

# Evaluating Design Language for Vehicle Instrument Clusters

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## ABSTRACT

The fields of Human-Computer Interaction and interface design have been expanded from a narrow focus on usability to more broadly consider the human experience and aesthetic response to design. Tools and methods developed to evaluate the relationship between perceived usability and interface aesthetics have revealed that overall preference for an interface is highly correlated to positive aesthetic response, and that positive aesthetic response is elicited through use of positive symbolism, incorporation of classical aesthetic elements and creating an interface that is typical (expected) and attractive. While symbolism can be a representation of sentiments, such as family or the environment, or cherished memories, such as one's youth or achievements, in product design, the container for symbolism is often the brand and is expressed through the brand or design language (DL). In large multidisciplinary product design organizations the DL is more often created by marketing and/or brand management organizations to position the brand and control the product statement, and the DL is conveyed formally to the designers using image boards, inspiration videos and other media to infuse the language into those whom will make decisions that affect product brand expression. Since there currently is no formal method for assessing how well products convey the design/brand language, we used, and present here, the methodology for aesthetics-usability assessment to assess brand language expression. Our intent is to create a tool that can be used as part of an iterative design-refinement cycle to help designers hone designs to crisply convey the intended messages. To do so, we created 24 designs of automotive instrument clusters, which were variations of 8 different basis designs. 5 of the 8 basis designs were inspired by adjectives from the Cadillac DL and 3 were inspired by that of Chevrolet. The seven adjectives/terms – daring, dramatic, attitude, groundbreaking, impressive, intricate and precise – were used to convey the Cadillac brand. Similarly, the 7 adjectives/terms – clean, pure, straightforward, strong, bold, solid and confident – were used to express the Chevrolet brand. The basis designs differed through their exploration of the design trades between simplicity and complexity, symmetry and asymmetry and openness and closedness. In a structured three

phase experimental protocol, 50 respondents evaluated the 24 designs for overall attractiveness, overall preference and how well the designs communicated the terms of the two different DLs. Detail analysis of respondent data revealed that both of the DL are comprised of two dimensions. The Cadillac DL (as expressed via the stimuli in this research) is comprised of two factors, one that includes (F1) daring, dramatic, attitude, groundbreaking and impressive, and a weaker factor that includes (F2) intricate and precise. One of the two strong factors that comprise the Chevrolet DL has the grouping – (F3) clean, pure and straight forward and the other factors contains the terms (F4) bold, solid, confident and strong. Attractiveness and preference ratings revealed that not only were the designs considered quite attractive with average values of 5.85 and 5.18, respectively (1-10 rating scale), but that there was fairly high correlation (0.7) between attractiveness and preference. This correlation indicates, as was found in previous research, that the brief exposure of the respondents to the design (500 ms) is sufficient to elicit aesthetic impression. Assessment of how well each of the designs expressed the Chevrolet and the Cadillac design languages revealed that the goal of expressing the DL of Cadillac is more challenging than that for Chevrolet. Only one of the Cadillac designs received a high score in expressing the Cadillac DL, and the second highest score was received by a design inspired by the Chevrolet DL. On the contrary, with the exception of one design (a Chevrolet DL inspired design) that scored low for both design languages, all of the design adequately expressed the Chevrolet design language. These results indicate that the DL adjectives/ terms were not semantically orthogonal. For instance, bold (Chevrolet) & daring (Cadillac) are not semantically distinct terms and clean (Chevrolet) & precise (Cadillac) are not completely distinct. While the designers had less success in their goal of expressing the Cadillac design language than they did for expressing the Chevrolet DL (for instance, none of the designs adequately conveyed 'precise' or 'intricate'), they did uncover design directions that could be leveraged in additional design cycles. Design features such as filled area indicators seem to convey Cadillac whereas traditional needle-in-dial indicators score higher for expressing Chevrolet than Cadillac. These design threads and this analysis methodology is being pursued in follow-on iterative design/ evaluation research to create instrument clusters that truly convey the brand intent.