Arguing Against the Argumentative
Theory of Reasoning

Argumentando en contra la teoría argumentativa
del razonamiento

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Abstract: This essay argues against the argumentative theory of reasoning as put forth by Mercier and Sperber (2011), centering on the theory's inability to support an epistemic definition of reasoning proper, especially based on examples of how reasoning fails, not why reasoning exists. The arguments against the theory are that it values justifiability over truth and thus cannot account for epistemic success in reasoning, that it relies on argumentative contexts for epistemic success in reasoning, and that its method for evaluating reasoning, epistemic vigilance for listeners, should be extended to all parts of the reasoning process. This essay also highlights a case where the presented evidence does not support the conclusion the authors draw, by examining how a supposedly argumentative phenomenon also occurs in capuchin monkeys.

Keywords: Argumentative context, argumentative theory of reasoning, epistemic theory of argument, epistemic vigilance.

Resumen: Este trabajo reflexiona en contra de la teoría argumentativa del razonamiento avanzada por Mercier y Sperber (2011). Centrándose en la inhabilidad de la teoría en apoyar la definición del razonamiento apropiado, porque se basa especialmente en ejemplos de cómo el razonamiento falla, y no en por qué el razonamiento existe. Los argumentos en contra de esta teoría son: valora la justificabilidad sobre la verdad y de este modo no puede explicar el éxito epistémico del razonamiento; descansa en la contextualidad argumentativa para explicar el éxito epistémico del razonamiento; y su método para evaluar el razonamiento, y la vigilancia epistémica de los oyentes, debiera ser extendida a todas las partes del proceso de razonamiento. Este ensayo también enfatiza un caso en el que la evidencia presentada no apoya la

conclusión que los autores obtienen, examinando cómo un supuesto fenómeno argumentativo también ocurre en monos capuchinos.

Palabras clave: Contexto argumentativa, teoría argumentativa del razonamiento, teoría epistémica del argumento, vigilancia epistémica.

1. Introduction

In the January 2011 issue of *Behavioral and Brain Sciences*, Hugo Mercier and Dan Sperber published a compelling article entitled *Why do humans reason? Arguments for an argumentative theory*. Mercier and Sperber (hereafter M&S) assert that, contrary to the majority view that the function of reasoning is to enhance individual cognition (e.g. Kahneman 2003), because of evidence that reasoning is poor at actually fulfilling this function, the main function of reasoning is argumentative (M&S, 2011, p. 60). The authors present an impressive body of evidence in order to test the signature effects they believe an argumentative theory of reasoning (ATR) entails. Reasoning proper, they maintain, consists of arriving at a belief by reflecting on reasons to accept said belief, and as such being aware of both a conclusion and the argument that justifies the conclusion. While such a definition of reasoning proper applies to the majority view as well, the authors diverge from other theories by maintaining that the intuitive processes and inferences inherently involved in reasoning proper are, in themselves, argumentative. While it is clear that the presented body of evidence by itself has serious implications for cognitive psychology and philosophy alike, it is also clear that though the ATR can explain how reasoning fails in the presented cases, it does so relying on a definition of reasoning proper that fails to account for the normativity of argumentation. The ATR thus values justifiability over truth (epistemic success) and relies on context for epistemic success, and does so with a body of evidence that supports how reasoning fails in certain cases, not why reasoning exists. In this essay, I primarily will clarify how the ATR values justifiability over truth, why reasoning proper needs normative constraints to account for successful reasoning, and how argumentative contexts and epistemic vigilance relate to reasoning proper. Secondarily, I will explain how the ATR is limited in its application as similar arguing patterns arise in non-arguing species.

2. The Role of Argumentation in Reasoning

Not at stake in the present debate between the majority view and the ATR is the importance of argumentation in reasoning, but the role of argumentation lacks necessary normative constraints under the ATR by valuing justifiability over truth and thus failing to account for cases of successful reasoning. Ralph H. Johnson, in a 1991 article in *Communication & Cognition* entitled "The Place of Argumentation in the Theory of Reasoning," asserts that, similarly to notions that drive the ATR, "*Argumentation plays a pivotal role in the theory of reasoning. Hence, without an adequate account of argumentation, it will not be possible to develop a complete theory of reasoning*" (Johnson, 1991, p. 5). However, whereas this version of the argumentative view sees reasoning as argumentative in nature, M&S see reasoning as argumentative in both nature (our intuitions that drive argumentation are argumentative) and function (the thesis of M&S's paper). Johnson, along the lines of the majority view, differs from M&S in asserting that the function of argumentation is rational persuasion. While the notions of rational persuasion and argumentation seem like similar functions, M&S's emphasis, seen in their abstract, is on persuasion, whereas Johnson's emphasis is on rational persuasion, which invokes notions of epistemic success, or truth. Johnson encompasses rational persuasion within his five basic criteria for a theory of reasoning, one of which is an element of normativity. While argumentation is central to reasoning, one of the main merits of argumentation is not a search for persuasion or justifiability, but for truth. "*A third reason for the importance of argument: if, as I believe is the case, argumentation is the primary rational strategy for arriving at the truth [or most warranted view], then it surely deserves a place of prominence in any theory of reasoning*" (Johnson, 1991, p. 10). Reasoning is argumentative in nature but epistemic in function.

Argumentation theory draws a similar distinction between the rhetorical theory of argument and the epistemic theory of argument.[1] The ATR has similarities with a rhetorical definition of argumentation, which provides the criterion for evaluation of argument that it should elicit assent. While

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[1] For views on the epistemic theory of argument, see Aikin (2008); Biro and Siegel (1997); Feldman (2005); and Goldman (2003).

the rhetorical theory can characterize how reasoning happens, as pointed out by Aikin (2008), it cannot address fallacies of reasoning, as they are justifiable but within epistemic norms they should not be. The ATR addresses fallacies by showing why they may exist, but it cannot explain how to fix the fallacies within reasoning proper. Based on two requirements of argumentation, that (1) they are supposed to achieve a change in view in audiences and (2) that they are to be normatively evaluated, the epistemic theory of argument requires these changes in audience views come on good epistemic grounds and provides criteria for normative evaluation, holding that arguments are to be evaluated in terms of their comprising epistemic reasons. A good argument is one that is pursuant not of justifiability, but of epistemic success – rational persuasion instead of just persuasion.

Cristián Santibáñez (2012), in an article responding to the ATR as put forth by M&S, further connects these argumentation theory notions to the ATR, focusing generally on how the ATR does not account for some of the most basic aspects of argumentation, including normativity, and specifically on the distinction between justifiability and truth and how this distinction is necessary for epistemic success. Santibáñez reasons:

> When M&S maintain that the function of reasoning is argumentative, that it is to devise and evaluate arguments intended to persuade, they abolish in one shot the distinction between rhetoric and argumentation, whereas the later field studies precisely the criteria why and how good arguments can finally convince and persuade to different audiences. (Santibáñez, 2012, p. 20)

Both M&S's argumentative theory and traditional argumentation theory see argumentation as essential to reasoning proper, but whereas the ATR sees these arguments rhetorically driving toward justifiability, traditional argumentation theory and the epistemic theory of argument see them driving towards truth. Reasoning centers around argumentation, but these arguments need epistemic constraints in order to account for the normativity of argumentation that allows for successful cases of reasoning proper. If arguments are intended to persuade, then the ATR cannot distinguish between persuasive reasoning and good reasoning.

3. Argumentative Contexts

The ATR relies on argumentative contexts to achieve epistemic success from argumentative intuitions. In section 2.3 of the target article, M&S analyze research of group reasoning tasks in order to justify the prediction of the ATR that reasoning should work best in argumentative contexts. They argue that because group reasoning tasks inherently create debate, the outcomes of reasoning should be especially good in these contexts, and cite studies that confirm this hypothesis as evidence in favor of the ATR[2]. To the contrary, Cass R. Sunstein, in a 2002 *Journal of Political Philosophy* article entitled "The Law of Group Polarization," argues that in certain cases, members of a deliberating group have a tendency to polarize to a group conclusion that is not representative of the mean of the group's thoughts. These results stand in contrast of the prediction that reasoning, as it is argumentative in function, produces its best results in argumentative contexts. As Sunstein states, "*If deliberation predictably pushes groups toward a more extreme point in the direction of their original tendency, whatever it may be, do we have any reason to think that deliberation is producing improvements?*" (Sunstein, 2002, p. 177).

Sunstein's and M&S's analyses of group reasoning are not perfect matches that analyze the same phenomenon in group reasoning and argue conflicting outcomes. In fact, M&S limit their analysis of group reasoning tasks to those "...*pertaining to logical or, more generally, intellective tasks for which there exists a demonstrably correct answer within a verbal or mathematical conceptual system (Laughlin & Ellis, 1986, p. 177)*" (M&S, 2011, p. 62), whereas the phenomenon observed by Sunstein pertains to deliberating groups "... *with some kind of salient shared identity*" (Sunstein, 2002, p. 176) discussing an issue rather than a deductive problem. However, the importance of group polarization for the ATR is not diminished by the fact that its effects only occur when like-minded individuals discuss an issue; what matters most is that group polarization shows an instance in which an argumentative context leads to negative, not positive, consequences. Whereas the ATR asserts that reasoning is best in argumen-

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[2] M&S cite Bonner *et al.* (2002); Laughlin and Ellis (1986); Stasson *et al.* (1991).

tative contexts because it is argumentative in function, group polarization research shows that, outside of the selected evidence of groups performing deductive reasoning tasks, reasoning about decisions and issues for which a demonstrably correct answer does not exist may not be best suited to argumentative contexts. This conclusion poses a problem for a theory of reasoning with a conception of reasoning proper that relies on purely argumentative intuitions.

Though the counter-example of group polarization shows that argumentative contexts can produce poor epistemic outcomes, it only shows that this is the case in the specific setting of groups with like-minded ideas. One could argue that such a situation represents a bad argumentative context, and thus it is unsurprising that such a context leads to polarization. In fact, good argumentative contexts are, as highlighted by M&S, a positive environment that often produce epistemically successful reasoning. Jonah Lehrer, in the chapter of his book *How We Decide* (2009) entitled "The Brain is an Argument," demonstrates how such contexts positively affect decision-making. In the book, Lehrer makes accessible research from neuroscience and psychology to sketch a rough definition of reasoning proper as it relates to decision-making. Lehrer argues that "... *we can create decision-making environments that help us better entertain competing hypotheses...when making a decision, actively resist the urge to suppress the argument*" (Lehrer, 2009, pp. 217-218), but that such a process is hard to perform. However, despite not always being easy to create, the fact remains that good argumentative contexts tend to produce good reasoning.

Though argumentative contexts exist which produce bad reasoning and good argumentative contexts produce good reasoning, the underlying issue for the ATR is that it relies on good argumentative contexts for epistemic success in reasoning, and reasoning proper cannot coherently rely on context for epistemic success. In section 4.2.1 of the target article, M&S discuss research on the polarization of attitudes (they unfortunately do not extend this discussion to how argumentative contexts in a group setting would affect the polarized attitudes), and this analysis of attitude polarization at the individual level is a case where the ATR can explain patterns in reasoning but not why these patterns exist, thus highlighting the ATR's reliance on context for epistemic success. M&S describe an experiment, similar to those cited by Sunstein but individual rather than in groups, in which the

subject is asked to objectively evaluate an argument for or against an issue about which he or she has a preconceived opinion (Lord et al., 1979). The results are not shocking: people tend to confirm or deny the study based on their preconceived beliefs, which leads M&S to conclude that, "*Participants are not trying to form an opinion: They already have one. Their goal is argumentative rather than epistemic, and it ends up being pursued at the expense of epistemic soundness*" (M&S, 2011, p. 67). The ATR correctly predicts that in such cases as described above, participants will rely on their preconceived argumentative intuitions and focus on justifiability over truth, but the issue for the ATR is that reasoning as such is thus dependent on context for justifiability to lead to truth. Good argumentative contexts produce good reasoning, and without such contexts humans tend to pursue justifiable arguments rather than good arguments, but such an analysis does not provide a sense of how to reason proper without relying on context. A good definition of reasoning proper requires more than good argumentative contexts for epistemic success. If argumentative contexts create both good and bad reasoning outcomes, then the ATR relies on context for epistemic success, not reasoning proper itself.

4. Reasoning Systems and Argumentation

This critique of the ATR valuing justifiability over truth is not unique. In the peer commentary following the target article, two responding peers highlight similar issues with the proposed ATR as it relates to more traditional theories of reasoning. Peter Godfrey-Smith and Kritika Yegnashankaran draw out the fact that if reasoning is best in group, argumentative contexts, yet the argumentative theory supports that reasoning is not after truth but after justifiability, it becomes puzzling that people are best at finding truth when arguing with each other, when they should just be bolstering their own position (M&S, 2011, p. 80). Drew Michael Khlentzos and Bruce Stevenson emphasize a similar epistemic critique. Khlentzos and Stevenson draw on the prevalent psychological conception that characterizes the operations of the mind into two distinct systems that constantly work in concert (M&S, 2011, pp. 82-83). As described by Daniel Kahneman (2003), System 1 (S1) is automatic and effortless, and often governed by habit and

thus difficult to control or modify, whereas System 2 (S2) is slow, effort-ful, more likely to be consciously controlled, flexible, and potentially rule governed (Kahneman, 2003, p. 698). To simplify each system's role, S1 is responsible for intuitive judgments whereas S2 is behind explicit reasoning and is often credited with correcting for errors in automatic S1 judgments. Khlentzos and Stevens ask whether S2 might require independent reason-ing capabilities beyond the specific competencies entailed in each system by M&S's argumentative view, correcting instead of justifying S1 intuitions when applicable in order to perform reasoning proper. They posit, "*The social psychology findings M&S adduce to support their view present a puzzle for it: How can truth win out amongst sophistical S2s committed not to discovering the facts but to defending S1's representation of them? Convergence-on-truth suggests there's more to S2 than defense of S1*" (M&S, 2011, p. 82).

Within their argumentative framework, M&S critique a correcting S2 as functionally problematic because reasoning itself can cause mistakes. They state, "*... there is considerable evidence that when reasoning is applied to the conclusions of intuitive inference, it tends to rationalize rather than correct them*" (M&S, 20110, p. 59). M&S see S2 as driving toward justifica-tion of S1 argumentative intuitions, not correcting toward truth. How then, outside of argumentative contexts, do we make good decisions, if reason-ing is purely argumentative in nature and function? M&S posit that argu-mentative intuitions still drive individuals towards making good decisions because these decisions are more easily justifiable:

> Indeed, in most cases, reasoning is likely to drive us towards good deci-sions. This, we would suggest, is mostly because better decisions tend to be easier to justify. The reasons we use to justify our decisions have of-ten been transmitted culturally and are likely to point in the right direc-tion – as when people justify their avoidance of sunk-cost mistakes by using the rule they have learned in class (Simonson & Nye 1992). In such cases, the predictions of the argumentative theory coincide with those of more classical theories. However, what the results just reviewed show is that, when a more easily justifiable decision is not a good one, reason-ing still drives us in the direction of ease of justification. Even if they are rare, such cases are crucial to comparing the present theory (reasoning drives us to justifiable decisions) with more classical ones (reasoning drives us to good decisions). (M&S, 2011, p. 71)

In decision-making situations where justifiability conflicts with truth, the prediction of the ATR is that reasoning will drive people towards decisions for which they can argue, even if these decisions are not optimal. While the presented body of evidence highlights cases in which reasoning does indeed drive us to justifiable decisions, a theory of reasoning based on justifiability is not one that can coherently operate in a normative society nor serve a true definition of reasoning proper. In their response to the peer commentary of the target article, M&S reassert that they recognize the potential that reasoning has other functions, such as contributing to individual cognition, but maintain that the main function of reasoning is argumentative (M&S, 2011, p. 96). However, if we are to believe in the importance of reasoning being normative such that its goal is truth over justifiability, one must ask: *How can the main function of a trait not serve its goal?* There is a deep divide in reasoning between the ease of justifiability and the appropriateness of justifiability: though the ATR relies on examples of how we often choose ease over appropriateness, this is an analysis of how we reason, not how or why we reason proper. A complete conception of reasoning proper cannot rely on ease of justifiability, counting on argumentative function to fulfill epistemic goals, and only doing so successfully in special contexts.

5. Epistemic Vigilance

Within the target article and the response to the peer commentary, M&S address the issue of reasoning tending toward justifiability instead of truth through the concept of epistemic vigilance (EV), but this concept still fails to capture the importance of epistemic constraints on argumentative intuitions, because it is only a responsibility extended to listeners, not speakers, within argumentative contexts. Reasoning, under the ATR, can only be explained within the evolution of human communication if such a high cost mental activity provided benefits to both speakers and listeners. "*To avoid being victims of misinformation, receivers must therefore exercise some degree of what may be called epistemic vigilance (Sperber et al. 2010). The task of epistemic vigilance is to evaluate communicators and the content of their messages in order to filter communicated information*" (M&S,

2011, p. 60). According to M&S, the two most important mechanisms of EV are trust calibration and coherence checking, with the former involving the competence and sincerity granted to the speaker by the listener, and the latter occurring within the process of comprehension and involving integrating new information with previously held beliefs and evaluating inconsistencies.

Within this framework and along with their argumentative thesis, M&S assert that, "*Reasoning has evolved and persisted mainly because it makes human communication more effective and advantageous*" (M&S, 2011, p. 60). M&S define reasoning in three parts as (1) the mental action of working out an argument, (2) the public action of verbally producing the argument to convince others, and (3) the mental action of evaluating and accepting the conclusion of an argument produced by others (M&S, 2011, p. 59). This definition fails epistemologically in comparison to reasoning proper as defined earlier because the evaluative component of EV is only extended to the part (3) of the definition. While reasoning no doubt makes communication more effective and advantageous, it does so not just on the basis of the third-person EV of receivers of information, but in coherent and useful first-person arguments being asserted by communicators in the first place. As such, if EV is needed for the production of arguments, it is also inherently needed for the mental action of working out arguments prior to their production, a requirement that can also thus be extended to individual cognition. As stated by M&S in their response to peer commentary in an attempt to further clarify the importance of EV, "*Arguing consists in displaying coherence-based reasons for the acceptance of a given message*" (M&S, 2011, p. 96). Implicit in this comment is that the arguments put forth in communication must display epistemic coherence, and as such the argumentative intuitions that M&S posit drive this process must adhere to epistemic norms of coherence.

M&S's definition of reasoning only extends an evaluative component to receivers of information in communication because of (a) the communicative framework within which they view the development of reasoning and (b) the reliance on appropriate argumentative contexts of argumentative intuitions to achieve epistemic success in reasoning. Given their discussion of group polarization and as discussed above, M&S would likely reply to the problems posed by Sunstein's examples by positing that the cases Sunstein

discusses do not represent actual argumentative contexts because of the initial similarity of opinions. In a 2010 article, "Epistemic Vigilance," M&S, along with several other authors, explain how argumentative contexts can lead to poor reasoning outcomes (citing Sunstein) in such situations where differences of opinion between communicators are not present. Sperber et al. explain the coexistence of these poor outcomes and ATR-predicted good outcomes of argumentative contexts through the concept of confirmation bias. In the target article, M&S define confirmation bias as "*seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations, or a hypothesis in hand (Nickerson, 1998, p. 175)*" (M&S, 2011, p. 63). In both the target article and "Epistemic Vigilance," confirmation bias is seen as a feature of reasoning that produces good outcomes in true argumentative contexts, when receivers of information apply appropriate EV to communicated information, but confirmation bias is also blamed for the flaws of reasoning that occur in cases cited by Sunstein, as the argumentative context does not allow for appropriate EV and thus reasoning proper due to the monotony of opinions. As above, the issue again arises as to how, within an argumentative framework, reasoning without appropriate argumentative contexts can achieve epistemic goals, especially with regards to individual cognition that inherently involves only the confirming perspective of the individual. In "Epistemic Vigilance," Sperber et al. posit, in regards to this issue:

> We are not claiming that reasoning takes place only in a communicative context. It clearly occurs in solitary thinking, and plays an important role in belief revision. We would like to speculate, however, that reasoning in non-communicative contexts is an extension of a basic component of the capacity for epistemic vigilance towards communicated information, and that it typically involves an anticipatory or imaginative communicative framing. On this view, the solitary thinker is in fact considering claims she might be presented with, or that she might want to convince others to accept, or engaging in a dialogue with herself where she alternates between different points of view. (Sperber *et al.*, 2010, p. 36)

Sperber et al. speculate that the EV mechanism of communicated information applies to individual cognition, but certainly, within the ATR, M&S must argue that this speculation is the case in order to account for individual cognition. If individual cognition consists of a self-replication

of argumentative contexts in anticipation of being subjected to EV in the future, then this inherently shows that EV and thus epistemic constraints on argumentative intuitions need to exist in all parts of reasoning in order to achieve reasoning proper that is not context dependent, especially at the individual level.

While M&S do not explicitly comment on the reasoning force behind epistemic vigilance, Santibáñez (2012) rightly questions whether the mechanism of EV is a product of S1 or S2 processes. Due to the evaluative nature of the coherence checking process, it seems plausible that such a mechanism needs to involve S2 explicit reasoning, even if initial reactions to new thoughts are intuitive S1 responses, as are general calibrations of trust. Concerning the processes that drive reasoning itself, M&S maintain that:

> [A]ll arguments must ultimately be grounded in intuitive judgments that given conclusions follow from given premises. In other words, we are suggesting that arguments are not the output of a system 2 mechanism for explicit reasoning, that would be standing apart from, and in symmetrical contrast to, a system 1 mechanism for intuitive inference. (M&S, 2011, p. 59)

However, if we must necessarily apply EV or more specifically coherence checking to the senders of information in argumentative contexts and to individual cognition, these intuitive judgments that drive reasoning may be argumentative in nature but must also be epistemic in goal and function. The goal here is not to counter the above quote and assert that arguments are the output of a S2 mechanism for reasoning, it is merely to demonstrate that, having understood the importance of EV for reasoning as a whole, not just listeners, the argumentative intuitions that drive reasoning need to have normative constraints. Jonathan Evans, in his response to M&S, highlights that while it is well demonstrated that reasoning fails in certain predictable cases, we can reason proper, and it would be difficult to explain, "... *why humans evolved a capacity for reasoning which is best not trusted*" (M&S, 2011, p. 78) or not utilized significantly in reasoning processes. When examining reasoning outside of the framework of communication, or even when focusing on speakers in communication, there is still a need for a normative component that the ATR does not entail in order to achieve reasoning proper.

6. The Framing Effect

Looking specifically at the presented body of evidence, in at least one case the errors attributed to the interference of S2 reasoning seem to actually belong more to S1intuitive judgments. In section 5.3.3 of the target article, M&S examine the framing effect, which occurs "... *when people give different answers to structurally similar problems depending on their wording – their 'frame' (Tversky & Kahneman 1981)*" (M&S, 2011, p. 70). While M&S cite the general opinion that S1 intuitions are blamed for framing effects (Kahneman 2003), M&S assert, because participants who reason more about the tasks are more influenced by framing effects, and because when groups make framed decisions, they converge on the decision with the strongest reasons in support, that S2 reasoning is to blame for framing effects. The framing effect is, according to the ATR, an outcome of reason-based choice, which occurs when individuals make decisions because they can easily find reasons to support them, which results in easily justifiable decisions but not necessarily good decisions. In contrast, an alternative study on framing effects uses the same 1981 Tversky & Kahneman study to highlight how framing effects are intuitive (Lakshminarayan et al., 2011). Published in the *Journal of Experimental Social Psychology*, the article "*The evolution of decision-making under risk: Framing effects in monkey risk preferences*" explains how capuchin monkeys, when presented with either loss or gain frames, exhibit the same signature effects as human subjects. Moreover, a 2002 study by Marsh and Kacelnik demonstrates how even "*starlings switch from risk-neutral to risk-seeking depending on their history with the decision problem*" (Lakshminarayanan *et al.*, 2002, p. 690). As the authors highlight, the results of these studies are important because they suggest, "...*that the cause of reversals of risk-preferences in humans such as the disposition [framing] effect might be explained by the same simple mechanisms that drive similar preference-reversals in non-human animals*" (Lakshminarayanan et al., 2002, p. 692). In context of the ATR, these results suggest that, at least in one case, S1 intuitions are at fault for a failure in reasoning proper that M&S have attributed to S2 reasoning, as monkeys do not argue, which furthers the above discussion that these intuitions need constraints of normativity in a complete conception of reasoning proper.

7. Conclusion

The ATR fails as a complete theory of reasoning primarily because its conception of reasoning proper lacks normative constraints and secondarily because patterns of flawed reasoning occurring in non-arguing species limits its application. Within the psychology of reasoning, the ATR can explain prevalent instances of reasoning flaws, especially in the case of confirmation bias, and it highlights how good argumentative contexts can promote good reasoning. The ATR concept of epistemic vigilance also plays an important role in reasoning proper, once extended to include all phases of reasoning. However, the ATR underplays the integral role S2, despite its apparent flaws, needs to play in reasoning proper, in order for good epistemic outcomes to depend on argument content, not context. Reasoning proper is difficult, and the ATR aptly points out how humans fail at its application in many cases, but proper use of reasoning needs to rely on appropriate justification and truth, not easy justification. Though the ATR can explain important cases of S2 reasoning distorting S1 intuitions, showing how reasoning fails does not show or explain what good reasoning is.

Works cited

Aikin, Scott F. "Three Objections to the Epistemic Theory of Argument Rebutted." *Argumentation and Advocacy* 44 (2008): 130-142.

Biro, John and Harvey Siegel. "Epistemic Normativity, Argumentation, and Fallacies." *Argumentation* 11 (3) (1997): 277-292.

Bonner, Bryan L., Baumann, Michael R., and Dalal, Reeshad S. "The effects of member expertise on group decision-making and performance." *Organizational Behavior and Human Decision Processes* 88 (2002): 719-736.

Feldman, Richard. "Useful Advice and Good Arguments." *Informal Logic* 25 (3) (2005): 277-287.

Goldman, Alvin I. "An Epistemological Approach to Argumentation." *Informal Logic* 23 (1) (2003): 51-63.

Johnson, Ralph H. "The Place of Argumentation in the Theory of Reasoning." *Communication & Cognition* 24 (1) (1991): 5-14.

Kahneman, Daniel. "A Perspective on Judgment and Choice." *American Psychologist* 58 (9) (2003): 697-720.

Lakshminarayanan, Venkat R., Chen, M. Keith, and Santos, Laurie R. "The evolution of decision-making under risk: Framing effects in monkey risk preferences." *Journal of Experimental Social Psychology* 47 (2011): 689-693.

Laughlin, Patrick R. and Ellis, Alan L. "Demonstrability and Social Combination Processes on Mathematical Intellective Tasks." *Journal of Experimental Social Psychology* 22 (1986): 177-189.

Lehrer, Jonah. "The Brain is an Argument." *How We Decide* (pp. 196-218). Boston: Mariner Books, 2009.

Lord, Charles G., Ross, Lee, and Lepper, Mark R. "Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence." *Journal of Personality and Social Psychology* 37 (11) (1979): 2098-2109.

Marsh, Barnaby and Kacelnik, Alex. "Framing effects and risky decisions in starlings." *Proceedings from the National Academy of Sciences* 99 (5) (2002): 3352-3355.

Mercier, Hugo and Sperber, Dan. "Why do humans reason? Arguments for an argumentative theory." *Behavioral and Brain Sciences* 34 (2011): 57-111.

Nickerson, Raymond S. "Confirmation Bias: A Ubiquitous Phenomenon in Many Guises." *Review of General Psychology* 2 (2) (1998): 175-220.

Santibáñez, Cristián. "Mercier and Sperber's Argumentative Theory of Reasoning. From the Psychology of Reasoning to Argumentation Studies." *Informal Logic* 32 (1) (2012): 132-159.

Sperber, Dan, Clement, Fabrice, Heintz, Christophe, Mascaro, Olivier, Mercier, Hugo, Origgi, Gloria, and Wilson, Deirdre. "Epistemic Vigilance." *Mind and Language* 25 (4) (2010): 359-393.

Stasson, Mark F., Kameda, Tatsuya, Parks, Craig D., Zimmerman, Suzi K., and Davis, James H. "Effects of Assigned Group Consensus Requirement on Group Problem Solving and Group Members' Learning." *Social Psychology Quarterly*. 54 (1) (1991): 25-35.

Sunstein, Cass R. "The Law of Group Polarization." *The Journal of Political Philosophy* 10 (2) (2002): 175-195.

Tversky, Amos and Kahneman, Daniel. "The Framing of Decisions and the Psychology of Choice." *Science* 211 (4481) (1981): 453-458.