is always possible to make formal rules compatible with any given situation. Producing an adequate informal reasoning suffices to do so.<sup>43</sup>

According to Bloor, social scientists thus do not need to look for logical foundations to behaviors and propositions. The latter only hold as long as they are required by, or compatible with, institutions. Any logical justification for them is nothing but a facade. That's why formal contradictions cannot affect the stability of Zande witchcraft for Bloor. Such contradictions may be easily circumvented by proper informal reasonings.<sup>44</sup>

In the framework of this social relativism, and more precisely of this institutional relativism, referring to logical norms of behavior and reasoning to assess the people's rationality is simply out of the question. For this peculiar reason, Bloor also does not portray Zande people as irrational due to a lack of logic.<sup>45</sup>

#### Conclusion: Do social scientists refer to logic with great care?

We could certainly go on analyzing this debate and studying the arguments of other authors who participated in it or whose writings were cited by its participants. The list of authors could include Alasdair MacIntyre,<sup>46</sup> Dan Sperber,<sup>47</sup> Bruno Latour,<sup>48</sup> Geoffrey Lloyd,<sup>49</sup> and Gilles Gaston Granger among others.<sup>50</sup> Undoubtedly, very diverse views and uses of logic would emerge as we proceed, some of them being quite sophisticated and fruitful. We would

<sup>&</sup>lt;sup>42</sup> *Ibid.*, pp. 154-155. See also L. Wittgenstein, *Remarks on the Foundations of the Mathematics*, Oxford, Blackwell, 1956, p. 155.

<sup>&</sup>lt;sup>43</sup> Bloor [1982], op. cit., p. 150.

<sup>&</sup>lt;sup>44</sup> *Ibid.*, p. 158.

<sup>&</sup>lt;sup>45</sup> *Ibid.*, pp. 162-163.

<sup>&</sup>lt;sup>46</sup> A. MacIntyre, "A Mistake about Causality in Social Science," in P. Laslett and W. G. Runciman (eds.), *Philosophy, Politics and Society (Second Series): A Collection*, Oxford, Blackwell, 1962, pp. 58-61.

<sup>&</sup>lt;sup>47</sup> D. Sperber, *Le savoir des anthropologues : trois essais*, Paris, Hermann, 1982, pp. 49-85.

<sup>&</sup>lt;sup>48</sup> B. Latour, *La science en action*, Paris, La découverte, 1989, pp. 301-318.

<sup>&</sup>lt;sup>49</sup> G. E. R. Lloyd [1993], op. cit.

<sup>&</sup>lt;sup>50</sup> G. G. Granger, *L'irrationnel*, Paris, Odile Jacob, 1998, pp. 139-179.

also show how logic is an object of debate within and between various disciplines of the social sciences and the humanities.

In the writings I just analyzed, it appears that authors adopted diverging principles to assess the rationality of behaviors and reasonings, based on different, and sometimes quite basic views of logic. But it also appears that the nature of these views led the authors to refrain from blaming the Azande for being irrational due to a lack of logic. On the basis of this observation, should we worry about the views of logic and its uses among social and human scientists? Or is the situation less dramatic than we may have thought?

Geoffrey Lloyd's cautionary statement against hasty denunciations of irrationality based both on his criticism of the notion of mentalities and on a fully historical approach to logic appears to speak in favor of the last assumption.<sup>51</sup> So does ethnomethodological approach that advocates against the use of logical norms to assess the rationalities of individuals in their everyday life.<sup>52</sup> Of course, it is not possible to answer the questions I have just raised on the basis of the limited set of writings I analyzed. The inquiry should therefore be pursued.

<sup>&</sup>lt;sup>51</sup> G. E. R. Lloyd [1993], op. cit.

<sup>&</sup>lt;sup>52</sup> See H. Garfinkel, *Studies in Ethnomethodology*, Cambridge, Polity Press, 1984, pp. 262-283. On the evolution of the representations and uses of logic in ethnomethodology, see M. Lynch, *Scientific Practice and Ordinary Action: Ethnomethodology and Social Studies of Science*, Cambridge, Cambridge University Press, 1993. See also E. Livingston, *The Ethnomethodological Foundations of Mathematics*, London, Routledge, 1985.