

MEASURING PACKAGING FUNCTIONALITY

I. Lucas¹, A.Yoxall¹, H.Parikh²

¹Sheffield Hallam University, ²Britvic Soft Drinks Plc

ABSTRACT

'Easy to open' is the most important feature of packaging for 52% of customers when buying soft drinks, and this number rises to 93% of over-55s¹.

Rapidly changing demographics highlighted a growing need for socially sustainable products: inclusive, universal and accessible for people with a different set of capabilities.

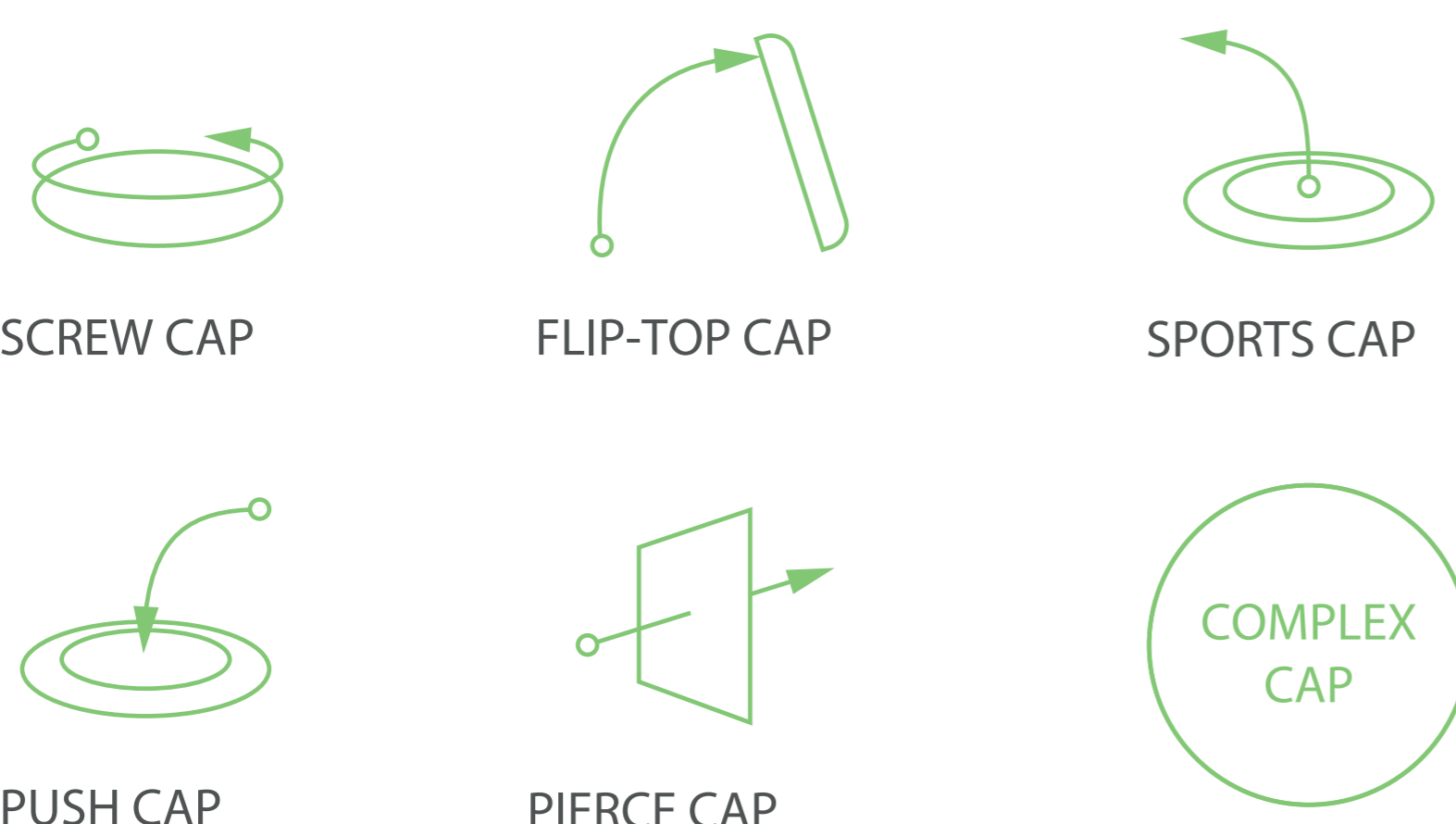
Previously Britvic has unsuccessfully attempted to explore potential improvements around packaging functionality and inclusive design. Then, with the help of KTP and through a successful collaboration with Sheffield Hallam University we have tested over 1500 caps and closures, created a relevant consumer capability suite and set up an innovative Sensory Panel procedure for identifying the level of physical effort when opening caps. Now it is becoming a key element of the New Process Development for future packaging.

¹ Mintel, Drinks Packaging Trends UK, April 2018

METHODOLOGY

To study the factors influencing the perception of the level of difficulty or easiness when opening a bottle cap, we started by dividing caps into categories.

Classifying caps by their functionality (screw cap, flip-top cap, sports cap, etc.) turned out to be most useful. This allowed to concentrate on the opening movement itself and identify the primary skills used to open packaging: strength, dexterity, vision, cognition.



Preliminary sensory testing showed there is a perceptible difference when opening bottles pre-capped with different preset torque forces. The measurement was done using the Tornado cap torque tester.

The use of other skills was evaluated subjectively by the Sensory Panel, as direct evaluation was not possible.

METHODOLOGY (cont.)

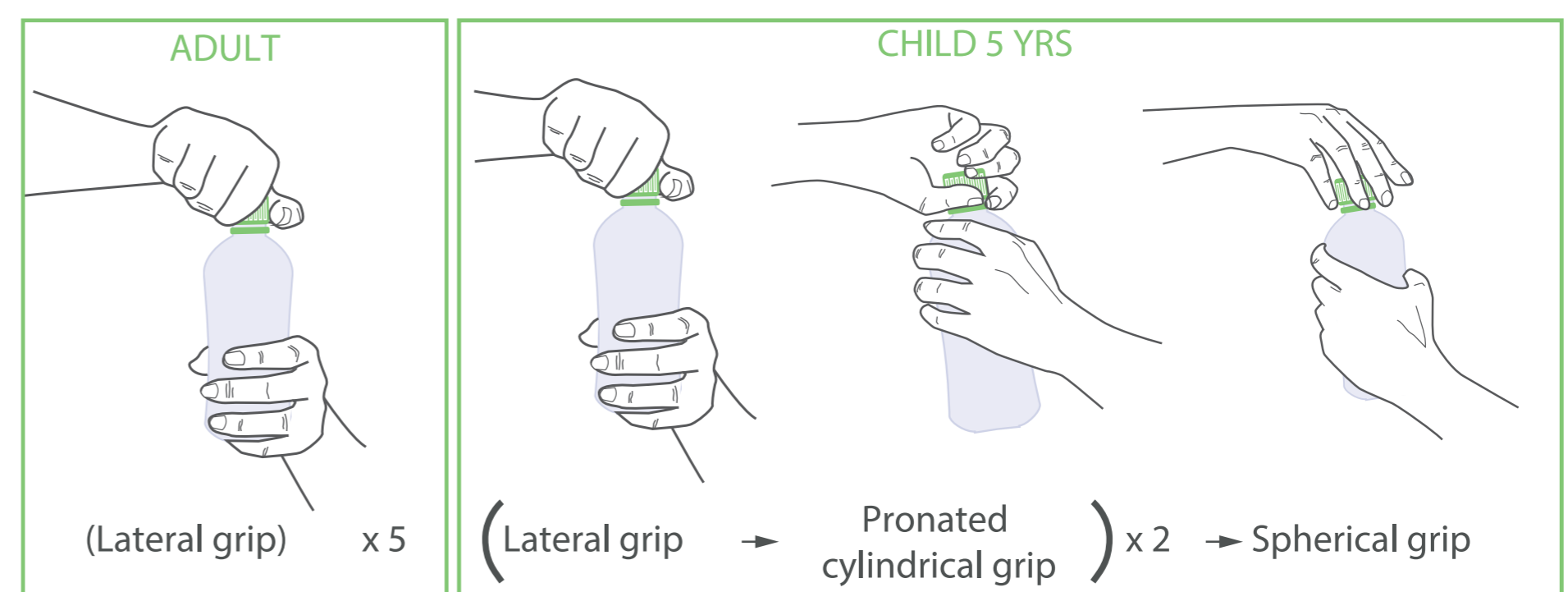
Following all the initial knowledge a work plan and sensory panels were used to generate vocabulary of caps and closures parameters and then analyse and rate a range of different packaging types using a QDA sensory profiling methodology on different attributes across pack opening mechanism. QDA data was then correlated with analytical data which showed that objective assessment of packs using sensory panels was 90% correlated to analytical data but was way more predictable of how easy or difficult a packaging will be for consumers.

In addition, cap opening performed by kids and older adults were video recorded to capture any difference in techniques and unique movements specific to these age groups.

RESULTS AND CONCLUSIONS

1. In our case, Sensory Panel proved to be a reliable and most comprehensive method for measuring packaging functionality. Using the obtained results we've been able to group the caps into 3 categories - easy, medium and difficult. Further analysis was done to show how the details of the caps and bottles: knurling, tamper-evident seals, bottle rigidity, influence the ease of opening.

2. The movements used to open 'screw' and 'flip-top' caps by kids and older adults differ from those of an adult. If to open a 'screw cap' an adult uses the lateral grip only, a kid can use up to 3 different grips to open one cap.



When opening 'flip-top' caps, kids are using the thumb's proximal phalange by placing the thumb horizontally and pushing the lid upwards, while older adults are holding the bottle with two hands at a time and use two thumbs simultaneously to push the top lid.

Considering these details when designing the shape of the cap could ease the opening experience.

FURTHER WORK

Questionnaires will aim to validate the relevance of the study, by measuring the frequency and scale of the problem, when it comes to opening bottles.