



## BACKGROUND

There is an ongoing debate concerning the relative merits of proto-monadic vs. sequential monadic designs for consumer tests that involve two products. The designs differ with respect to whether liking and attribute questions are asked for both products (sequential monadic) or only for the first product (proto-monadic).

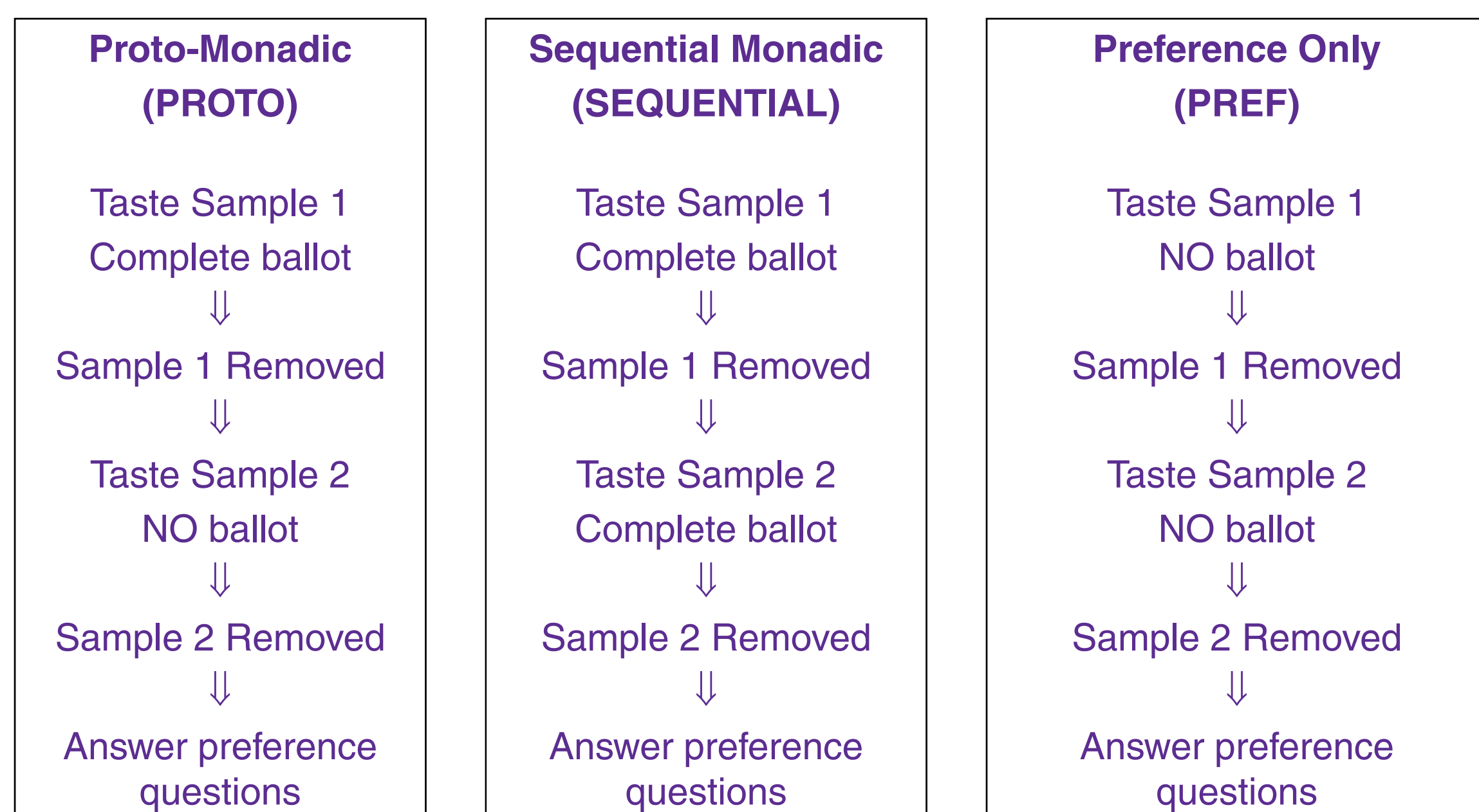
## RESEARCH QUESTIONS

- Do proto-monadic and sequential monadic designs lead to similar or different conclusions:
  - with respect to preference?
  - with respect to liking?
  - with respect to attribute ratings?

## METHODOLOGY

- Experiment 1 (n=450): Cheese Crackers
  - 2 samples: Full Fat (FF) and Reduced Fat (RF)
- Experiment 2 (n=471): Lemonade
  - 2 samples: Control and Lem+ (higher concentration)
- In both experiments, ~ 150 respondents were randomly assigned to one of the 3 designs described below (Fig. 1).
  - PREF was included to assess preference in the absence of ballot questions.

Fig 1. Design description



- Associations between type of design and preference were assessed using Pearson's  $\chi^2$  statistic.
- ANOVA was applied within each design in order to test for product effects. Paired comparisons were achieved through t-tests.
- Attribute JARs were used in the Penalty Analyses to compare direction for product improvement between the proto-monadic and sequential monadic designs.

## CONCLUSIONS

- The sequential monadic and proto-monadic designs lead to the same preference results.
- The sequential monadic design provided slightly higher sensitivity with respect to relative liking as well as additional insight regarding potential product improvements.

Since the sequential monadic design yields similar preference results and monadic product measures to the proto-monadic design as well as providing added information, the sequential monadic design is recommended.

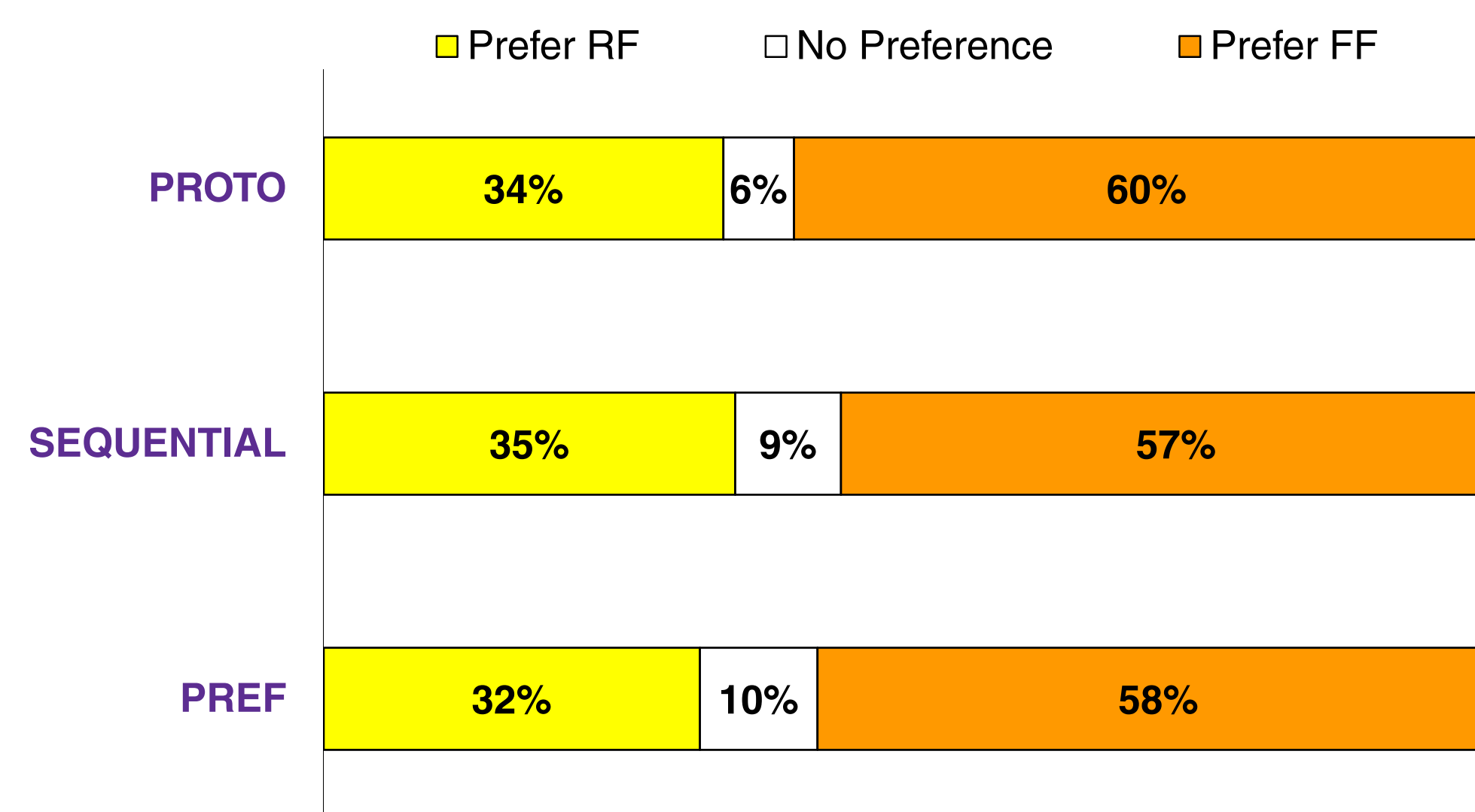


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## RESULTS

### EXPERIMENT 1: CHEESE CRACKERS

Fig 2. Overall Preference



- Preference was unaffected by the type of design ( $p=0.71$ ; Fig. 2).
- Strength of preference was also unaffected ( $p=0.44$ ; Fig. 3).
- Proto-monadic liking data showed smaller differences between products than did sequential monadic liking data (by total; Fig. 4):
  - differences between products were significant for sequential monadic (by total) but not proto-monadic data.
  - most first position sequential monadic liking data were similar to the proto-monadic liking data.
- Penalty Analysis (PA) from the sequential monadic design showed more criticism of the reduced fat sample than the PA from the proto-monadic design (Fig. 5).

Fig 3. Strength of Preference

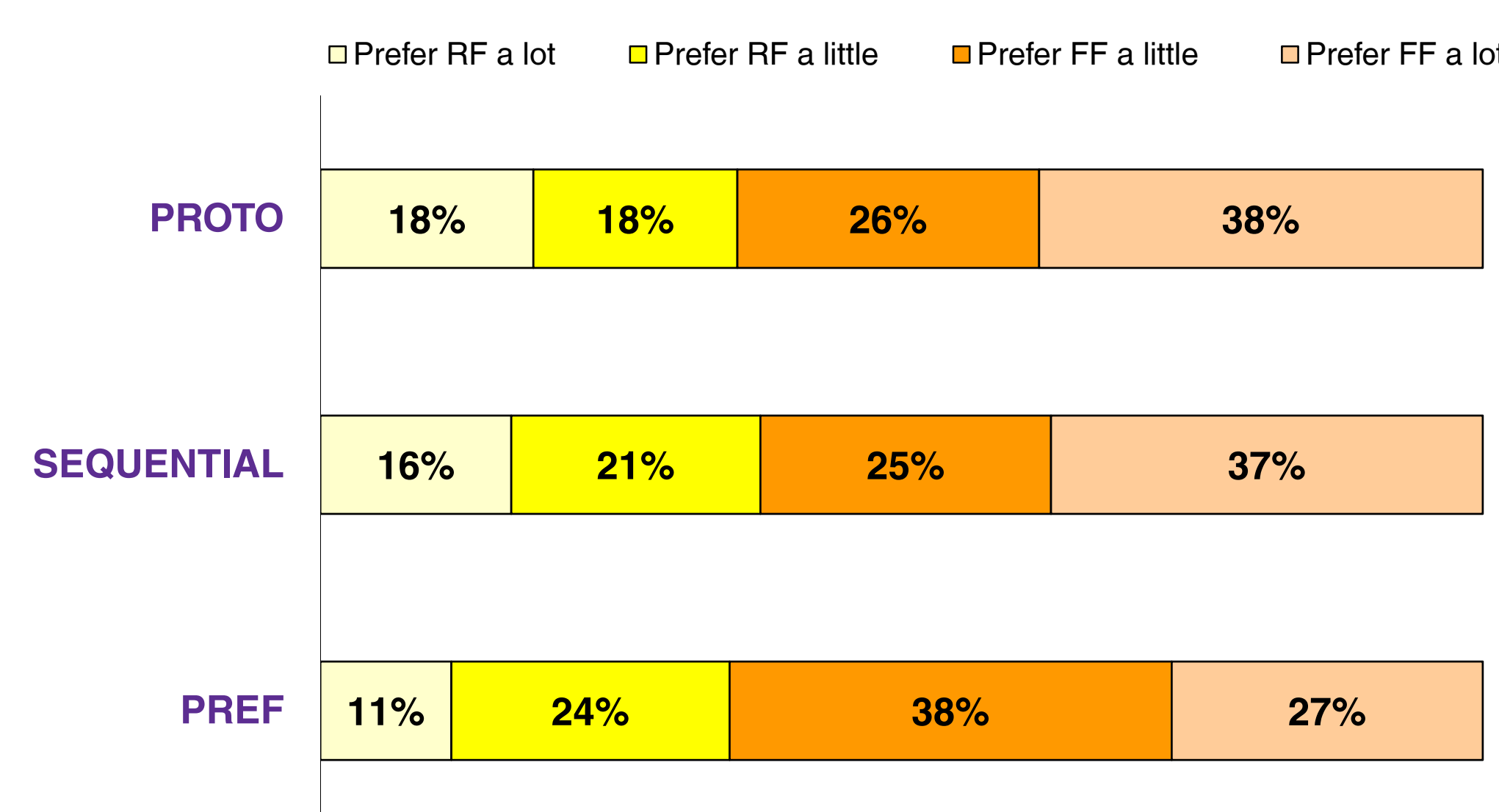
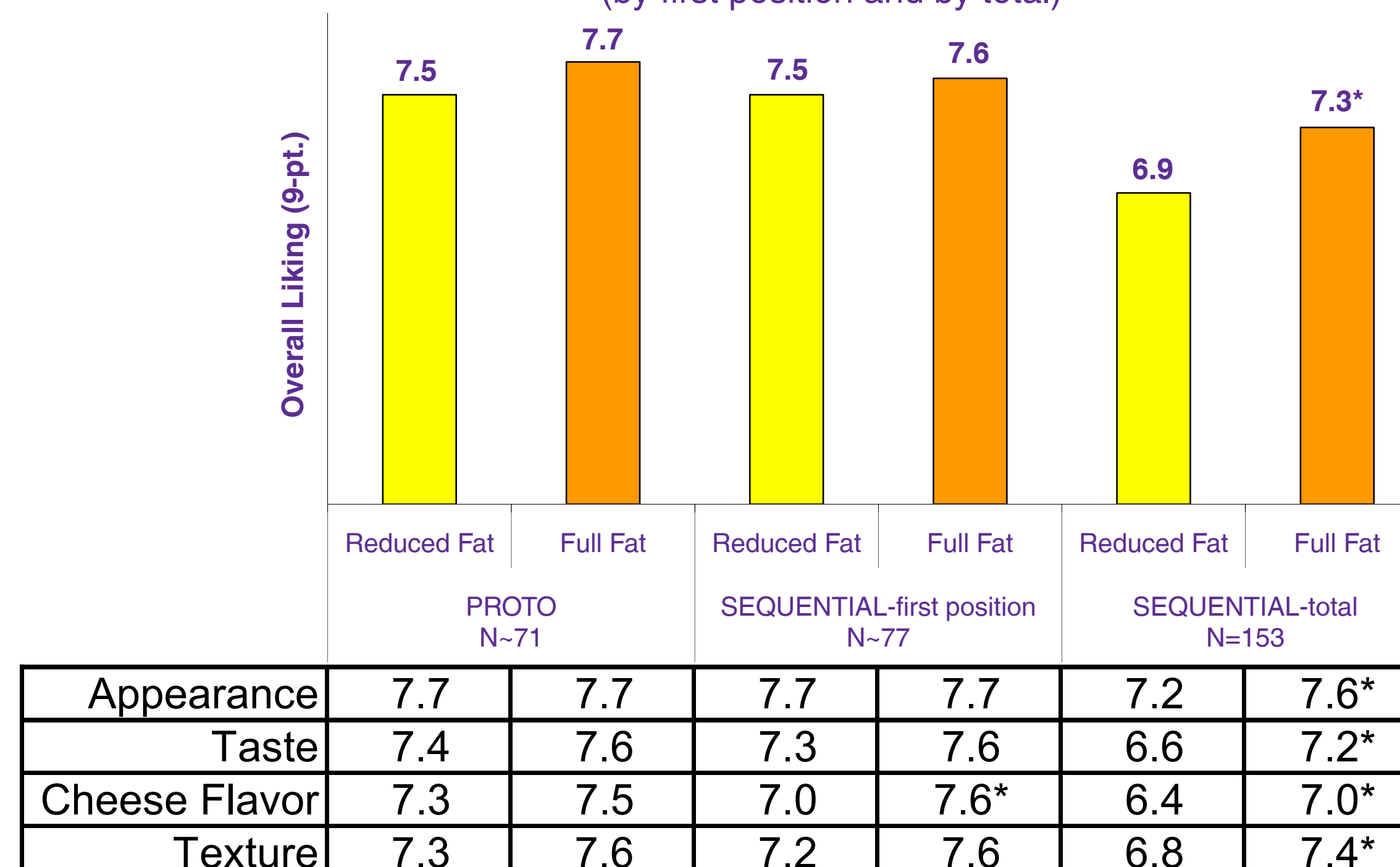
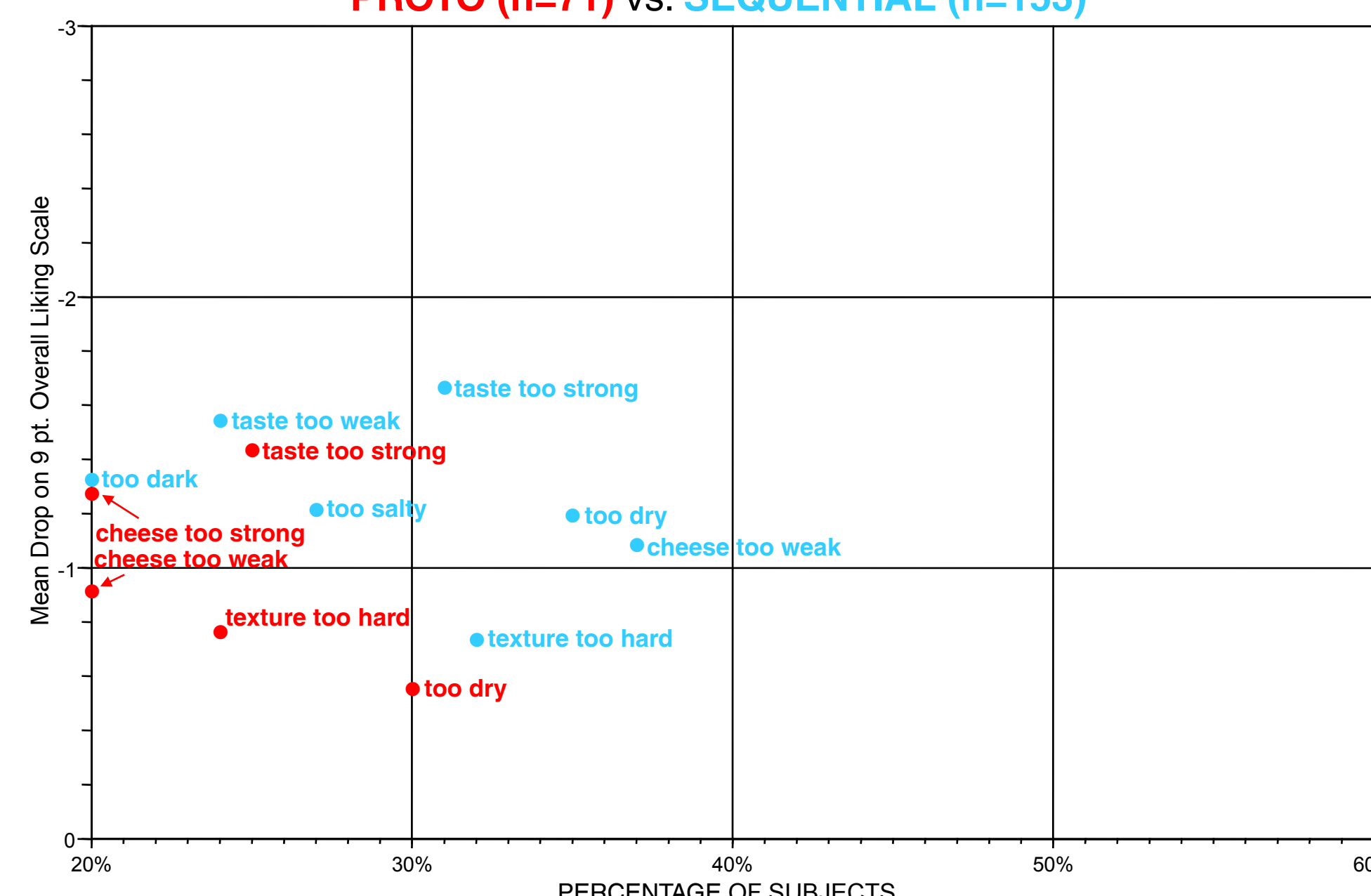


Fig 4. Liking data from PROTO and SEQUENTIAL (by first position and by total)



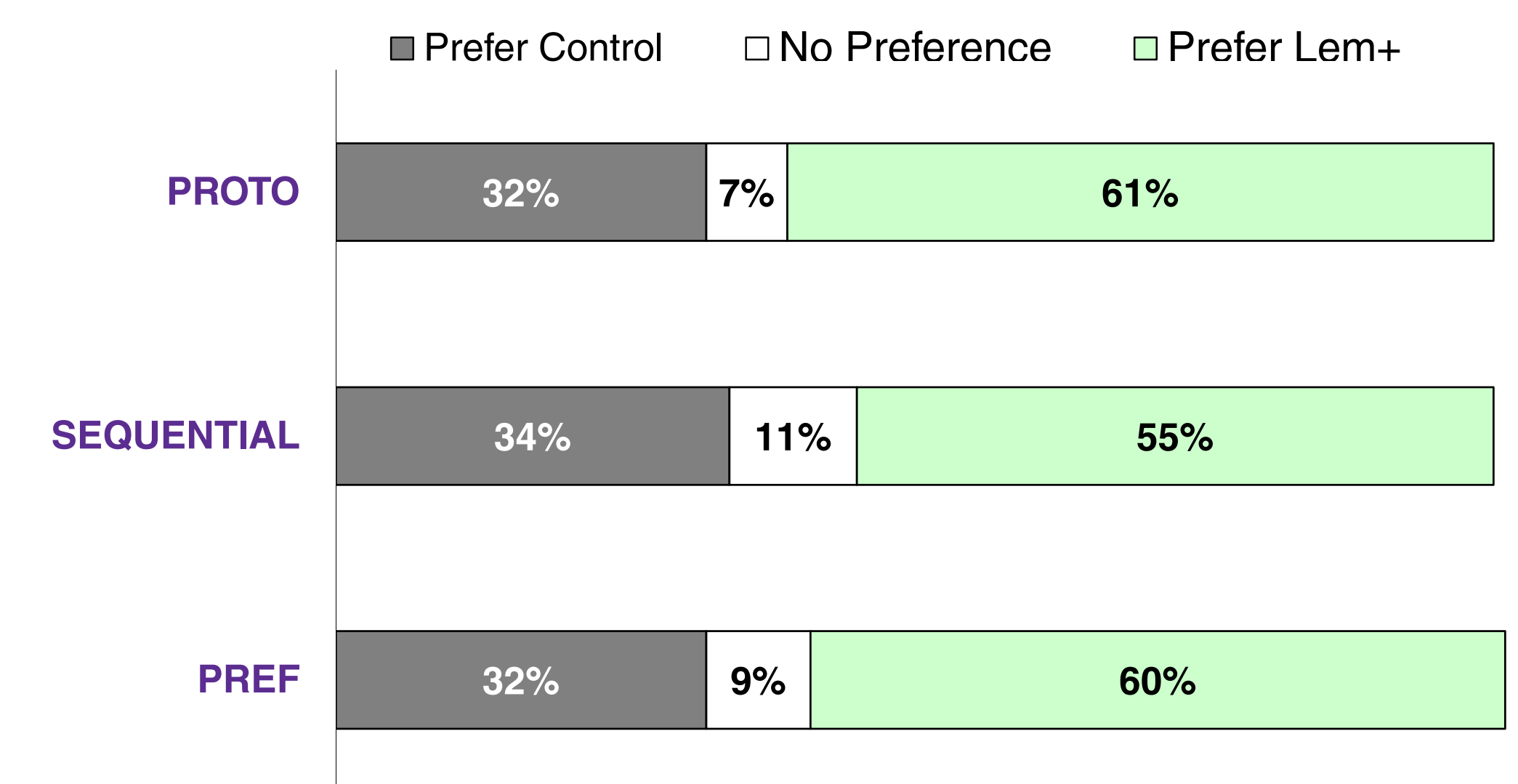
\* Indicates that a product's liking score is significantly higher ( $p < 0.05$ , comparisons within each design)

Fig 5. Penalty Analyses for Reduced Fat cheese cracker PROTO (n=71) vs. SEQUENTIAL (n=153)



### EXPERIMENT 2: LEMONADE

Fig 6. Overall Preference



- Preference was unaffected by the type of design ( $p=0.66$ ; Fig. 6).
- Strength of preference was also unaffected ( $p=0.25$ ; see Fig. 7).
- Proto-monadic and sequential monadic liking data were similar (Fig. 8):
  - most differences between products (including overall liking) were significant for sequential monadic (by total) but not for proto-monadic data.
  - first position sequential monadic liking data were similar to the proto-monadic liking data.
- Penalty analyses for both designs were similar (Fig. 9).

Fig 7. Strength of Preference

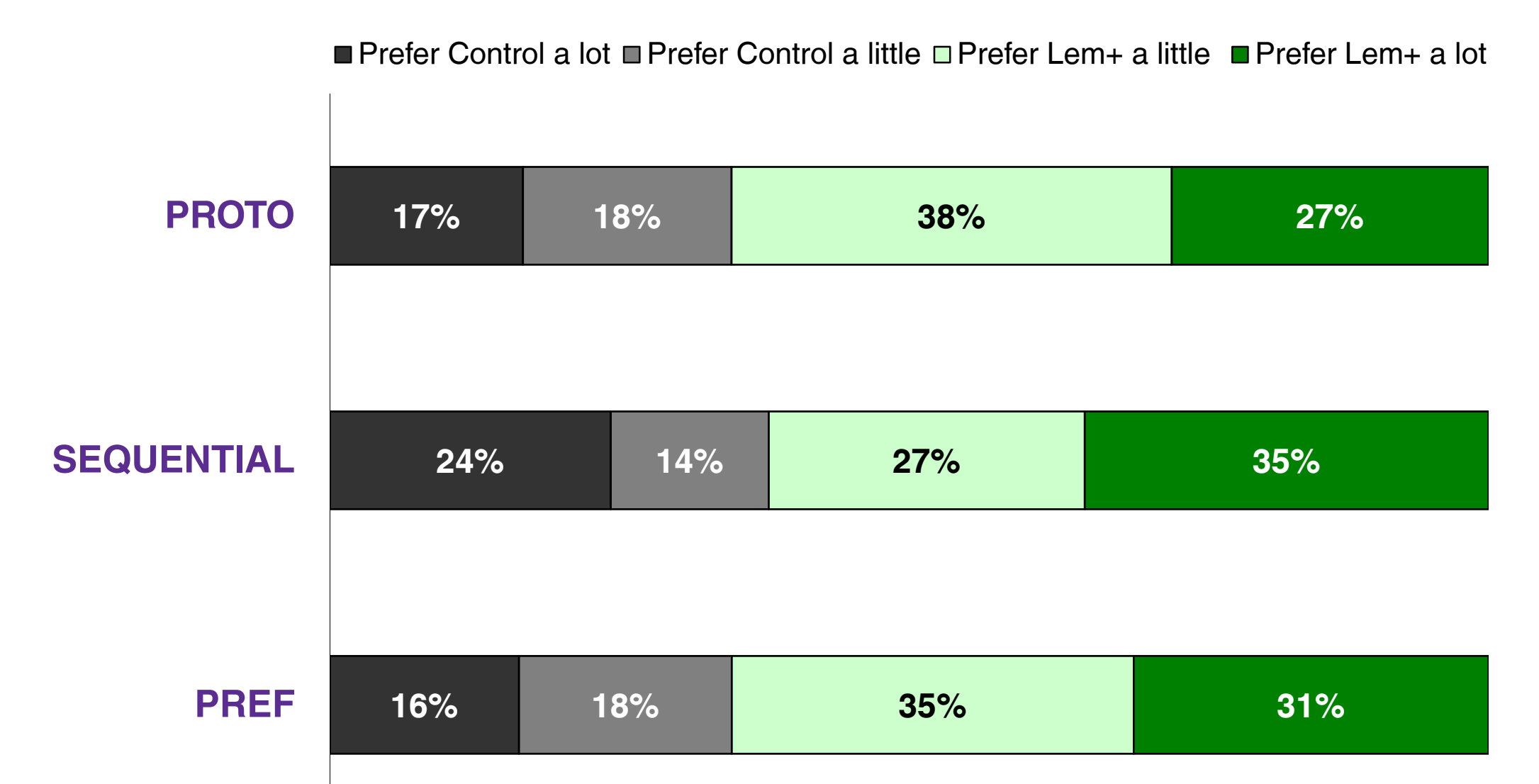
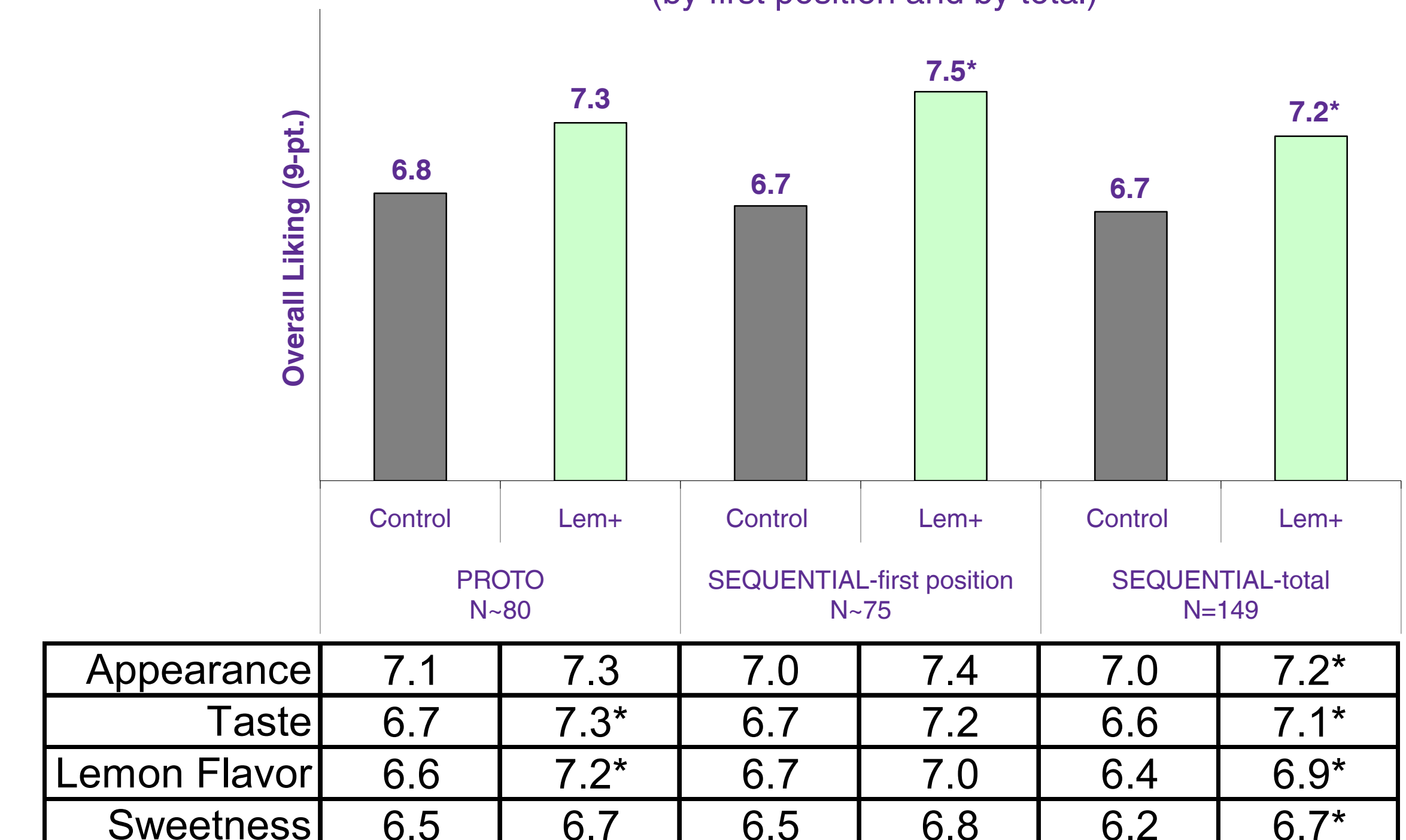
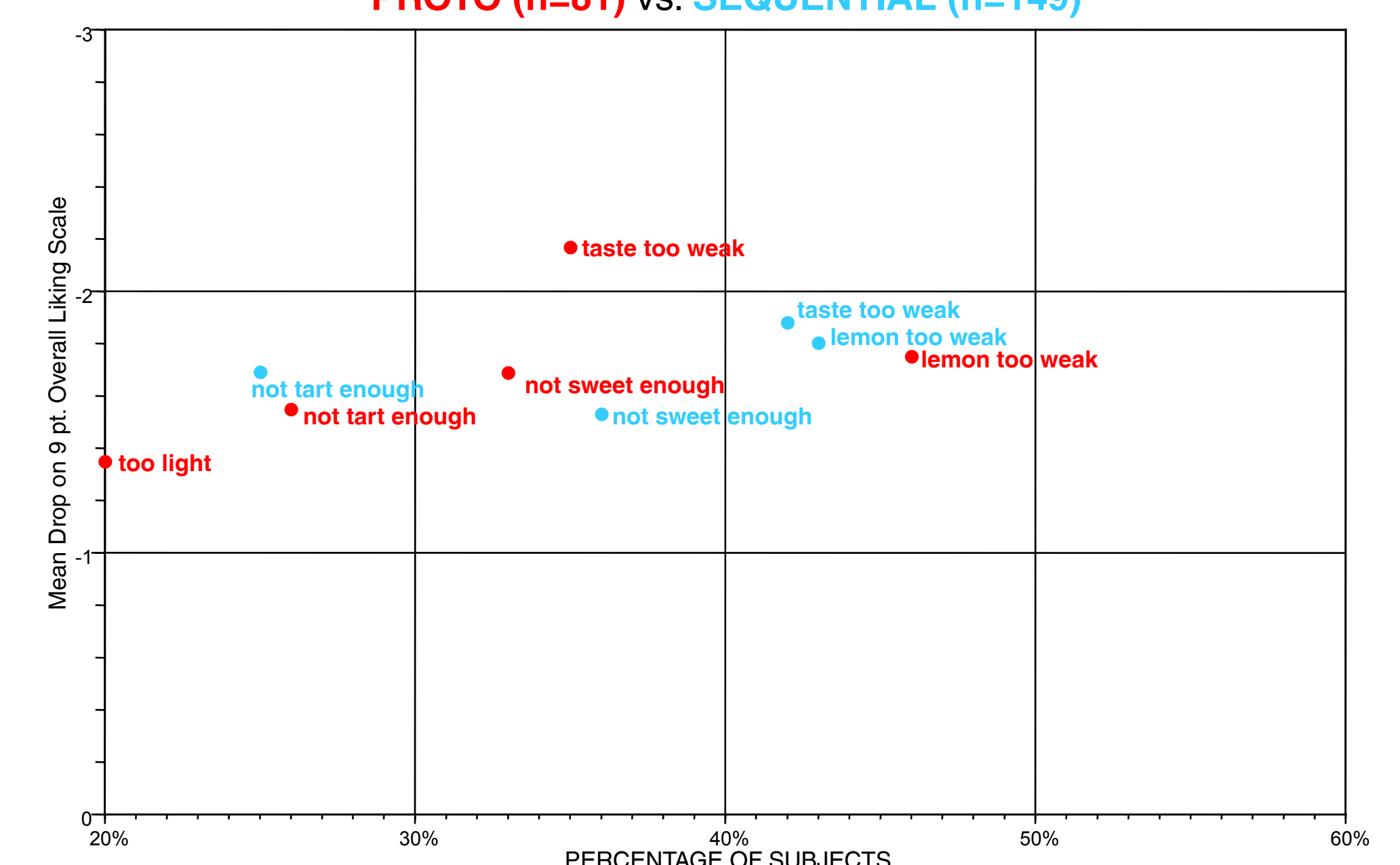


Fig 8. Liking data from PROTO and SEQUENTIAL (by first position and by total)



\* Indicates that a product's liking score is significantly higher ( $p < 0.05$ , comparisons within each design)

Fig 9. Penalty Analyses for Control lemonade PROTO (n=81) vs. SEQUENTIAL (n=149)



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