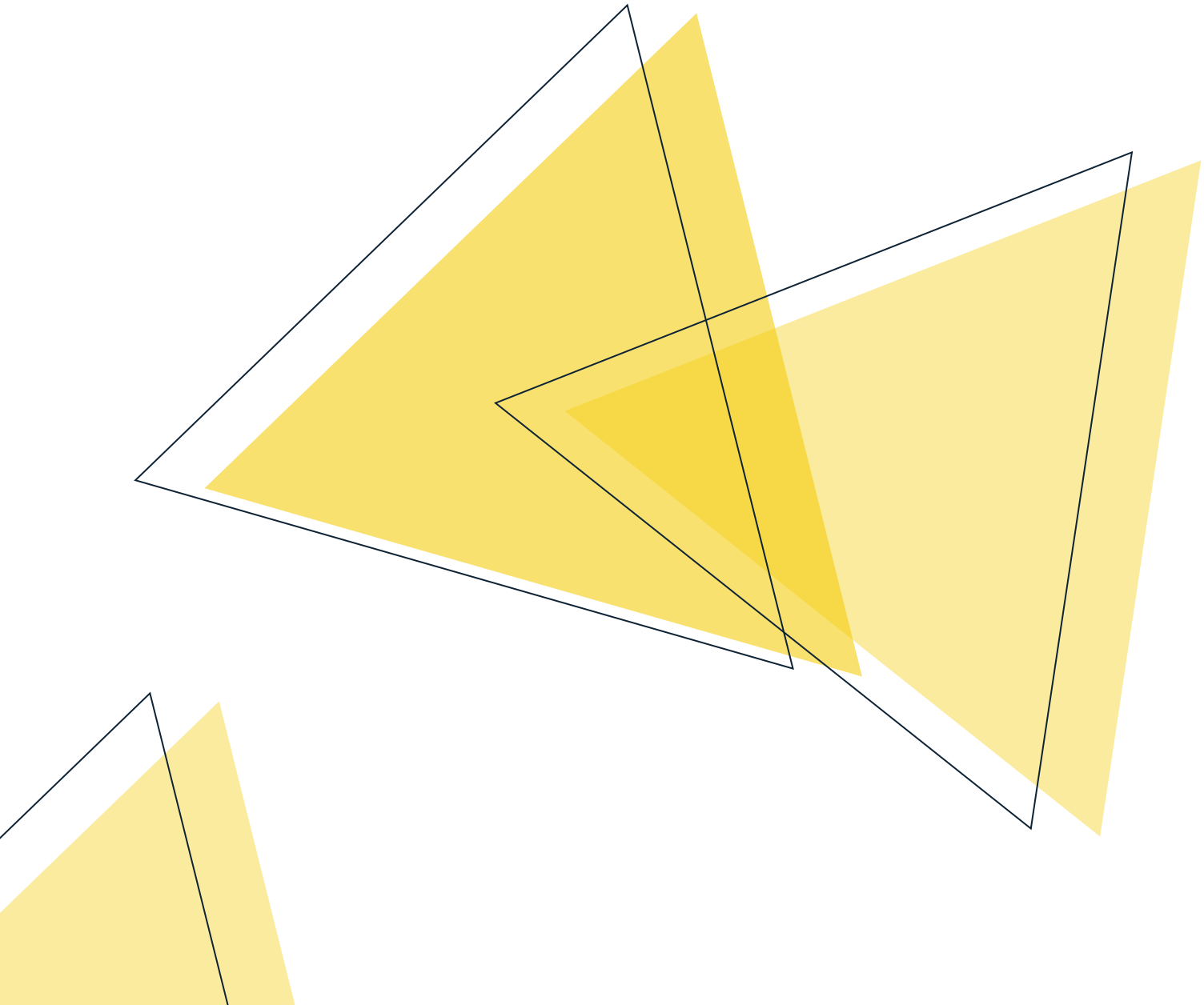
Coffee Value Assessment

Prepared by the Specialty Coffee Association (April 2024)

Evolving the Extrinsic Assessment

Literature Review, Survey Results, and Beta Proposal



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Specialty Coffee Association

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About This Report

Purpose

Since its creation, the Specialty Coffee Association's 2004 Cupping Form and Protocol ("the 2004 SCA Cupping System") has become a globally recognized industry standard used by many stakeholders around the world. These tools are critically important to coffee producers, traders, and roasters, as well as other skilled professionals who work within coffee's value system, and they exist to be used by the community to improve coffee quality, support producers, and establish a common language between buyers and sellers.

In 2020, the Specialty Coffee Association (SCA) began a multi-year project to understand and evolve the 2004 SCA Cupping System into a holistic Coffee Value Assessment, a new set of tools that could better meet the needs of the industry, integrate the latest advancements in sensory science, and address information asymmetry within the sector. These would be underpinned by a descriptive definition of specialty coffee, released in 2021, which introduced the concept of "attributes," or different aspects of a coffee which could make it valuable. Although the 2004 cupping system had extensive opportunities to capture intrinsic information about a coffee, it did not have a way of systematically capturing extrinsic information.

In 2023, the SCA released a beta version of the SCA Coffee Value Assessment (CVA), which expands the two-part approach used in the 2004 system (green grading and cupping) and splits it into four discrete assessments: a physical assessment, a proposed evolution based on the existing green grading process for washed arabicas; descriptive and affective assessments, a proposed evolution based on the practice of cupping, which splits sensory descriptive information and impression of quality scores into two separate assessments; and an extrinsic assessment, an entirely new tool that would offer a systematic way to capture informational attributes of a coffee.[1] To this end, the CVA's Extrinsic Assessment was released only as a "alpha version," to allow for additional rounds of research and user input in its development. This report outlines the academic literature reviewed in its initial creation, the results of a user study focused on the attributes captured in the alpha version, and a proposal for the beta version of the CVA's Extrinsic Assessment, slated for release in 2024.

1 Specialty Coffee Association, *A New System to Assess Coffee Value: Introducing the Beta Version of the Specialty Coffee Association's Coffee Value Assessment (April 2023)*. https://bit.ly/earlyadopter-cva

Executive Summary

In 2022, following the results of a research project to understand users' perception of the 2004 SCA Cupping System,[2] the SCA identified the need for a new way to capture the informational attributes of a coffee and proposed a new, fourth compartment in its forthcoming Coffee Value Assessment that would capture information about a coffee's extrinsic attributes. After reviewing relevant academic literature on the impact of extrinsic attributes on quality perception as well as studies identifying and prioritizing the importance of different extrinsic attributes on price (as a proxy for value), the SCA created and proposed an alpha version of the CVA's Extrinsic Assessment, released in April 2023.

In addition to an ongoing, broader early adopter feedback program related to all aspects of the Coffee Value Assessment, the SCA conducted a survey in English, Spanish, and Korean to gather feedback on the proposed elements of the alpha extrinsic assessment within its categories of identity attributes, processing attributes, and sustainability attributes. Although there was a high degree of agreement across some categories, findings indicate that different actors value different attributes, with some responding in particularly idiosyncratic ways. Findings also indicate that a user's valued attributes (i.e., a list or sense of which specific attributes they may value) may change over time, with some correlations found between specific attributes and a respondent's number of years in the industry. The results of this survey—taken in conjunction with broader CVA early adopter feedback and relevant literature—suggest the need to anchor the next iteration of the extrinsic assessment in a common language (either existing, or yet to be developed).

2 Specialty Coffee Association, *Understanding and Evolving the SCA Coffee Value Assessment System: Results of the 2020-2021 Cupping Protocol User Perception Study and Proposed Evolution* (SCA, August 2022). / *Comprendiendo y evolucionando el Sistema de evaluación de valor del café de la SCA: resultados del studio de percepcíon del usuario del protocol de cata 2020-2021 y majora propuesta* (SCA, October 2022).

Glossary of Terms

Attribute(s). A property that is characteristic of something; a product (or coffee) can be thought of as a collection of attributes. Well-defined attributes can be identified using a variety of methods.

Extrinsic attribute. Also known as "informational" or "symbolic" attributes, extrinsic attributes are qualities or features *about* a coffee. For example, this includes a coffee's place of origin, the name of the producer, or any certifications it might carry as well as branding, stories, or claims.

Extrinsic assessment. A descriptive activity that focuses on profiling and characterizing the informational or symbolic attributes of coffee objectively. It responds to questions like "what information do I know about this coffee, beyond its physical and sensory information?"

Intrinsic attribute. Attributes related to the material reality of a coffee: its form and appearance, its chemical makeup, and the sensory properties that derive from these material constituents. Also known as "material" attributes.

Specialty coffee. A coffee or coffee experience which is recognized for its distinctive attributes, and because of these attributes, has significant extra value in the marketplace.[3]

Specialty Coffee Association (SCA) 2004 Cupping System. The set of standards, protocols, and tools used to assess the quality of arabica coffee, developed primarily by the Specialty Coffee Association of America between 1997-2016. The original purpose of the system was to define "specialty grade coffee" in order to distinguish it from "commercial" coffee. Two key standards underpinning the system included the *SCA Green Grading Handbook* and the "SCA Cupping Protocol," a method outlining the process used to cup coffee as well as the criteria to score it.

Specialty Coffee Association (SCA) Coffee Value Assessment. A set of standards, protocols, and tools used to discover a coffee's value for a specific buyer by offering a way to compare the attributes of a specific coffee with the desirable attributes outlined by a buyer.

3 Specialty Coffee Association, *Towards a Definition of Specialty Coffee: Building an Understanding Based on Attributes – An SCA White Paper* (SCA, published October 2021). / *Hacia una definición de café de especialidad: Construyendo una comprensión basada en atributos – Un Documento SCA* (SCA, published October 2021). / 스페셜티 커피 정의에 대하여:속성에 기반한 이해 SCA 백서, published December 2021.

Relevant Literature: A Brief Review

Introduction

In 2022, the Specialty Coffee Association (SCA) adopted a definition of specialty coffee based on the idea that a coffee, or coffee experience, is a collection of its characteristic properties. These characteristic properties are commonly known in academic literature—and across a wide variety of academic disciplines—as "attributes." Complex products like coffee often have many different kinds of attributes, and thinking about these as separate properties is extremely useful in a research context. By deconstructing a complex product into its constituent parts, it's possible to measure and understand each individual attribute in relation to the others as well as how it may (or may not) be valued in the marketplace.

A common way to distinguish between types of attributes is based on a dichotomy that also exists in many academic disciplines, from physics to philosophy, using words that date back as far as the 1500s: the "intrinsic" and the "extrinsic."[4] A coffee's intrinsic, or material, attributes are related to the material reality of the coffee: a coffee bean's form, its chemical makeup, its sensory properties, and even its roast level are all intrinsic attributes. A coffee's extrinsic, or symbolic, attributes are related to the information about the coffee: the place of origin, name of the coffee's producer, and any product certifications a coffee might carry are all examples of extrinsic attributes.

In complex food products like coffee, sensory attributes like flavor (and their surrounding experience) are arguably the most important intrinsic attributes impacting consumers' enjoyment and perceived quality—so it should be no surprise that the tradition of coffee cupping, which began in the late 1800s, offered a systematic evaluation of a coffee's intrinsic sensory attributes long before the foundation of sensory science as a discipline. Although it has since evolved and incorporated sensory science tools in recent years, cupping remains a foundational assessment for important intrinsic attributes—but there has never existed a similarly systematic way to assess a coffee's extrinsic attributes.

A 2022 report, *Understanding and Evolving the SCA Coffee Value Assessment System: Results of the 2020–2021 Cupping Protocol User Perception Study and Proposed Evolution*, identified the need for a new kind of assessment, specifically an assessment to capture a coffee's extrinsic attributes.[5] This assessment, "a standard form for capturing this information [which] could be promoted," might even offer early insight into how "special" a coffee was: "a lot for which all types of information are known would immediately become more valuable for certain buyers than an anonymous lot with little more than a country of origin and a lot number."[6]

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4 Word factsheets and etymology for "Intrinsic" and "Extrinsic," as presented in the Oxford English Dictionary (Online); accessed January 22, 2024.
5 SCA, *Understanding and Evolving the SCA Coffee Value Assessment System* (2022), p20-21.
6 SCA, *Understanding and Evolving the SCA Coffee Value Assessment System* (2022), p20-21.

Just as the CVA's Descriptive Assessment seeks to list significant sensory attributes of a coffee, the extrinsic assessment would be a similarly descriptive activity aimed at listing any extrinsic attributes that may make the coffee interesting to buyers in the marketplace. With so many potential types of information to be captured on this new assessment—including but not limited to traceability, origin, processing, and other product certifications or credentials—it was first important to review and understand the relevant academic literature at the intersection of extrinsic attributes and their effect on both perceptions and value. The findings, outlined below, have been divided into the following areas of review: impact on sensory perception, impact on quality perception and value, and prioritization of extrinsic attributes.

Using these findings, the SCA released an "alpha" version of the assessment in April 2023 which included a proposed list of extrinsic attributes. It is worth noting that, although many of the studies from the literature consider the role extrinsic attributes at the point of consumption, this alpha version was designed to capture information only about green coffee. The list contained both extrinsic attributes regularly featured in research studies as well as those found on coffee sample lists, which were shown to be valuable in the marketplace between 2000 and 2023.

Impact on Sensory Perception

All sensory inputs may arrive via sensory organs, but they only come together to form an overall perception of the sensory stimuli in the brain:

> Whenever we taste coffee, we are taking in visual, tactile, aromatic, auditory, and taste information all at the same time. This information, once communicated to the brain, is used to form a sensory image of the coffee. Though taste and smell might be of primary importance, the other three main senses also contribute information, which can drastically affect the perception of the coffee.[7]

This effect—where sensory input from one sense influences input from other senses—is known as "the crossmodal effect," and it applies to everyone. Although an active field of research, it has established that different shapes, colors, intensities, textures, and more will influence the perceived taste and smell of foods. For example, a 2014 study by Shermer and Levitan established that the color hue and intensity of different salsas impacted participants' perception of spiciness even when the spiciness of the salsas were consistent.[8] This large—and growing—area of research often focuses specifically the ways in which different sensory stimuli interact with each other, but many of them also—inadvertently—explore the impact of a coffee's extrinsic attributes on tasters' perceptions of its intrinsic attributes.

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7 Mario Fernández-Alduenda and Peter Giuliano, *Coffee Cupping and Sensory Handbook,* Specialty Coffee Association (London: 2022): 56.

8 Devin Z. Shermer and Carmel A Levitan, "Red Hot: The Crossmodal Effect of Color Intensity on Perceived Piquancy," *Multisensory Research* 27, no. 3-4 (2014): 207-23. https://doi.org/10.1163/22134808-00002457

For example, in 2019, a research group investigated how the design elements of coffee packaging labels (specifically the color and shape of the label) influenced Brazilian consumer expectations and hedonic[9] judgements of specialty coffee, finding that the colors pink and green increased consumers' expectations of finding sweetness or acidity in the coffee served, respectively.[10] In 2022, the same research group—in collaboration with the Coffee Science Foundation and Savor Brands—further explored the impact of packaging color on consumers' judgement of the coffee inside with US specialty coffee consumers.[11] Using pink and brown bags at different saturations (weak and intense), the group found that coffee in a pink bag was not only associated with higher expectation of sweetness and acidity, but also carried over to influence participants' actual perception of the coffee sample. Later on, when asked about their perception of value for each bag color and associated coffee, even participants who reported disliking the sensory attributes associated with the pink bag (sweetness, acidity, fruitiness) reported that they would be more willing to pay for the pink bag than the brown bag—establishing that even extrinsic attributes which seem to be only vaguely related to a specific coffee, like the color of its packaging, are a substantial part of experience of buying and consuming specialty coffee.

Another study, this time leveraging a neuroscience approach, confirmed the impact the mere presence of an extrinsic attribute—in this case, a very basic implication that a coffee had come from a particular kind of location—has on a coffee drinker's cognitive processing while drinking coffee.[12] This study by Artêncio et al in 2022 focused on something known as a Geographical Indication (GI):

> First created as a kind of intellectual property, GIs legally protect traditional foods that have a strong bond with a place's natural and human characteristics (i.e., terroir and savoir-faire, respectively). DOC Parmigiano-Reggiano, Vidalia onions, Prosciutto di Parma (Parma ham), and Champagne are all examples of foods protected under the GI system. ... [The use of a GI might] evoke consumers' mental imagery of a place... [and] also confirm the relationship between the origin (or terroir) of a coffee, indicating that it may present high-quality and unique properties during consumption...[13]

GIs and GI cues are common attributes in studies exploring the impact of extrinsic attributes on perception and willingness to pay. To test this theory that a GI cue would alter participants' brain activity, they designed a blind coffee tasting experiment, where participants—hooked up to an electroencephalograph (EEG)—first tasted a coffee without any information at all, cleansed their palate with

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9 "Hedonic" refers to a perception or impression of liking or preference. In the SCA Coffee Value Assessment, this is reflected in the "Impression of Quality" scale used in the CVA's Affective Assessment, which is defined as "a coffee taster's opinion of the distinctiveness and desirability of a coffee cupping section, reflecting either their own preference or a known market preference."

10 Maisa M. M. de Sousa, Fabiana M. Carvalho, and Rosemary G. F. A. Pereira, "Color and shape of design elements of the packaging labels influence consumer expectations and hedonic judgements of specialty coffee," *Food Quality and Preference* 83 (2020): 103902. https://doi.org/10.1016/j.foodqual.2020.103902

11 Fabiana Carvalho, "Beyond Freshness: How Packaging Color Influences Consumer Behavior," 25, Issue 17 (October 2023).

12 Mateus Manfrin Artêncio, Janaina de Moura Engracia Giraldi, and Jorge Henrique Caldeira de Olivera, "A Cup of Black Coffee with GI, Please! Evidence of Geographical Indication Influence on a Coffee Tasting Experiment," *Physiology and Behavior* Volume 245 (March 2022): https://doi.org/10.1016/j.physbeh.2021.113671

13 Mateus Manfrin Artêncio, "All in the Mind: How External Cues Impact Brain Activity and Preference," 25, Issue 18 (October 2022).

water, were presented with a written cue that the next coffee they were about to taste had come from a GI, and then tasted the same coffee again, before recording their preference for one of the two samples. Coffee drinkers with more product involvement experienced more distinct changes in their brainwave activity when drinking the coffee sample presented with the geographical cue than drinking the same coffee without the cue.

While this initial study focused on the impact of a GI cue on consumers, Artêncio et al would go on to study the impact of different kinds of origin information on the sensory perceptions of professional coffee tasters.[14] Here, the research explored the impact of origin information on coffee professionals in two formats: first, by presenting only the name of a GI, and second, by incorporating the same GI's name within a storytelling context. Although trained coffee tasters are generally expected to remain un-biased, the results of the study showed that the way a story is told about the coffee's origin can influence their perception, particularly for acidity and overall flavor.

The repeated evidence that any kind of extrinsic information about a coffee—from a cue about its origin to the color of its packaging—can influence our sensory perception is one of the key elements underpinning the SCA's assertion that any assessment of extrinsic information should be kept wholly separate from the other sensory assessments.

Impact on Quality Perception and Value

If extrinsic attributes shape our perception of a coffee's flavor attributes—again, arguably the most important intrinsic attributes impacting consumers' enjoyment and perceived quality—it follows that these attributes will also likely shape our preferences or our perception of quality, too.

At a very basic level, this concept has been demonstrated in neuroscience by examining which areas of the brain light up when drinking two different colas with and without brand information. In what's known as "the Pepsi Paradox" following a study by McClure et al in 2004, neuroscientists found that different parts of the brain light up when study participants taste un-labelled Coca Cola and Pepsi compared to when they taste the same colas with brand information (the orbitofrontal cortex and the dorsolateral prefrontal cortex/hippocampus, respectively).[15] Without any brand information, consumers were more likely to prefer the sensory experience of Pepsi, but Coke was preferred over Pepsi (by the same consumers) when brand information was included—and researchers have been trying to understand what prompts this shift, ever since.[16]

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14 Manfrin Artêncio, M., Cassago, A. L. L., da Silva, R. K., Carvalho, F. M., Da Costa, F. B., Rocha, M. T. L., & de Moura Engracia Giraldi, J. (2023). The impact of coffee origin information on sensory and hedonic judgment of fine Amazonian robusta coffee. Journal of Sensory Studies, 38(3), e12827. https://doi.org/10.1111/joss.12827

15 Samuel M. McClure, Jian Li, Damon Tomlin, Kim S. Cypert, Latané M. Montague, P.Read Montague, "Neural Correlates of Behavioral Preference for Culturally Familiar Drinks," *Neuron* Vol. 44 No. 2 (2004), p379-387. https://doi.org/10.1016/j.neuron.2004.09.019

16 George Van Doorn, Byon Miloyan, "The Pepsi Paradox: A Review," *Food Quality and Preference* Vol 65 (April 2018), p194-197. https://doi.org/10.1016/j.foodqual.2017.11.007

Much like Artêncio et al's 2022 study exploring the impact of a GI cue on brain waves in consumers, researchers have looked for links between specific extrinsic attributes and their impact on consumers' quality perception. In 2006, a study by Fandos and Flavián on Spanish specialty ham showed that consumers were significantly more likely to be loyal to a product bearing a particular denomination of origin (Jamon de Truel, a type of GI) than to a product without.[17]

In fact, all kinds of extrinsic attributes are important factors when consumers are evaluating and categorizing products. In 2020, Brown et al performed a technique called "projective mapping," asking chocolate consumers to identify the quality level of various chocolate products. The consumers used extrinsic attributes (further classified as "search attributes" and "credence attributes" in the study) to group chocolates into quality segments. Extrinsic attributes were found to interact in a complex way with intrinsic attributes, strongly affecting perceptions of quality and price.[18] For example, when participants were asked to judge product quality after tasting each chocolate sample, they relied more heavily on extrinsic attributes when explaining their quality assessment, rather than intrinsic attributes.[19]

The effect of extrinsic information on value has been revealed in coffee research as well. In an unusual "revealed preference" study (where consumers are observed in a real-world environment—in this case, an urban coffee shop), Arnot et al showed that information attributes such as country of origin and Fair Trade certification had an effect on the price responsiveness of consumers when purchasing a cup of coffee. This was an exceptional study in that it showed that this kind of information had a real (as opposed to hypothetical) effect on price sensitivity in a real environment using real coffee.[20]

In a similarly interesting study, Van Loo et al performed an "attention study" using coffee packaging, which measured consumers attentiveness to different elements of coffee labels by tracking their eye movements as they reviewed different labels. They found that consumers paid attention to extrinsic "ecolabeling" information, suggesting that this information was important to them—at least important enough to spend time reading the information.[21]

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17 Fandos, C. and Flavián, C., "Intrinsic and extrinsic quality attributes, loyalty and buying intention: an analysis for a PDO product," British Food Journal, Vol. 108 No. 8 (2006), pp. 646-662. https://doi.org/10.1108/00070700610682337S

18 Alison Brown, AJ Bakke, H Hopfer, "Understanding American premium chocolate consumer perception of craft chocolate and desirable product attributes using focus groups and projective mapping," *PLOS ONE*, Vol. 15 No. 11 (2020): e0240177. https://doi.org/10.1371/journal.pone.0240177

19 Brown et al, 2020.

20 Arnot, C., Boxall, P.C. and Cash, S.B. "Do Ethical Consumers Care About Price? A Revealed Preference Analysis of Fair Trade Coffee Purchases," *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 54 (2006): 555-565. https://doi.org/10.1111/j.1744-7976.2006.00066

21 Ilen J. Van Loo, Vincenzina Caputo, Rodolfo M. Nayga, Han-Seok Seo, Baoyue Zhang, Wim Verbeke, "Sustainability labels on coffee: Consumer preferences, willingness-to-pay and visual attention to attributes," *Ecological Economics*, Vol. 118 (2015): p.215-225, https://doi.org/10.1016/j.ecolecon.2015.07.011

Prioritizing Extrinsic Attributes

It seems very clear that extrinsic attributes have a strong effect on quality and value perception of specialty foods, including coffee—but with so many potential extrinsic attributes, which are likely to be most valuable to a consumer when making decisions about a coffee's quality and value? To help explore possible answers to this question, the team working on building the extrinsic assessment also reviewed economics and consumer research literature to better understand which extrinsic attributes had the most impact on purchase decisions.

In an especially large and comprehensive economic study of Cup of Excellent auctions, agricultural economists Traore et al used data from 11 specialty coffee competitions and auctions to identify which attributes—both intrinsic and extrinsic (described as "material" and "symbolic" respectively in the study)—are likely to be most valuable.[22] The researchers used a technique called "hedonic price modelling" to calculate the effect of attributes on final price, showing how different attributes had different effects on the final sale price of the coffee. The work reveals the importance of both intrinsic (flavor) and extrinsic (informational) attributes, but also provides a quantitative measure of each attribute's importance. In the study, important extrinsic attributes included country of origin, coffee variety, process, and crop year, in order of importance.[23]

A long-term North American consumer study—the *National Coffee Association's National Coffee Data Trends Study*—gathers information from coffee drinkers on important extrinsic attributes. Called "coffee claims" in the study, consumers are asked, year on year, whether they are more or less likely to buy a coffee with a specified attribute. In order of importance, the data reveals that extrinsic attributes of roast date, fairness to farmer, worker well-being, environmental sustainability, processing method, Fair Trade certification, farm identification, and Organic certification all make consumers more likely to purchase a coffee.[24] In a similar study by the Specialty Coffee Association, coffee consumers were asked to record their own purchasing behaviors and coffee preferences on personalized "blogs." The results showed that extrinsic attributes roast level, coffee origin, organic practices, sustainability, and fair trade were key valuable extrinsic attributes to these consumers, also in order of importance.[25]

This sense of prioritization also held true in more academic studies. For example, Abdu et al's meta-analysis of 22 coffee "eco-labeling" studies exploring the importance of ecological extrinsic attributes to coffee consumers showed a powerful effect of Fair Trade, organic, country of origin, and Rainforest Alliance on consumer willingness to pay (in that order).[26] In another study, this time performed on Spanish and Colombian coffee consumers by Sepúlveda et al in 2016, extrinsic attributes were shown to affect consumer preferences, including (in order) Fair Trade, Organic, country of origin, Rainforest Alliance, and the term "Gourmet."[27]

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22 Togo M. Traore, Wilson Norbert L. Fields Deacue. "What Explains Specialty Coffee Quality Scores and Prices: A Case Study from The Cup of Excellence Program," *Journal of Agricultural and Applied Economics*, Vol. 50 No. 3 (2018): p349-368. https://doi.org/10.1017/aae.2018.5

23 Traore et al, 2018.

24 National Coffee Association, *2023 National Coffee Data Trends Study*, National Coffee Association, p. 89-92.

25 Specialty Coffee Association of America, *2016 Specialty Coffee Consumer Study*, SCAA: California.

26 Nizam Abdu, Judith Mutuku, "Willingness to pay for socially responsible products: A meta–analysis of coffee ecolabelling," *Heliyon*, Vol. 7, No. 6 (2021), e07043: https://doi.org/10.1016/j.heliyon.2021.e07043

27 Wilmer S. Sepúlveda, Louiza Chekmam, María T. Maza, Nelson O. Mancilla, "Consumers' preference for the origin and quality attributes associated with production of specialty coffees: Results from a cross-cultural study," Food Research International, Vol. 89 Part 2 (2016), p997-1003, https://doi.org/10.1016/j.foodres.2016.03.039

Alpha Extrinsic Assessment User Survey and Focus Group Activity

About the Alpha Extrinsic Assessment Form

Taken as a whole, the literature reviewed suggested that among coffee buyers and consumers, the following extrinsic information is likely to be valuable:

- Farm identity information such as country of origin, farm name, and farmer name
- Harvest year
- Coffee process information
- Coffee variety information
- Sustainability information
- Certifications, especially Fair Trade, Organic, and Rainforest Alliance.

To this end, the SCA developed and designed an "alpha" version of the extrinsic assessment form, released in April 2023. Using the basic elements of the design language established in the beta versions of the descriptive and affective assessments, the form included a list of extrinsic attributes across five different categories:

- "Identity Attributes," which included country/region (or other geographical information), name of farm or co-op, name of producer(s), variety or varieties, and ICO number
- "Processing Attributes," which included name of processor(s), name of wet mill or processing station, name of dry mill, process type, and process description
- "Grading Attributes," which included size grade (AA, Supremo, etc.) and other grade (EP, Strictly High Grown, Strictly Hard Bean, etc.)
- "Sustainability Attributes," including established certification programs like 4C, Fair Trade, Organic, Rainforest Alliance, Regenerative Organic, SMB Bird Friendly, and Second-party Verification Scheme
- "Other Extrinsic Attributes," which was left blank for freely elicited descriptors.

In addition to having a space to "check" the presence of each attribute within their respective category, the form also left space in each section for users to hand-write additional relevant information ("freely elicited descriptors").

Early feedback upon release suggested that not only were some key extrinsic attributes missing from the list (in particular, harvest date), but that the categorization of third-party certification programs as "sustainability attributes" was confusingly limited. In addition to gathering general feedback from CVA Early Adopters across all the proposed assessments, the team working on the CVA identified that a specific survey, asking for broad feedback on the extrinsic attributes to include in the form, should be undertaken before progressing the alpha version into a beta version.

Description and Methodology

About the Survey

On August 24, 2023, the SCA announced the opening of a survey aimed at "coffee professionals, cuppers, and green coffee buyers and sellers," to help the SCA "develop a useful list of attribute categories that can be integrated into the [CVA's] Extrinsic [Assessment]."[28] The survey was released in English, Spanish, and Korean simultaneously, and closed for responses on September 30, 2023.

The survey was designed in three parts, beginning with an introduction, which defined extrinsic attributes and linked to relevant resources. Next, participants were asked a series of questions to understand the importance of each of the attributes listed on the alpha version of the form using a sliding scale from "not important" to "very important," before listing any other extrinsic attributes they believed were relevant in an open-ended question. Last, but certainly not least, participants were asked to situate their responses with their experience by answering a series of demographic questions (business type, occupation, years working in specialty coffee, and country of employment).

Respondent Demographics

Across all available languages, the SCA received 827 responses to the survey. The English language version of the survey received the most responses, at 559 responses (67.59%), followed by Spanish (212 responses; 25.63%), and Korean (56 responses; 6.77%).

Of the total respondents, 780 respondents provided information about their business type. The most frequently reported business types were Roaster Wholesaler (132), Roaster Retailer (126), and Retailer (91). However, between languages, there were different top reported business types:

- English: Roaster Wholesaler (109), Roaster Retailer (101), and Retailer (61)
- Spanish: Exporter (37), Producer (24), Roaster Retailer (24), Retailer (24), Consultant (18)
- Korean: Education (13), Roaster Wholesaler (10), Consumer (8)

All respondents provided information about their occupation. The most frequently reported occupations were Roaster (108), Coffee Taster/Cupper/Grader (106), and Manager/Director (84). However, between languages, there were different top reported occupations:

- English: Roaster (81), Manger/Director (61), Coffee Buyer (56)
- Spanish: Coffee Taster/Cupper/Grader (57), Barista (22), Manger/Director (20)
- Korean: Roaster (16), Barista (15), Educator/Trainer (12)

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28 SCA, "Participate in the Extrinsic Assessment Survey," SCA News, published August 24, 2023: https://sca.coffee/sca-news/participate-in-the-extrinsic-asessment-survey

All respondents also reported their length of time in the specialty coffee industry, with an average of 12.2 years; even so, over half of respondents reported working in the industry for 0-10 years (477 respondents).

When asked, "in what country do you work," the top five most reported were the United States of America (172), Poland (66), Colombia (58), Republic of Korea (45), and Mexico (35). (Only 766 respondents provided an answer to this question.)

Data Analysis

In addition to basic statistical analysis across all responses and a box plot of ratings, the SCA also conducted multivariate analysis, including: bivariable correlations, multivariate correlations of dependent variables (via principal component analysis), and analysis of variance of explicative variables (via analysis of variance). These additional analyses helped to find relationships between the business type of the respondent, professional occupation, country of employment, and total years' experience in the industry and which attributes were (or were not) valued.

About the Focus Group Activity

While the survey tested the relevance of each of the attributes on the alpha form and asked respondents to identify anything missing, it did not solicit feedback on the categories used to organize attributes on the alpha form (identity, processing, grading, sustainability, and other). After analyzing survey data, the next step in the evolution process was to conduct a categorization exercise. On November 7, 2023, at the Educator Summit event in Italy, SCA staff presented a printed list of extrinsic attributes in no particular order—including the ones on the alpha form and others suggested by survey respondents—and crayons to 55 coffee industry professionals from across Europe, the US, Asia. Participants were then asked to sort the attributes into categories that made sense to them individually based on their personal experiences in different coffee industry roles. After 15 minutes, participants turned in their categorized lists, which the SCA reviewed at the conclusion of the event.

Findings and Implications

Early in the analysis of the survey results, it became clear that some attributes were widely considered important by all respondents, but that others varied in importance for respondents depending on their role in the value chain, years of experience, or geographic location. Attributes of processing and origin were seen as highly valuable to everyone in the study; other attributes (like variety, process description, producer, and farm name, etc.) differed greatly in their value among respondents. However, all attributes were deemed to be "very important" by at least some respondents (Figure 1).

Box Plots of Ratings per Attribute

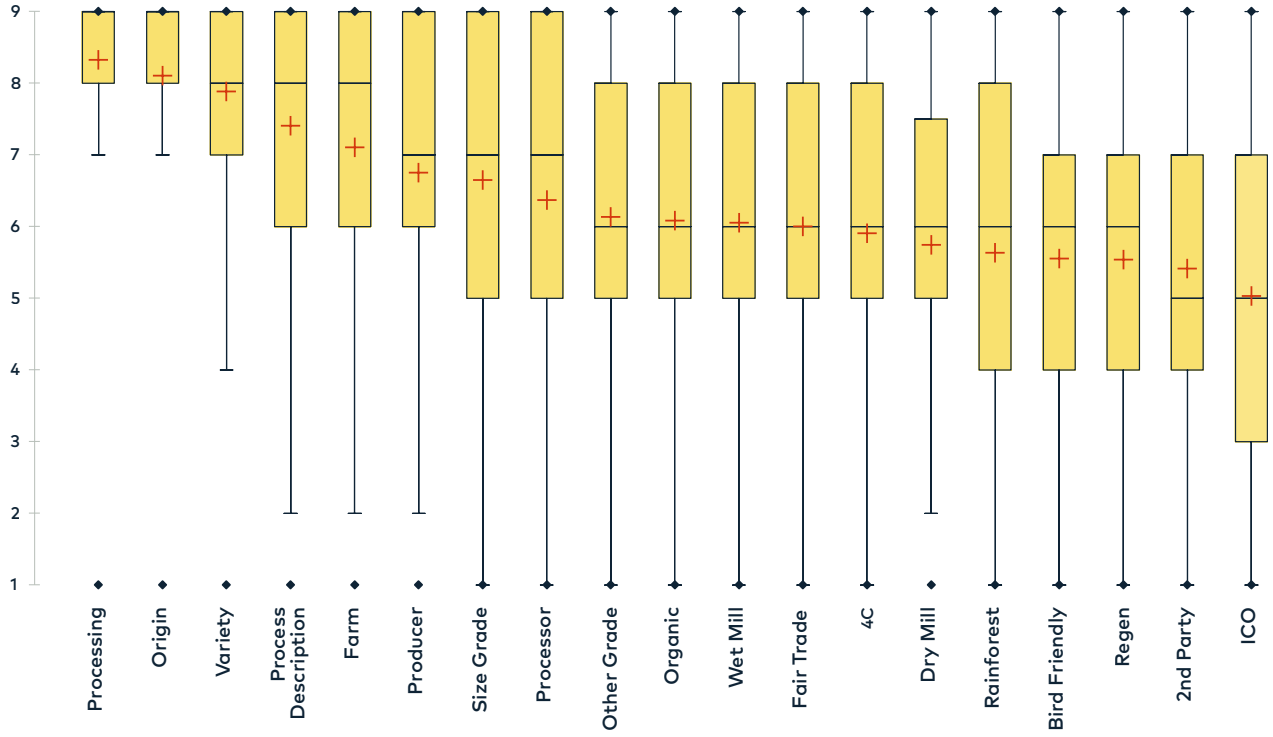


Figure 1. Box plot of ratings for each attribute on the survey. Each variable's set of "box and whiskers" displays key statistical data for each attribute from bottom to top: the "minimum" (the lowest point in the data set, shown with the low "whisker"); the first quartile (the median of the lower half of the data set, shown as the lower edge of the box); the median (the "middle" value within the data set, shown as the middle line within the box); the third quartile (the median of the higher half of the data set, shown as the highest edge of the box); and the "maximum" (the highest point in the data set, shown with the higher whisker). In this box plot, the attributes are arranged from left to right by median and overall spread of responses. In other words, attributes on the left were more commonly agreed to be important by survey respondents, while attributes on the right were far less consistently deemed important.

Results also indicated direct correlations between certain attributes: if a respondent said one attribute was a certain level of importance, they would rate other attributes of a similar importance. For example, respondents who rated Fair Trade as "very important" were also likely to rate Rainforest Alliance as "very important," too. These "significant bivariable correlations," as they're called in statistics, were found between the following attributes:

- Name of Farm or Co-op and Name of Producer
- Name of Wet Mill or Processing Station and Name of Dry Mill
- Size Grade (AA, Supremo, etc.) and Other Grade (EP, SHG, SHB, etc.)
- Fair Trade and Rainforest Alliance
- Rainforest Alliance, Regenerative Alliance, and SMBC Bird Friendly

When displayed across a principal component analysis plot (PCA plot, Figure 2), a way of understanding the relationships between complex data sets, the analysis confirmed a general correlation of all attributes along factor 1 (F1): this means that respondents with high scores tend to have highs scores across the board. In other words, respondents who prize extrinsic attributes tend to prize all of them. However, a finer analysis along factor 2 (F2) identified the extrinsic attributes clustered in two groups. One group of attributes, in the upper-right quadrant of the PCA plot, could be described as "identity" attributes (describing a coffee's origin and general identity). Meanwhile, the second group of attributes, in the lower-right quadrant, could be described as "sustainability" or "certification" attributes, as it encompasses the different certifications. This suggests that "identity" and "sustainability" attributes are not equally prized by all respondents, but that respondents who prize "sustainability" attributes tend to prize them all in general. By factoring in respondents' reported experience within the specialty coffee industry, another trend emerged: as respondents were more experienced, they tended to score the importance of all attributes slightly lower than respondents with little experience. This was despite their preference for "sustainability" attributes, which otherwise would have resulted in a respondent prizing all attributes more (as described in F2).

Principal Component Analysis Plot

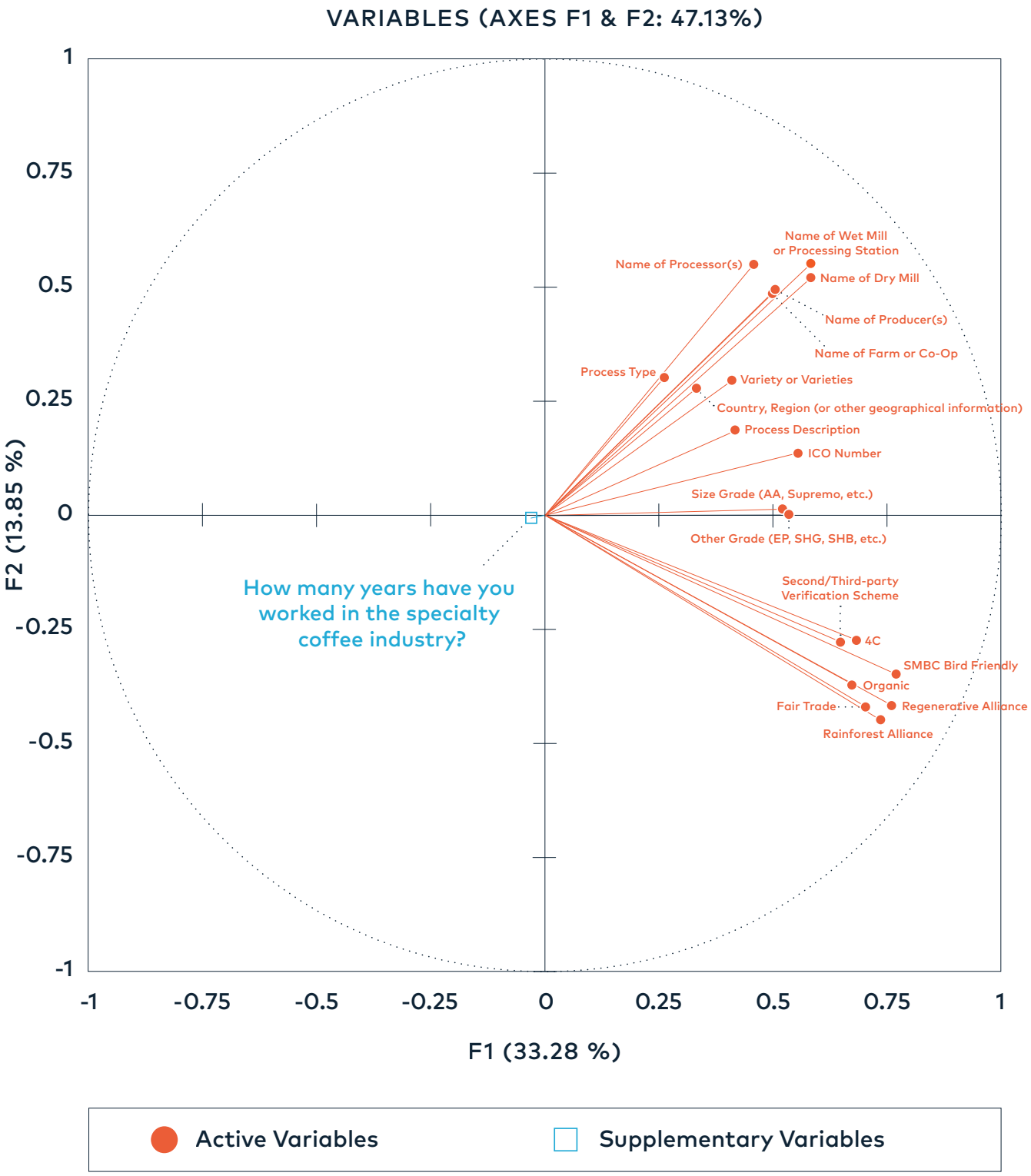


Figure 2. PCA plot of all responses. Factor 1 (F1) is represented by what would typically be seen as the "X" axis, or the line running horizontally through the middle of the plot. The fact that all the attributes available in the survey are situated on the right side of the plot indicates that respondents who prize extrinsic attributes tend to prize all of them, and not just some. Factor 2 (F2) is represented by what would typically be seen as the "Y" axis, or the line running vertically through the middle of the plot. The fact that some attributes sit above F1 and some attributes sit below shows that identity attributes and sustainability attributes are not equally prized by respondents.

Using the survey's demographic descriptions to understand the relationship between respondent business type and importance of attributes, analysis of variance showed that different business types value different attributes (Table 1).

Table 1. Variables in attribute importance which are significantly explained by business type.

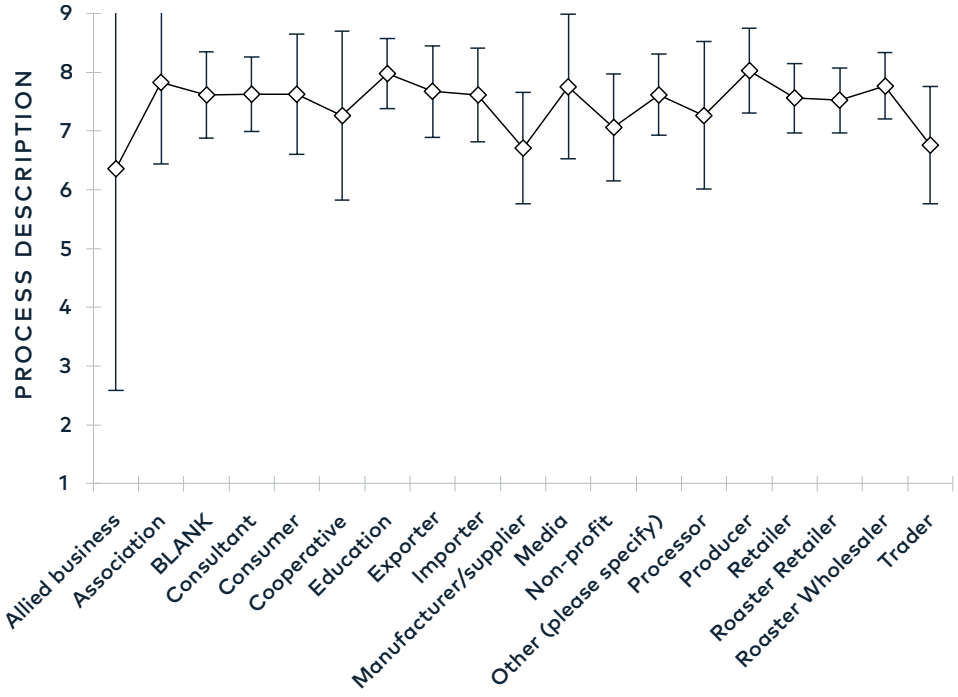
Attribute	Significantly Lower	Lower	Higher
Name of Wet Mill		Trader	Education, Importer, Media
Name of Dry Mill		Trader	Importer, Other
Process Description		Manufacturer/ Supplier	Producer
Size Grade	Processor		Importer, Exporter, Education
Other Grade	Processor		Importer, Association
Organic	Processor		Cooperative, Media, Consumer
Rainforest Alliance		Processor	Cooperative, Media
Regenerative Alliance		Processor	Cooperative
SMBC-Bird Friendly		Processor, Trader	Media

Although somewhat expected, these results were a good reminder that any further development of the extrinsic assessment will need to keep the wide range of potential users in mind. With so many potential use cases, business types, and roles within coffee's complex system, there will likely always be significant variability of which extrinsic attributes are valued, by whom, and how much.

This kind of analysis also revealed a new idiosyncratic role: the processor. Respondents who self-identified as processors were less aligned than other roles as to which attributes were important when compared to other actors. For example, while they were generally aligned around the importance of attributes related to the processing of coffee, they were significantly less aligned to other groups around an attribute like "Organic" (Figure 3). This suggests that processors might be more focused on the specific attributes relevant to coffee processing and be less aware of valuable attributes in the larger coffee marketplace than other actors.

Comparing Attribute Importance by Business Type

Importance of Process Description Attribute by Business Type



Importance of Organic Attribute by Business Type

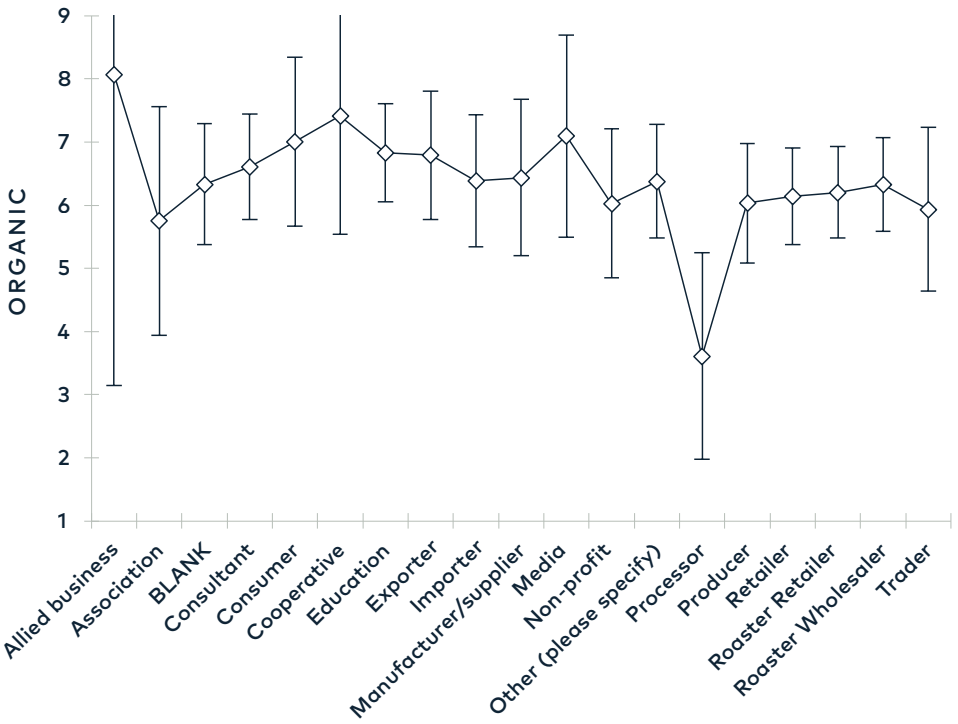


Figure 3. Comparing the mean of "Process Description" (top) and "Organic" (bottom) by self-reported business type. Note how most of the "whiskers" are aligned in the top graph, indicating that the respondents from each business type generally agree with each other around an attribute's importance, but that on the bottom, the processor is not only significantly lower than the other business types, but also has wide whiskers.

Other interesting correlations emerged during analysis related to years of experience, geographic location, and survey language. Respondents who reported working fewer years in the industry or who were base in coffee producing countries were more likely to rate the attribute of "Varieties" as more important than those who had more experience or those who were based in China, Japan, or the Netherlands. (Those who had more time in the industry were more likely to rate "Other Grade (SHG, SHB, etc.)" as more important.) Similarly, attributes like "Variety," "Name of Wet Mill," "Fair Trade," "Rainforest Alliance," and "SMBC-Bird Friendly" were more important to respondents of the Spanish survey and those who reported working in exporting countries.

Where the survey focused on specific extrinsic attributes—and highlighted potential additions to the existing alpha list—the focus group activity explored how these attributes should be categorized and labeled. Respondents grouped the listed attributes in a variety of ways and used many different terms to express similar concepts. The highest degree of alignment occurred among the ten percent of participants who used the same titles for their categories as the alpha form, which had been publicly available online for six months by that time and was likely known to them. Despite that agreement, they made different choices about which of the additional attributes belonged in each of those categories, and most participants in the activity came to different conclusions about how to label each group as well as how to divide the attributes among the groups they had created. Examples of suggested category titles include: food safety, origin, sustainability, certification, production vs. consumption attributes, physical vs. flavor attributes, and more vs. less important attributes. The lack of alignment across participants in both category names as well as which attributes belonged to which categories suggests that a significant opportunity for the SCA to establish a more common language for these categories and attributes.

Developing the Beta Extrinsic Assessment: A Proposal

To date, studies on the value of different extrinsic attributes have either focused on understanding a single attribute, like Fair Trade certification or a pink package, or on ranking the importance of a series of attributes. Without a way to record attributes in the coffee evaluation process, it has been impossible to collect and compare data from a wide range of sources about which attributes drive purchasing decisions. To many specialty coffee industry veterans, the extrinsic assessment will feel like something new, since on the 2004 SCA Cupping Form, no space is provided to catalogue non-sensory attributes. Despite that, cuppers across the globe and along the value chain have grown accustomed to using the notes section of the form, as well as the margins of each page, to capture information that helps them contextualize a coffee's sensory attributes and understand its value. Green coffee sellers around the world want to know whether particular plant varieties offer promising price premiums from buyers, and green coffee buyers want to know what kind of information is worth printing on the package that will represent their brand on a supermarket shelf. Given the demonstrated importance of extrinsic attributes in decision-making, it does not make sense to keep them in the margins, and the extrinsic assessment gives them a standalone form.

The beta version of the extrinsic assessment will integrate feedback on the alpha form, the results of the 2023 alpha extrinsic assessment user survey, and learnings from the focus group at the Educator Summit Italy in November of 2023. Broadly, the changes suggested by this feedback includes adapting the name of each category to better align with the language of the SCA's *Coffee Systems Map* as well as more clearly articulating options for freely elicited descriptors (in the absence of clear CATA boxes, like the CVA's descriptive assessment).

The "Identity" category will be renamed "Farming" to align with the language of the Coffee Systems Map, with "Grading" replaced with "Trading," which better represents the systems map activities of "Exporting" and "Importing." The "Sustainability" category of the alpha form, which raised concerns for seeming to equate sustainability with third-party certification schemes, will be renamed "Certifications." In addition to an "Other" category dedicated to capturing extrinsic attributes that do not fit into other categories, space will be added to each of the defined categories for detailed information and specific vocabulary.

After much discussion and review of the feedback surfaced through the general feedback tool, specific extrinsic assessment user survey, and focus group, the beta version of the CVA Extrinsic Assessment will only focus on a few widely used attributes within each category instead of a long list of possible attributes. This reflects the logic of the descriptive assessment, where a limited number of descriptors from the *SCA Coffee Tasters Flavor Wheel* appear as check-all-that-apply options, but cuppers are encouraged to add their own, freely elicited

descriptors as they see fit. The presence of an attribute on the assessment will not necessarily mean that it is more important or more valuable than attributes that are not listed—rather, these attributes will appear because they have been demonstrated to generate value and are recognizable to cuppers working anywhere in the coffee system. In digital applications, this list will feed a database that can be queried to determine which informational attributes correlate to higher value in the marketplace and desirability in different consuming regions.

Just as in the alpha version, users will be asked to complete the extrinsic assessment separately from the descriptive or affective Assessments due to the high likelihood that extrinsic information will impact the sensory evaluation process. The beta version of the CVA Extrinsic Assessment is anticipated to release in mid-2024 and will continue to collect industry feedback using the CVA's Early Adopter program.

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