Reproducibility of Rate-all-that-apply (RATA) with semi-trained assessors

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Background
Rate-all-that-apply (RATA) is a variant of check-all-that-apply (CATA) questions that allows assessor to rate the intensity of selected attributes. Compared to CATA, RATA has been reported to improve sample description and discrimination, and is more appropriate when only a small number of assessors are available. Before advocating its use with confidence, investigations on the method validity and reproducibility are necessary.

Method
This work examined the reproducibility of results obtained elicited by RATA within a test-retest paradigm, drawing on data from a relevant case study involving sensory assessment of common defects in chocolate production (Table 1) by a panel of semi-trained assessors (N=11) over four replicated evaluations. Criteria considered were 1) within-assessors reproducibility, 2) attribute stability, and 3) configurational agreement between perceptual spaces obtained across replicates. The former two criteria were evaluated by means of (univariate) reproducibility indexes, while the latter by Multiple Factor Analysis (MFA).

Results
Within-assessors reproducibility was moderate, with reproducibility indices spanning a range between 0.66 and 0.45 (Table 2). The mean value was 0.55, indicating that on average 55% of the terms (36 out of 65) were used reliably across all four replicates. Stability indices for individual attributes spanned a large range of values, 38 out 65 reproducible at or above 50% (data not shown). RATA showed a very good reproducibility at panel level indicated by the high configurational agreement between product maps obtained from individual replicates (Figure 1). RV coefficients between configurations obtained from individual replicates ranged from 0.81 to 0.97 (Mean=0.87) when considering two MFA dimensions, and between 0.79 and 0.91 (Mean=0.83) when considering four MFA dimensions, indicating a high degree of configurational similarities (Table 3).

Conclusion
In conclusion, these results indicate that RATA is a valid and reliable sensory profiling tool. Its inherent characteristics make it particularly advantageous in industrial contexts where small semi-trained panels (e.g. of co-workers) are most readily available, but where the time or the budget for sensory evaluation is often limited.