Adding Scents to Symbols

How fragrances can facilitate choice-making.

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Choice-making for people with severe disabilities can be extremely challenging. While this ability may be limited by their awareness of the choice to be made or the range of options available, a new research project aims to unlock the potential role of fragrance in helping individuals make daily decisions.[1] Here, the authors review the approach, outline the initial findings and consider the implications for this innovative field of study.

Strong Partnership

The Seashell Trust, a UK-based school providing education, care and ancillary services for young people and adults with sensory and other disabilities, has a long-standing, charitable relationship with global fragrance supplier Seven Scent. A collaboration between the two organizations in 2011 led to an exploratory study designed to investigate how multi-sensory impaired children can use olfactory cues to improve communication.[2] Encouraging results from this initial project suggested that fragrance can be beneficial in improving engagement, thus prompting a second study to explore the possibilities of aiding choice-making at mealtimes.

Mealtime Menu

Pupils attending Seashell Trust have access to a reserved dining room with food displayed and served at a cafeteria-style counter. Young people are encouraged to choose their own lunches, tasting samples of different dishes presented in small taster pots and/or viewing the foods ready for serving. This approach works well for many students but has a number of limitations:

- The counter is, by necessity, visually cluttered and reverberative. Many deafblind students find it hard to access and interpret information in such conditions.
- Students without sight need to access different taster pots in turn. Foods can easily be spoiled or combined, creating confusion.
- Students cannot choose their lunches ahead of time because the taster pots can only be filled once the dishes are cooked.
- The choice-making skills which students learn in the dining room are not easily transferable to community-based cafés and restaurants, where taster pots are unavailable and choices are made using words and perhaps pictures.

While images are generally easier to access than written words, they are relatively poor representations of food. Given that the primary senses involved in eating are taste and smell, the appearance of food may contribute to the experience but is not normally the deciding factor in whether we would choose a specific dish.

> The project offers a positive use of fragrance to support the interpretation of stimuli from other senses.

Research Design

Deafblind students have complex and highly individual needs, often exacerbated by additional learning, physical, sensory and/or medical disabilities. Most cannot express opinions verbally, and their behavior may be hard to interpret due to variable sensory function, health issues and other hard to identify factors.[3] The comparison of information from different sources and perspectives is therefore a priority, as is collaborative working by staff with detailed knowledge of individual students, as well as expertise in deafblindness.

Given these considerations, a case study design was chosen. The suitability of this format is supported by studies which suggest that case studies are especially valuable for the evaluation of new or unique approaches—in this case, the use of fragrances in mealtime choices.[4,5]

Three units of analysis were identified for investigation:

- Students understanding of mealtime choice-making with and without fragrances added to the symbols used.
- Students' engagement with the symbols and the process of choice-making with and without fragrances added.
- Any other changes in behavior linked by staff to the introduction of the fragrances.

Mixed methods were used including mealtime diary records, interviews, direct observations and video analysis. These provided qualitative and quantitative information from both longitudinal and cross-sectional purposes.

Selecting Students

Two criteria were used to decide whether students would benefit from trying the fragrances:

[a]An expanded review of this research was originally published in the British Journal of Special Education (Volume 41, Number 3, 2014); DOI: 10.1111/1467-8578.12072 2014

- The student was known to use olfaction to gain information.
- He or she was able to make and communicate informed choices about what to eat at lunchtime, although not necessarily consistently.

The first criterion was used because many students with deafblindness also have olfactory impairments.[6] The second is a prerequisite for the use of symbols in choice-making.

Three students met the criteria although, due to one expected departure before completion, this report will outline results of the two remaining participants—namely Jack and Seroj (for the purposes of privacy, we will use first names only).

Profoundly deaf and severely visually impaired, Jack makes good use of his residual vision for communication and learning. He is interested in his environment, highly active, easily distracted from activities such as choice making—but highly motivated by fragrances in general. Fourteen-years-old at the start of the study, it was hoped the use of food fragrances on pictures would increase his engagement.

Seroj is inquisitive, fully mobile and very interested in her environment. She has a rare genetic condition causing severe hearing loss, significant progressive visual impairment, and complex learning and medical needs which can affect both concentration and mood. She relies on visual information for communication and understanding, making it a priority to encourage her to use other sensory channels. The project provided a structured, motivating context for Seroj—seven-years-old at the time—to use olfactory information alongside vision to develop her use of olfaction in choice-making in a natural way.

Food Fragrances

It was decided to introduce three fragrances initially, each representing one whole dish, rather than separate fragrances for the different components. Fragrances were specifically developed by Seven Scent to match the dishes served at the school:

- Pizza: tomato, oregano, thyme, cheese
- Curry: aromatic coriander, cumin, turmeric and pepper
- Fish, chips and peas

The fragrances were chosen to be very different from each other, and students were always offered at least one scented choice daily. As with all fragrances, the food aromas used at Seashell Trust were tested for toxicity and safety during developments. This was particularly important because the project entailed giving deafblind students pictures which smelled like food, so licking or tasting the symbols would be a natural response.

Fish, chips and peas scent card.

Seven Scent creative perfumer, Kate Williams.

One important learning gained from the previous Seashell Trust study concerned the format of fragrance delivery. Previously, a spray was used but this caused difficulties because the fragrance spread too far, especially onto staff members' hands, which in turn caused contamination between scents. To overcome this, the food fragrances were stored in pens commonly used for samples by industry and the scents "drawn" onto symbols when needed. Symbols and pens were stored in separate zipped plastic bags between uses to avoid contamination.

Introducing the Fragrances

Jack and Seroj were encouraged to use photographs of food, presented using a "choice board," to select a meal in the dining room before lunch. After choosing, they took their selected photographs to the counter and exchanged them for the meal represented. It was known that neither would leave the counter until they received the meal they wanted, so this approach gave them opportunity to change their minds and gave staff confidence that the meal they accepted was a true choice.

The fragrances were introduced by adding them to the relevant photos without changing other elements of the routine. This was important because deafblind students lack the redundancy of information provided by full sight and hearing and often rely on routines to understand events in their environment. Options other than pizza, curry or fish and chips were represented by unfragranced pictures.

Data Collection and Analysis

Several sources of information were used to explore the students' reactions to the fragrances:

- Mealtime diary records: 30 entries were completed and analyzed before the fragrances were introduced and a further 30 afterwards. Written by the students' key workers each day, observations noted the students' choices and responses.
- Interviews with the students' 1:1 key workers, supplemented by information from teaching and therapy staff.

- Film of each student choosing his or her lunch on several occasions before and after the fragrance introduction. Visual analogue scales were used to record student's level of understanding of choice and engagement with the process.

Fascinating Findings

For Jack, the results show a marked increase in confidence in choice-making following the change. Before the introduction of fragrances, he changed his mind on 15 of 30 possible occasions; afterwards, on only four of 30. The increased accuracy of his choices when using pictures indicated a surer understanding of their function. He was also observed to take his chosen plate without smelling it—something he had always routinely done—which indicated a high level of assurance that the food served would be what he wanted.

In addition, Jack's interest in the process of choice-making increased. His keyworker, for example, said in an interview that he "focuses on the fragrances." This is supported by the visual analogue scale which shows he was observed to have stronger engagement with the decision.

Taken as a whole, the data suggests that Jack is more connected with the process of choice-making when fragrances are used and, on some occasions at least, more confident. The next step is to encourage more discriminating choices among fragranced options.

Seroj showed an equally interesting change in behavior following the introduction of fragrances. During the initial 30 mealtimes, Seroj chose pizza only three times—and changed her choice at the counter every time. After the fragrances were introduced, she chose pizza seven times and only changed her choice twice, keeping and eating the pizza on the other five days.

The fact that she changed her choice less frequently suggests the fragrance drew her attention to the pizza and so indicates interest. This is further supported by direct observation and the video recordings which show her spontaneously smelling the pictures, including the unfragranced ones, suggesting that she is actively seeking olfactory information.

Overall, while Seroj is still very visual, she has tolerated and shown interest in fragrances. When her key worker asked how mealtimes could be improved, she immediately asked for more fragrances to represent the full range of meal choices. This would provide Seroj with equivalent visual and olfactory information regarding the range of options and encourage her to extend her use of smell in this context. Further study is needed to explore how many options can be presented simultaneously before olfactory fatigue affects their value.

Conclusion

The project broke new ground in evaluating the use of food fragrances to assist the choice-making of deafblind students. The outcomes are all the more pertinent because this appears to be the first study of its kind; literature searches prior to commencement found no research exploring the use of fragrances to help people with severe disabilities make choices. While it is acknowledged that the scale of the project was small and its progress was affected by practical constraints, it generated and investigated new hypotheses about the use of olfaction in the education of deafblind students. While it is not possible to apply the findings to the wider population of deafblind children due to the individual needs of participants, they do offer valuable insights. Importantly, the project offers a positive use of fragrance to support the interpretation of stimuli from other senses. Continued work in this area will develop understanding of how fragrance can be used to support learning and communication for this complex audience.

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