

# Take it slow! Can feedback from a smart fork reduce eating speed?

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## Introduction

Eating rate is a basic determinant of appetite regulation, as people who eat more slowly feel satiated earlier and eat less. Unfortunately without assistance, eating rate is difficult to modify due to its highly automatic nature. These studies address the hypothesis that real-time feedback can reduce eating rate.

## Intervention: the 10sFork

The 10sFork, designed by Slow Control, Paris, provides feedback to raise awareness of eating rate in order to help people eat more slowly. It records behaviour and provides real-time vibrotactile feedback on individual eating rates.

## Efficacy Study

Does feedback delivered by the 10sFork reduce eating rate?

### Method

Participants used the 10sFork to eat a standardized meal (pasta bolognese) in a laboratory setting. 123 participants (77 female, 46 male, age  $m = 29.35 \pm 13.15$ , body mass index (BMI)  $m = 24.04 \pm 4.19$ ) were randomly assigned to either the experimental condition ( $n = 64$ ), in which they received vibrotactile feedback from the fork when eating too fast (period between bites  $< 10$  seconds), or a control condition ( $n = 59$ ) in which they did not receive feedback from the fork.

### Results

Participants in the experimental condition:

- ate significantly **slower**,  $F(1,123) = 5.40$ ,  $p = .02$ ,  $d = 0.42$ ,
- had a **higher success ratio**, i.e. took less bites within a 10s timeframe,  $F(1,123) = 24.20$ ,  $p = .00$ ,  $d = 0.9243$ ,
- took **longer** ( $m = 9$  minutes, 51 seconds) to eat their meal than participants in the control condition ( $m = 7$  minutes, 35 seconds),  $F(1,117) = 11.929$ ,  $p < .001$ ,  $d = 0.64$ ,
- reported **higher satiation** after their meal than those in the control condition,  $F(1,123) = 6.268$ ,  $p = .014$ ,  $d = 0.4588$ ,
- ate **similar amounts** of pasta than participants in the control condition,  $F(1,123) = .081$ ,  $p = .777$ .

## Qualitative User Experience Study

Is the 10sFork an acceptable and comfortable tool to reduce eating rate in real-life settings?

### Method

11 participants (aged 18–35) used the fork both in a laboratory setting and at home. All participants were self-perceived fast eaters. We interviewed them on perceived efficacy, acceptability, comfort, accuracy, motivation, and sustained use of the fork.

### Results

Participants feel the 10sFork is an acceptable tool to decelerate eating rate. The fork is generally seen as comfortable and sufficiently accurate. The vibrotactile feedback worked as expected, but the visual feedback largely remained unnoticed. Participants did not feel uncomfortable using the fork in a social setting.

Participants were more aware of their eating rate, but this did not always lead to behaviour change. Every participant tried to cheat the fork at some point. Sustained motivation to use the fork was limited because participants did not see themselves as the product's target group.



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## Conclusions and further research

Vibrotactile feedback through a smart fork is an acceptable and comfortable means to reduce eating rate. Because of the fork's vibrotactile feedback, participants ate slower, with extended meal duration and more time between bites.

In further research, we will test the sustained effect of vibrotactile feedback on eating rate in real life settings.