A comparison of two rapid methods for dynamic sensory profiling: TDS and Temporal CATA

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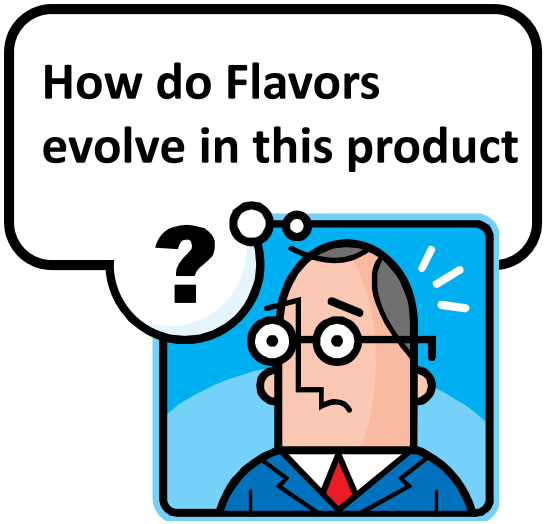
My Goal for this Presentation

I want to make you curious about temporal sensory methods and what they do and don't deliver. Especially **Temporal Check-All-That-Apply**, the method that I'm about to present.

I want you to become interested in its potential, to want to play with it, and to get real benefit from it in your work.

I also want you to learn from it, criticize it, tweak it, and to try to improve it. Then I want for you, and I, to take what we've learned and to create new methods that surpass it, so that we can throw it away, and start again with something even better.




How do Flavors
evolve in this product
?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?



Flavor Profile method

(cf. Caul, 1957)

Order of elicitation of Flavor characteristics is one aspect of the characterization of complex food… especially important is the early development of appropriate sensations.



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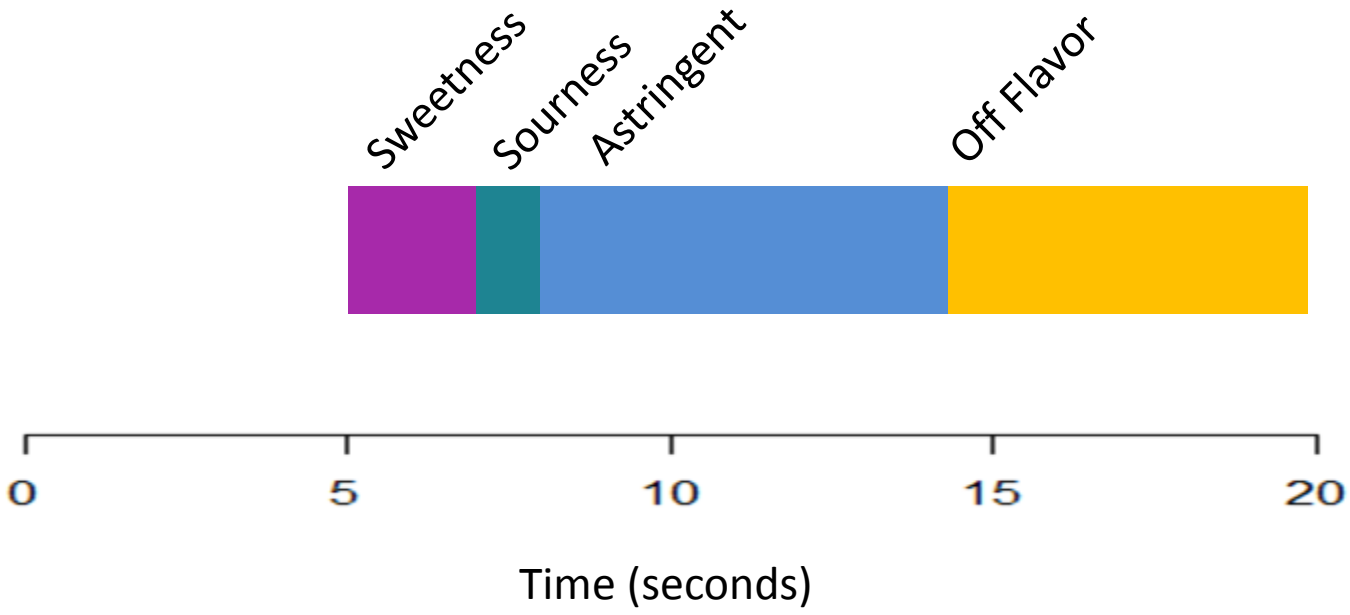
Temporal Dominance of Sensations (TDS)

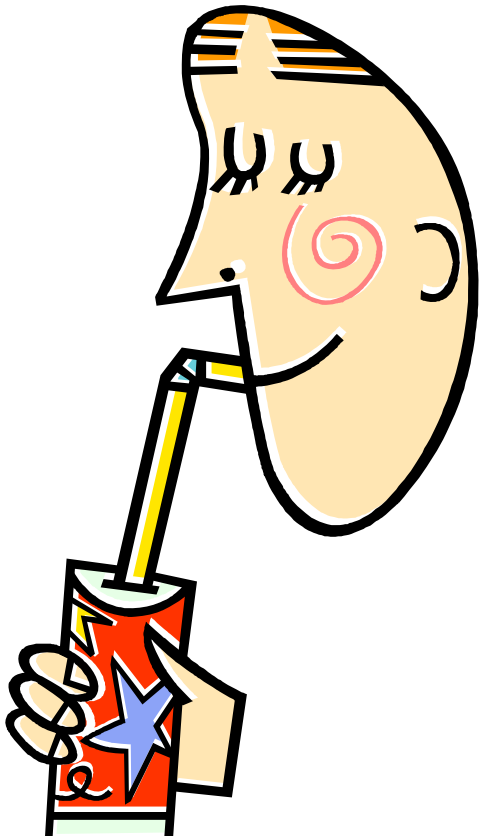
(Pineau et al., 2009)

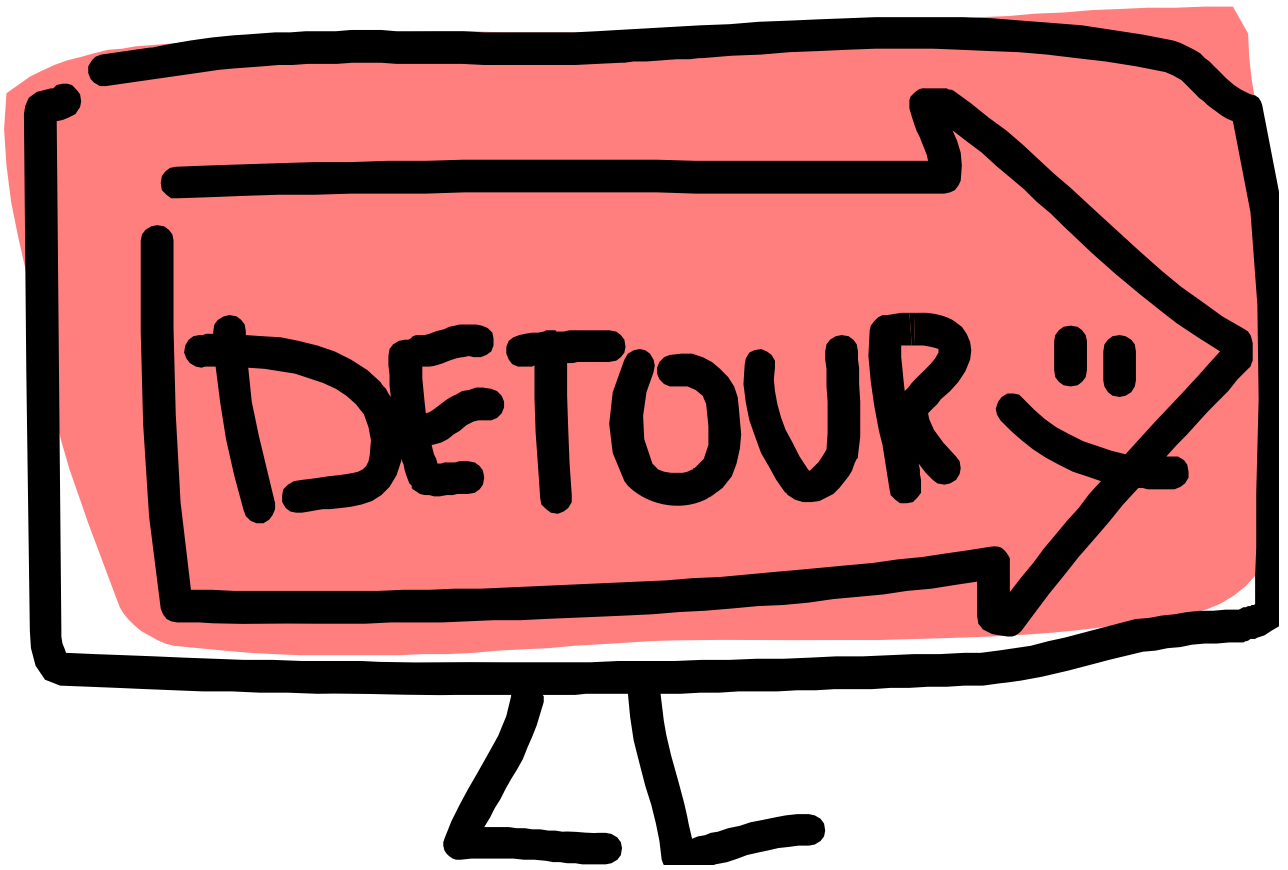
"…the new sensation popping up at a given time…"

TDS

Data provides **a sequence of dominant sensations** over time.



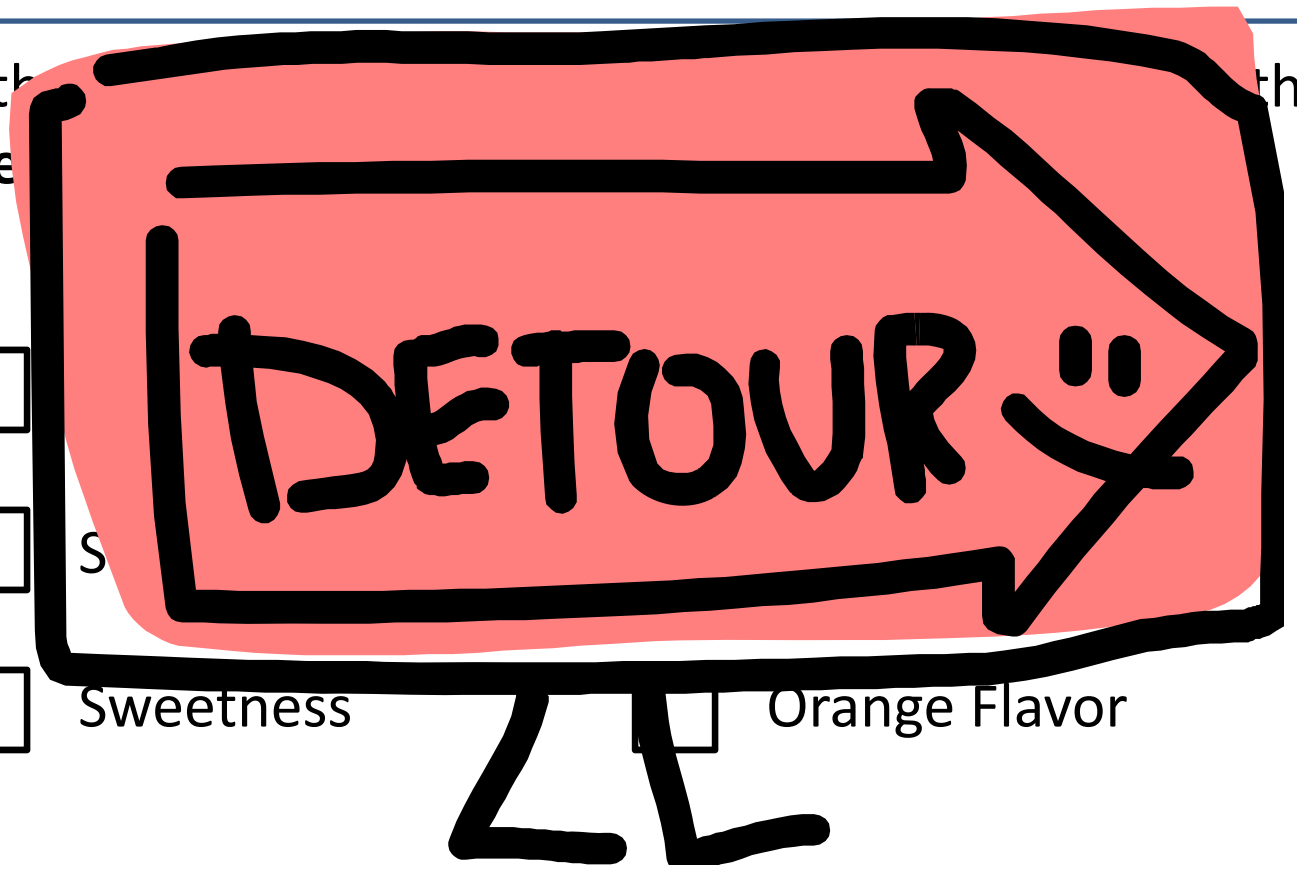


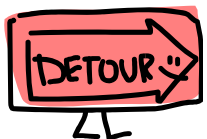

DETOUR

Check-All-That-Apply (CATA)

From th… …the **orange**

- ☐ S…
- ☐ Sweetness
- ☐ Orange Flavor

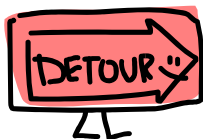




Check-All-That-Apply (CATA)

From the following list, check the **words** that **describe** the **orange juice** that you just tasted (check ***all*** that apply).

- ☐ Astringent
- ☐ Sourness
- ☐ Sweetness
- ☐ Off Flavor
- ☐ Bitterness
- ☐ Orange Flavor





Temporal Check-All-That-Apply (TCATA)

- Extends CATA to **continuously track sensory properties**.
- Builds on earlier methods

  (Flavor Profile, TDS, …)
- Could be used by trained assessors or consumers.

Temporal CATA

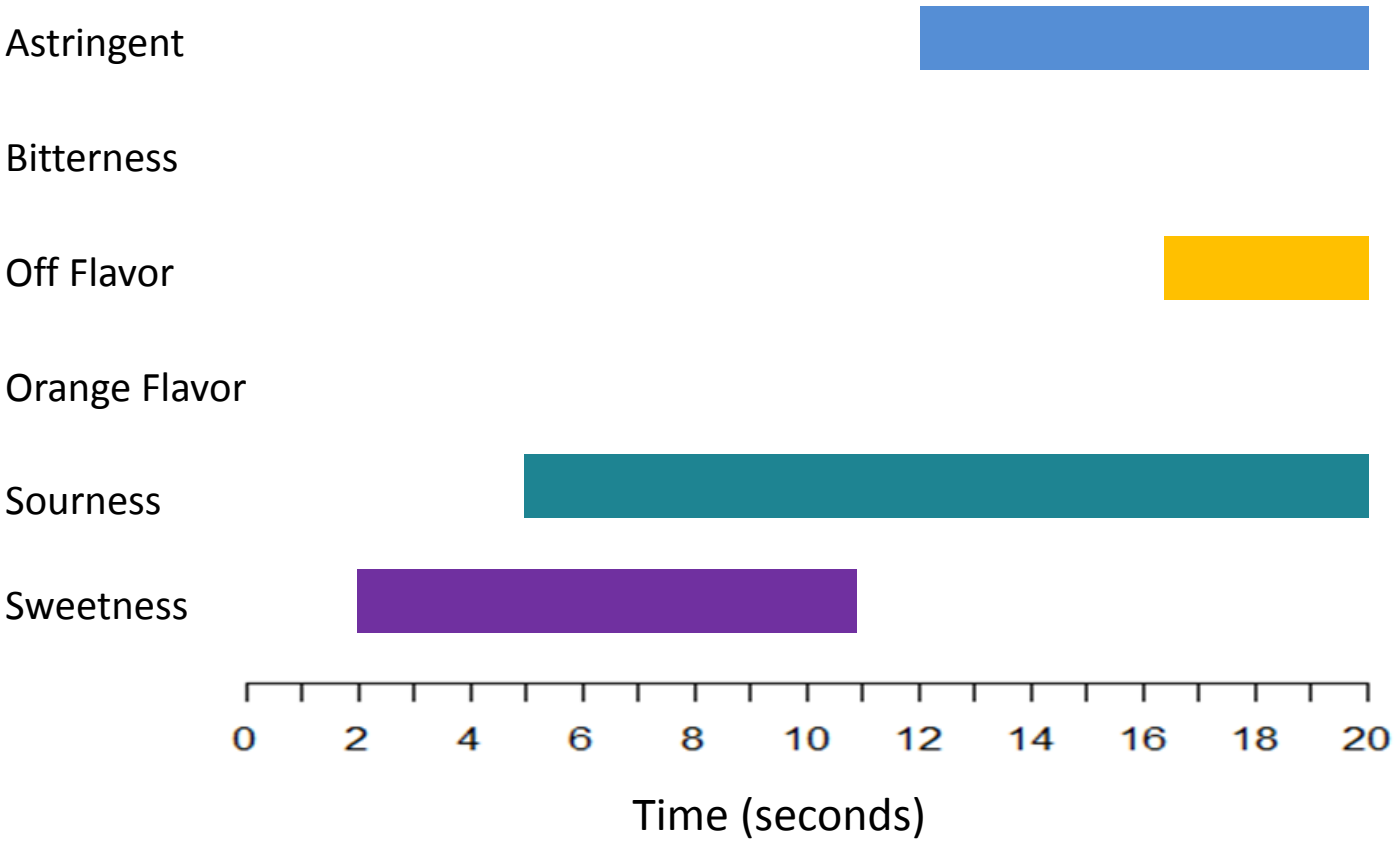
Check and uncheck words to track changes in the orange juice. At each moment, the words that are **checked** should **describe** the **orange juice** (check *all* that apply, in that moment).

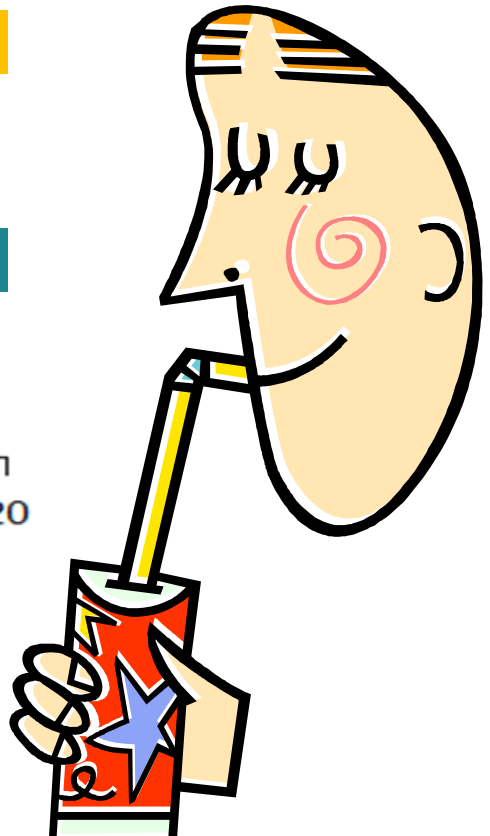


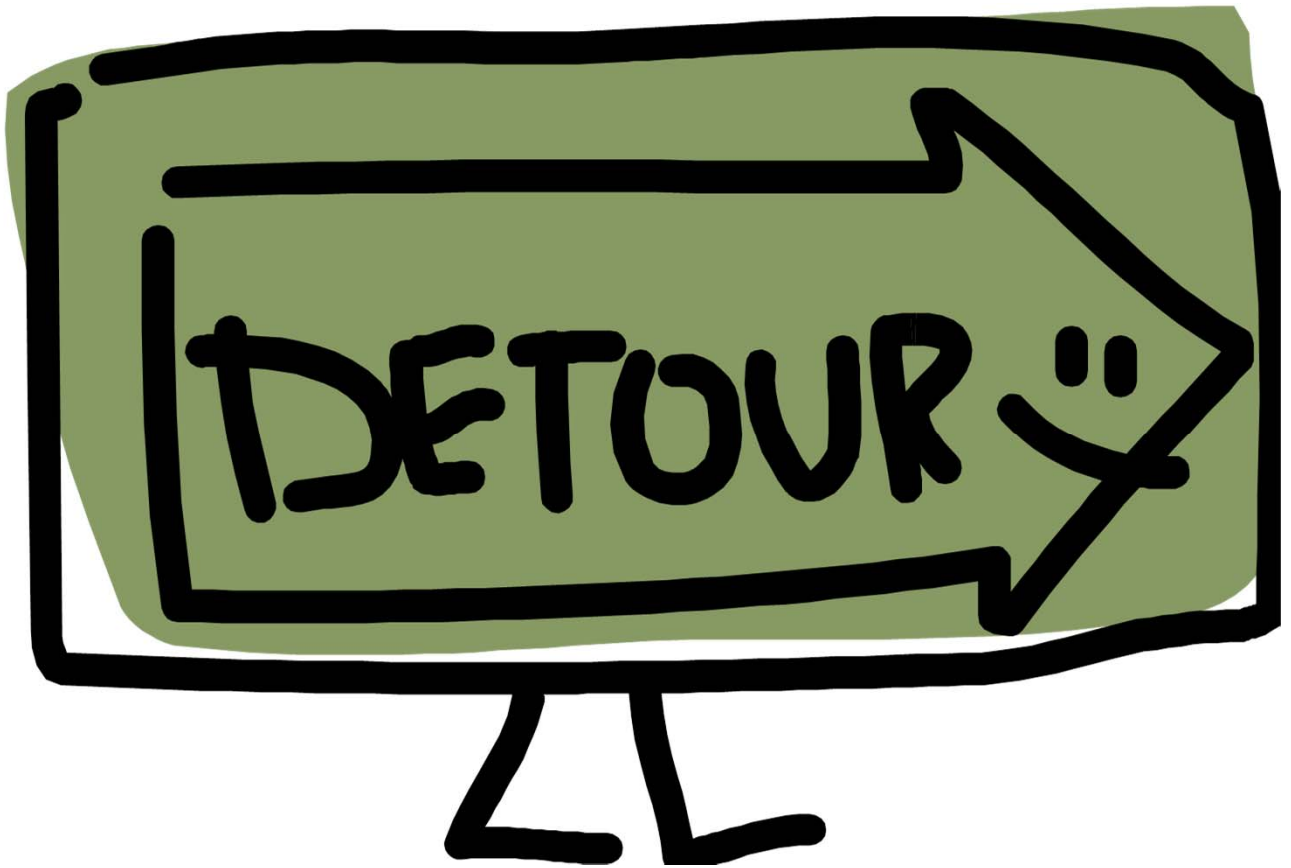
0:20

- ☐ Astringent
- ☐ Off Flavor
- ☐ Sourness
- ☐ Bitterness
- ☐ Sweetness
- ☐ Orange Flavor

Temporal CATA



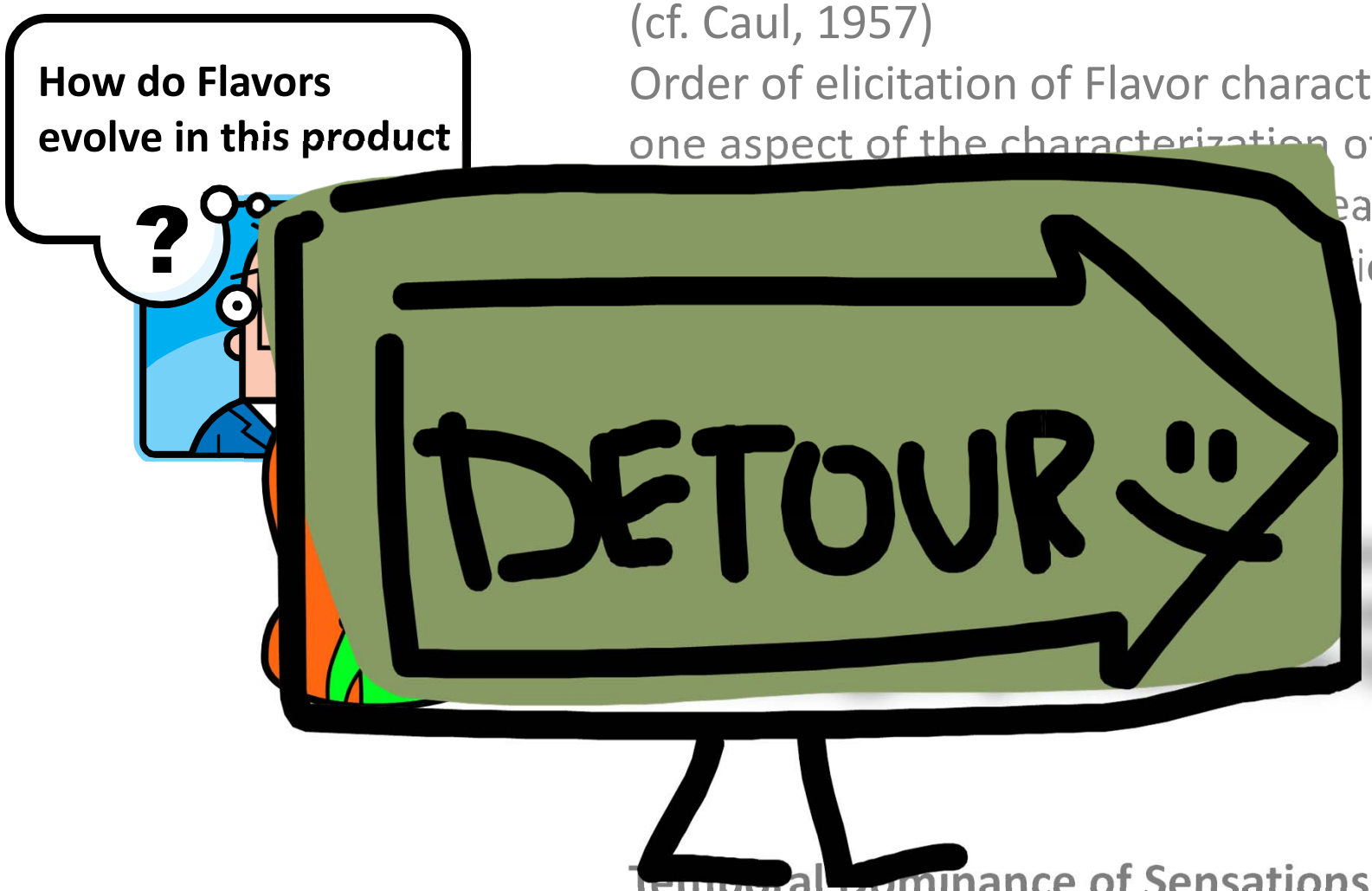



DETOUR

Flavor Profile method

(cf. Caul, 1957)

Order of elicitation of Flavor characteristics is one aspect of the characterization of complex [illegible] early [illegible]ions.



Temporal Dominance of Sensations (TDS)

(Pineau et al., 2009)

"…the new sensation popping up at a given time…"





Flavor Profile method
(cf. Caul, 1957)
Order of elicitation of Flavor characteristics is one aspect of the characterization of complex food… especially important is the early development of appropriate sensations.

Time Quality Tracking
(Zwillinger & Halpern, 1991)
TQT is highly similar to TDS. The authors find evidence of assessors processing sensations in parallel.

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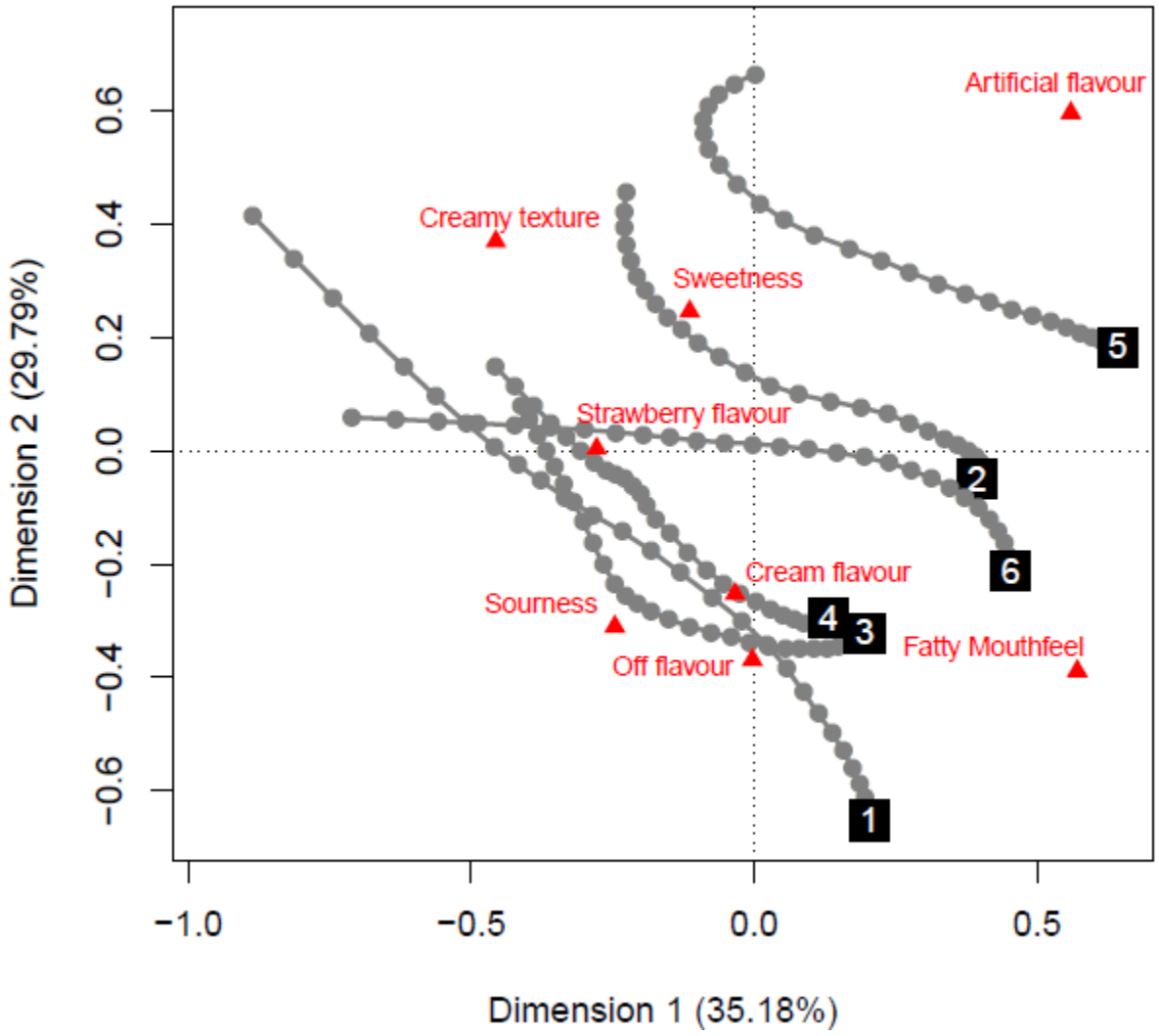
	TDS	TCATA
Respondent's task	Indicate the dominant attribute at each moment	Describe the sample at each moment
Underlying model for processing sensations	Sequential, slow	Sequential Parallel
Data	Multinomial (often treated as binomial for simplicity)	Binomial (straightforward statistics)

TCATA @ Sensometrics 2014



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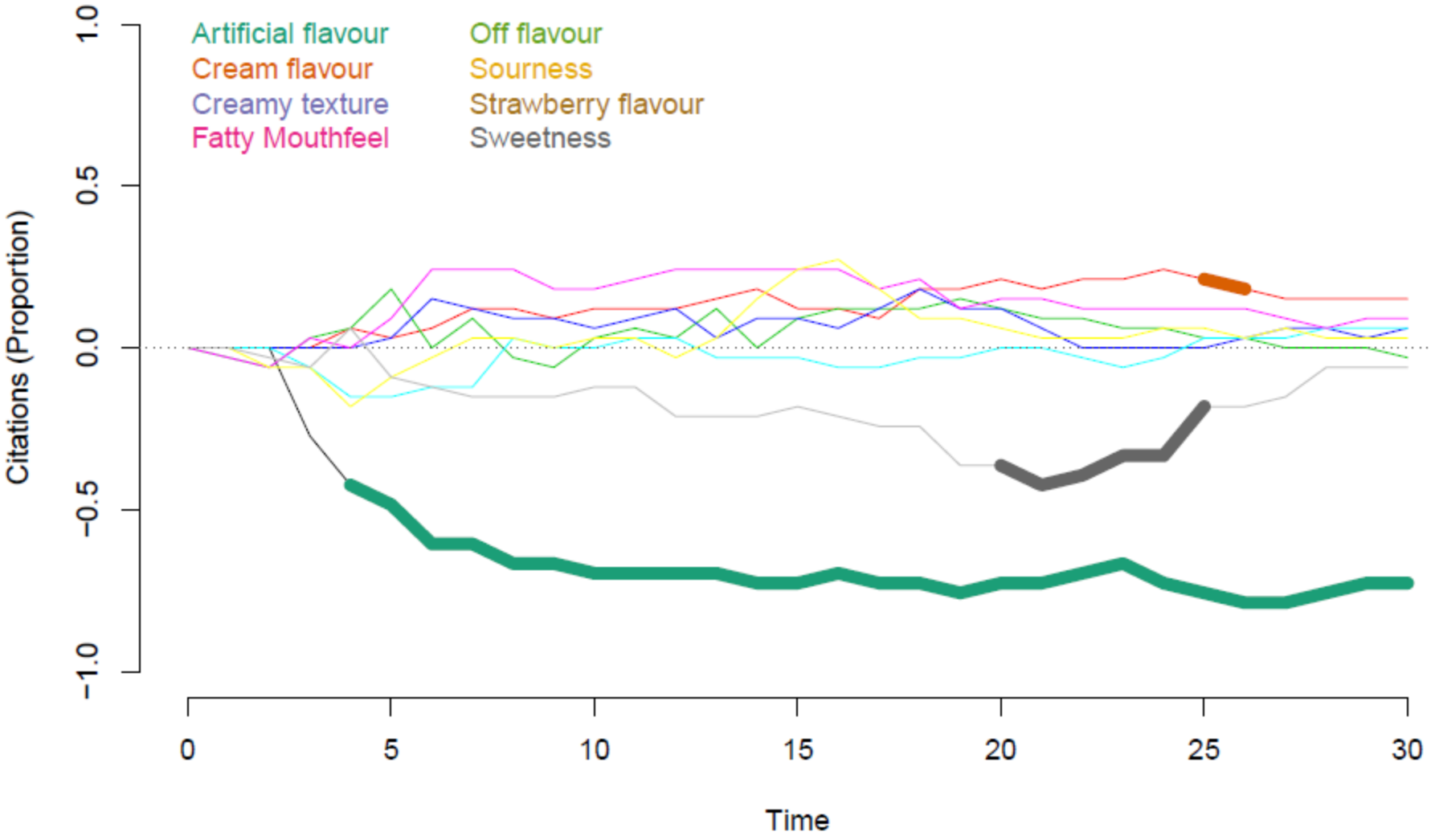


Orange Juice Study

(March 2014)

TDS consumers



TCATA consumers



Each panel evaluated the same 6 orange juices

Orange Juice Study

(March 2014)

TCATA consumers



6 orange juices

Orange Juice Study

(March 2014)

TCATA consumers

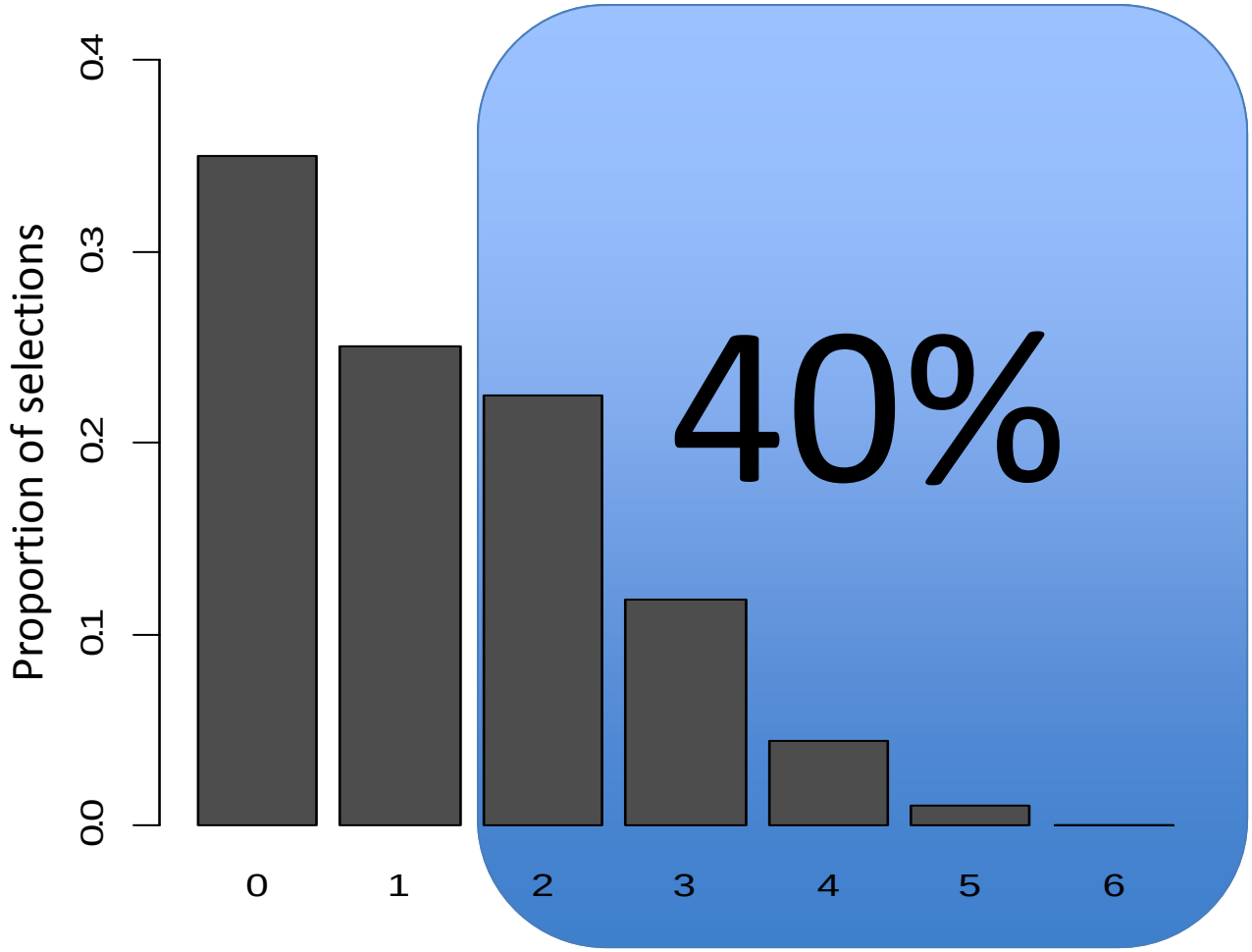
Did consumers check multiple attributes?



Did consumers uncheck attributes?

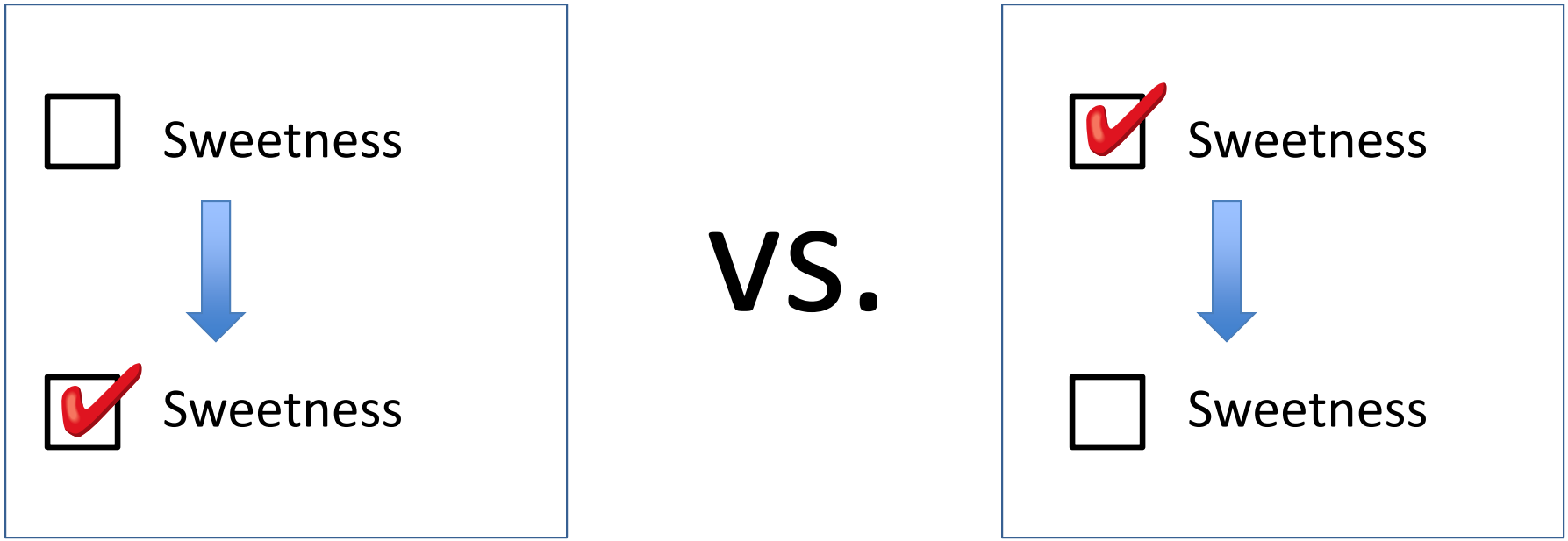
6 orange juices

Concurrent attribute selections



Number of concurrent attributes selected by consumers in the TCATA orange juice evaluation

Odds



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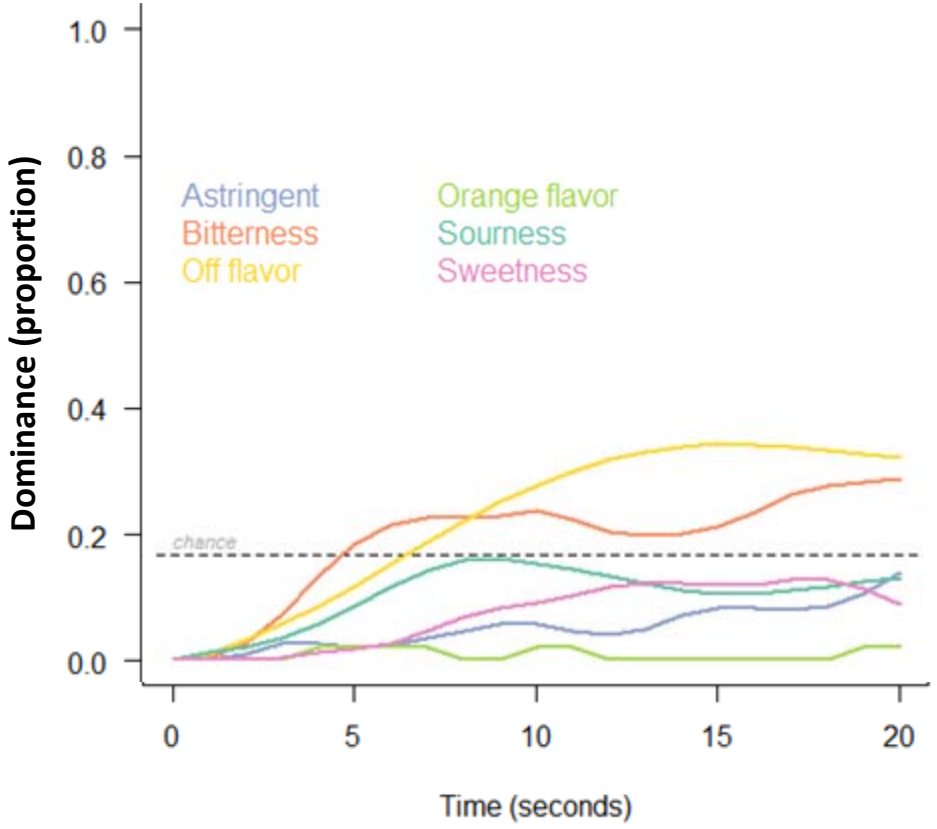
3 key findings:
TDS – TCATA

1. **TCATA and TDS orange juice profiles are similar for several juices.**

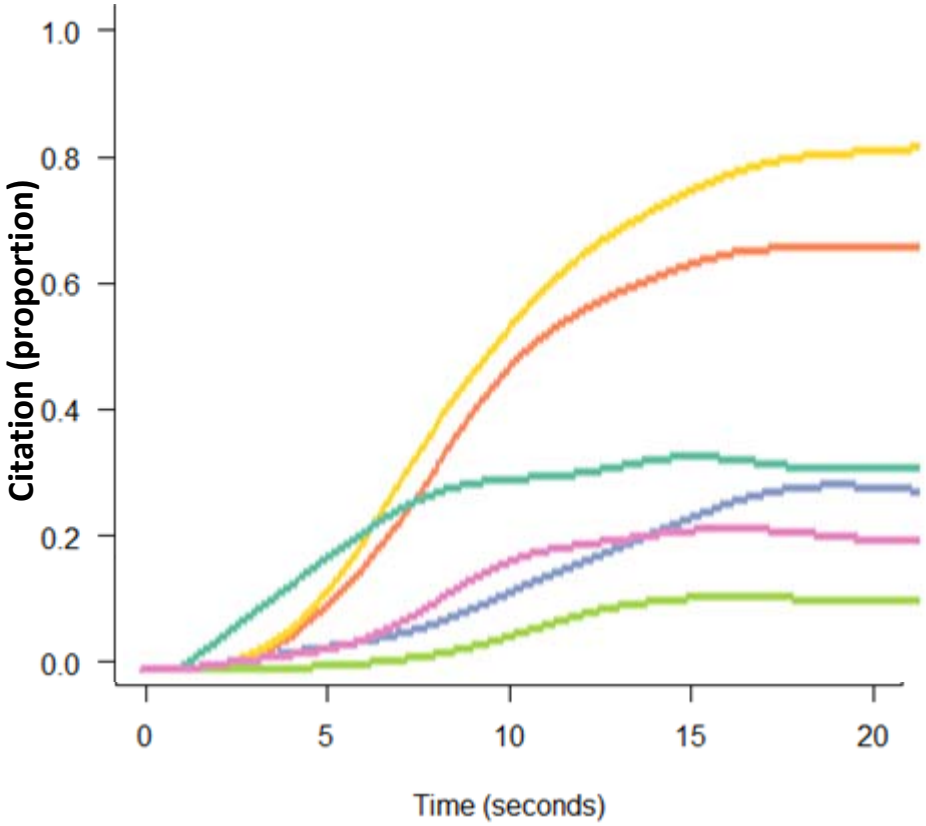
   This tells us that both methods are capturing “signal” (not just noise).

Results for Orange Juice 4

TDS



TCATA

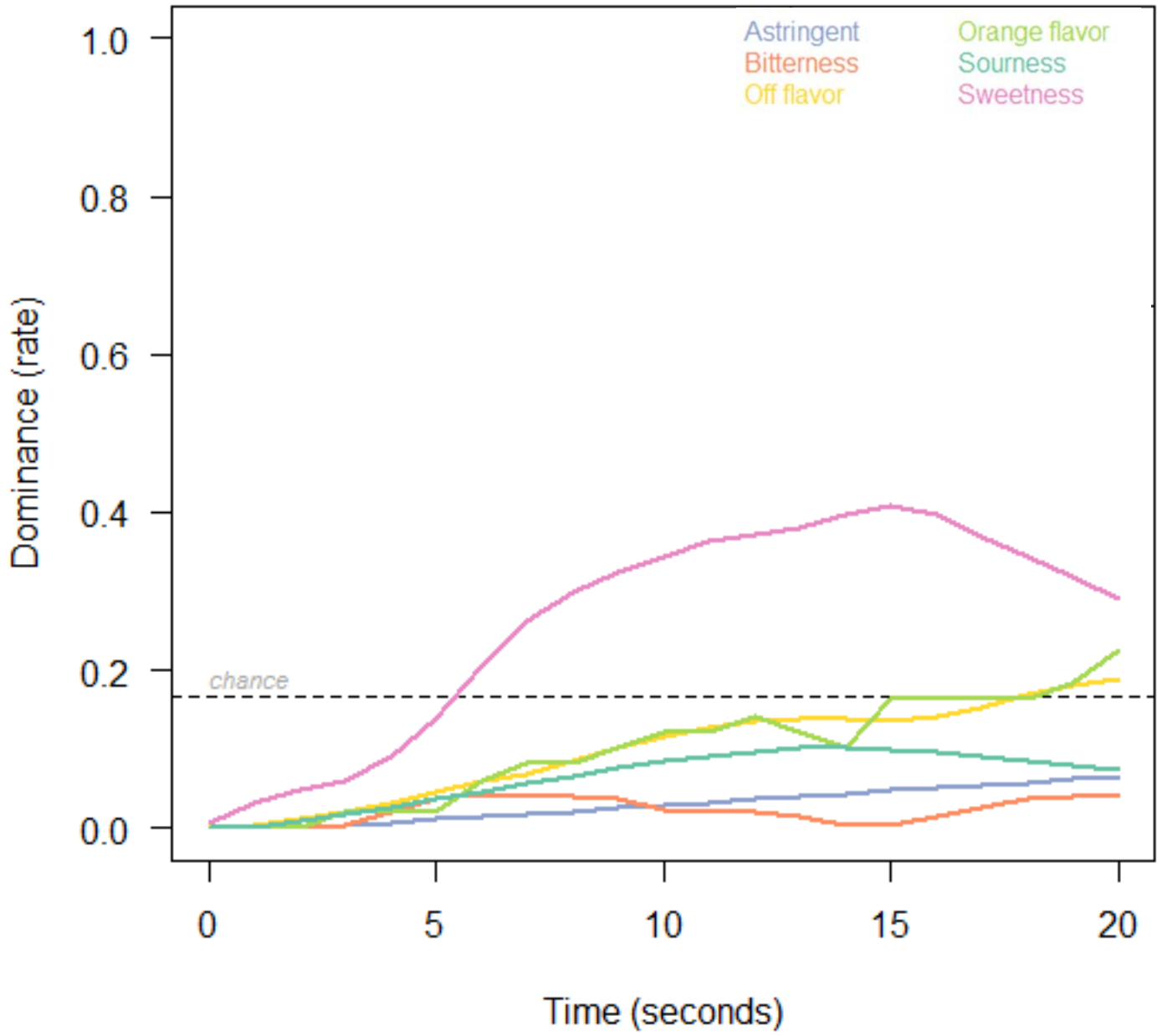


2. TDS shows a “kingmaker effect”.

We gain information about one attribute, at the expense of other attributes.



TDS Results for Orange Juice 2



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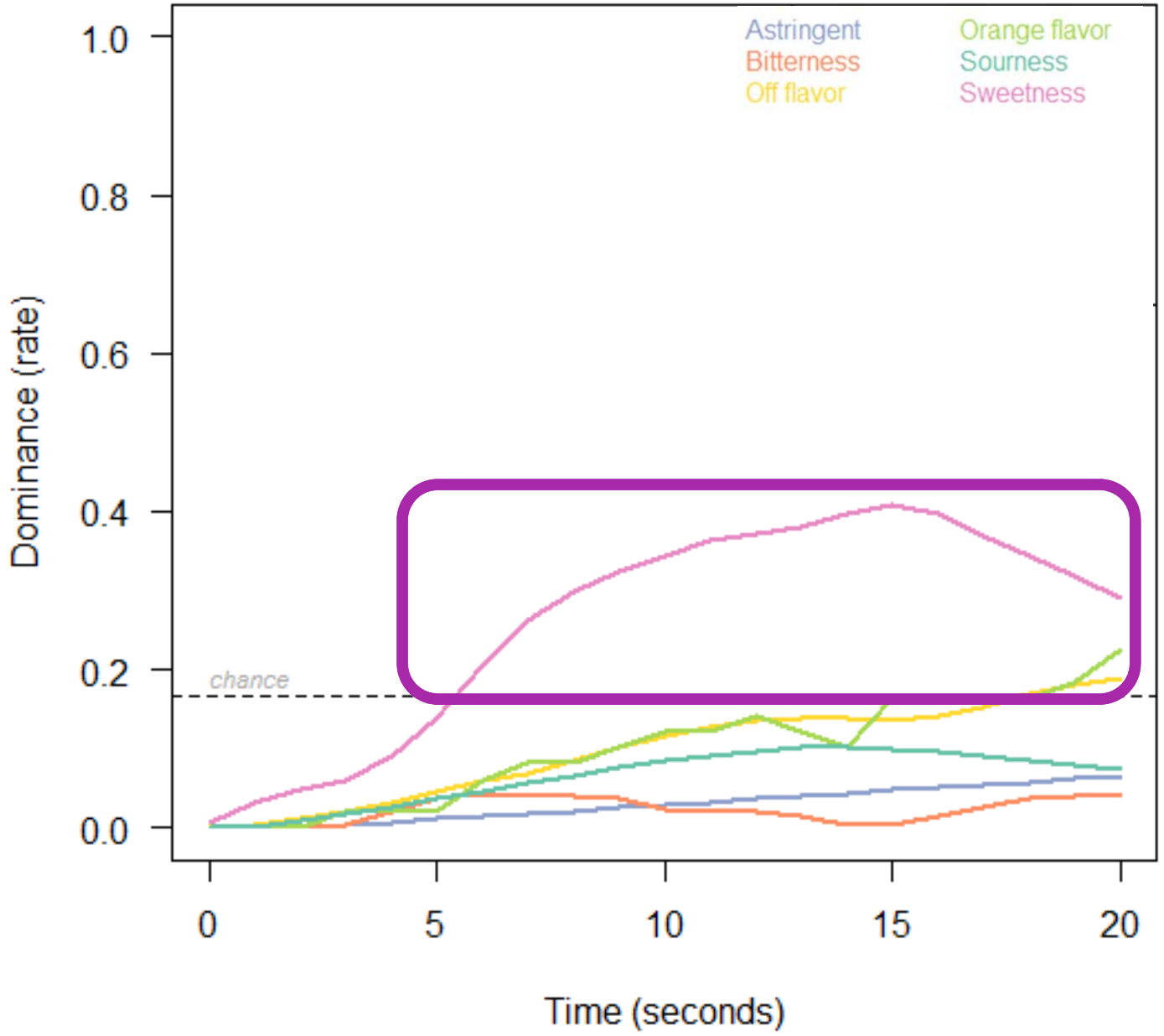
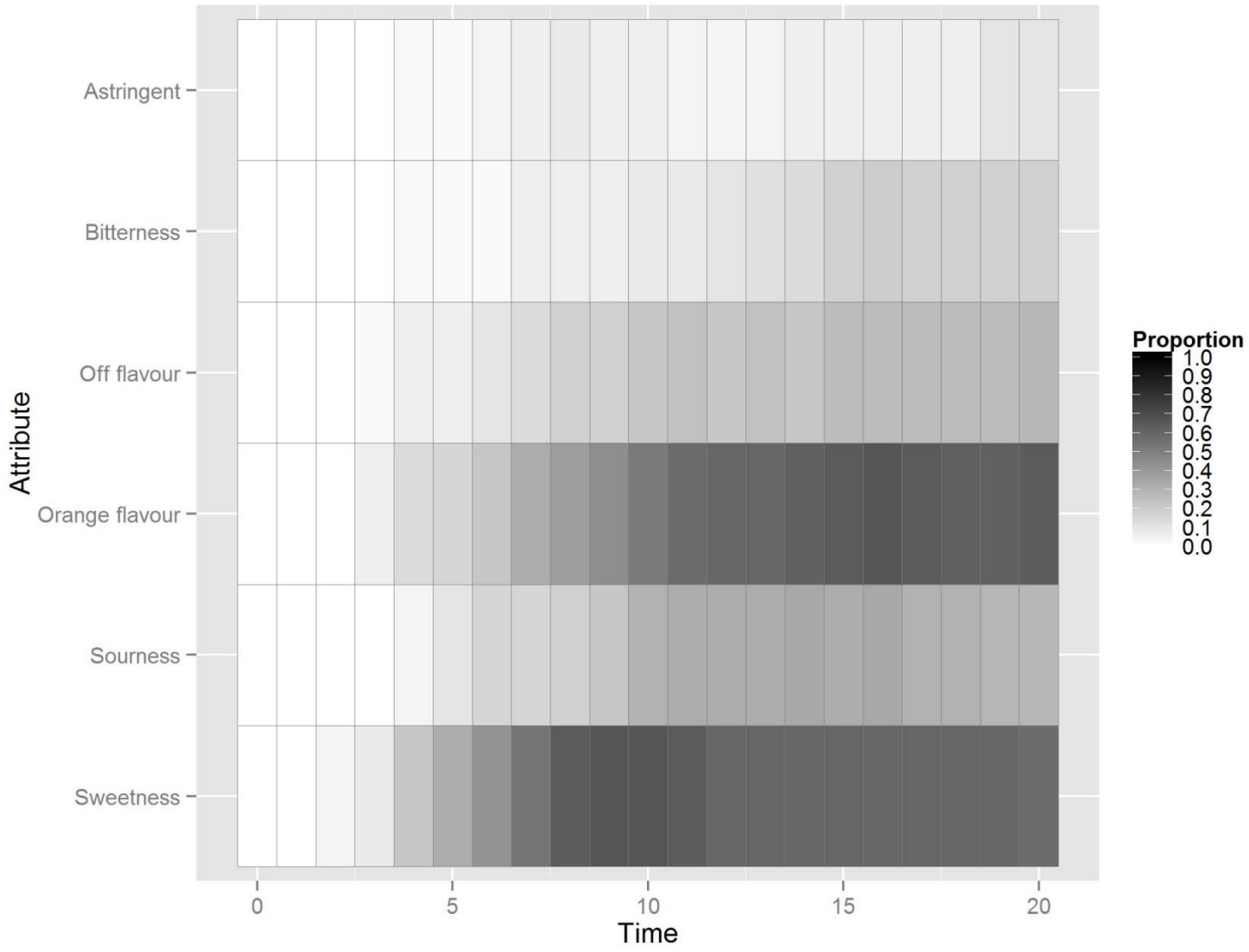


TCATA allows multiple attribute selection so there is no "**kingmaker effect**".

We gain information about secondary attributes, at the expense of the primary attribute.

TCATA Results for Orange Juice 2



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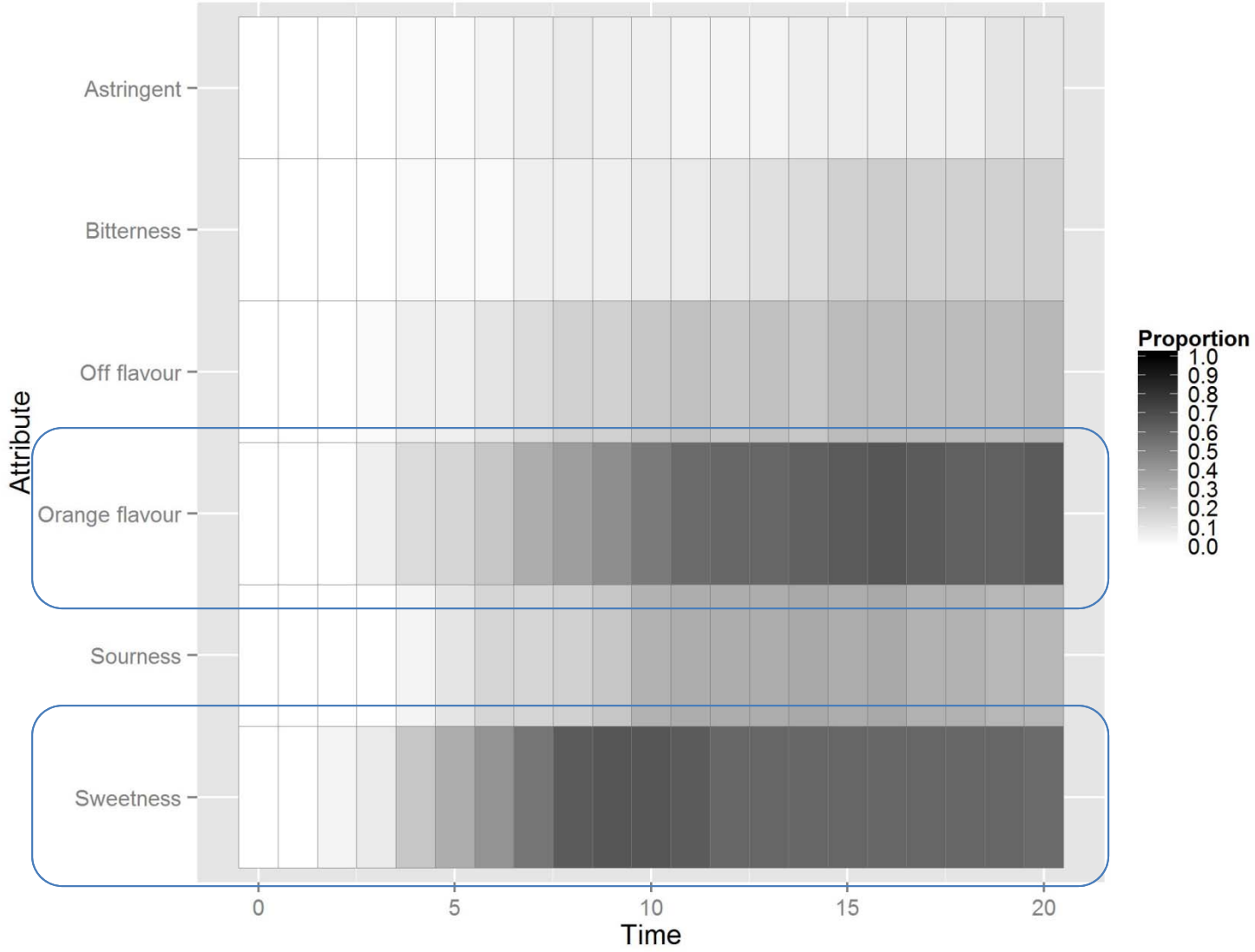
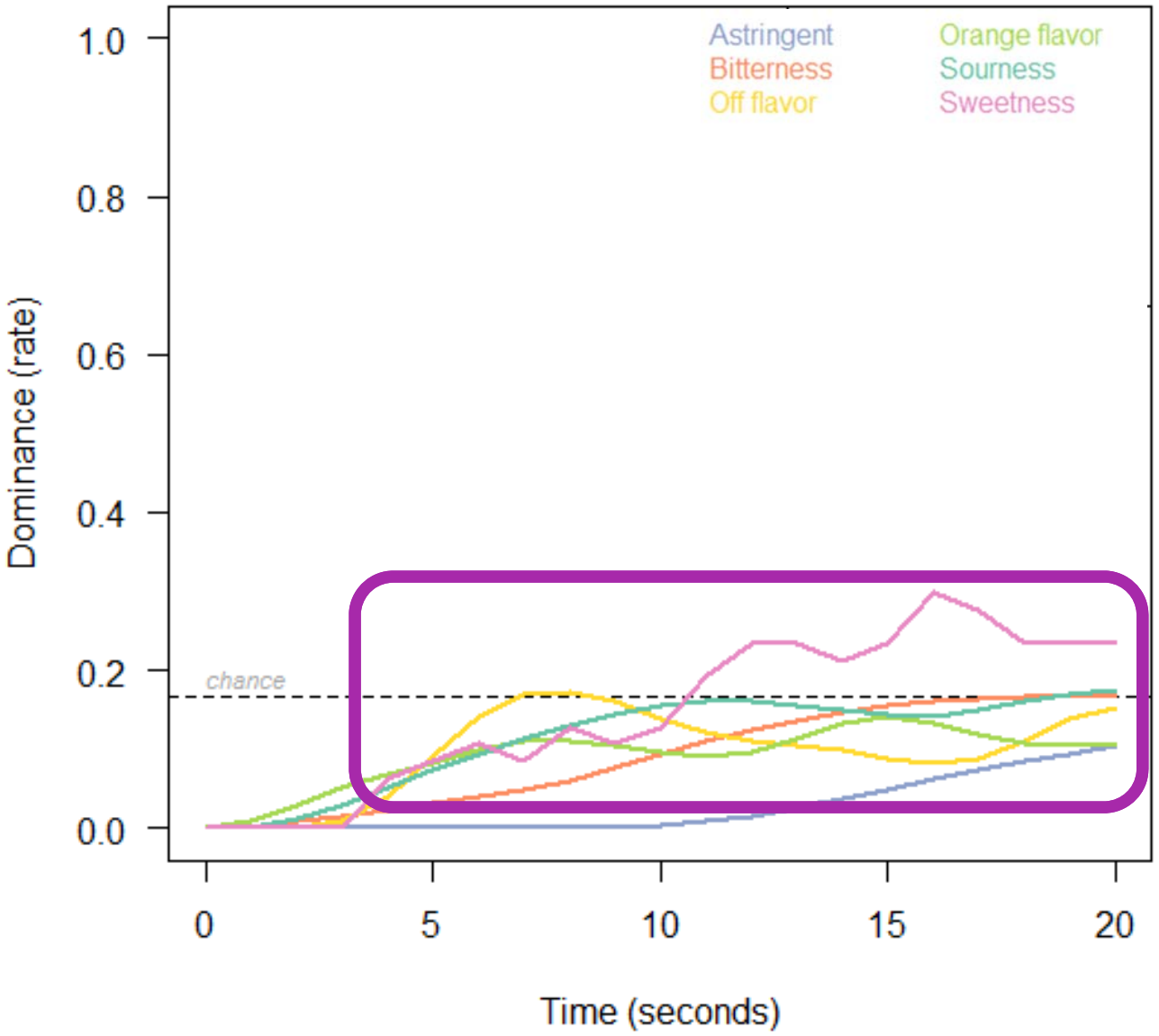


3. **TDS is affected by a “damping effect”.**

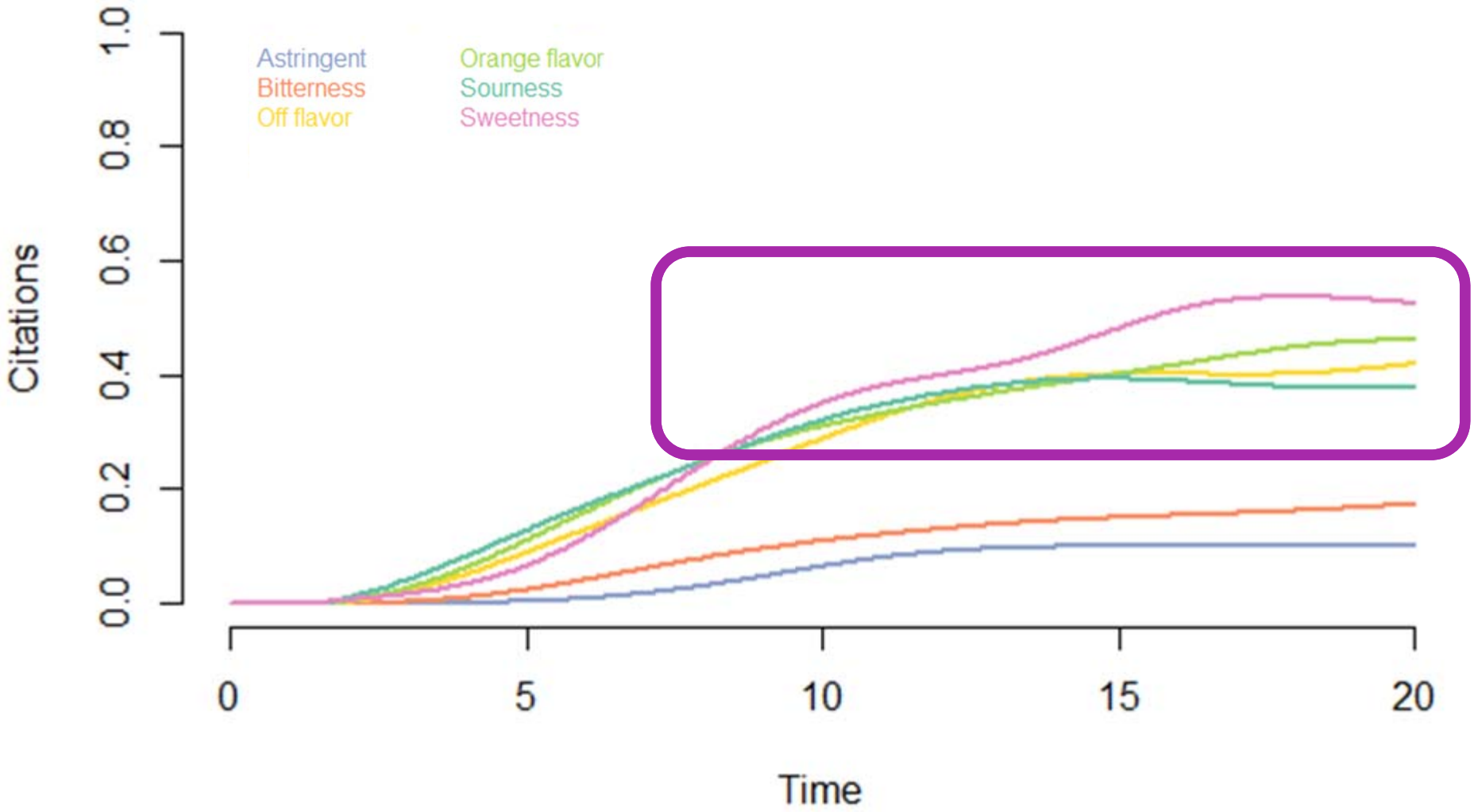
   Due to competition, the importance of several attributes is obscured.

TDS Results for Orange Juice 5

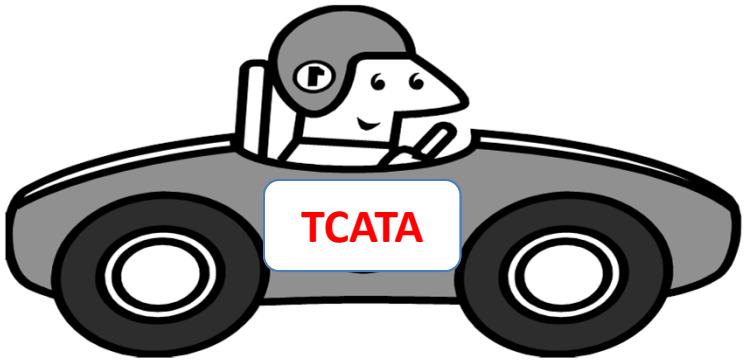


In TCATA, there is no “**damping effect**”.

TCATA Results for Orange Juice 5







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