DESIGN ACUMEN

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Abstract

Over the past decade, design has earned the respect of most established firms and even cash-strapped entrepreneurial startups and their investors have begun to focus on design. They are becoming more mindful of nurturing and including elements such as design expression to assess the performance of a new venture. Academic studies have also shown that good visual expression alone can aid in users' interface with products and with pre-established criteria in place, users can now more readily agree on what constitutes a good visual design expression. By applying the Industrial Design Excellent Award reception as a standard for good visual design expression, this study examines how laymen, novice designers, design experts and design researches intuitively judge design. In conclusion, we show how to ensure that one has included a sufficient number of these elements when assessing the performance of a visual design expression and how this can dramatically improve the performance of design centric ventures.

Keywords: design perception, expression, tast, Design cognition

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1 INTRODUCTION

A product, service, experience or symbols' intuitively perceived value significantly relies on its visual design cues. In humans and animals, the peacock effect, attractive visual appearance, is perceived as a sign of health and reproductive performance. In one study of shoes, positive expression increased preference by two hundred percent (Kristensen et. al. 2012, Gabrielsen et. al. 2009). What signifies a good visual design perception and is there any agreement on this or are some people just more experienced or gifted in perceiving good visual design expressions (as in the case of online, printed ads and posters)?

Applying criteria used at BMW Group and several leading automotive and industrial design firms as well as educational programs, we defined visual design expression as the perception of: proportion, surface and functional/styling details. In automotive design this includes (headlight, grill, door handle, etc.), with characteristics such as material, texture, color and finishing (assembly, parting lines, radii, chamfer, fit and finish, etc.) We then applied the Gold, Silver and Bronze categories from the Industrial Design Excellent Award (IDEA) reception as a metric for comprehensive design quality. Studies show that design experts (not IDSA members) could visually judge the difference between Gold prize recipients and applications receiving no award along the criteria: Design philosophy, Structure (organizational and supply chain), Innovation level, Social/human, Environmental and Expression, with the last achieving the most significant agreement. It was noteworthy that these experts did not recognize the products from the previous year's winners. (Petersen 2009).

Academic studies have also shown that visual design expression influences the assessment of the value of a new venture's business opportunity, as presented in a design concept (Petersen & Ryu 2014) and for new entrepreneurial ventures the advantage of Expression represented up to thirteen percent of the perceived value of the business opportunity (Petersen 2015). New product development projects in Japan and Israel found that pleasing design increases perceived friendliness of ATMs, causing users to forgive a products' user interface particularities, increase engagement and form a bond. Studies of users' ability to distinguish between various levels of visual design expression, show that educating users in what to look for and which criteria to apply increases their ability to visually judge design expression (Petersen and Joo 2012) and design in general. (Petersen 2009).

In this study, we assess users' ability to intuitively gauge visual design expressions, using the Industrial Design Excellence Award (IDEA), as a metric, and the same procedure as in the original study of experts. These awards are announced in June and are awarded by the Industrial Design Society of America (IDSA). IDEA's No-award, Bronze, Silver and Gold award reception represents increasing levels of design quality. Studies have shown that IDEA reception acts as an early indicator for online trendsetting (as measured by the number of commended Web Citations) (Petersen 2007a) and investors' expectations. (as measured by stock value) (Petersen 2007b).

Does familiarity with the displayed products or previous exposure to these products bias the study by influencing the expert participants' judgment? Studies show that designers in general and expert designers specifically do not follow IDEA announcements closely and few recalled having seen the products in an IDEA context before. (Petersen 2009).

Design quality and general acceptance are interrelated. A study revealed a one to two year adoption delay for Gold winners. The present urban legend is that winning an IDEA Bronze is a sign of success, while receiving the IDEA Gold Award is the kiss of death. The cause of this may be the generally higher innovation level (breakthrough vs. incremental) of Gold winners, consequently with a delay in adoption by the early adopters and early majority. This suggests that the perception of design quality changes and that this can be measured by observing IDEA reception.

There are always exceptions, however. The BMW Mini won IDEA Gold in 2003 and enjoyed success right away, while the Chevrolet Super Sport Roadster that won IDEA Gold in 2004, started as a miserable failure and was eventually discontinued. Others start out with limited success, then eventually grow in popularity and become commercial blockbusters, such as the Aeron Chair, which

won the IDEA Silver in 1994. Today, the Aeron Chair is generally considered a disruptive innovation in office seating and has moved on to become a design classic for task chairs.

Previous studies have shown design experts to perform on par with or slightly better than random and we thus expect design experts to outperform laymen, design novices, creative professionals, design researchers and designers, who are members of IDSA. The intended contribution of this paper is thus prescriptive, providing a recommendation for an effective evaluation of consumer products' visual design expressions based on images alone and defined as design acumen.

2 RESEARCH PROCEDURE

The study consists of ten separate studies conducted in the period of February to July 2014, applying the design quality assessment method from Design Quantification (Petersen 2009). The Design Quantification method presents participants with an 8 ½" by 11" board containing a six by five grid populated by images of thirty consumer products. The products represented have received various levels of IDEA awards from no award, to Bronze, Silver and Gold. The participants are then instructed to mark their judgment of each product in a corresponding empty grid, assigning N, B, S and G for the corresponding four levels of design quality performance (No Award, Bronze, Silver and Gold). No time restraints are imposed and the exercise usually takes between five and ten minutes.

For our study, we used the IDEA consumer products submitted to the IDEA in 2012 and placed thirty product images in a six by five matrix. The selection contained five (seventeen percent) Gold winners, five Silver winners, five Bronze winners and fifteen (fifty percent) non-award applicants. See Figure 1.

Figure 1. Grid with Industrial Design Excellent Award recipients, Gold, Silver, Bronze and runner-up, from 2012

The study deviated from the original Design Quantification study, in that instead of studying a single individual at the time we studied large groups of participants. A two-page package, containing the grid with the product images and an empty grid for judging, was distributed at conference presentations, lectures and workshops. The participants were instructed to judge the design award worthiness of the consumer products any way they wanted and not worry about if they could determine what the product was and how it was being used.

The participants were randomly selected at professionally specific, invitation only events, conducted by the paper's author. See Table 1. To assist the judgment of the products, a PowerPoint slide of the populated grid was projected for ten minutes in a break between presentations, allowing the participants ample time to study large-scale images of the designs while judging the consumer products.

Table 1.Study participants and their performance. Performance is rated on the percentage of judgments (No match: 0 to Full match: 1,00) corresponding to the original IDEA jury's judgment.

Study	Participants	Geography	Experience	N	Performance	VAR	STD
1	The Danish Society of Engineers	Denmark	laymen engineering)	17	0.31	0.012	0.108
2	Copenhagen Business School	Denmark	laymen (business)	23	0.28	0.012	0.112
3	IT Provider	South Korea	laymen (business)	20	0.24	0.011	0.103
				60	0.28		
4	Art Center College of Design study A	California	novice designers	17	0.27	0.012	0.109
5	Art Center College of Design study B	California	novice designers	12	0.28	0.009	0.093
6	Calstate University Long Beach	California	novice creatives	23	0.26	0.016	0.128
				52	0.27		
7	Art Center College of Design study C	California	creative experts	8	0.23	0.003	0.059
8	IDSA Conference	Texas	designers mixed	14	0.26	0.003	0.053
9	Personal contacts	California	design experts	6	0.36	0.019	0.138
				28	0.28		
10	AgIdeas Conference	Australia	design researcher	16	0.31	0.013	0.115
				156			

3 FINDINGS

Laymen (business students, engineering students and IT professionals), novice designers and IDSA conference participating designers were found, on average, to possess identical design acumen, however they performed no better than random. Design researchers, on the other hand, performed slightly better as compared to laymen, though the difference was not statistically significant ($p<0.10$, $n=16$). Design Experts showed the best design acumen, outperforming laymen by twenty percent, on average ($p<0.05$, $n=6$.)

Creative professional experts, from other areas than industrial design (such as photography and graphics), performed worse than the laymen, though this was not statistically significant ($p<0.10$, $n=8$). This suggests that laymen, being less attuned to visual design expression, to some extent take more non-visual design expression cues into consideration when passing their judgment. See Figure 2.

Design experts also showed a larger variance than laymen and novices Var(design experts)=0.019, $n=6$ vs. Var(laymen)=0.012, $n=60$), which is common in comparative studies of experts and laymen/novices. Consequently more experts are required to provide a convergence on a reliable average. Analyzing the correlation between the IDEA jury and Expert Designers we found a statistically significant medium correlation ($corr=0.519$ $p<0.01$, $n=6$). Six expert designers can thus assess a visual design expression with seventy-two percent accuracy.

How does one ensure the best evaluation of the intuitive impression of a product's visual design expression? Analyzing the performance of the accumulated average for the six design experts, the evaluation by four experts provides a judgment within ninety percent of that of all six experts. It is important to note, that these experts need to be impartial, since multiple designers competing to have

their designs selected tend, while acting as judges, to engage in conscious or unconscious career promoting political manoeuvring by gaming the evaluation.

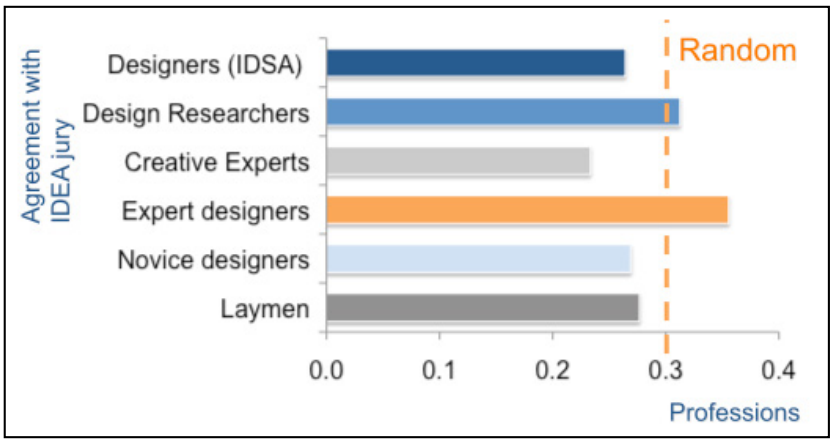

Figure 2. Judgment of IDEA consumer product award and non-award recipients performed by laymen, novice designers, expert designers, creative experts, design researchers and designers (IDSA)

4 CONCLUSION

By applying IDEA reception as a standard for intuitively good visual design expression (design acumen), we have determined the design acumen of laymen, novice designers, design experts, design researchers and designers (IDSA) as measured by their judgement of thirty consumer products' visual design expression, in comparison to an IDEA jury. We found design experts to be the only group with any significant design acumen, twenty percent above random judgement. Inviting four or more unbiased design experts is required to judge a particular design and will allow one to reliably assess a consumer products design quality and thus provide an early indicator for its trendsetting ability and investors' valuation of the firm.
The findings caution against using any single layman, novice or even a single expert designer to judge design, since their performance is, at best, random and, at worst, highly unreliable.

This improves the performance of design centric ventures by being able to easily judge a concepts design quality. It enables new ventures to make more reliable go/no go decisions early on before large investments are made in marketing and new product development, allowing investors to optimize a portfolio of consumer products.

REFERENCES

Gabrielsen, G, Grønhaug, K., Kahle, L., Kristensen, T., Plenborg, T., Wilke, R. (2009) Is Good Design Good Business? Industrial Design, Competition and Globalization, Palgrave Macmillan 2009, p. 220-241

Kristensen, T., Gorm, G. and Zaichkowsky, J. (2012) How Valuable is a Well-Crafted Design and Name Brand? : Recognition and Willingness to Pay, Journal of Consumer Behaviour, Vol. 11, No. 1, 2012, p. 44-55

Petersen, S. (2009), Design Quantification Design Concept Argumentation As Related To Product Performance Metrics, Stanford University, April

Petersen, S. and Ryu, B. (2014) Gamification in Concept Design: Applying Market Mechanisms to Enhance Innovation and Predict Concept Performance, AgIdeas Design Week, Melbourne

Petersen, S. (2015) Design Driven Startups, ICED'15, Milano

Petersen, S. and Joo, J. (2012) Improving Collaborative Concept Evaluation using the Concept Aspect Profile Method, Interdisciplinary Approaches to Product Design, Innovation, & Branding in International Marketing (Advances in International Marketing, Volume 23) Emerald Group Publishing Limited, pp.207 - 222

Petersen, S. (2007) The Idea Award As A Design Quality Metric: Part-A, Driving Web Citations And Public Awareness, ICED'07, Paris

Petersen S. (2007), The Idea Award As A Design Quality Metric: Part-B, Predicting Investor Valuation, ICED'07, Paris,

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