

Selecting the Right Tool for the Task: A Hard-Soft Cake Eating Experiment with a Spoon and Fork

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Abstract. It is generally accepted that one needs to select the correct tool for a given task. The same holds for eating utensils. A cake eating experiment was designed to determine if the visual appearance of cakes with different associated hardness would affect the choice of eating utensil. A total of 25 participants was recruited. The results did not reveal any effect of cake type, or presentation layout on the choice of eating utensil. It therefore seems that other factors, such as, for instance, customs and/or habits, are more influential in the choice of cake eating tool choice.

Keywords: eating utensil, design, fork, spoon, preference, hand dominance

1 Introduction

The preferences and mechanisms controlling the selection of tools in various situations has been extensively studied, including at industrial level [1] and tool level [2]. Generally, tools are linked to certain problems, training, habits, customs and culture. In order to decide about the most appropriate tool for a task an individual must first identify the nature of the problem. Then, an individual is likely to choose a tool that he or she is trained to use, or according to the individuals' habits.

Culture also plays a part. In Chinese Heritage Cultures chopsticks are mainly used for most eating, with the occasional accompanying by a spoon, while in Western cultures knives, forks and spoons are used to achieve the same goals. Some individuals are trained in eating utensil etiquette from childhood, such as holding the knife and the fork in the "correct" way and in the "correct" hands. Others, on the other hand, just use whatever seems more practical and natural with less regard for etiquette.

Fig. 1 illustrates one classic table setting which may be used on formal occasions so that a meal can be consumed according to a set protocol and custom. In this convention, utensils are used from the outside and inwards for the starter and main course, while the utensils on the top are used for the desserts, being it pudding or cake. Notice that the dessert utensils often comprises both a cake fork and a dessert spoon. There seems to be no generally agreed convention for what is the "correct" way to eat cake. A search

on this topic on discussion forums reveals that most people prefer forks for eating cake as they do not have to “chase the last piece around the plate with the spoon”, and the cake fork often have a knife-like edge that can be used for cutting. Other argue that the spoon is useful for sorbets, puddings and other soft desserts, and sometimes hard cakes are served on the same dessert platter as a sorbet, pudding or mousse. Others claim that desserts should be formally eaten with a spoon, with a fork as an optional extra utensil.

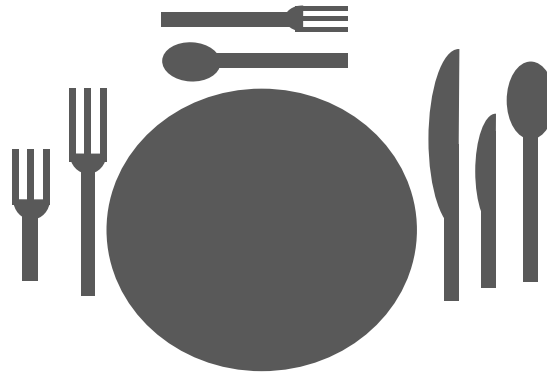


Fig. 1. A classic table setting with spoon and fork for desserts.

This study set out to study whether the hardness associations triggered by the visual appearance of a food affected the participants’ choice of eating utensils. Cake was chosen as the food category as most people like cake and it would simplify recruiting participants. Cake and desserts are usually eaten with a spoon or a fork, and these two categories of utensils were therefore used in the experiment. It was predicted that with soft cake the participants would choose a spoon as the spoon will be more efficient in preserving the shape of the cake, while it was predicted that a fork would be preferred when eating a hard cake as more force is needed to break the firm cake into pieces.

The rest of this paper is organized as follows. Section 2 present related work, Section 3 outlines the methodology, while the results are presented in Section 4 and discussed in Section 5. Conclusions are presented in Section 6.

2 Related works

The literature on eating utensils have focused on the design of utensils in general [3], to facilitate children [4] and individuals with reduced motor function such as Parkinson’s disease [5, 6, 7] and arthrogyriposis multiplex congenital [8].

Eating with utensils have also been used to study hand preference among children [9]. Eating utensils have also been studied from a more technological perspective, such as eating utensils with sensors that can detect eating problems among children [10, 11]. Moreover, interactive eating utensils have been used as a platform for developing fine motor skills [12] and to slow down eating speeds [13].

3 Method

3.1 Experimental design

A within groups controlled experimental design was chosen with one independent variable, namely visual food hardness with two levels, hard or firm (brownie) and soft (cream cake). The dependent variable was utensil preference. This variable was a dichotomous variable with values fork and spoon. Utensil placement (left-right) was also used as a random variable.

3.2 Participants

A total of 25 participants was recruited for the experiment among the students in the first authors' University, of which 12 were female and 13 were male. Of these, 6 participants were left-hand dominant, while 19 participants were right-hand dominant.

3.3 Materials

Two sets of cakes were baked, namely hard backed brownies and three-layer cream cake. Both cakes were assumed to be familiar to participants both in taste and consistency. Brownies are usually hard and sticky while cream cakes are usually soft, and it was assumed that the participants would expect the hardness of the cake type according to its visual appearance before eating.

3.4 Procedure

The participants were tested individually in isolation. First, each participant was brought into a room and placed in front of a desk with one cake type on a plate with a metal spoon and knife on a napkin next to the cake. Next, each participant was informed about the experiment and were asked about any potential allergies. Then they were asked to choose one of the utensils and eat the cake. When finished, they were asked to turn around while the other cake type and the utensils in opposite order were placed in front of the participants. They were then asked to turn back and asked to select one of the utensils and eat the cake. The order of the cakes was randomized, and so was the initial left and right placements of the knife and the fork to minimize the risk of bias. During each eating trial the participants' choice of eating utensil was recorded. Spearman correlations confirmed that there was no correlation between the presentation side of utensil and the participants' choice of utensil, hence no effect of the random variable utensil position.

3.5 Analysis

Statistical analyses were performed with JASP version 0.11.0.0 [14].

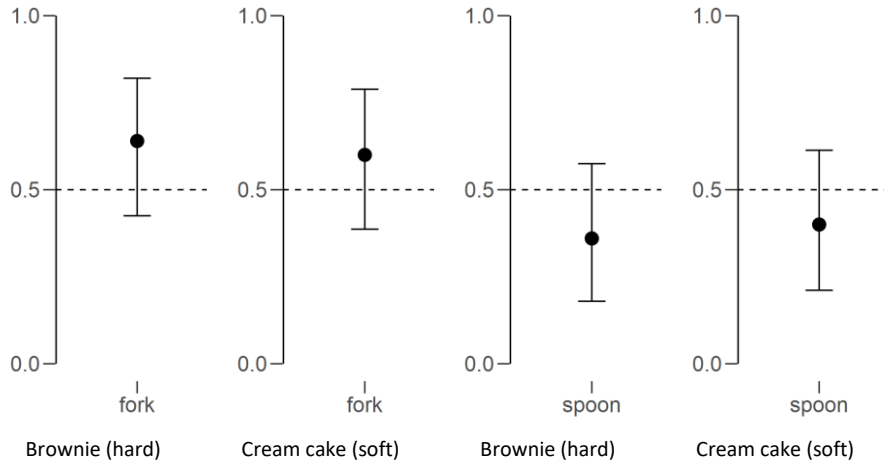


Fig. 2. Proportions of fork and spoon choices for hard and soft cake with 95% confidence intervals.

4 Results

Fig. 2 shows the results of the experiment. According to our predictions 100% of cake eaters will choose a fork to eat a hard cake while 100% will choose a spoon to eat a soft cake. With our cohort of students ($N = 25$), a Binomial test revealed that the proportion of students who prefer forks while eating hard cakes was significantly less (64.0%, $p < .001$) and those using spoons significantly more (36.0%, $p < .001$) than expected. Moreover, the proportion of students who prefer spoons while eating soft cakes was significantly less (40.0%, $p < .001$) and those using forks was significantly more (60.0%, $p < .001$) than expected. A hypothesis based on 50/50 distribution of choices cannot be rejected. A contingency table analysis further confirms that there was no significant difference in choice of utensil for the two cake types ($\chi^2(1) = 1.418$, $p = .234$).

There appear to be some differences between right dominant participants and left dominant participants, although the number of left dominant participants is too small to be the basis for any conclusions. Among right hand dominant participants, 72.2% prefer the fork with the hard cake, while only 55.6% prefer fork with the soft cake. For left hand dominant participants only 40% preferred fork with the hard cake and 60% preferred fork with the soft cake. There is a moderate non-significant correlation between handedness and the utility choice for hard cake ($r_s(25) = 0.359$, $p = .078$). A contingency table analysis further confirms that there is a significant difference in choice of utensil for the two cake types for right-hand dominant participants ($\chi^2(1) = 3.997$, $p = .046$).

5 Discussion

The results clearly show that the hypothesis had to be rejected as no significant effect of cake type on utensil choice could be observed. Hence, participants do not distinctly choose a fork with a hard cake and spoon with a soft cake. Overall, the results indicate that the participants generally preferred the fork over the spoon.

One may speculate what triggers the participants' choice of utensil. The results of this study show that the type of food and the placement of the utensils had no significant effect. It is possible that the choice is influenced by previous experiences and habits. If a participant is used to eating cake with a fork, they may choose a fork regardless of cake type, and vice versa if their habits is that of a spoon. Additionally, another possible explanation refers to the fork as a more versatile utensil compared to the spoon in the task of eating cake, as it offers the possibility of two actions to pick up the food: to prick with the ends or to collect by the sides.

One drawback of the current experiment is the limited number of participants. It is possible that the results may have looked different with a larger sample. Usually, it is relatively challenging to recruit participant to voluntarily participate in controlled experiments. This was not the case in this study. In fact, once rumor got around about the experiment, several students contacted the authors with a request to participate. The prospect of getting free cake to participate in a short and easy experiment served as an effective incentive. The practicality of having enough material (cake) to scale up the experiment is the main obstacle in this experiment.

The forks used in the experiment were slightly larger than the spoons. It may be that this has caused some bias if participants preferred to use the largest utensil.

6 Conclusions

An experiment was conducted to assess if the type cake with distinct hardness characteristics would affect the choice of eating utensil. The results did not show that the type of cake affected the choice of eating utensil. About 60% of the participants preferred to use a fork and the remaining participants chose to use a spoon. Further studies exploring different types of food might bring information that could elucidate this question.

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