



Title	Reasoning and its limits
Author(s)	Kanit, Sirichan
Citation	Philosophia OSAKA. 2012, 7, p. 31-45
Version Type	VoR
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Reasoning and its limits*

Abstract

The paper argues that logical reasoning is what constitutes critical thinking because reasoning is normative, and logic provides a norm for reasoning. If a logical way of thinking is simply the same thing as reasoning, then the only limit or constraint of reasoning is the nature of the (logical) “rule” the kind of which is engaged with the practice of reasoning; rather than with either a component of social context or a component of a purely non-inferential or “immediate” perception of a situation which is called sensitivity toward an object alone. However, such components are built into my analysis of what “reasoning” is. An approach to critical thinking being employed here is “an agent-based approach”. This paper also aims to pave the way for a further discussion on the limit of reasoning in a way that is relevant to the question of how critical thinking or reasoning should be taught in higher education.

Introduction

An issue in philosophy of education concerns the aim of education. One such aim that is much discussed is to develop “critical thinking”. However, the notion of critical thinking is also much disputed as if it is another independent area. This may be due to the fact that the concept of critical thinking is a normative concept the nature of which is concerned with what is a “right” way of thinking. (cf. Bailin&Siegel, 2003). Examples of normative concepts are “beauty”, “good” and “meaning”. In case of education, the concept in question is what it is to think “critically”. As normative concepts, they are all contentious. There are many ways to assess such concepts, and one way is to find out its limits.

In this paper, I will argue that logical reasoning is sufficient for critical thinking. This means that what constrains reasoning will also constrain critical thinking. Thereby, I will look at the limits of reasoning. The word ‘limit’ means a constraint or a boundary where one cannot go beyond. This constraint can be accounted for in terms of a subject’s nature or the way a subject is characterized. The subject of reasoning is normative as reasoning is

* This paper was first presented at *An International Forum on Critical Thinking, Reasoning and Philosophical Practice*, the Department of Philosophy, Chulalongkorn University, Thailand, 21-22 December 2009. I would like to thank the audience of the conference, in particular, Professor Taro Mochizuki for his helpful comment and his intellectual support. Moreover, I would like to express my sincere gratitude to the Department of Philosophy, Osaka University, Japan, both for accepting to publish this paper and for their active staffs whose philosophy’s engagement provides me a source of inspiration.

a kind of rule-governed activity, namely, an activity the description of which is not possible without appealing to an idea of how the activity should be performed. In reasoning, rules are provided for how an inference should be made. So the ultimate limit of reasoning, which is normative, can be bluntly put that it is dictated by a kind of “rule” the direction of which is ‘truth’. The conception of “truth” that I suggest in this paper is not employed in a robust sense, i.e. a correspondent conception of truth where truth may be beyond our access. Rather it is used in a weaker sense: i.e. a perspectival kind of truth. However, it is not the paper’s main aim to analyze such a concept of truth. What I will do is rather to explore arguments leading to such a constraint.

My main argument is this. Because reasoning is normative, and logic provides such a norm for reasoning, so logical reasoning is what constitutes critical thinking. That is to say, in order to achieve critical thinking, logical reasoning is required. If logical way of thinking is simply the same thing as reasoning, then the only constraint of reasoning is the nature of the (logical) “rule” the kind of which is engaged with the practice of reasoning; rather than with either a component of social context or a component of a purely non-inferential or “immediate” perception of a situation which is called sensitivity toward an object alone. However, my argument does not rule out all such components as they are built into my analysis of what “reasoning” is. The way I show that such an analysis is possible is by employing an approach to critical thinking which can be called “an agent-based approach”, rather than a “skill-based approach” such as that of Ennis (Ennis, et al., 1996). This paper also aims to pave the way for a further discussion on the limit of reasoning in a way that is relevant to the question of how critical thinking or reasoning should be taught in higher education.

The paper is divided into three main parts. The first part’s main argument is that if reasoning is normative and logic provides a norm for reasoning, then logic does play a role in reasoning. The second part explores some conceptions of critical thinking and then provides some comments on such conceptions. And the last part is to propose an agent-based approach to critical thinking grounded on a revised definition of reasoning, and to show that if “truth” is the constraint of reasoning, then it is also of critical thinking.

1. Reasoning and logic

In this section, I will show that logical reasoning is sufficient for critical thinking, and if logical rules aim at truth, then truth is a constraint of reasoning. Before going to my argument in detail, I will first make some clarifications of the three terms: “critical thinking”, “reasoning” and “logic”. Although those terms seem to be closely related, they are different

in nature. Broadly speaking, “critical thinking” has been described as a kind of thinking grounded on a process of giving and asking for reasons; “reasoning” as a kind of thinking being regulated inferentially; and “logic” as the laws of reasoning. However, these are just a general understanding. To see their precise meanings and how they are interwoven, I will start from the less problematic terms: “logic” and “reasoning”.

As already mentioned, logic is broadly taken as the study of laws of reasoning, and reasoning is a kind of thinking. In particular, logic is usually described as the methods used in distinguishing correct from incorrect reasoning. In other words, it is the study of reasoning. But what is reasoning? Reasoning is a kind of thinking that thoughts are brought into connection in a certain way, namely, an inferential way. An inference is the process of drawing an information/statement from information/ statements given. In case of reasoning, an inference is a process of drawing a conclusion from premises. So reasoning can be defined as a process of inference. Logic can be viewed as the laws containing rules of inference. But as reasoning is a kind of thinking, it seems that the process of inference is psychological or a mental process. However, logic does not seem to be the study of something psychological. One may think, as Mill (1898) thinks, that logic is the study of what people reason. If that is the case, then logic is the study of something empirical or psychological. But, for Fregean (Frege, 1897), logic is not empirical; rather it is *a priori* laws of truth. At this point, I will look at the difference between logic and reasoning in order to show that reasoning is normatively governed by logical rules.

The difference between reasoning and logic

Harman (1984) proposes that reasoning and logic are not the same. His account of the two main views of logic is roughly this. First, logic is a body of the science of truth or axioms; and second, logic is the study of the rules of inference or certain patterns of implication.¹ The first view is influenced by the view of Frege (1897): logic is a general knowledge of thinking. According to Frege, logic has two characteristics: generality and normativeness. The generality of logic means that logic does not involve thinking as a particular psychological process; rather it is the knowledge of the general characteristics of thinking: “... logic is the science of the most general laws of truth” (p. 228). Frege takes “truth” as the object of study of logic because the property or the predicate that logic studies is “true”, in the same way

¹ Harman (1984, p. 110) just put the two views roughly, but the better clarification of Harman’s is in Goldstein (1988). I owe a lot from Goldstein’s paper on this point although I do not agree with the final solution of his paper. However, I will not discuss his arguments in this paper. Briefly, Goldstein argues against Harman mainly on the point that Harman’s view of logic is actually a kind of psychologism (Mill and Ellis), and his attempt to pull apart logic from reasoning is not successful. Goldstein’s suggestion in the end is what he called a kind of Wittgensteinian neo-psychologism.

that ethics studies the property “good” and physics studies “heavy” and “warm”. A thought that is true is not the same as thinking itself because judging that a thought is true is based on an independent criterion. As a result, logic is normative -- it prescribes our thoughts: “Like ethics, logic can also be called a normative science it studies” (p. 228). This kind of account of logic is called “logicism” or “anti-psychologism” corresponds to the well-known view that mathematics can be reduced to logic. To put it broadly, it is the view that logic is the study of formal rules. Harman calls it an extreme view: the view that logic is a body of truth. That is to say, logic is the study of the rules of our thinking, which is prescribed by the laws of truth. Another view of what logic is is called “psychologism”. This is Mill’s view of logic (1898), which takes logic as a study of the rules of inference. But, for Mill, logic is the study of the mental process when people reason. As he states: “it is necessary that the logician should analyse the mental processes with which logic is concerned” (p. 10). Mill is an empiricist who holds the view that logic, especially inductive logic, which is based on empirical evidences, provides “a test for ascertaining whether or not the belief is well grounded” (p. 6). So, for Mill, logic is empirical. To study the laws of thinking, it is necessary to study the way people reason. This view of logic contrasts with that of Frege (1884) who thinks that the general laws of truth or logic is not about what people believe or reason; even inductive logic is based on deductive logic.

As Frege writes:

If general truths are recognized at all, then it must also be granted that there are such primitive laws, since from purely individual facts nothing follows, except on the basis of a law. Even induction rests on the general proposition that this procedure can establish the truth or at any rate the probability of a law. For those who deny this, induction is nothing more than a psychological phenomenon, a way in which people come to believe in the truth of a proposition, without this belief thereby being at all justified (p. 93).

These contrastive views show that there is a split between logic and reasoning. Harman’s point is actually to support such a split. He argues that logic is not the same thing as reasoning because reasoning is “a procedure for revising one’s beliefs, for changing one’s view” (Harman, 1984, p. 107). An example of the arguments he explored is this. Suppose logic plays a role in reasoning, for instance, via the rule of consistency. It means that if someone has inconsistent beliefs, she should modify her beliefs in order to avoid inconsistency. But that is not true, for what people do is simply to accept the contradiction, and keep the inconsistent beliefs as another set of beliefs. It may be because either people find it is difficult to modify the beliefs or they have no time to examine them in detail. That is possible because the rule of “avoid inconsistency!” has an exception: “not to believe thing

one knows to be jointly inconsistent" (1984, p. 108). It means that if one knows that the beliefs are jointly inconsistent, then one tends to avoid the contradiction. But many times, it is not the case that one knows. What Harman said is:

...rational fallible person ought to believe that at least one of his or her beliefs is false. But then not all of his or her beliefs can be true, since, if all of the other beliefs are true, this last one will be false. So in this sense a rational person's beliefs are inconsistent. It can be proved they cannot all be true together (1984, p. 109).

An example of the inconsistency is the case of the preface paradox (Makinson, 1965). A popular version is about a writer who wrote in the preface that she believes everything that is written in her book is true, but she also realized that there may be some mistakes. It means that her beliefs are self-contradictory: she believes the conjunction of all her beliefs is false.

Harman had explored but failed to support many hypotheses that may lead to a possibility that logic plays the role in reasoning, the argument of which I will not go further (see Goldstein, 1988; Field, 2009; Milne, 2009; Sainsbury, 2002). But if Harman is right, an implication will be this: the account of logic that is connected to reasoning is probably the one that simply describes what people do, rather than a prescriptive account. Goldstein (1988) calls this 'a naturalistic account of logic'. However, it is hard to see that the naturalistic account is right. For one thing, in describing the way people practice or reason, one always needs a frame of reference in giving the description. Inevitably, the intelligibility of such a frame of reference requires some basic logical rules in a logical system. For example, one may imagine people who hold a belief which seems to be against the law of excluded middle; a possible description may be based on a system of fuzzy logic where truth-values are more than two.²

However, there is an interesting point in Harman's view which may be supported by some works in psychology of thinking, for example, the well-known 'selection task' of Wason (1968). The task is an experiment for determining the difficulty in conditional reasoning (*Modus Ponens/ Modus Tollens*). In Wason's words, he says:

The subjects were presented with the following sentence, "if there is a vowel on one side of the card, then there is an even number on the other side," together with four cards each of which had a letter on one side and a number on the other side. On the front of the first card appeared a vowel (P), on the front of the second a consonant (P), on the front of the third an even number (Q), and on the front of the fourth an odd number (Q). The task was to select all those cards, but only those cards, which would have to be turned over in order to discover whether the experimenter was lying in making the conditional sentence (1968, p. 273).

² See a working detail on how this is possible in Sainsbury (2002)

The finding of Wason's experiment is that people tend to have no difficulty with the *Modus Ponens* pattern, but this is not the case with the *Modus Tollens*. Actually, Wason's paper is to argue against Piaget's "formal operational thought" (Inhalder&Piaget, 1958). Piaget's idea is that at a certain age, people will develop their cognitive ability in accordance with logical rules. However, the task has invited lots of debate ever since, both concerning the ambiguities of the experiment itself and interpretations of the finding. But my concern is that the experiment is a way of describing how people reason, but the way people reason is not always correct. To take the way people reason as the correct reason is simply like confusing a ruler with what it measures. Wittgenstein (1953) had used the analogy of the scale and a lump of cheese to illustrate this point as follows:

the procedure of putting a lump of cheese on a balance and fixing the price by the turn of the scale would lose its point if it frequently happened for such lumps to suddenly grow or shrink for no obvious reason. (1953, nr. 142)

That is why we say that reasoning is normative and logic is a guiding rule which constrains reasoning. But, of course, the normativity of the logical rules is not such that it is impossible to be characterized in relating to the way people reason. Otherwise, that would face a paradox of rule-following, i.e. the problem that if rules are independent from our grasp, it will beg for a regress of interpretation; but if our practice is the rule itself, then it will beg for a state of absurdity where talking about "what is right" is not intelligible at all (cf. Wittgenstein, 1953, nr. 201, and, especially, McDowell, 1984).

Although I do not think Harman's view is right, I do accept his initial definition of reasoning, i.e.

Df.= reasoning is a process which beliefs are revised.

But I suggest a revision of that definition into:

Df.r. = reasoning is a normative process in which beliefs are revised under the guidance of logical rules the kind of which is engaged with the way the rules are followed.

As seen above, Harman's definition is actually a descriptive account of the way people do when there are changes in their beliefs. This implies that without reasoning, people are unskeptical with what they believe: they do not change their beliefs. Usually, we tend to think that in "non-reasoning" activities, such as, in loving, in hating, in perceiving, people do not doubt what they do. That is because such activities seem to be a "direct" process that we and the attended object in the final end get connected. The doubt occurs when thoughts

are connected in an inferential way which is not an immediate way. In other words, doubts occur when people reason. According to Harman's analysis, the doubt occurring in reasoning is not under the guidance of logical rules. Harman's idea (1984) is that no logic, either deductive rules or inference to the best explanation, can guide reasoning. However, if that is right, it would be nonsense because his argument will lead to the point that reasoning is not normative at all. Moreover, then there will be no content ascription to reasoning. And that means it is absurd to talk about reasoning being defined as a process of belief revision.

Something grounded Harman's view may be called a dualist view of reasoning, namely, the view that reasoning activity is purely conceptual contra to "non-reasoning" activity which is non-conceptual. However, such view overlooks a possibility that the content of the thoughts is conceptually inherent. One reason is that: if the non-reasoning process is a non-inferential direct process, there will be no content of the thoughts, which means that they will be just a "brute fact" or the fact that is empty and no meaning at all. If it is the brute fact, to understand what it is about, then one needs interpretations of the fact. But then again the problem of regress of interpretations is looming. An implication of Harman's view is that non-reasoning activity is non-conceptual and that reasoning is a pure conceptual one. But, surprisingly, Harman would say that the pure conceptual of reasoning is not an inferential or logical one. But that overlooks the fact that reasoning is not purely conceptual for it is also partly constituted by the way people reason. In my view, there is a way to take reasoning as conceptual. However, what reasoning is about cannot be characterized freestandingly from the practice of reasoning. In other words, if the implication of Harman's idea works out, the kind of logic that suits the practice cannot be a sort of infinite rail of logic: it has to be a rail that engages with the practice itself. So, that corresponds to my revised definition of Harman stated above. And this means that if logical rules are what constitute reasoning, and logical rules aim at "truth" as its object of study, then "truth" is the constraint of reasoning.³ To show how such a constraint can accommodate some other elements, such as the social context and our sensitivity to the object of reasoning; put it another way, it is to show how the kind of rules that are engaged with the practice are possible, a good example is in how "critical thinking" should be perceived. So I turn now to explore some conceptions of critical thinking in the following before proposing my own approach later on.

³ The concept of "truth" using here is a neo-Fregean sort of concept. It is meant to be a perspectival kind of truth. To illustrate this concept will require more space and not be in the scope of this paper. But I intend to use my elaboration of critical thinking as a way to show how this kind of truth is possible. (see G.Evans (1982) *The Varieites of Reference* for a classical neo-Fregean view on "truth")

2. Conceptions of critical thinking

In psychology of reasoning, reasoning means a kind of cognitive process functioning as a part of human thinking including decision making or problem solving (see Sternberg&Leighton, 2003). It is an empirical study of human behaviour including the functions of the brain. This way of studying reasoning is simply a descriptive way of observing how reasoning is processed in human behaviour. However, philosophy studies reasoning by analyzing the laws underlying it, namely, logic. Similarly to critical thinking, it is described as a normative activity (see Bailin&Siegel, 2003). A study of critical thinking is not a study of what people think; rather it is a study of what people should think. The former study is the study in psychology. This is consistent with my view discussed above that reasoning is normative, so is critical thinking.

The term “critical thinking” is widely recognized under the influence of the works of Ennis, a philosopher of education (1989, et al.). But originally, the concept of critical thinking is based on Dewey’s conception of “thought”, in particular, “reflective thinking” (Dewey, 1933) (cf. Fisher, 2001, p. 2). In “How We Think”, Dewey made a distinction between three kinds of “thought”: first, a thing “that goes through our heads” (1933, p. 1) or a kind of mental phenomena; second, things that are not known by senses and third, an evidential based belief. However, the last one is divided into two types: ungrounded belief and well-grounded belief. The process of getting the latter belief is called “reflective thought” the value of which is for education. Reflective thinking aims at knowledge, belief about facts or truth (1933, p. 3). According to Dewey, what constitutes reflective thought is “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends,...” (1933, p. 6).

Basing on Dewey’s concept of reflective thought, Ennis (1993) has defined critical thinking as “reasonable reflective thinking focused on deciding what to believe or do” (1993, p. 180). Dewey’s account of “reflective thought” may induce an understanding that critical thinking means not merely a process of inference but also problem solving and decision making. A work on the psychology of thinking has expressed a doubt whether reasoning should be put under problem solving or decision making because it may be so broad that reasoning has no meaning (see Sternberg& Leighton, 2003). But that may not be a proper doubt, because an inferential process in reasoning includes both deductive and inductive inference, which play the role in problem solving and decision making also. However, the problem is that if reasoning is the same thing as problem solving and decision making, then does it mean that critical thinking should be constituted of skill-training? I will now take a brief look at Siegel (1988), since his view holds the sort of non-skill approach to critical thinking which is quite close to my view. Nevertheless, there is one main weak point in his

view that my agent-based approach does not have.

Siegel's idea is that the conception of critical thinking should be taken as the reasons conception, because a "critical thinker is one who is appropriately moved by reasons" (1988, p. 2). What critical thinking involves are "dispositions, habits of mind, and character traits as well as skills" (1988, p. 8). Although skill possession is an element in critical thinking, Siegel does not agree with Ennis. According to Ennis, the element of skill is not the only element which is important but also the disposition to use the skill. These two elements -- skills and disposition to use the skills -- are necessary elements for any approaches to critical thinking. Ennis tends to emphasize more on the disposition element. His works mainly contribute to create sort of proficiencies test. The main attack of Siegel on Ennis is that Ennis's approach is actually a skill plus tendencies conception of critical thinking. The problem of this approach is that it does not address the more important question that why should critical thinkers have such tendencies. For Siegel, the answer for that question is this:

critical thinkers should be disposed to think critically and tend to do so, because they recognize the value of critical thinking. This recognition involves the recognition of related values, such as truth, intellectual honesty, and justice to evidence. Moreover, to recognize the value of critical thinking it is necessary that critical thinking *has* value; consequently, a fully worked out conception of critical thinking ought to demonstrate that value (1988, p. 9)

This answer is a justification for critical thinking to be an educational goal. However, Siegel thinks that he and Ennis may not be totally different. They both seem to agree that critical thinking concerns the characterization not only of a set of cognitive skills but a certain sort of person. But the difference is that while Ennis's conception is concerned with micro-dispositions, Siegle's is more with the macro-dispositions, namely, "a sort of character trait; a person who has it is not simply a person with a certain disposition but a certain sort of person" (1988, p. 8).

In fact, the main point that worried Siegel most is the question of how the two components – skills and disposition to use the skills - are connected. He thinks that Ennis's micro-disposition cannot do the work of connecting both components. The main reason is that there is no guarantee that the thinker will dispose to use the skills in some other unknown areas. Siegel hence thinks that the macro-disposition can fill in the gap between the two elements because it is a person who has a disposition to use the skill is a person who has a critical spirit or a critical attitude (1988, p. 39). The better word that Siegel brought from Binkly is "a love of reason". To put it short, for Siegel, skills are just necessary, but what is sufficient is the attitude. My bottom-line of the idea of critical thinking is actually quite close to Siegel. But the difference is that I don't think that the gap between skills and disposition

can be bridged by the attitude. My main reason is : Siegel's model is rather like an idealist who fixes the problem of mind-body by stating that the body can be reduced to the mind. To explain whether a person is going to dispose to use her skill or not is in terms of whether she has a proper attitude. But then an epistemic doubt concerning the attitude is looming: how can one know that the attitude is the right one, if not by observing her actions? So I conclude that Siegel's model does not appear to be convincing as it seems. I then turn now to the last section in order to give a rough sketch of my own approach.

3. An agent-based approach

It seems that the meaning of “critical thinking” is broader than the meaning of “reasoning”. Good reasoning may not be sufficient for being a critical thinker because being a critical thinker seems to encompass some other properties more than simply the cognitive ability, for example, not just somebody who can win a debate; rather somebody with goodwill, or probably somebody whose reasoning aims at “truth”. However, usually, it seems that in saying someone thinks critically is just like saying her reasoning is good. But saying that someone thinks uncritically can mean two things: either bad reasoning or just a failure of applying reasoning at all. In the latter case, we would also say she does not think at all. Bad reasoning can still mean that reasoning is applied, but in the sense that: either the reasoning does not reach some standards of good reasoning or that the reasoning may not be a proper or a right one in some context. But the latter sense is suspicious: is there such a thing like “improper” reasoning? This suggests a sense that there may be something else besides merely good reasoning in order to be a good critical thinker.

Nevertheless, critical thinking has been often characterized as something that a rational thinker should acquire because it is a cognitive ability, contra to non-cognitive one. However, a “rational thinker” is surely a normative term. It suggests a preferable valuable sense. In this broader sense, critical thinking is highly honored as a laudable way of life. Many take it as an essential activity for living a meaningful life.⁴ So it seems that critical thinking is broader than reasoning in this sense. It seems to incorporate more aspects of life. In general,

⁴ One obvious example is from Joe Lau *A Mini Guide to Critical Thinking* (Department of Philosophy, The University of Hong Kong, August 2003, see <http://philosophy.hku.hk/think/>) (“critical thinking is the ability to engage in reflective and independent thinking, and being able to think clearly and rationally.“critical thinking is also necessary for self-reflection. *In order to live a meaningful life and to structure our lives accordingly, we need to justify and reflect on our values and decisions. Critical thinking provides the tools for this process of self-evaluation.*”)

Another example is from The Foundation of Critical Thinking which is a sort of institutionalized critical thinking for the public on a web page <http://www.criticalthinking.org/aboutCT/ourConceptCT.cfm> This organization seems to take critical thinking as a kind of moral/utility value.

there is something true there. However, as I have already argued earlier that the concept of reasoning should not be taken as a cognitive ability contra to a non-cognitive one. If that is right, then reasoning is sufficient for critical thinking because it can account for other aspects of life which seems to be broader than reasoning *per se*. Therefore, it is legitimate for me now to say that reasoning or critical thinking is not just a process describing human cognitive activity. It is actually all it is about being an agency in the world, the reasons for which are the following. First, it is the only way we can engage with the world, the world where there are nuances of thoughts. To be more precise, reasoning is all and only method for living together in a democratic society. Second, reasoning is an epistemic activity. It is a method for acquiring knowledge in two senses: first, reasoning as a process of inference, and second, reasoning as a process of belief revision.

As I have provided the revision of Harman's definition of reasoning in the above section, both senses of reasoning are connected. Grounding on this understanding, I call my approach to critical thinking an agent-based approach. The approach means that what constitutes critical thinking cannot be simply skill training in logical rules; rather it requires an account of how the practice of reasoning is engaged. The practice of reasoning does not mean what people do in reasoning, rather it means the way people handle the world in a meaningful way. That is to say, it requires an ability to perceive the world directly or a sort of sensitivity to the object of reasoning. This may sound mysterious if perception is taken to be non-inferential as contra to an inferential process like reasoning. But if this assumption is not right, then the kind of direct perception to the world is not dark at all. It means that reasoning or critical thinking is constituted of a direct sense to the world but in a way which is not freestandingly characterizable from our inferential process. I will try to clarify this idea by using an example of the Keegstra case from the paper of Hare (1990).

The Keegstra Case (the case was in 1985) is the case of a school teacher, James Keegstra, who was convicted of "willfully promoting hatred against the Jews". Since 1968, Keegstra had been a teacher at Eckville High School in Canada and had taught history and social studies the class he was charged promoting hate speech. Although he, in general, was praised as "a good teacher", a "caring, generous, Christian man" (see Mertl, S. & John Ward, 1985), his teaching "displayed and fostered anti-Semitic attitudes" (Hare, 1990, p. 376). He

"It is quite possible and, unfortunately, quite "natural" to live an unexamined life; to live in a more or less automated, uncritical way. It is possible to live, in other words, without really taking charge of the persons we are becoming; without developing or acting upon the skills and insights we are capable of. *However, if we allow ourselves to become unreflective persons — or rather, to the extent that we do — we are likely to do injury to ourselves and others, and to miss many opportunities to make our own lives, and the lives of others, fuller, happier, and more productive.*"

believes that the holocaust is the Jewish conspiracy to establish a world government and had defended his belief in his teaching. However, the defense of his belief was not grounded on weighing the reasonableness of different sides of arguments. When students responded conforming to his belief, he gave supportive feedbacks. Once the allegation was made against his style of teaching, he appealed to the principle of freedom of speech and the value of open-mindedness.

The Keegstra case seems to be a controversial case for educationists including philosophers of education and political philosophers. It is controversy simply because what he taught is opposed to the political correctness in western societies. The controversial issues concern mainly the problem of biased teaching, the problem of indoctrination in education and the aim of education in promoting a democratic value of tolerance. Hare had discussed these points and argued against the view that the Keegstra case is the case of an honest heretic, namely, someone who is sincere in defending his own view. The view that Hare is against is Mary Warnock's idea (Warnock, 1975, 1988 in Hare, 1990, p. 383).

Although Warnock's paper is not about the Keegstra case, her view on the neutrality in education is stimulating. For Warnock, it is not the case that teachers should be neutral on controversial issues, if there are principles or reasons supporting the issue, and if the teacher is sincere enough even though her belief looks so perverse or so dotty. Hare argued against applying Warnock's view to the Keegstra case. For the first thing, Keegstra did not have principles and did not encourage his students to weigh evidences and to be independent in having judgement; second, Keegstra did not also have sincerity: his belief is immune to counter-evidence.

Following Warnock's view, principle of tolerance is not universally applied. But then the problem is the dilemma that: if neutrality is applied, then the controversial idea will be so offensive to the point that it is intolerable; but if neutrality is not applied, there will be more suspicious of the credibility of the controversial idea (e.g. the Jewish conspiracy theory). The way out that Hare discussed is "not to ignore the theory unless a student raises it" (1990, p. 384). But what is presupposed here is that students feel free to raise issues. However, I think that the choice of not applying neutrality actually creates a gray area where there is no distinction of indoctrination and education. The issue is also about whether political correctness is itself another moral taboo which obstructs critical thinking. However, Hare thinks that it is obvious that the Keegstra case is not the case of the violation of freedom of speech, but it is the case of indoctrination, not education.

Another way out which Hare argues against is the so-called argument from truth. The argument is the view that "truth should emerge in open discussion", the assumption of which is that humans are rational. But Hare suspects that the assumption is rather "the

search for truth is the supreme value" (1990, p. 385). Moreover, for Hare, this argument is not suitable for an idea of education the assumption of which is that students are not always rational:

Tolerating open discussion of reprehensible views does not assume that students are thoroughly rational; rather, it stems from a central aim of education – to *further* students' development as rational agents (1990, p. 385)

But "to curtail discussion in schools because people are not always rational would deprive students of the very practice that might develop their rational abilities" (p. 385). It means that because students are not always rational, so we need "to look for ways to develop this ability". A question of my concern is whether the argument from truth threatens my suggestion that the constraint of reasoning is "truth". It seems to me that according to Hare, the search for truth obstructs critical thinking rather than fosters it. But I think the concept of truth that Hare has in mind is a kind of a robust conception of truth, namely, the correspondent kind of truth where truth is independent from our access. It obstructs critical thinking because in asserting it, people overlook the fact that what is out there may be perspectival. But I don't think it is right to take this as a reason for avoiding truth-seeking. This is just to explain away all the good things that may come with truth-seeking. If my suggestion on the limit of reasoning is correct, that is, the purpose of reasoning is to search for "truth", then it is the only way to show that disagreement is possible and is also a valuable thing for being in the world.

Conclusion

This paper aims to show that the limit of reasoning is a perspectival kind of truth by, firstly, arguing against the view that there is no connection between logic and reasoning; secondly, discussing some conceptions on critical thinking basing on the revised definition of reasoning which is *a normative process in which beliefs are revised under the guidance of logical rules the kind of which is engaged with the way the rules are followed*; and finally, proposing an agent-based approach to critical thinking grounding on the revised definition. In a nutshell, the approach means that critical thinking and reasoning is constrained by a perspectival kind of truth, which is based on the idea that perception is not purely non-conceptual, and that reasoning is not purely conceptual. So this approach focuses more on how an engagement with the practice of reasoning is performed, rather than on how to train the skill of critical thinking. However, there are still some points that need to be worked out more in detail, for example, how this approach is applied in teaching a course on critical thinking.

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This article is part of the achievement of the research supported by JSPS's Grant-in-Aid for Scientific Research "Asian Adaptation of Critical Thinking Education" (Basic Research C(1), 2009-2011, Representative: Taro Mochizuki).

本論文は、日本学術振興会科研費補助金（基盤研究C(1)「批判的思考教育のアジア型適応」代表者：望月太郎）による研究成果の一部である。

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