Exploring the Impact of Forcing a Yes/No Response in Check-All-That-Apply Questions

P. Hartwig and M. Foley *Nestlé Nutrition R&D, Fremont, MI, USA*

Nestlé Good Food, Good Life

Background

In the last few years, check-all-that-apply (CATA) questions have received much recognition by sensory researchers as an additional source of insights for guiding product and package design.[1] In 1982, Loh and Ennis explored a related method called applicability scoring.[2] In this method, consumers are asked if a word or a phrase does apply or does not apply, forcing consumers to make a choice. This related CATA method inspired the following research.

Objective and Design

CATA method was compared with forced Yes/No response method on two key measurements, association response and discrimination rate, to explore the impact of forcing a response on CATA questions.

Association Response Study

- 450 parents of young children completed online surveys
- Respondents were shown an image of a commercially available food product and then were asked to complete a CATA questionnaire
- Approximately 2.5 weeks later, the same respondents were shown the same image and then completed the same CATA questionnaire, but with forced Yes/No response
- Difference between Percent of checks and Percent of yeses were calculated

Discrimination Rate Study

- 610 parents of young children (305 participants completed CATA questionnaire and 305 participants completed the same questionnaire with forced Yes/No response) completed an online survey
- Sequential Monadic test design where respondents were shown two images of commercially available food product, each followed by a randomized list of 17 attributes
- Discrimination rate was compared between the CATA and the forced Yes/No response test (Chi-square test was used to determine significant difference at $p \leq 0.01$)

Results

- Forcing a Yes/No response increased the rate of Yes responses by an average of 22%. (Figure 1)
- A similar level of discrimination was achieved by both CATA and forced Yes/No responses for 65% of attributes. (Figure 2)
- Forced Yes/No responses failed to discriminate 29% of attributes that CATA found significantly different. (Figure 2)

Figure 1: Association Response Difference (n = 450)

	CATA	Yes/No	Difference
Nutritious	83%*	92%*	9%
High Quality	58%*	89%*	31%
Fresh	46%	66%*	20%
Worth Paying More For	27%*	48%	21%
Delicious	69%*	96%*	27%
AVERAGE DIFFERENCE			**22%**

* Denotes significant difference from 50% at $p \leq 0.01$.

Figure 2: Discrimination Rate Difference (n = 610)

Attribute	Same Discrimination	Only CATA Discrimination	Only Yes/No Discrimination
Artificial			
Cheap			
Delicious			
Fun			
Grown Up			
High Quality			
Looks Processed			
Looks Unappetizing			
Nutritious			
Playful			
Worth Paying More For			
A Food My Child Loves			
Creative			
Fresh			
Natural			
Wholesome			
Unique			
% of Total	**65%**	**29%**	**6%**

Conclusions

- Yes response is increased with forced Yes/No response test, but this does not necessarily lead to better discrimination.
- CATA may provide better discrimination over forced Yes/No response test.
- Aspirational attributes may have skewed response rates of CATA and forced Yes/No tests (Figure 1). It may be possible to improve discrimination of forced responses based on attribute category (sensory, hedonic, product usage, etc.), the length of the list, etc.

References

[1]Valentin, D., Chollet, S., Lelièvre, M. and Abdi, H. (2012), Quick and dirty but still pretty good: a review of new descriptive methods in food science. *International Journal of Food Science & Technology,* **47**: 1563-1578.

[2]Loh, C.F. and Ennis, D.M. (1982), Glossary of attributes. *Philip Morris Internal Report,* accession number 82-288. Retrieved from http://www.pmdocs.com/pdf/2001298236_8263_yxst2j55q0r2f4q43i4gkj55.pdf.

Nestlé Research