

# Human perception of the application of non-injurious temperatures on the tongue and the hand.

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To the best of our knowledge, the \*thermal grill illusion\* has only been investigated on the skin of the hand and of the forearm. The main objective of the study is to investigate the existence of this phenomenon on the tongue.

<b>Ethical review</b>	Approved WMO
<b>Status</b>	Recruitment stopped
<b>Health condition type</b>	Other condition
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON33747

### Source

ToetsingOnline

### Brief title

Oral grill

### Condition

- Other condition

### Synonym

niet van toepassing

### Health condition

perceptie van temperatuurverschillen

### Research involving

Human

## Sponsors and support

**Primary sponsor:** Unilever

**Source(s) of monetary or material Support:** Unilever

## Intervention

**Keyword:** psychophysics, senses, temperature perception, thermal grill illusion

## Outcome measures

### Primary outcome

- To test the functionality and the applicability of a developed thermal device for stimulating the human hand and tongue
- To determine whether different simultaneously presented non-injurious cold and warm temperature combinations (18, 20, 22, 24, 36, 38, 40 and 42°C) usually known to induce a thermal grill illusion on the hand could also elicit this sensation on the tongue
- To compare whether the sensation induced by various temperature combinations on the tongue is similar to the sensation induced when stimulating the hand under the same conditions

### Secondary outcome

A secondary objective is to verify whether the sensation induced on the hand using the device build by ourselves would lead to the same results as those observed by Leung et al. (2005) in similar conditions.

## Study description

### Background summary

The so-called \*illusion of the thermal grill\* is a well known phenomenon

related to a new (\*heat/burning\*) perception when stimulating the skin by mild cold and warm, non-injurious alternating bars. This has been demonstrated several times, but the underlying mechanisms of the \*thermal grill\* is not understood nor is there agreement on its exact qualities (\*stinging\*, \*prickling\*, \*painful\*,\*). Understanding this illusion and the conditions under which this illusion appears provides determining understanding on temperature and pain perception and on the interaction between the involved sensory systems.

## **Study objective**

To the best of our knowledge, the \*thermal grill illusion\* has only been investigated on the skin of the hand and of the forearm. The main objective of the study is to investigate the existence of this phenomenon on the tongue.

## **Study design**

There are two measurement days, lasting 1,5 and 2 hours respectively. During each measurement day, participants will be asked to apply the thermal grill device for 10 seconds on the hand (6 times) and on the tongue (6 times). Temperature combinations will semi-randomly vary between applications. After each applications, participants are asked to rate their perceived temperature by means of a VAS and also choose relevant qualitative descriptor.

## **Intervention**

For the purpose of this study, a thermal grill device has been manufactured in-house. The device is composed of eight stainless steel bars (15×3 mm and placed 1 mm apart on an isolating food-grade silicone support) mounted in such a way that half of the bars can be controlled independently of the other half, by a common inflow and outflow. The inflow and the outflow of the two series of bars are connected via two independent water baths. By appropriately adjusting the valves and settings of the baths, it is possible to control the temperature of alternating bars.

Participants will be asked to put the device during 10 seconds on the tip of their tongue (2 times 6 temperature combinations) and the hand (2 times 6 temperature combinations).

## **Study burden and risks**

No health risks are expected, but participants might report (illusionary) sensations of pain, prickling and/ or burning.

## Contacts

### Public

Unilever

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Nederland

### Scientific

Unilever

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## Trial sites

### Listed location countries

Netherlands

## Eligibility criteria

### Age

Adults (18-64 years)

Elderly (65 years and older)

### Inclusion criteria

Age 18-55

Apparently healthy

No reported current or previous psychological or psychiatric conditions

Having a general practitioner

Agrees to adhere to study restrictions and procedures

Willing to sign an informed consent

Non-smoking

### Exclusion criteria

For women: being pregnant or lactating

Allergy or intolerance to cling film  
Wearing dental braces  
Having a tongue piercing  
Systematic use of certain medication and/ or painkillers  
A history of opiate use

## Study design

### Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)
Control:	Active
Primary purpose:	Other

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	25-02-2009
Enrollment:	44
Type:	Actual

## Ethics review

Approved WMO	
Date:	17-02-2009
Application type:	First submission
Review commission:	METC Wageningen Universiteit (Wageningen)

## Study registrations

## **Followed up by the following (possibly more current) registration**

No registrations found.

## **Other (possibly less up-to-date) registrations in this register**

No registrations found.

## **In other registers**

<b>Register</b>	<b>ID</b>
CCMO	NL24934.081.08