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Author: Sun-Joo, Shin

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Abstract: Logicians have strongly preferred first-order natural deductive systems over Peirce's Beta Graphs even though both are equivalent to each other. One of the main reasons for this preference, I claim, is that inference rules for Beta Graphs are hard to understand, and, therefore, hard to apply for deductions. This paper reformulates the Beta rules to show more fine-grained symmetries built around visual features of the Beta system, which makes the rules more natural and easier to use and understand. Noting that the rules of a natural deductive system are natural in a different sense, this case study shows that the naturalness and the intuitiveness of rules depends on the type of representation system to which they belong. In a diagrammatic system, when visual features are discovered and fully used, we have a more efficacious deductive system. I will also show that this project not only helps us to apply these rules more easily but to understand the validity of the system at a more intuitive level.

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