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Aviva Halani* (aviva.halani@gmail.com), 20 Main Street, Exeter, NH 03833. *Student Use of Venn Diagrams to Represent Additive and Multiplicative Reasoning in Counting Problems.*

This case study explored how a student could use Venn diagrams to explain his reasoning while solving counting problems. Open coding was used to identify the representations he used and the ways of thinking in which he engaged were analyzed using an existing framework. Venn diagrams were first introduced to the student as part of an alternate solution written by a supposed prior student. Following this introduction, the student in this study often chose to use Venn diagrams to explain his reasoning, stating that he was envisioning them. They were a powerful model for him – they helped him visualize the sets of elements he was counting and to recognize over counting. Further, he adopted the representation of the universal set in his diagrams when posing new questions and finding additive relationships between the solutions of the new and original questions. He transferred this representation to find multiplicative relationships in other problem posing situations. (Received September 04, 2014)