

The Impact of Interior Sensory Quality to North American Customers

Lauren Abro
Toyota Technical Center USA, Inc.

ABSTRACT

North American customer perception of Quality has changed over time and has shifted from Quality, Dependability, and Reliability (QDR) to Interior Sensory Quality (ISQ). ISQ is defined as the harmony of characteristics that combine to make an emotional connection to the vehicles' interior. Vehicles need to correctly appeal to customers emotional side through providing class-leading ISQ. Hypotheses for specific interior areas were developed in order to identify key ISQ strengths, weaknesses, and preferences. These hypotheses were then tested at customer clinics held across the country. The key goals were to understand customer judgment of ISQ execution, understand customer ISQ priority, and understand customer preference of detailed component areas.

CITATION: Abro, L., "The Impact of Interior Sensory Quality to North American Customers," *SAE Int. J. Mater. Manf.* 9(3):2016, doi:10.4271/2016-01-0523.

INTRODUCTION

Sensory, or "kansei" in Japanese, is an emotional reaction to stimuli that we identify through our 5 senses.



Figure 1. Interior senses applicable to automotive interiors.

Interior Sensory Quality (ISQ) for our investigation is defined as the harmony of characteristics that combine to make you feel emotionally connected to your vehicles' interior. For automotive discussion, Taste and Smell were eliminated.

For example, if two parts are next to each other, both are black, one is painted and one is mold in color, will the color be consistent to the customer? This is one of the areas of ISQ that involves Sight.

A high ISQ vehicle interior is driven by many factors. This report focuses on the directly observable and controllable aspects (See, Hear, Touch). Also important, but not well known, is which aspect most impact customers' holistic evaluation of the interior.

FACTORS

OEMs (OEM1, OEM2, and OEM3 for this discussion) 3rd Party Syndicated scores have greatly varied. Each OEM has had peaks and valleys over time. Most recently, OEM2 has been declining in this area from Direct 3rd Party Syndicated Customer Data for Interior Sensory Quality.

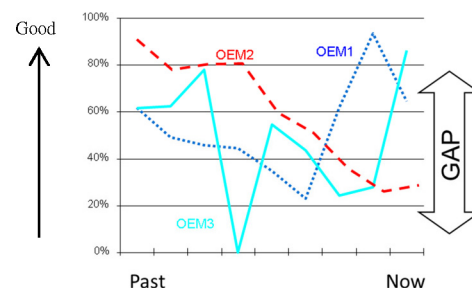


Figure 2. Direct 3rd Party Syndicated Customer Data tracking of ISQ

Next, I wanted to understand what industry 3rd Party Evaluators are saying through Trusted 3rd Party Industry Evaluation research, an important resource to customers planning to purchase a vehicle:

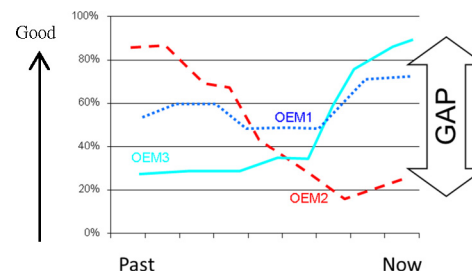


Figure 3. Trusted 3rd Party Industry Evaluation tracking of ISQ

Previously OEM2 was acclaimed for its fit/finish and choice of high quality materials. In the case of Customer Voice, OEM2 has been declining in these key areas. For OEM1, there was a slow decline and then a recent peak. For OEM3, there have been many peaks and declines. Focusing on "Now", there is a big gap between OEM1/OEM3 and OEM2.

METHODS

The overall goal was to understand what current North American (NA) customers think of vehicles in a specific segment. The goal was also to get better insight into what most influenced ISQ. The final participants were a random sample of current owners in a given vehicle segment who met certain recruitment criteria:

- 1. Purchased new vehicle within 3 years
- 2. Ages 25-55
- 3. Gender (roughly 50/50 male/female)
- 4. Participants = 100

Subjective Vehicle Evaluation

The goal for vehicle evaluation was to understand how NA customers scored different NA vehicles. Participants reviewed 4 vehicles from a specific segment:

- 1. Vehicle badges were covered to prevent brand bias
- 2. All exteriors were draped to prevent styling bias
- 3. All interiors were black in color with navigation, leather, and wood trim
- 4. Participants had 5 minutes per vehicle to familiarize themselves with the interior, and understand how interior elements looked/felt
- 5. Participants were asked questions utilizing a 1-10 scale (Figure 4). After providing a score, they were asked to explain their answer.
- 6. The interviewer then explained each key area of ISQ, in order to have a more in-depth conversation of strengths/weaknesses of the ISQ execution and overall holistic evaluation.



Figure 4. ISQ Customer Clinic Rating Scale



Figure 6. Customer Clinic Re-Focus Explanation

Subjective Part Evaluation

The goal for part evaluation was to understand Customer preference of a detailed functional area (component by component). For this example, we focused on interior glossy black decoration and button feeling.

Glossy Black

- 1. 4 Glossy black samples of varying technologies were set up for visual/touch evaluation by the participants



- 2. Participants were asked to rank the 4 samples from #1-#4 (Figure 6). After ranking, they were asked to explain their answer.

Q5C2a. First, I will show you examples of black decoration (G,K,M,P) used in the interior of your vehicle (example location or image to show). Please look and touch each panel...

Considering what you would want in your next vehicle, please rank from #1 (most preferred) to #4 (least preferred)

#1 (most preferred) WHY?

#2

#3

#4 (least preferred) WHY?

Figure 6. Glossy Black Rating Scale

Button Feeling

- 1. 3 audio control samples and 3 HVAC control panels were evaluated by the participants
- 2. Participants were asked to rate each sample using a 1-5 scale (Figure 7). After ranking, they were asked to explain their answer.

Q5C4w. Considering the Audio knobs and the Climate Control knobs, how important is it for all of the knobs to look the same?

Not Important	Somewhat not Important	Neutral	Somewhat Important	Very Important
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q5C4x. Considering the Audio knobs and the Climate Control knobs, how important is it for all of the knobs to feel the same?

Not Important	Somewhat not Important	Neutral	Somewhat Important	Very Important
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Q5C4y. Please Explain

Figure 7. Button Feeling Rating Scale

ANALYSIS

Vehicle Evaluation Analysis: Gloss

Participant scores were tabulated for each ISQ area, and explanations (verbatim) were categorized. This evaluation example will focus on the results of Vehicle F and Vehicle A, for the Gloss ISQ metric.

In Vehicle F, Gloss ISQ metric scored the lowest out of all 8 categories (Figure 8).

The important conclusion from Vehicle F evaluation was that, even though some areas scored very high on the 1-10 scale used (Figure 4), the vehicle's overall score of 6.6 was strongly impacted by the large delta between the high scoring areas and low scoring areas. After categorizing verbatims (Figure 9), 12.5% of all comments