

## The role of sensory relevance in the ordering of adjectives

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ABSTRACT. Starbucks has developed a system for ordering adjectives, inspired by standardization and printed on each cup. *High frequency visitors* (HFVs) to Starbucks were found to comply less with the Starbucks' standardized order and used more adjectives than *distributed frequency visitors* (DFVs). HFVs also formed new adjectives not found on the menu and used adjectives that reflected Starbucks' sensory intentions for their customers significantly more often than DFVs. This indicates that customers are becoming more complex in their adjective use as their visits to Starbucks become more frequent. This increase in complexity is posited to be the result of cross-sensory conceptualization that guides the order and use of adjectives, rather than the findings for adjective ordering that other linguistic studies might have led us to expect. In particular, one might predict adjectives to be especially sensitive to this input as they are the very words we use to describe sensory information.

*Keywords:* adjectives, adjective ordering, cross-sensory conceptualization, sensory intentions, store atmospherics, Starbucks, coffee

**1. INTRODUCTION.** Customers ordering coffee at Starbucks rattle off many variables, or adjectives, related to size, temperature, syrup flavor, espresso shots, name of drink, and more. What order these adjectives are placed in has been standardized for Starbucks' employees to maintain training consistency and for purposes of efficiency (Le Meur 2009). The ordering system, from Starbucks' perspective, is driven by the variables as they are printed on the side of the cup itself. Table 1 shows the cup-printed order that employees of Starbucks typically use when they restate each purchase back to the customer.

1	Size
2	Temperature
3	Caffeine
4	Shots of espresso
5	Syrup
6	Milk
7	Custom details
8	Drink name

TABLE 1. Cup-printed order used at Starbucks

A typical ordering exchange at Starbucks involves a dialogue between the customer and the barista. As an example, a customer may state an order as, “Decaf, nonfat, venti latte.”

The Starbucks barista would then restate the order back to the customer for confirmation as, “Venti, decaf, nonfat latte.” The barista's restatement reflects the customer's drink, but the variables now coincide with the Starbucks' cup-driven sequence of size (*venti*), caffeine (*decaf*), milk (*nonfat*), and drink name (*latte*). This demonstrates how the barista came to place each adjective in its order, but it remains unclear as to what drives customers' initial placements of adjectives when they place their coffee order.

THEORIES OF ADJECTIVE ORDERING. Wulff's (2003:249) corpus analysis revealed that just 0.096% of noun phrases contained adjective pairs. Of those, only 4% were followed by a third adjective. Several theories on adjective ordering exist when multiple adjectives occur in a noun phrase. One theory is Hetzron's (1978:165) *subjectivity-objectivity gradience*, where adjectives are coded and ranked by their semantic class. For example, an adjective from a semantic class of purpose (e.g., *ironing*) would be coded with a 1, indicating it would be located closest to the noun when there are multiple adjectives. By comparison, an adjective from a semantic class of epistemic qualifiers (e.g., *famous*) would be coded with a 13, indicating it would be located furthest from the noun. The *length* of the adjective has also been discussed, with some theories suggesting that longer adjectives follow shorter adjectives before the head noun. Another theory relates to each adjective's *nominal character*, stating that the most nounlike adjectives rank themselves closest to the noun they modify. Still another theory says that *semantic closeness* ranks adjective ordering, with the adjectives that are most closely represented in thought to the noun also being placed closest to the noun.

While any of these differing theories on adjective ordering may apply to Starbucks, it is also possible that the ordering is being determined as a function of routinization. Mithun (2001:73) discusses that "human beings, like other animals, routinize frequently recurring tasks, including the assembly of grammatical constructions" and "recurring constructions become automated; speakers choose them as units rather than as individual components."

Starbucks' customers, especially those who are high frequency visitors (HFVs), may begin to place their orders as though the words have become automated, routinized units.

HFVs have heard the Starbucks' cup-driven order repeated back to them with every purchase, which may lead to an adoption of the Starbucks' system of ordering. Based on these views, this study hypothesizes that high frequency visitors (HFVs) to Starbucks will routinize their adjective order to the Starbucks' cup-driven order more than customers who visit less often.

CROSS-SENSORY INPUT. A quick visit to any one of Starbucks' worldwide stores shows a consistent presentation of cross-sensory inputs through branded materials, rich use of color, light, music, special cups, photographs and more. Coffee itself is a highly sensory product that includes variables such as temperature, foaminess, flavor, caffeine, and size. Starbucks holds the largest market share of coffee and snack shops in America (Stockdale 2012). This implies significant, consistent, cross-sensory input to HFVs. Starbucks has achieved a substantial competitive advantage largely attributed to creation of a cross-sensory customer experience (Pine & Gilmore 1999). This experience has been engineered to solicit specific emotional responses in customers through senses of bodily experience, sight, hearing, smell, and taste (Biehl-Missal & Saren 2012:168). For example, Biehl-Missal and Saren describe Starbucks as having a "seductive consumption atmosphere" that utilizes architectural features such as tall columns and large windows to suggest feelings of being inviting, open, and friendly. Another example of using cross-sensory input to elicit emotion is seen in Starbucks' choice of round tables and lamps that are described as creating a "cuddly" sensory experience. This study hypothesizes that HFVs to Starbucks will use more adjectives that

coincide with Starbucks' sensory intentions for their customers compared to customers who visit Starbucks less often.

**2. METHOD.** Customer orders and barista responses were overheard and written down from three different Starbucks in Albuquerque, New Mexico. The customers were not aware of their participation in the study. Additionally, orders were collected from an article published in the *Huffpost Taste* (2013). Orders were placed by 17 female and 18 male adults (information about the individuals placing orders in the *Huffpost Taste* article was not available). All Albuquerque participants demonstrated English proficiency, which was determined by their ease of ordering. Participants were deemed to be primarily of middle class status based on Starbucks' pricing (a cup of coffee can be over four dollars) and on reports that Starbucks' sales numbers are correlated to middle class economics (McIntyre 2009).

Two groups were analyzed. Members of the first group did not say anything during their visit to Starbucks that provided information as to how frequently they visited. This group is referred to as *distributed frequency visitors* (DFVs) because it is assumed that there is a distribution of low, medium, and high frequency visit customers in the group. The second group consisted of customers who were seen at the same Starbucks multiple times during the data collection period or who made statements while ordering that indicated they visited Starbucks frequently. This group is labeled as *high frequency visitors* (HFVs). For example, a customer was placed in the HFV group after stating, "I've earned a reward drink!" which meant they had previously purchased the 12 drinks necessary to earn a reward drink. Additionally, orders were taken from a *Huffpost Taste* (2013) article,

which described the most obnoxious Starbucks' orders. These orders were identified as belonging to the HFVs group, simply because a low visit or even medium visit customer would seem ill equipped to place orders with variables that deviate away from the typical drink features of size, type of milk, flavors of syrup, or temperatures. For example, one of the *Huffpost* orders was a *quad-grande, nonfat, extra-hot, caramel macchiato, upside down*. It seems unlikely that a low or medium frequency visit customer would be aware of the availability of these adjectives when ordering a coffee, largely because items such as *quad-grande, extra-hot, and upside down* cannot even be found on the Starbucks' menu.

In fact, it could be suggested that the number and use of adjectives in Starbucks' coffee orders is driven by the menu posted at each location. To investigate this suggestion, each coffee order was examined to determine how many words were explicitly posted on the Starbucks menu and how many were not.

Adjectives were defined as words that described or modified the coffee related noun. For example, in the case of the coffee order *grande single-shot extra-hot light-foam latte*, the words *shot* and *foam* are considered adjectives that describe the latte when they are paired with other descriptive or modifying words connected with a hyphen. These words were counted as one compound adjective because when these words compounded they described or modified the coffee related noun.

To examine the possibility of cross-sensory inputs influencing adjective choices, specific components of Starbucks' environment were investigated based on Biehl-Missal and Saren's (2012:173) analysis of intended customer emotional responses to the Starbucks engineered environments. These emotional responses were then matched with coffee orders where customers' adjectives indicated that the sensory intention for Starbucks' customers were successful and, thus, translated to language use. For example, Biehl-Missal and Saren's analysis of Starbucks' use of round lamps and tables to inspire

emotional responses for cuddliness, translated to customer adjective choices of *foam*, *whip*, and *whipped cream* as indicating that these adjectives inspired similar concepts of cuddliness. Another example from Biehl-Missal and Saren's analysis is Starbucks' use of tall columns and large windows to inspire emotional responses for being inviting, open, and accessible. Customer adjective choices of *venti*, *light*, and *extra* then indicated similar concepts for openness and accessibility. Percentage of use for sensory intended adjectives was calculated from the total number of adjectives used.

**3. RESULTS.** Percentages correct were calculated for how often HFVs and DFVs complied with the cup-driven Starbucks' order. While HFVs and DFVs were both similar in where they placed adjectives related to milk at 44% and 43% and drink type at 50% and 52%, respectively, the groups differed in where they ordered adjectives of size, temperature, number of espresso shots, type or amount of syrup, and custom details. DFVs were at 81% accuracy for placing drink size in first position, 67% for temperature in second position, and 0% accuracy for placement of caffeine, espresso shots, syrup, and custom details. By comparison, HFVs were at 44% for placing drink size in first position, 33% for temperature in second position, and 0% accuracy for placement of caffeine, 17% for espresso shots, 17% for syrup, and 23% for custom details. Averages of the percentages of compliance across all positions for each group showed that HFVs were at 28% overall compliance compared with DFVs at 30%.

Further analysis was made regarding which variables were most-substituted for first and last position in each group, as seen in Table 2. Additionally, in the "custom" category for final-position substitutions, 28% of both groups combined substituted the use of a negative adjective, such as *nonfat*, *no-whip*, or *no-foam*.

First Position Substitutions								
group	temperature	caffeine	shots	syrup	milk	custom	drink name	total substitutions
DFV	20%	20%	0%	20%	20%	0%	20%	19%
HFV	10%	40%	30%	0%	10%	0%	10%	56%

  

Final Position Substitutions								
group	size	temperature	caffeine	shots	syrup	milk	custom	total substitutions
DFV	8%	15%	0%	15%	0%	8%	53%	48%
HFV	0%	0%	0%	0%	22%	11%	67%	56%

TABLE 2. First and final position adjective ordering by percentage of accuracy when measured against order imposed by Starbucks

Differences were also found in the number of adjectives used by each group. Customers used adjective pairs 47% of the time while ordering coffee, with three adjectives in an unbroken string at 18%, and three or more adjectives in an unbroken string at 24%. DFVs also displayed a lower use of adjectives, overall and in an uninterrupted string, compared with HFVs as seen in Table 3.

Group	average adjective number per order	average number adjectives in string per order
DFV	2.74%	2.15%
HFV	4.61%	3.67%

TABLE 3. Average adjective number per order for DFV and HFV

Hetzron's (1978:165) subjectivity-objectivity gradience and hypothesized adjective order is shown in Table 4, along with an example of each semantic class and the numeric code (taken from Wulff 2003:262).

EXAMPLE	CODE	SEMANTIC CLASS
<i>Famous</i>	13	Epistemic qualifier
<i>Good</i>	12	Evaluation
<i>Wide</i>	11	Static permanent property
<i>Sweet</i>	10	Sensory contact property
<i>Fast</i>	9	Speed
<i>Cheap</i>	8	Social Property
<i>Young</i>	7	Age
<i>Square</i>	6	Shape
<i>Blue</i>	5	Color
<i>Deaf</i>	4	Physical trait
<i>Asian</i>	3	Origin
<i>Wooden</i>	2	Composition
<i>Ironing</i>	1	Purpose/destination

TABLE 4. Hetzron's (1978:165) subjectivity-objectivity gradience and hypothesized adjective order (taken from Wulff 2003:262)

Example 1 shows Hetzron's coding applied to the Starbucks' order of *iced half-caff ristretto venti four-pump sugar-free cinnamon-dolce soy skinny latte*, which is an order from the HFV group.

(1)

order: *iced half-caff ristretto venti four-pump sugar-free cinnamon-dolce soy skinny latte*

class: ADJ ADJ ADJ ADJ ADJ ADJ ADJ ADJ ADJ N

code: 10 2 9 11 11 10 10 3 2

("ristretto" meaning espresso shots are pulled short, adding an extra complexity to the flavor).

Differences were also seen when examining the percentage of adjectives used while ordering at Starbucks and their appearance on the posted menu. The non-menu words found in our data consisted of adjectives (e.g., *double, cold, plain, regular, unsweet, triple, quad, ristretto*), shortened adjectives (e.g., *soy* for *soymilk*), and newly devised compound adjectives (e.g., *extra-hot, with-room, single-shot, light-foam, half-sweet, no-foam, medium-roast, extra-shot, black-tea, one-pump, light-ice, half-caff, four-pump, extra-whip, two-*

*percent-foam*). A total of 25% of all adjectives from the data were not posted anywhere on the Starbucks menu. Specifically, 29% of all adjectives HFVs used were not posted on the Starbucks' menu, compared to 16% for DFVs.

Based on a one-way analysis of variance (ANOVA) for correlated samples, HFVs used adjectives that complied with Starbucks' sensory intentions for their customers significantly more often than DFVs,  $F(1,15) = 17.19, p = .004$ . Table 5 shows the adjectives customers used that reflected the sensory intentions of Starbucks as a percentage of all adjectives used while ordering coffee.

STARBUCKS' CROSS-SENSORY INPUT	SENSORY INTENTION	RESULTING SENSORY INTENDED ADJECTIVES	HFV	DFV
tall columns and large windows	accessibility, inviting, open	<i>venti, light, extra</i>	20%	15%
furnishings are soft and plush	safe and intimate	<i>vanilla, sweet, cream, mocha</i>	10%	12%
round lamps & tables	Cuddliness	<i>foam, whip, whipped cream</i>	9%	1%
airy store arrangement	emotional & imaginative extension	use of adjectives not on menu	29%	16%
warm, yellow lighting	Relaxation	<i>decaf, drizzle, caramel, hazelnut</i>	12%	7%
aromatic coffee smell	inclusion with ambience	<i>shot, number of shots</i>	11%	4%
unobtrusive music	bodily relaxation	<i>skinny, free, light</i>	12%	5%
overall atmospheric	haven of escape from work & home	ordering MY way: <i>no, non, half</i>	16%	4%

TABLE 6. Percentage of adjectives used that reflect Starbucks' sensory intentions for their customers, based on sensory analysis of Biehl-Missal and Saren (2012:168)

### 3. DISCUSSION.

#### 3.1. THEORIES OF ADJECTIVE ORDERING. In considering Hetzron's *subjectivity-objectivity*

*gradience* and hypothesized adjective order as applied to Example 1 of *iced half-caff ristretto*

*venti four-pump sugar-free cinnamon-dolce soy skinny latte*, the two adjectives closest to the noun were numbered with low numbers (3 and 2), which is consistent with what one might expect. However, it is difficult to explain that the adjective eight positions away from the noun is rated as a 2 (a low numbered adjective should be closer to the noun). This indicates that Hetzron's analysis may not best explain how Starbucks' customers are ordering their adjectives. Using the same coffee order from Example 1 to consider the theory that adjective *length* dictates order, where longer adjectives follow shorter adjectives (Wulff 2003:251), it can be seen that this theory also does not explain Starbucks' customers ordering of adjectives, because the word *soy* is close to the noun while the longer word *ristretto* is far from it. Similarly, the hypothesis that *nominal character* drives the ordering of adjectives, with the most noun-like modifiers occurring closest to the head noun (Wulff 2003:252), is also not supported as some noun-like words in Example 1 (*iced, cinnamon*) have not appeared closest to the head noun. The theory of *semantic closeness* for sequencing adjectives, where "things belonging closely together in mind are also put closely together in communication" (Wulff 2003:256), also did not prove as an adequate theory to explain how Starbucks' customers order their adjectives. For instance, from the same Example 1, it does not seem inherent to the word *skinny* that it would be semantically related to *latte*. Interestingly, the most substituted final position category over the Starbucks order was "custom details" in both groups (Table 2). This includes variables such as *no- whip* or *2%-foam*. It is conceivable that users might perceive the customness of their order to be most semantically related to the noun, although analysis showed that in all drink orders from both groups the word concept

used 28% of the time closest to the noun described what the drink was **not** (*nonfat, no- whip, no-foam*). This was higher than other concepts we might expect to be semantically related to coffee, such as flavor, temperature, or caffeine, which were all less-substituted for final position. Given this analysis, it's difficult to imagine that users are semantically relating what their drink is **not** most closely with the head noun. It may be the case that users are saying what they feel is most important to them closest to the noun, and this importance somehow semantically relates the word to the noun. However, conflicting information comes from data in Table 2 where the most-substituted item to the first variable (furthest away from the noun) was related to caffeine (*decaf* or extra shots), which is arguably quite important to most coffee drinkers. It seems reasonable, then, to consider is that the user's semantic relatedness may not be at all related to how they are ordering their adjectives.

In Wulff's corpus analysis (2003:249) just 0.096% of noun phrases contained adjective pairs, with 4% of those followed by a third adjective. By comparison, Starbucks' customers used adjective pairs 47% of the time while ordering coffee, with three adjectives in an unbroken string at 18%, and three or more adjectives in an unbroken string at 24%. Additionally, HFVs used more adjectives per order and more adjectives in an uninterrupted string per order than DFVs. This would seem to indicate that, indeed, language produced in the context of ordering coffee at Starbucks is quite different from what is found from other contexts.

Based on Mithun's (2001:73) view of recurring constructions becoming automated, one might expect to see a routinization of ordering at Starbucks where customers place their

orders as though they are automated, routinized units, or as routinized units that comply with the Starbucks' system of ordering adjectives, especially for HFVs who may repeatedly order the same, favorite drink and who have repeatedly heard the Starbucks order repeated to them with every purchase. Interestingly, several of the HFVs were overheard saying things such as, "three o'clock comes, and I get a coffee" or "I can't get the day going without my trip to Starbucks," indicating that other aspects of their Starbucks' behavior have routinized.

However, the data showed that HFVs used orders that complied with the Starbucks order 28% of the time, whereas DFVs were at 30%, indicating that the Starbucks' order may be used even less as visits increase. Additionally, the use of adjectives not posted on the Starbucks' menu were at a rate of 29% for HFVs compared to 16% for DFVs, and differences were found in the average number of adjectives per order, with 4.61 adjectives used per order compared for HFVs compared to 2.74 for DFVs. These differences between HFVs and DFVs seem to indicate that users are becoming less routinized and more complex in their language use as their visits become more frequent.

It has been asserted that customers "speak Starbucks" (Smith 2012:62), which would imply a certain level of jargon may exist for frequent visitors to Starbucks. Jargon is considered to be the specialized language of a professional, occupational, or other group, often meaningless to outsiders. If HFVs are using jargon, it could explain the DFVs' use of less adjectives in their orders, because they don't yet know the jargon. However, it's arguable that terms such as *half-sweet*, *soy*, and *iced* would not be meaningless to an outsider. Even if these terms were foreign to an outsider, one might assume that the Starbucks' cup-driven

order would then be the framework of jargon. In that case, again, we would expect to see HFVs with a higher rate of compliance to the Starbucks order, but the data show HFVs actually use the Starbucks cup-driven order less.

To examine the possibility of cross-sensory inputs influencing adjective choices, specific components of Starbucks' environment were investigated based on Biehl-Missal and Saren's (2012:173) analysis of intended customer emotional responses. Adjectives that reflected Starbucks' sensory intentions for their customers were used significantly more often by HFVs than by DFVs. To demonstrate the impact of sensory input on customer behavior, it's important to note that Starbucks is not alone in their efforts to influence customers through cross-sensory input. There are numerous other examples taken from the realm of marketing:

- Lower lighting in the glassware section of IKEA led to increased glassware purchases (Hulten 2012:273)
- French music made people buy more French wine (North et al. 1999:271)
- Fast tempo music made people eat and drink more rapidly (McElrea & Standing 1992:362)
- Single sounds in a chemotherapy medication led people to perceive it as fast, light, or small (Abel & Glinert 2008:1863)
- Color impacted perception of time passing (Gorn et al. 2004:215)
- Impact of alcohol on inhibition differed based on familiarity of environment (Birak et al 2011:686)

The combined influence of these cross-sensory associations is greater than the sum of their parts (Spence et al. 2014:483). Given that language is inherently multimodal, also utilizing sight, hearing, touch, and motor actions (Gallese & Lakoff 2005:460, Krishna 2012:332), it seems reasonable to consider that language may be forming from cross-sensory inputs within the sensory-motor system. When discussing the role of a sensory-motor system we tend to consider perceptible features and action plans. Lakoff and Gallese's (2005:456) example of the word "grasp" invokes many features related to the concept of "grasp" with a central concept or schema for the word. However, there may not be a prototypical, central concept for cross-sensory input, yet these features may still build into prototypes across many concepts. Because sensory input can be almost imperceptible, we may not conceptualize these sensory inputs in the same way that we conceptualize words. This lack of traditional conceptualization shouldn't imply, however, that there isn't relevance for cross-sensory input as it applies to language.

Lakoff and Gallese (2005:460) also discuss how language codes location in relation to given actions. As an example, they discuss the sentence *he grasped the cup in front of him* and how the relation between the action and its location is part of the conceptual structure. This paper proposes that cross-sensory input is processed almost imperceptibly and added across many conceptual structures. However, unlike a cup that is in front of us in the moment, cross-sensory input is subtly washing over us each day as we move through our lives. Inevitably, some of these cross-sensory inputs may repeat themselves through frequent exposures and translate to language.

While Lakoff and Gallese (2005:460) discuss that *action simulation* is what integrates sensory modalities and triggers a “plan” for a specific purposeful action, this paper proposes that input from cross-sensory inputs themselves trigger integration without any one, specific plan. In other words, cross-sensory input does not produce one action, one association, or even one schema to correspond with each input. The almost imperceptible nature of cross-sensory input allows it to subtly spread across many associations. It is stored across these associations and we see its influence over time in language production. In the case of this study, it is seen in the non-routinized use of adjectives by HFVs to Starbucks who’ve had frequent exposure to a standardized, cross-sensory input. HFVs to Starbucks don’t place coffee orders that comply to linguistic theories for how adjectives are ordered, nor do they place orders that comply with the cup-driven order that Starbucks repeats to its customers after each order is placed. Their orders become more unique as their visits increase, using adjectives that are not present on the Starbucks’ menu 29 percent of the time.

**5. SUMMARY.** Collected data reveals that HFVs to Starbucks defy the patterns of adjective use that other linguistic theories might have led us to expect, as well as Starbucks’ own, standardized order for adjectives used in ordering their coffee. Additionally, HFVs used a greater number of adjectives when ordering coffee than did DFVs and formed new adjectives that were not found on the menu. HFVs also used adjectives that reflected the cross-sensory intentions of Starbucks for their customers significantly more often than DFVs. Starbucks’ cross-sensory input communicates with great frequency through world-wide branded coffee

houses, especially to HFVs, and appears to be a relevant factor in influencing adjective use in that setting.

As a final note, a coffee house in Edinburgh (The Elephant House 2014) is reportedly where J.K. Rowling (1997) wrote much of the famous *Harry Potter* books. Indeed, there is the perception that writers like to work from coffee houses. It may just be the caffeine and having a place to sit. But, perhaps, it's a stream of cross-sensory information that is resulting in an unexpected complexity of adjective use and novels filled with unique text.

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