1154-05-1298 **Greg Churchill*** (gregory.churchill@oswego.edu) and **Brendan Nagle** (bnagle@usf.edu).
Extending Hansel's Theorem to Hypergraphs.

For integers $n \geq k \geq 2$, let V be an n-element set, and let $\binom{V}{k}$ denote the set of all k-element subsets of V. Let $\mathcal{C}$ be a collection of pairs $\{A, B\} \in \mathcal{C}$ of disjoint subsets $A, B \subseteq V$. We say that $\mathcal{C}$ covers $\binom{V}{k}$ if, for every $K \in \binom{V}{k}$, there exists $\{A, B\} \in \mathcal{C}$ so that $K \subseteq A \cup B$ and $K \cap A \neq \emptyset \neq K \cap B$. When $k = 2$, such a family $\mathcal{C}$ is called a separating system of V, where this concept was introduced by Rényi and studied by many authors.

Let $h(n, k)$ denote the minimum value of $\sum_{\{A,B\} \in \mathcal{C}}(|A| + |B|)$ over all covers $\mathcal{C}$ of $\binom{V}{k}$. For $k = 2$, Hansel determined the sharp bounds $\lceil n \log_2 n \rceil \leq h(n, 2) \leq n\lceil \log_2 n \rceil$, and Bollobás and Scott sharpened these bounds to an exact formula for $h(n, 2)$ for all integers $n \geq 2$. Here, we extend these results by determining an exact formula for $h(n, k)$ for all integers $n \geq k \geq 2$. Also, we present some results regarding d-partite covers of $\binom{V}{k}$, which mirror Hansel's result. (Received September 14, 2019)