Food is Sensory

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Eating food IS a sensory experience. We learn to love food by experiencing its many sensory properties. We develop favorites and enjoy our mealtimes. Food has smells, tastes, textures, makes noise, and looks a certain way! When children struggle to eat, we need to consider the sensations of the food as a variable as we help them learn to enjoy new foods and expand their diets. We can change the sensory properties of foods and think about them on a continuum. Let's consider these sensory aspects of food.

Smell, taste from a distance!

Food smell is a preview of the taste to come, a rehearsal. Smell is 80% of taste and we can think of it as taste from a distance. We understand smell two ways. Oro-nasal smell is the *external* smell sensation that comes in through the nose from the outside. It is the way we smell cooking bacon and the burst of orange as we squeeze it. It is our way to check out a new food before we even try it to know whether it should even come to our mouth. It is how we can protect ourselves from placing bad smelling, or even toxic things into our mouth. If it smells BAD, we do not want it in our mouths. Smell helps us protect ourselves!

Retro-nasal smell is the *internal* smell we receive from within our mouth as food is chewed or swished around. The smell vapors that reach the nose from the chewing process, or even the burping process. They coming from within our bodies. Both oro-nasal smell and retro-nasal smell give us information about taste.

Smell is closely associated with our emotions and our memories. We all have had the experience of having a smell immediately remind of us of a past experience, time and place. Smells actually help us put information into memory storage and pull it back out. Smells also contribute to our emotional responses. We can REALLY like a smell or REALLY NOT like it. We react to smell! Smell contributes to our willingness to even try new foods.

Taste is complicated

The taste buds on our tongue pick up information about specific and combination tastes. The tastes of sweet, salty, sour and bitter have traditionally been thought to be mapped on the tongue in certain areas, but we now understand that all the taste buds contribute in some way to taste feel. We also now consider another taste area, umami. It is the savory, meat-like taste more recently included as we analyzed our taste interpretations.

Our taste preferences are personal. Unborn babies begin their tasting experiences in amniotic fluid and newborns taste changes with breast milk. We are wired to prefer sweeter flavors initially, perhaps as a

protection, so we do not eat foods BAD for us. Toddlers take time to appreciate more bitter tastes of some vegetables and some think there is a genetic predisposition for enjoyment (or not) of some of the more bitter vegetable flavors. Taste preferences evolve over time. They are influenced by personal, familiar and cultural experiences. Taste is considered the "bedrock of flavor" by Bob Holmes of Flavor: Our Most Neglected Sense in his descriptions of this complicated personal sensation.

When we think of *flavor* of foods, we must consider the contributions of both sensations of smell and taste. But, texture feel is also a contributing factor!

Oh, that texture!

Everything we put in our mouth has a feel. There is the feel of the breast, bottle, finger, spoon, fork, cup and straw and the texture from the liquid or food. And food has a feel.

We describe a continuum of textures as babies transition from liquids to purees to mashed foods and solids. However, within each of these descriptors, there are many more texture sensation variations that children interpret as they learn to like, or not like, new foods. In Japan, there are 408 food texture words and in the US there are 78! We usually, however only consider a handful to texture word options with children. Think about how the textures of lumpy, chunky slippery, viscous, dense, runny, scattery, meltable, crispy, airy, coarse, grainy, juicy, and stiff also contribute to our enjoyment or further complicate a worry about texture for children who have challenges with their sensory enjoyment of foods! Authors Mouritsen and Styrbaek describe the appreciation food as more than taste, but also, and very importantly, as the physical characteristics of foods as *mouthfeel*.

The sound of crunch!

And, food also has sound! The crunch or crisp of biting through foods provides an external auditory sound, but also we have internal bone conduction sound from the jaw experience of chewing that vary with the complexity of the solid. These sounds can be subtle, or very LOUD. They can enhance our enjoyment or contribute to displeasure.

Hearing, as in smell, is interpreted from external information as well as internal information. We hear sounds *externally* as sound waves that are collected in the ear and directed to touch the ear drum. Sound waves are turned into vibrations that are transmitted to the inner ear and cochlea for interpretation. This sound can be considered *touch from a distance* as the wave touches the ear drum. We know many children who sound sensitive or sound *and* touch sensitive. It is interesting how many touch sensitive children are also sound sensitive. This external hearing process hears the sound of the *cris*p of a potato chip or juicy crunch of an apple or celery. However, there is also sound generated from within the mouth as food is chewed and moved around the mouth.

The *internal* sounds comes from the sounds we hear from within the mouth due to the proximity of the jaw, throat and mouth to the hearing apparatus and the bones of the skull. Internal chewing sounds are amplified through bone conduction or bone

transmission. Most of us do not notice or can easily ignore these sounds. Sometimes surprise sound or crunch adds to our food enjoyment, BUT for some children the NOISE of food can be problematic!

Looking at food is a preview

We learn so much about food from seeing it! We get a preview, a rehearsal, of the meal and visually decide if the food on our plate is appealing, whether it is familiar or unfamiliar, whether it fits into our categories of personal preference. Some enjoy the experience of eating at a fancy restaurant and appreciating the artistic arrangement of the gourmet food. This visual attraction can entice us into the meal. We have experiences of having a new food presented that does not appeal to us at all visually. Vision can be the traffic patrol on whether we even want the food near our mouth!

Children learn a lot about mealtimes through their eyes. They learn about utensils, food differences, visual texture differences, and the pace of presentation. They see the feeder and can feel the feeder's pressure from the body language, the size of the mouthful, the lean of the grown up, and the persistence of the offer. Through grown up body language, children can be more, or less comfortable with the meal.

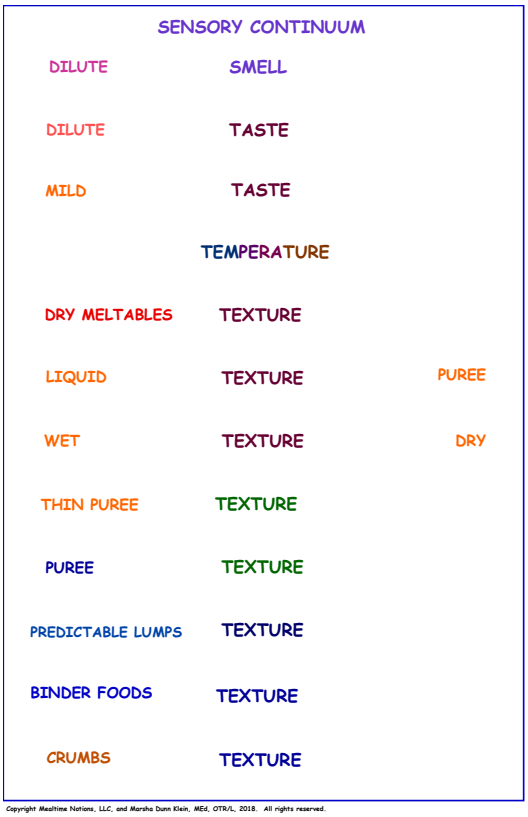
Some children who have feeding challenges can be extra sensitive about the tiniest of visual difference in their foods. An extra brown piece of toast, a random raisin in the oatmeal, or the apple that has green skin instead of red skin can be enough for a mealtime meltdown. A peanut butter sandwich cut in a rectangle instead of a triangle, or plate of elbow macaroni instead of a spirals can end the meal right there! Worried eaters can become visual detectives sleuthing out the tiniest change in their visual food expectations as they determine if they are going to eat any food offered. Vision counts.

Continua

The sensations of eating are key to food enjoyment. When children do not enjoy the specific sensations, they will reject food offered and can learn to be worried about mealtimes and the offer of any new foods. In order to reduce the worry and stress of mealtimes we recommend starting from SAFE. What foods are safe, familiar and trusted? What foods are okay NOW? And, how can we help the child tip toe towards a new food smell, taste, texture, sound or sight?

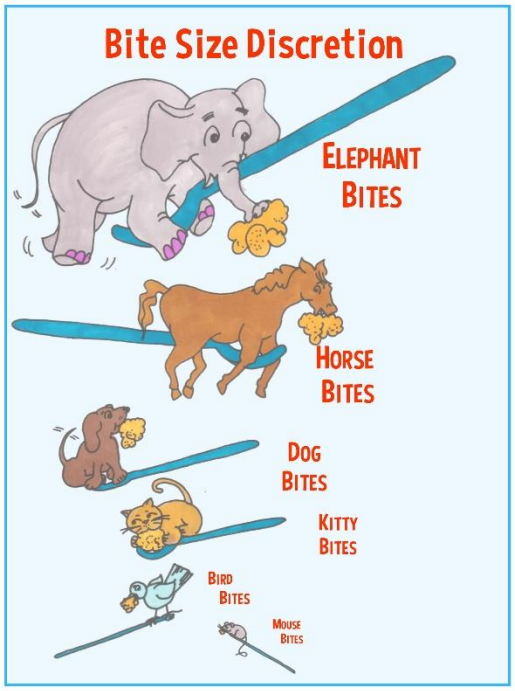
We consider each sensation along a graded continuum of complexity. Each child's interest in that sensation is somewhere on that continuum of tiny steps. By thinking ***continua*** we are consciously breaking down the steps to success into tiny achievable, less stressful ***stretches*** towards the goal of more developmentally appropriate foods and expanded food enjoyment. Sensations motivate children towards or away from the meal. When they find enjoyment with sensations, they WANT to come back.

Check out this continuum of sensory food properties found in Anxious Eaters, Anxious Mealtimes by Marsha Dunn Klein. Where is the child on each continuum? What would be a tiny next step for that child?



And this continuum of crumb choices as tiny tastes and smaller textures. Crumbs can add small or large texture to a food. They can be ON a spoonful of puree, under it or on the side to support small sensory changes as well as small oral motor challenges. They can be a bridge to solids and to flavor changes.

And a continuum of bite sizes from tiny to large! Some children are only comfortable with the tiniest of tastes and others stuff their mouths and need to learn to comfortably handle smaller bites. Each child can be somewhere on this continuum.



Those of us supporting children to make developmentally appropriate sensory transitions in eating need to fully understand each sensation and how it works to allow or block enjoyment. By understanding the gradation of each sensation, we can offer opportunities in tiny achievable, less stressful ways for children.

References

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