

The Link Between Logic and Cognition

Stance: Agree

Word Count: 397

1 In the interdisciplinary field of Cognitive Systems, many concepts and processes  
 2 interconnect; logic and cognition included. Logic, in this sense of valid reasoning and the  
 3 tautological laws that follow and cognition being the processing of information and knowledge.  
 4 Though these ideas intuitively seem connected, there is a debate across fields on their  
 5 relationship. In this conversation, three arguments should be considered: logic laws are engrained  
 6 inside human reasoning, logic is necessary in building new cognitive systems and cognition  
 7 without logic is useless.

8 First, the human mind has a universal foundation of logic. This should be distinguished  
 9 from being logical, but instead having logic as an underlying system influencing mental  
 10 processes. We can see this underlying logic everyday from children that grasp notions of ‘true’  
 11 and ‘false’ (Macnamara and Reyes) to adults applying Boole’s logic laws in deductive argument.  
 12 Plummer et. al argues against the idea laws of logic just externally exist like the laws of physics.  
 13 They point out one cognitive process, imagination, that can reject physics and picture water  
 14 defying gravity but it cannot visualize a world where there are and are not nine planets. Just as  
 15 our cognition is quick to accept logic, it is also incapable of rejecting logic.

16 Furthermore, when dealing with an artificial cognitive system, like a computer, its  
 17 program must be rooted in logic. Though there are hundreds of programming languages, they all  
 18 still have the same basic laws of logic. For example, in circuitry, we see the same Boolean logic  
 19 applied to gates with its output obeying operations performed on the input. In transfers of  
 20 information such as these, there seems to be no substitution for logic, at least not one more  
 21 effective. The fundamental truth found in logic is inseparable to cognition.

22 Lastly, in the most basic sense, thinking apart from rationality is useless. It is obvious  
 23 processes in cognition like reasoning or decision making demand logic, but logic is needed  
 24 foundationally through all processes. Logic is the last defence for memory loss, the principle of  
 25 knowledge, the baseline for judgement. If we were to say logic had no connection to cognition,  
 26 we would suggest they independently function in a system, thus removing one would not affect  
 27 the activity of the other. Because this is conceivable, it only strengthens the link between the  
 28 two. In conclusion, in order to understand cognition, logic must be considered due to its link.

Barker-Plummer, Dave, et al. *Language, Proof, and Logic*. CSLI Publications, 2011.

Macnamara, John, and Gonzalo E. Reyes. *Logical Foundations of Cognition*. Oxford University Press, 1995

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