Investigation of facial coding as a means of evaluating NPD concepts

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There is a strong theoretical link between human facial expression and the emotional reaction of people to stimuli of all types. This study investigates any additional value that coding and quantifying of facial expression may deliver over more conventional methods in the evaluation of NPD concepts.

Background

It is believed, in many cases, that it is better to try and understand consumer attitudes and behaviour via observational forms of research – e.g. ethnography, eye-tracking, biometrics and facial coding. These techniques avoid the need for direct questioning that has been criticised for leading to over-rationalised responses with poor predictive validity.

Significant scientific work undertaken in the 60's and 70's by Paul Ekman demonstrated that there are seven observable universal emotions; anger, fear, sadness, disgust, contempt, surprise and enjoyment or happiness (Ekman, Sorenson & Friesen 1969). Ekman went on to develop the Facial Coding Action System (FACS) (Ekman & Friesen 1978), allowing for facial expressions to be measured and analysed anatomically. Ekman's work provides the foundation for much of the facial coding conducted today.

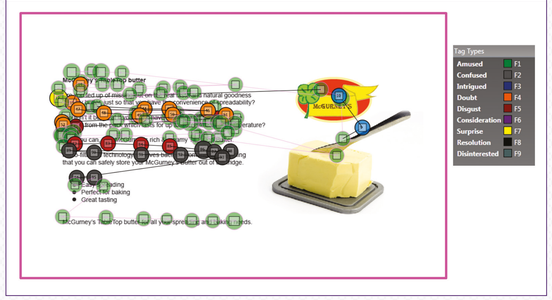
Most applications of facial coding in market research to date have focussed on the evaluation of TV ads, however, there is interest in understanding what additional insights facial coding could bring to the evaluation of static material such as
NPD concepts.

Method

Five different concepts covering sweet snacking, oral care and dairy were included. Participants (n=200) were recruited to evaluate three from five concepts at a central facility. Simultaneous videoing and eye-tracking was used throughout the interview to record where people were looking and their corresponding facial expressions. Facial expressions were coded for associated emotions using skilled manual interpreters and automated coding. Manual coding moved beyond Ekman's seven universal emotions to include amused, confused, intrigued, doubt, consideration, resolution and disinterest.

All three concepts were then re-presented and researched using conventional research tools and questioning which included the use of 'Hot Spots'. 'Hot Spots' is an interactive tool where participants can use the computer mouse to highlight any areas of the concept that they particularly liked (highlighting shown in green) and disliked (highlighting shown in red). At the close of the interview participants completed an Affect Intensity Measure (AIM) psychometric questionnaire (Diener et al 1985).

Fig. 1 **Example of an individual's eye-track gaze plot with emotion overlaid**



Results

Figure 1 shows manually coded emotions superimposed on top of the gaze plot (obtained from eye tracking) to reveal how respondents' emotional reactions unfold as their gaze traversed across the concept board.

Fig. 2 **Emotion heatmaps showing four positive emotion journeys**

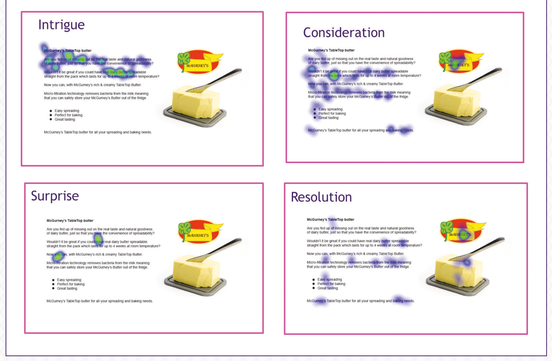
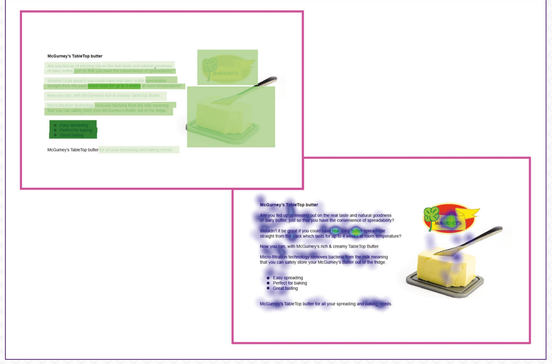


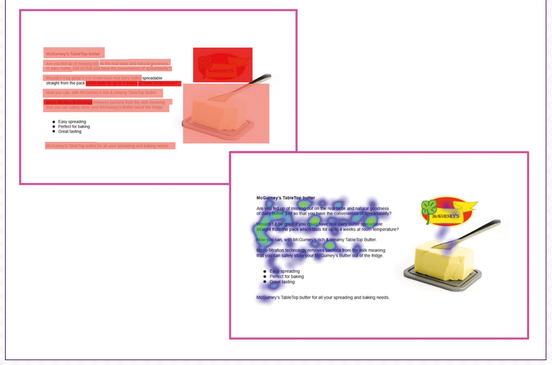
Fig. 3 **Explicit likes shown by green blocking, emotional positives by heat map**



The individual's gaze plots were then built up across respondents to provide emotion heat maps (see Fig.2). These are then disaggregated to reveal which elements of the stimulus are most powerful in eliciting emotions such as intrigue, consideration, engagement, confusion and resolution for example. However, facial expressions were only observed in about 20% of the sample for each concept tested.

Hot spots, a process that allows participants to highlight areas of the concept that they like/dislike, focussed predominantly on functional aspects of the concept whereas facial expressions focussed on the more emotive features (see Fig.3 & 4). When comparing the mean liking rating for each concept with the proportion of negative and positive facial response it was

Fig. 4 **Explicit dislikes shown by red blocking, emotional negatives by heat map**





observed that a higher level of negative facial expressions correlated better with a lower liking rating than positive facial expressions did with a higher liking rating. This indicates that negative facial expressions have a stronger link to participants' direct rating of liking/disliking.

Comparison of manual versus automated coding (using computer algorithms) demonstrated clearly that manual facial coding provides a more sensitive read on facial expression.

Summary and Conclusions

Although the scientific theory behind facial coding is compelling it is less convincing in practice. This research indicates that facial coding can provide an additional layer of insight to the evaluation of NPD concepts but the value is small in the context of more traditional questioning and in many cases would be unlikely to change the final recommendations.

The other issue is that only 20% of the sample in this study showed any facial response at all. This means that whilst the results from this study made intuitive sense, they were based on a very small proportion of the total sample. The commercial viability of facial coding for concept evaluation is also impeded further by the fact that, at this point in time, it is necessary to rely on expensive and difficult manual coding to get accurate and sensitive results.

Hence, the inclusion of facial coding (alongside eye-tracking) would only be recommended in NPD concept work where there is high commercial risk to the decision making or the concept is emotive in nature.

References:

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