An $H$-decomposition of a graph $G$ is a partition $P$ of $E(G)$ into blocks, each element of which induces a copy of $H$. An $(s, p)$-equitable $H$-coloring of $G$ is a coloring of the blocks in $P$ with exactly $s$ colors such that each vertex $v$ is incident with blocks colored with exactly $p$ colors, the blocks containing $v$ being shared out as evenly as possible among the $p$ color classes. The smallest value of $s$ for which there exists an $(s, p)$-equitable $H$-coloring of $G$, denoted $\chi'_p(v)$, is considered for $C_4$-colorings of $K_v - F$ where $F$ is a 1-factor of $K_v$; this will follow from suitable $K_2$-colorings of $K_{v/2}$. Of particular interest is when $\chi'_p(v) > p$, in which case traditional edge-coloring proof techniques are rendered useless. The color vector $V(E)$ of an $(s, p)$-equitable $H$-coloring $E$ of $G$ is defined to be $(c_1(E), c_2(E), \ldots, c_s(E))$, arranged in non-decreasing order, where $c_i(E)$ is the number of vertices in $G$ incident with a block of color $i$. In all cases where $\chi'_p(v) > p$, the extreme values of $V(E)$ are considered, namely $c_1(E)$ and $c_s(E)$. An overview of recent findings is presented, utilizing in some cases the powerful proof technique of graph amalgamations. (Received September 20, 2017)