



# “Synchronized Dining”

Tangible Mediated Communication For Remote Commensality

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# TARGET GROUP



Geographically distributed  
families &  
loved ones



a result of  
globalisation  
work oriented  
life style

# DESIGN QUESTION

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“How may we create togetherness  
-with the help of an interactive device-  
between loved ones separated by distance  
during dining,  
through remote communication?”

# RESEARCH QUESTIONS

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How do you sense  
togetherness  
while geographically  
separated?

How do you sense  
it through touch?

How can it be mediated  
through an  
interactive device?

# GOALS CRITERIAS

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Employ the  
modality of touch

Representation  
of movement

Immediacy

Joint  
action

Contextualised  
medium

# BACKGROUND **THEORY**



Psychology, Physiology  
Sociology, Communication  
Interaction Design

Commensality

Touch

Nonverbal  
Communication

Emotional  
Contagion



# COMMENSALITY

- Most frequently repeated social activity
- Vital part of human life
- Universal medium
- Shared experience
- Social bonds
- Togetherness



## SENSE OF **TOUCH**

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**“Touch is worth a thousand words”**

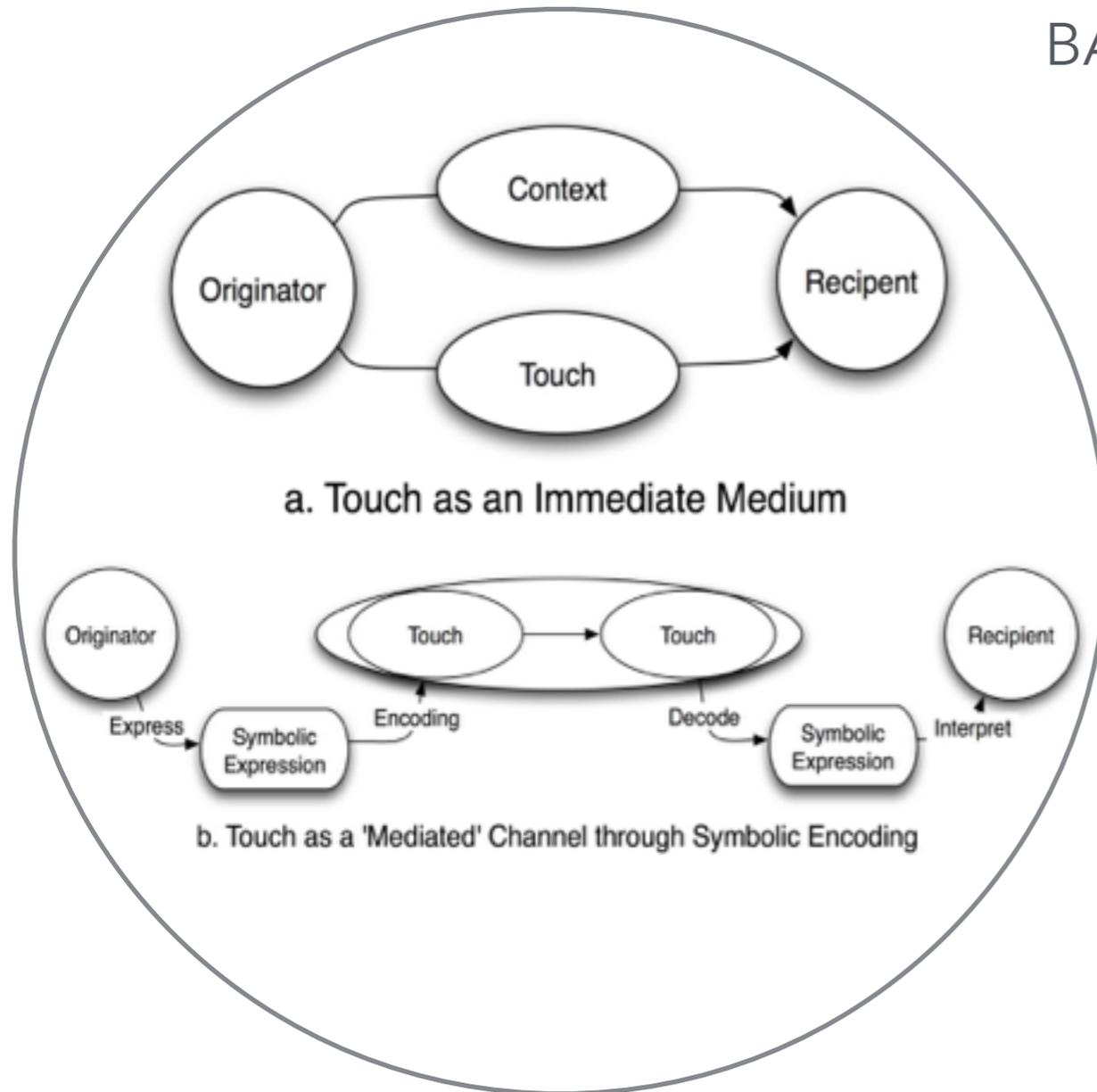
**Affective & immediate  
communication channel**

**Physiological phenomenon**

Cutaneous - receptors of skin

Kinesthetic - movement of body,  
active and passive modes of touch

Haptic - both Cutaneous & Kinesthetic



# SENSE OF **TOUCH**

## Immediate channel

“it carries unique affective information”  
(Wang and Quek, 2010)

## Contextualised medium

age, gender, environment, etc

## Non-vulnerable & Vulnerable

body parts



# NONVERBAL **COMMUNICATION**

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Physical & spatial environment  
Unique physical characteristics  
of the communicator  
Body movements & positions



## EMOTIONAL **CONTAGION**

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### **DEFINITION**

"automatically mimic and synchronise expressions, vocalizations, postures, and movements" (Hatfield, 1965)

Mimicking emotions through  
visual cue

# RELATED WORK INSPIRATION



## Friendl

Remote communication during dinner

Synchronous behaviour



## inTouch

Connected objects

Haptic, force-feedback technology

Physical link  
Representation of movement

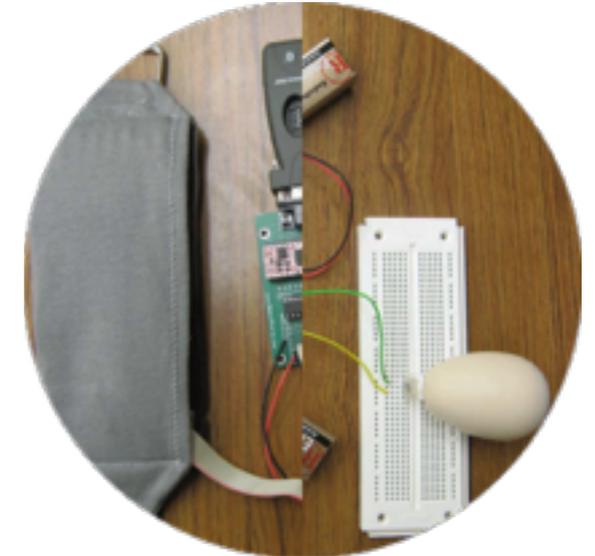


## Frebble

Remotely hold hands, send and receive squeezes

Tactile experience

Simultaneous action



## Touch&Talk

Haptic interaction

Allows expression of effect

# DESIGN METHODOLOGY

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Research  
Through  
Design

Scenarios

Workshops

Experience  
Prototyping

## DESIGN PROCESS



# DINNER WORKSHOPS

## GOAL

To identify features of  
face-to-face communication  
with focus on nonverbal

To find touch points, surfaces

Social dynamics, code of conduct





# EATING ALONE RECORDING 1

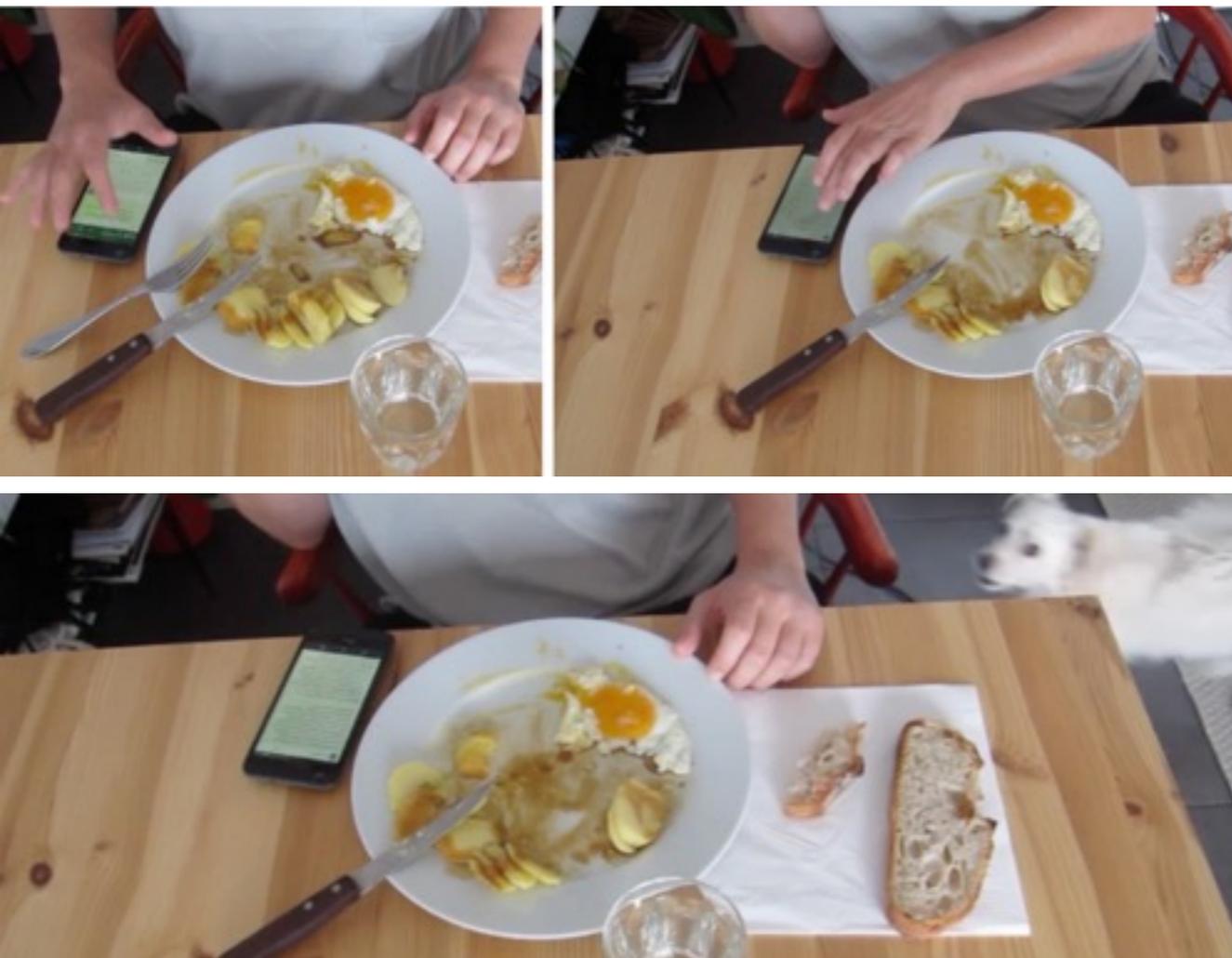
“Left-over lunch alone”

## GOAL

To identify and collect touch points, surfaces, movements, sound elements and the emotions of participant.

## FEEDBACK

Lunch felt “meaningless”  
“bored”, “lonely”





## EATING ALONE RECORDING 2

“Quick and busy lunch break”

### **GOAL**

To identify and collect touch points, surfaces, movements, sound elements and the emotions of participant.

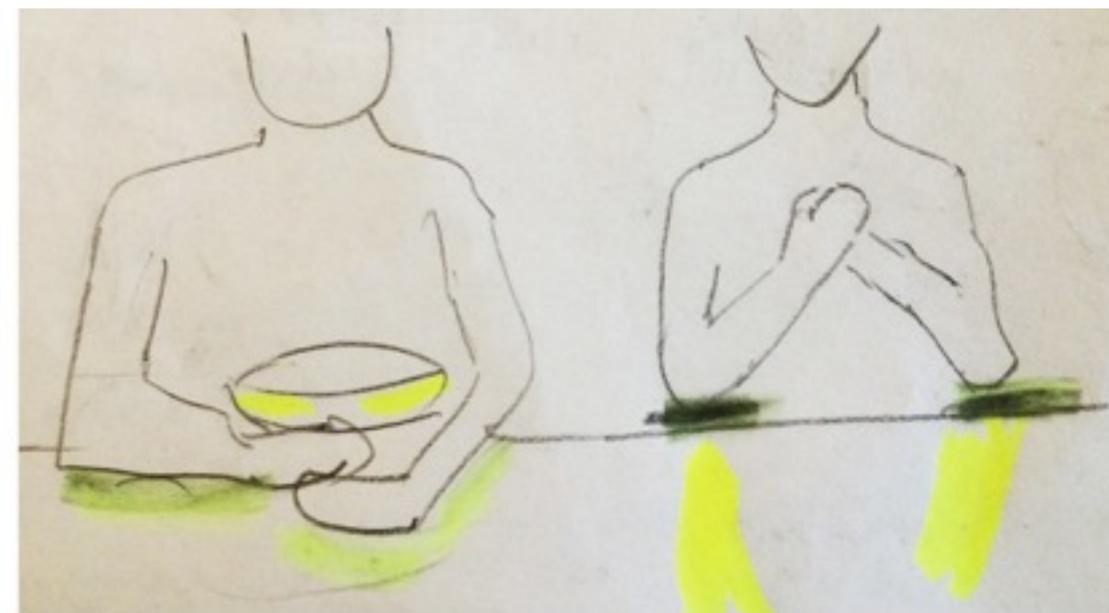
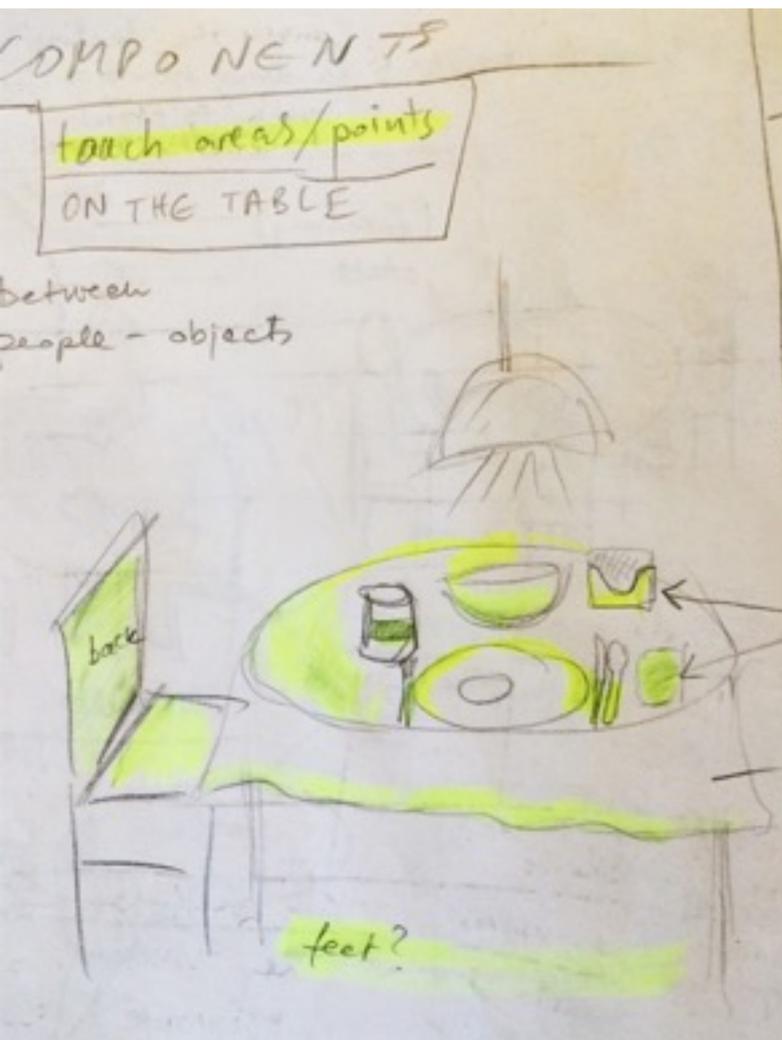
### **FEEDBACK**

It was like to  
“kill two birds with one stone”



# SKETCHING & IDEATION

Touch points, surfaces





“share our presence  
to each other”

“the best time  
of the day”

“connecting,  
recharging”

“a sense of belonging  
and sharing”

“touching each other’s  
feet accidentally”

“doubling the  
taste of food  
with laughter”

“sharing thoughts  
and experiences”

“it means that  
you care for  
each other”

“sweet”

“laughing”

“you make an effort to  
keep the relationship alive”

“sharing”

“love.  
sharing is  
caring”

“being around the table”

## ONLINE SURVEY

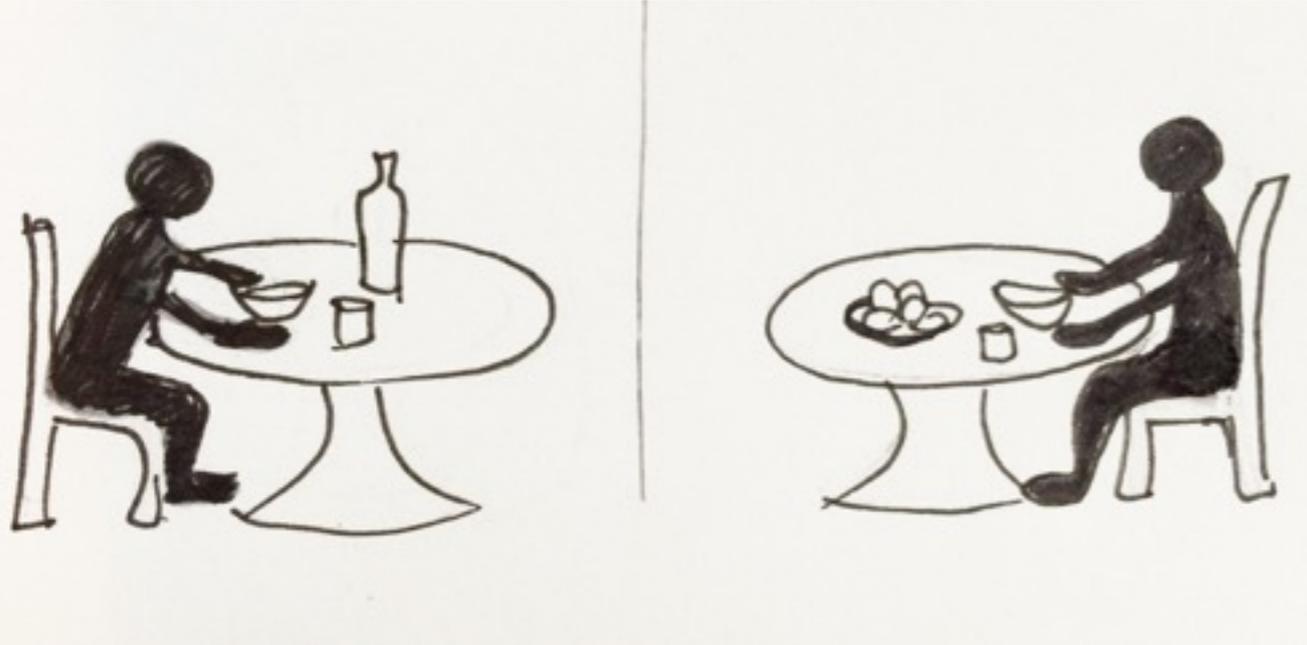
“Togetherness during mealtime”

### GOAL

To find out what togetherness means  
during mealtime

### PROCESS

Seventeen people completed it



## BACKGROUND

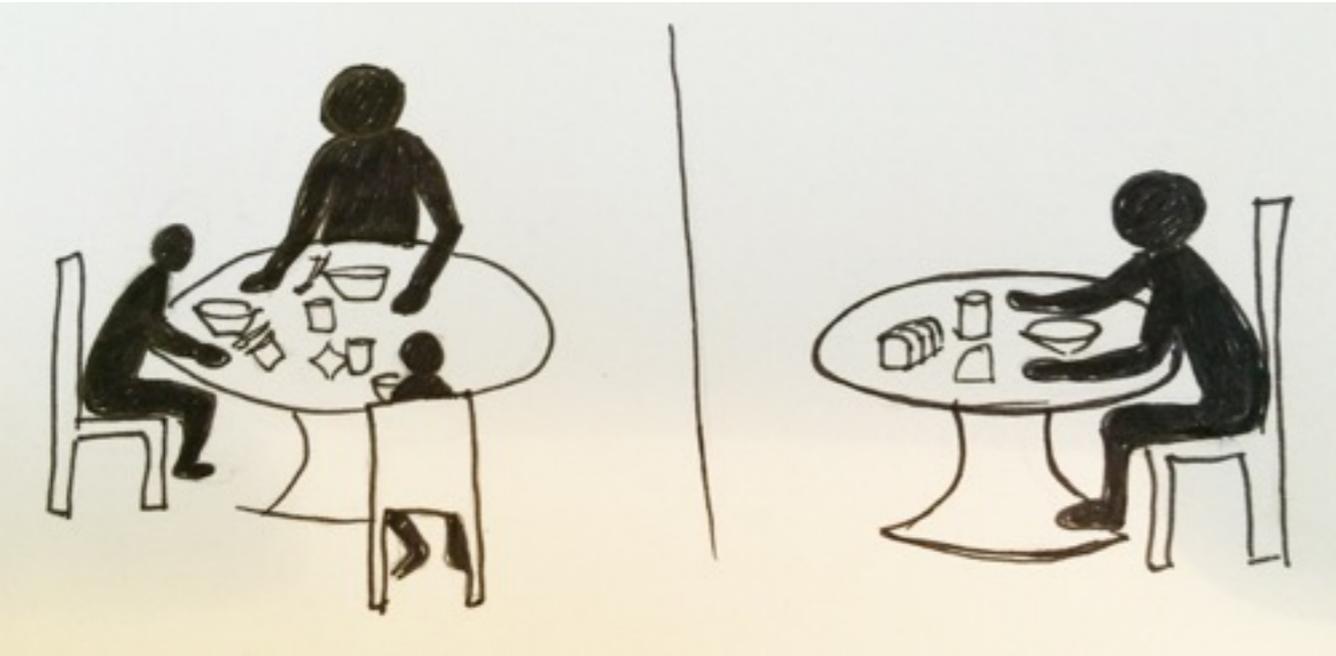
Often separated because of work, going on business trips regularly.

## COUPLE ALONE SCENARIO

**NEEDS - They want to**  
feel close while remotely dining

communicate affect

feel cozy, a sense of warmth



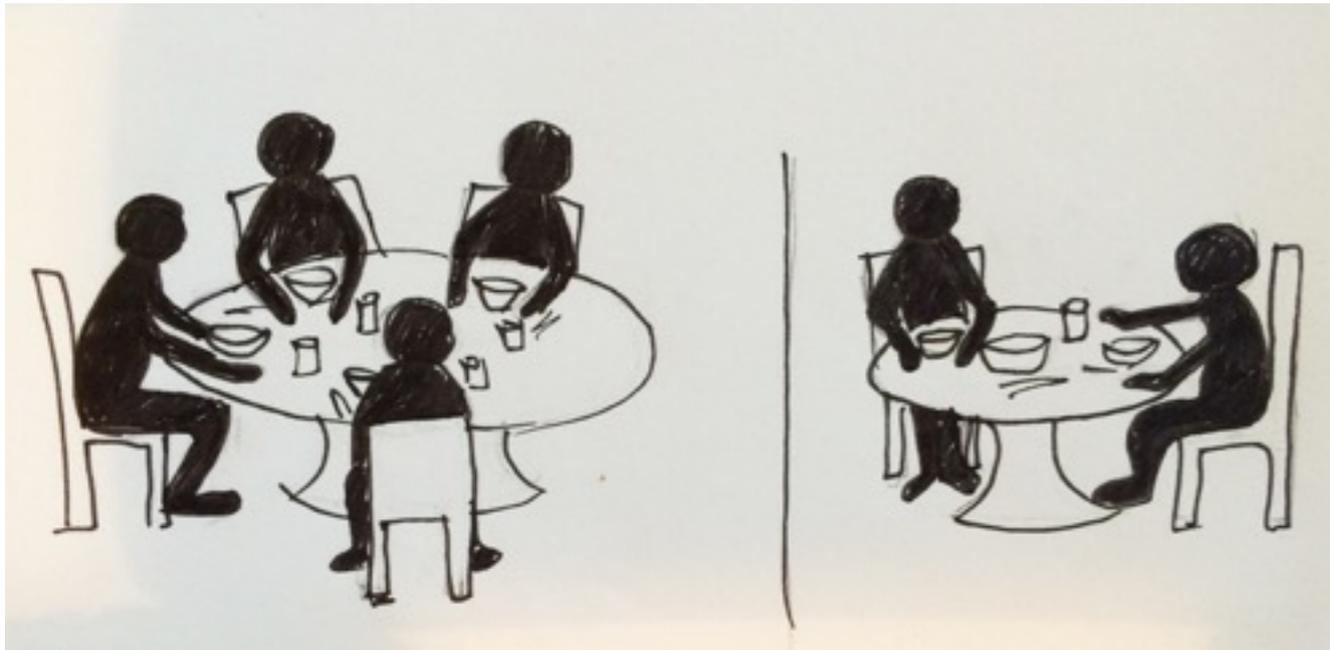
## BACKGROUND

A parent with two children, and a grandfather at a distant location. They can only dine together couple of times a year.

## FAMILY SCENARIO

**NEEDS** - They want to feel as if they're sitting around the same table

'come together' and feel 'united' as a family.



## BACKGROUND

Couple dining with their own families at distant locations, away from each other.

# TWO COUPLES SCENARIO

**NEEDS** - They want to communicate while eating with their families

discrete communication that doesn't interrupt others

feel closeness, together, warmth



# RAPID PROTOTYPING

## GOAL

Show joint action or movement

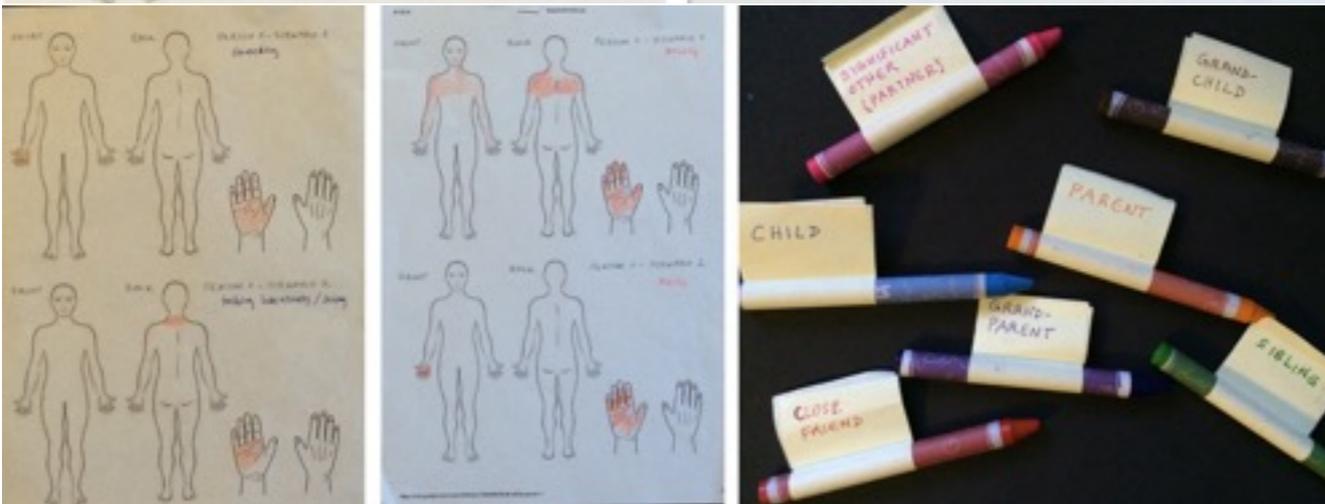
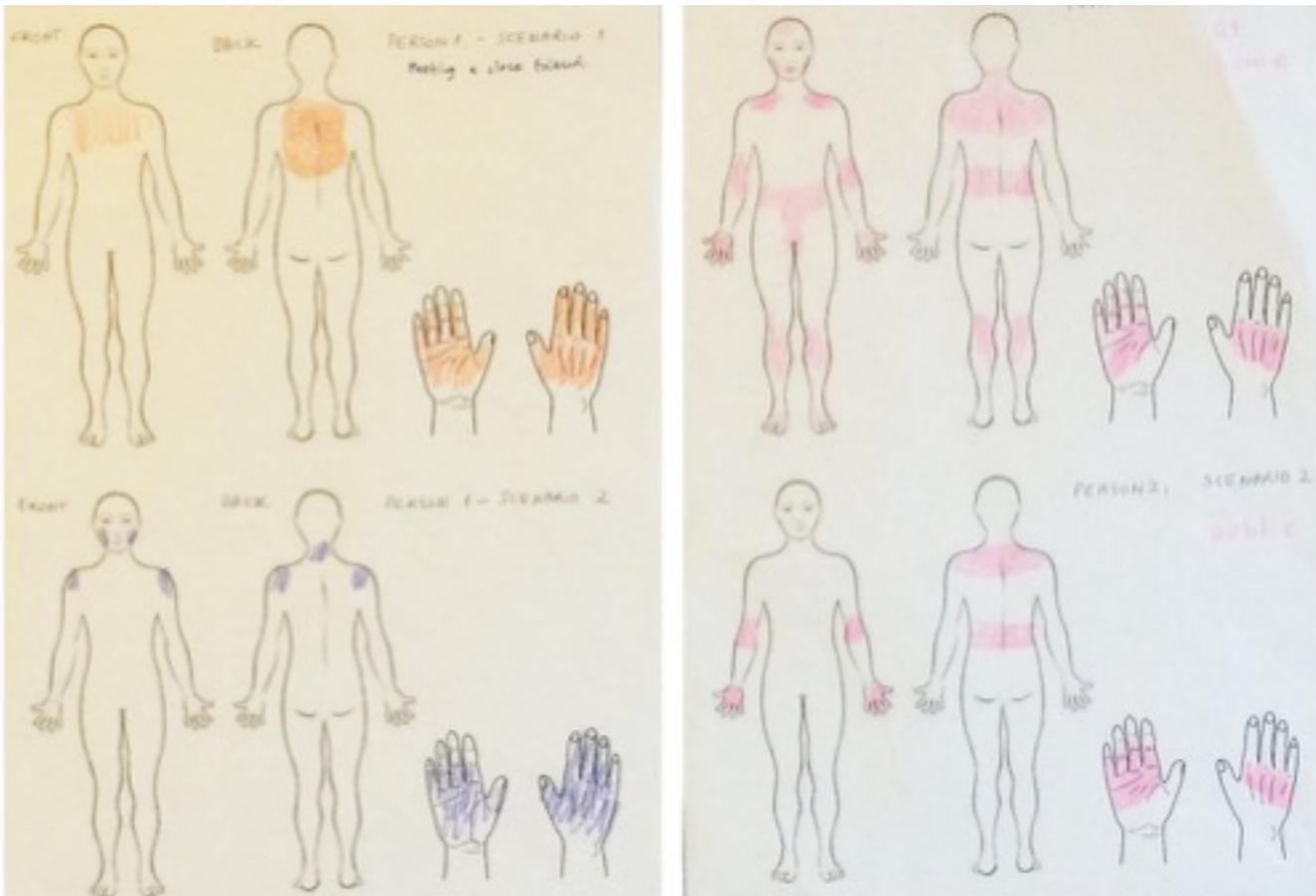
## PROCESS

Four participants during dining  
Inflated gloves & tube

## RESULT

Positive about joint action,  
it made them feel connected





## COLOR-IN EXERCISE

“Body, touch and context”

### GOAL

Explore the relationship between touch, body parts & context

### PROCESS

Twelve participants

### RESULT

Most touched are  
Non vulnerable body parts



## EXPLORING FORMS

### GOAL

Exploring grips, squeezes, and different hand positions

### RESULT

Informed the building of prototypes



# EMOTIONS & TOUCH WORKSHOP 1

“Togetherness”

## GOAL

Find out if it's possible to express togetherness through sense of touch?

## PROCESS

Seven participants during dining with family

## RESULT

Different dimensions of touch could be explored - location, duration, intensity





# EMOTIONS & TOUCH WORKSHOP 2

## GOAL

Find out if it's possible to communicate feelings via touch

Explore dimensions of touch: intensity, duration, etc

## PROCESS

Three participants

Described & expressed their feelings

## RESULT

Similar feelings 'relaxed' were expressed in a similar way, relatively same length of time



## DESIGN PROCESS



# EXPERIENCE PROTOTYPING

“Modalities of expression”

## GOAL

Explore the interaction alternatives of each scenario

Where to place the objects

Explore design possibilities around the bodies, objects, table, etc

To inform the final design solutions



# EXPERIENCE PROTOTYPING

“Modalities of expression”

## GOAL

Explore interaction alternatives of that allows playfulness

Explore design possibilities around the table while dining

To inform the final design solutions

## OBSERVATIONS

Kids interested in shared object  
Focus was on table & each other

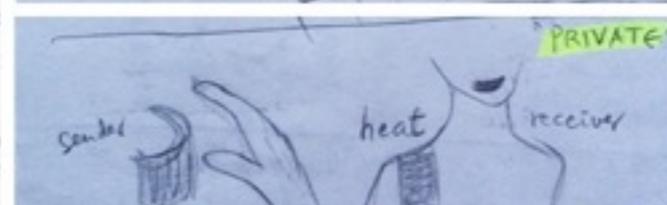
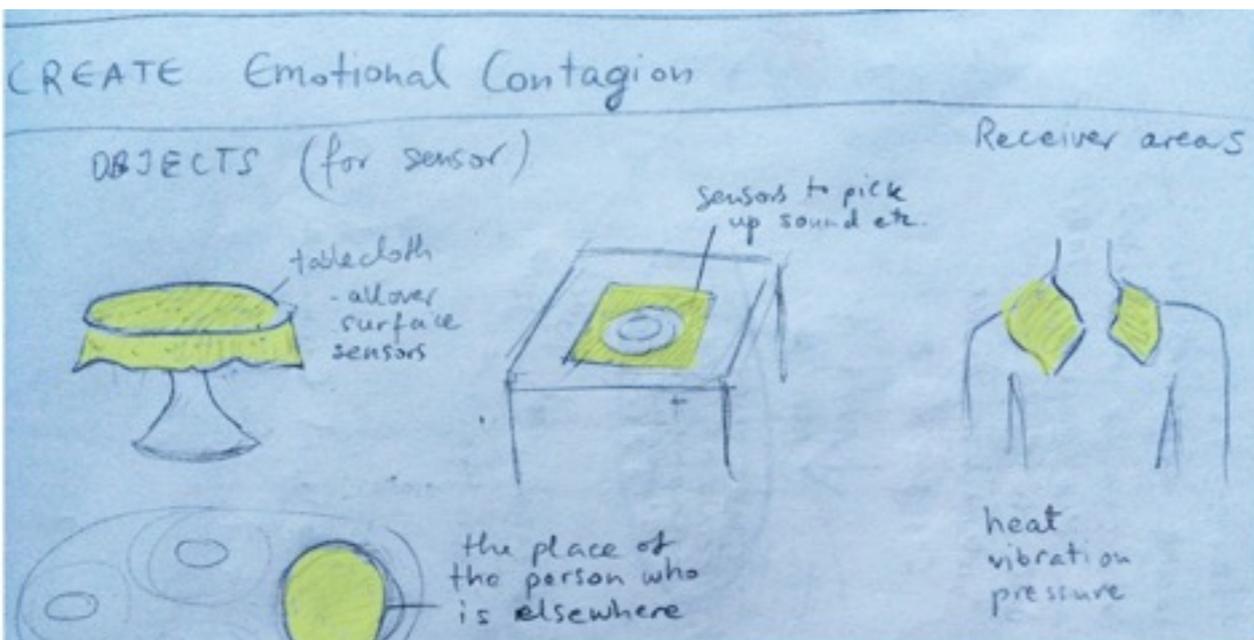




## EVALUATING IDEAS SKETCHES

Placing the object

Selecting the right movements, actions



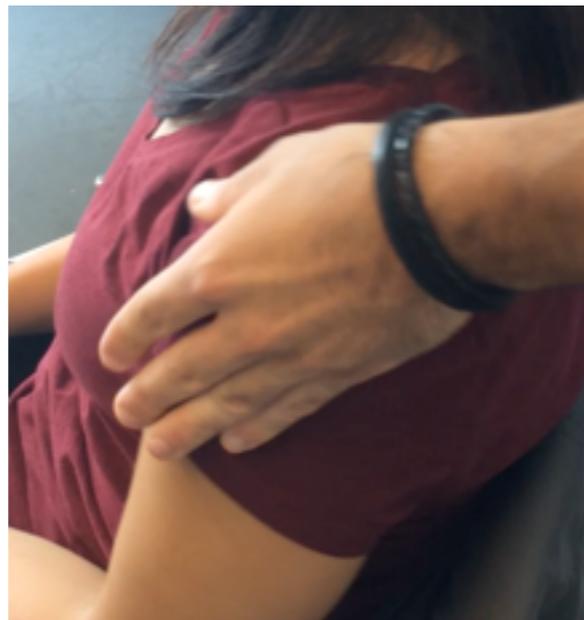
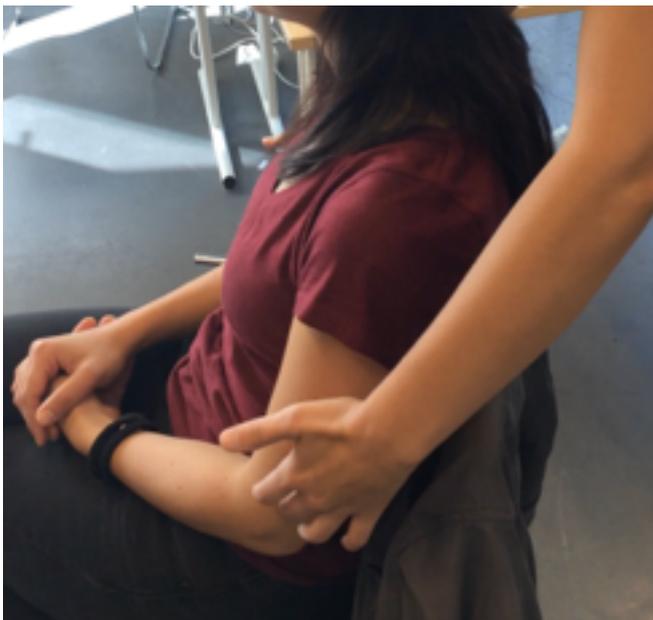
## FINAL DESIGN SUGGESTION 1



## 'CUDDLY' COZINESS

### INSPIRATION

Inspired by participant descriptions:  
'slow down', 'relaxed', 'warmth'



Motivated by touches observed during  
"Mealtime, feelings and touch"  
workshop

## FINAL DESIGN SUGGESTION 1



## 'CUDDLY' COZINESS

### DESCRIPTION

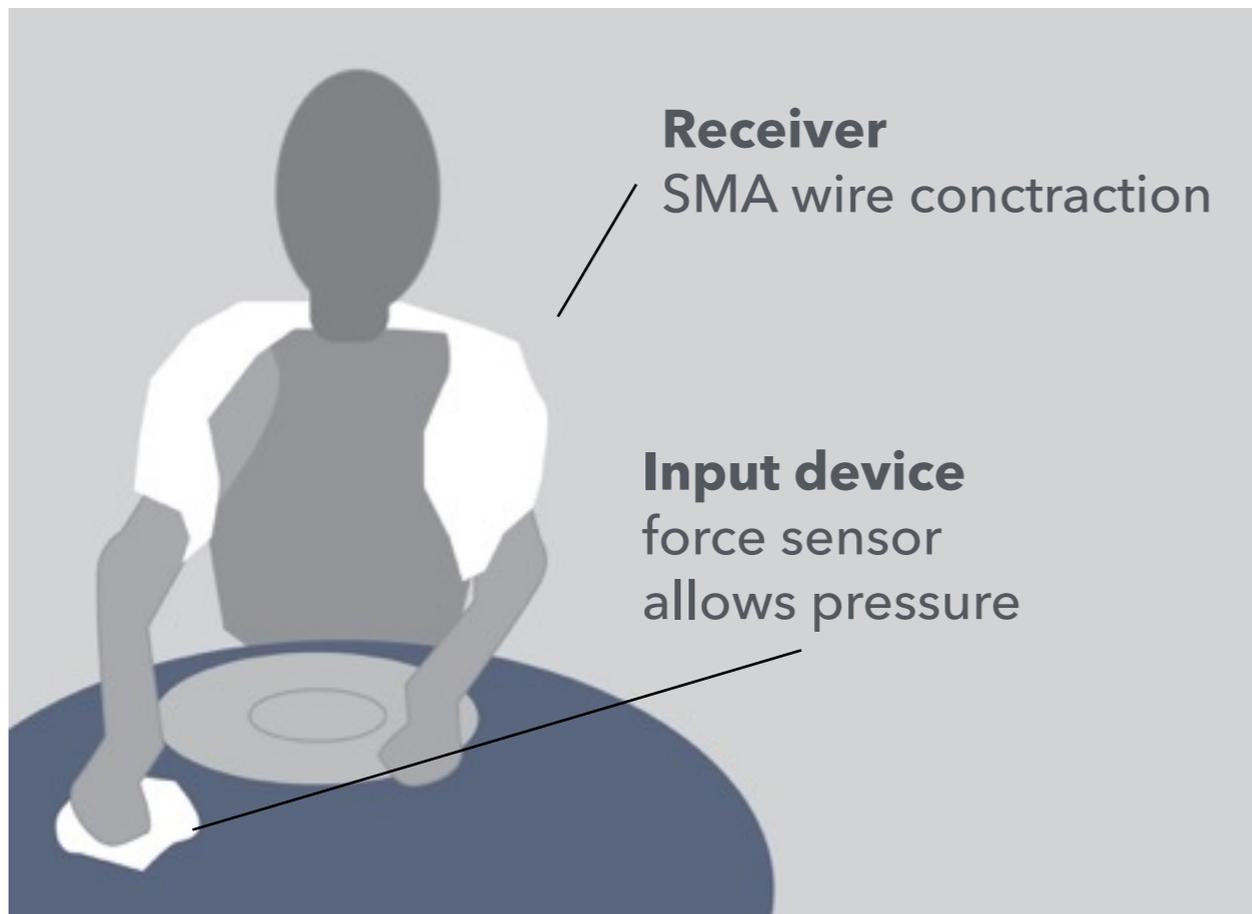
Enables a sense of warmth and togetherness

### Modalities

pressure  
vibration

**Input device:** force sensor (pressure)

**Receiver:** SMA wire contraction



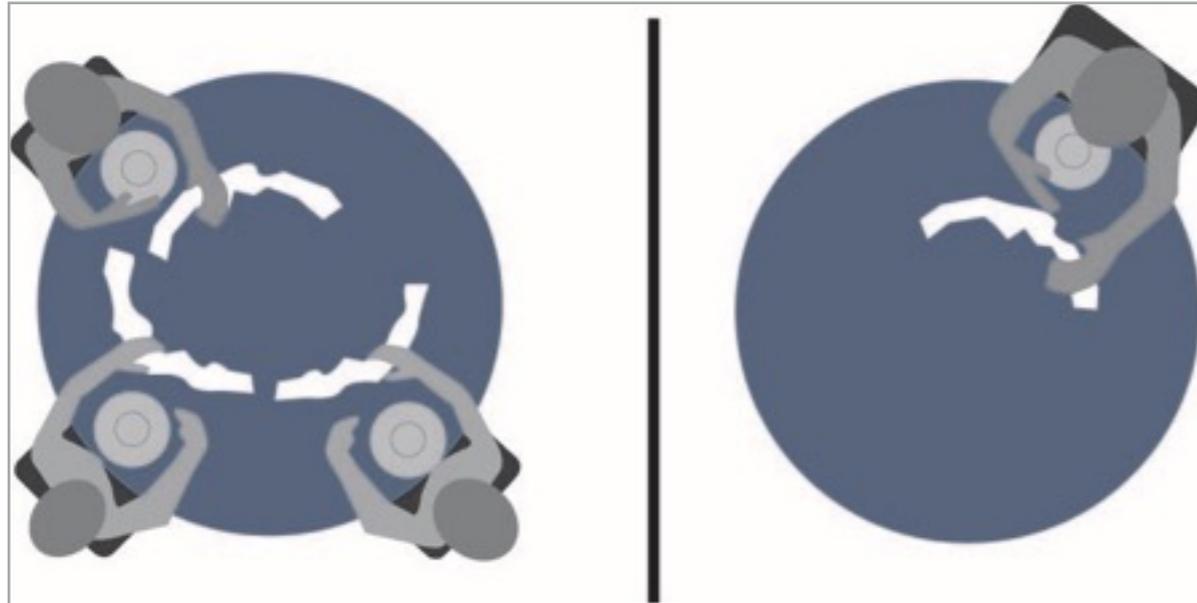


## “CIRCLE OF HANDS” **PLAYFULNESS**

### **INSPIRATION**

Circle games - children hold hands  
Family dining - similar setup





## “CIRCLE OF HANDS” **PLAYFULNESS**

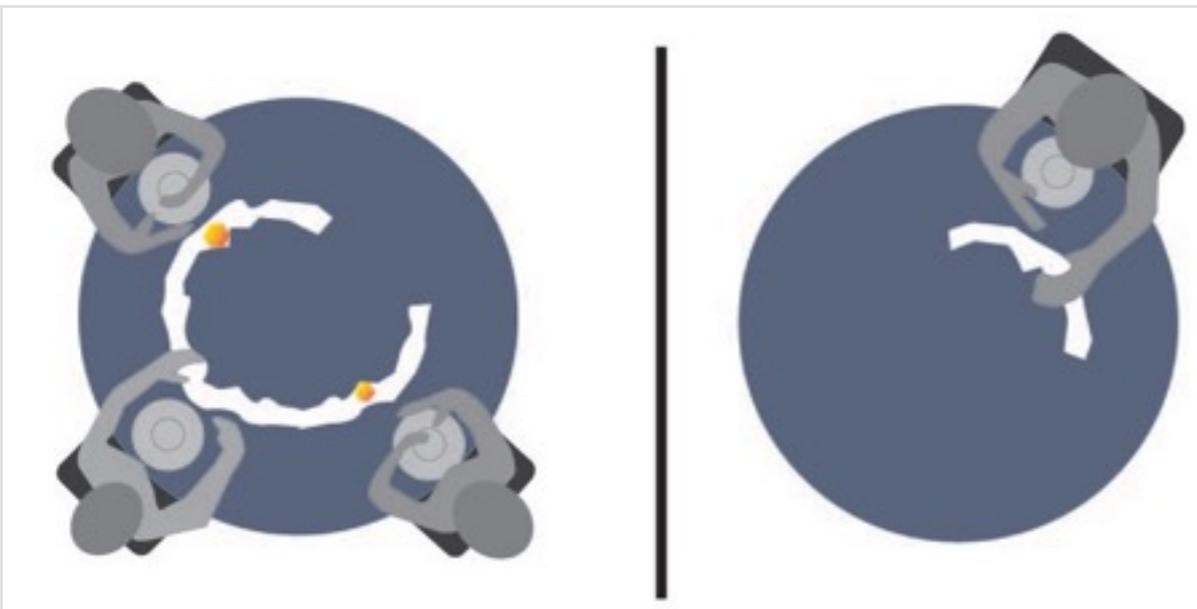
### **DESCRIPTION**

Composite - multiparts, depending on the number of family members

Haptic feedback - physical link

Sender & receiver same object

Real-time joint action



### **Modalities**

squeeze

twist

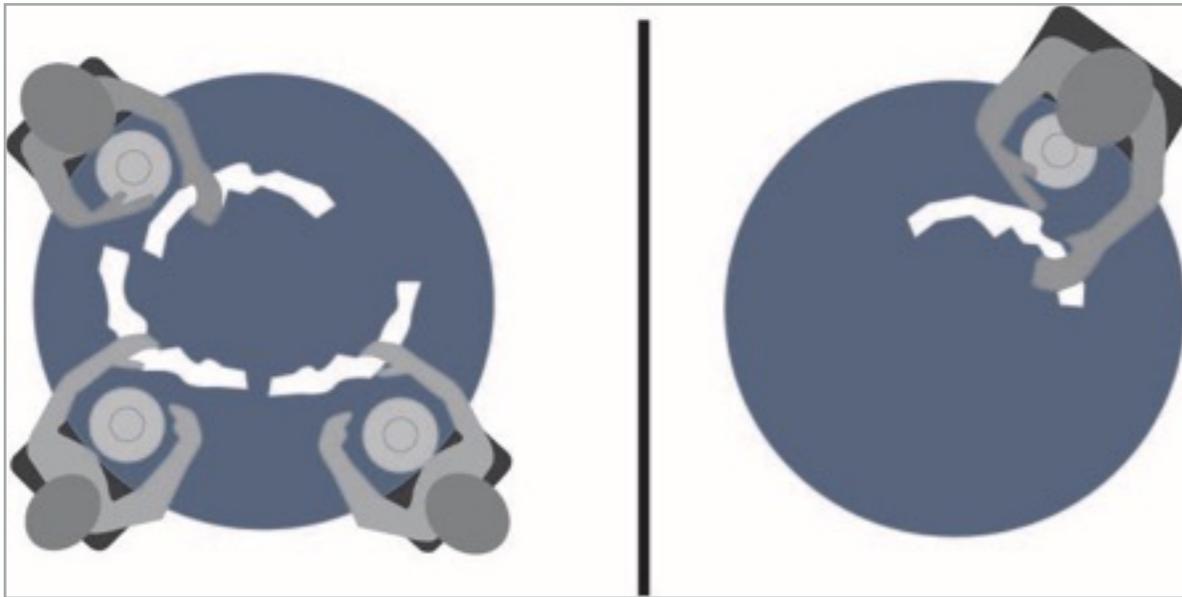
pressure

light

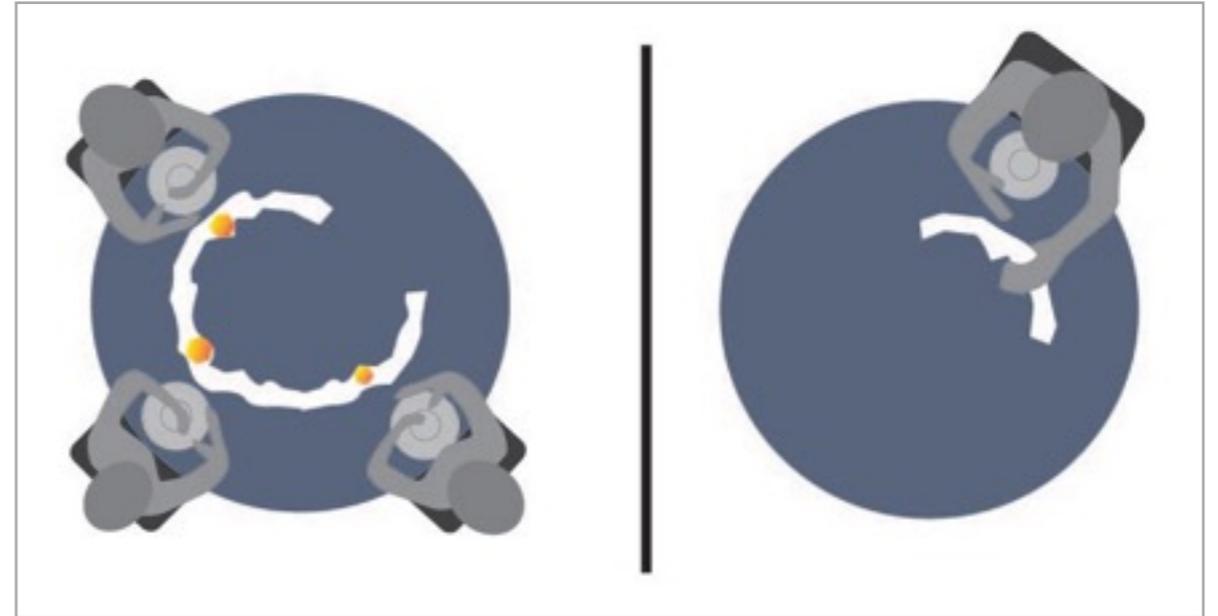
# FINAL DESIGN SUGGESTION 2



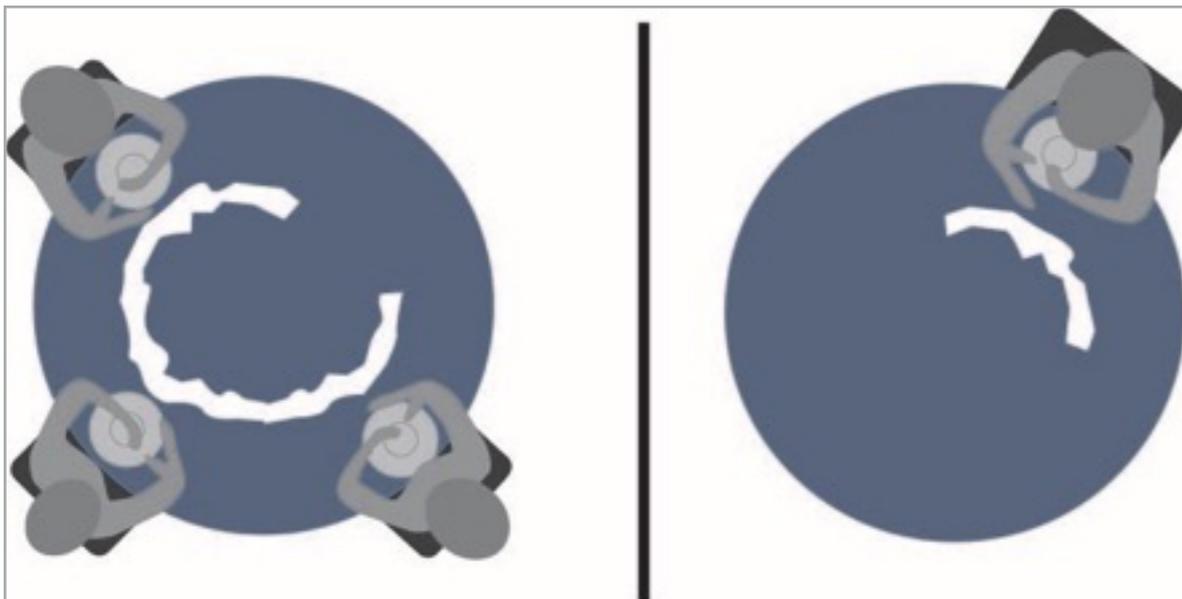
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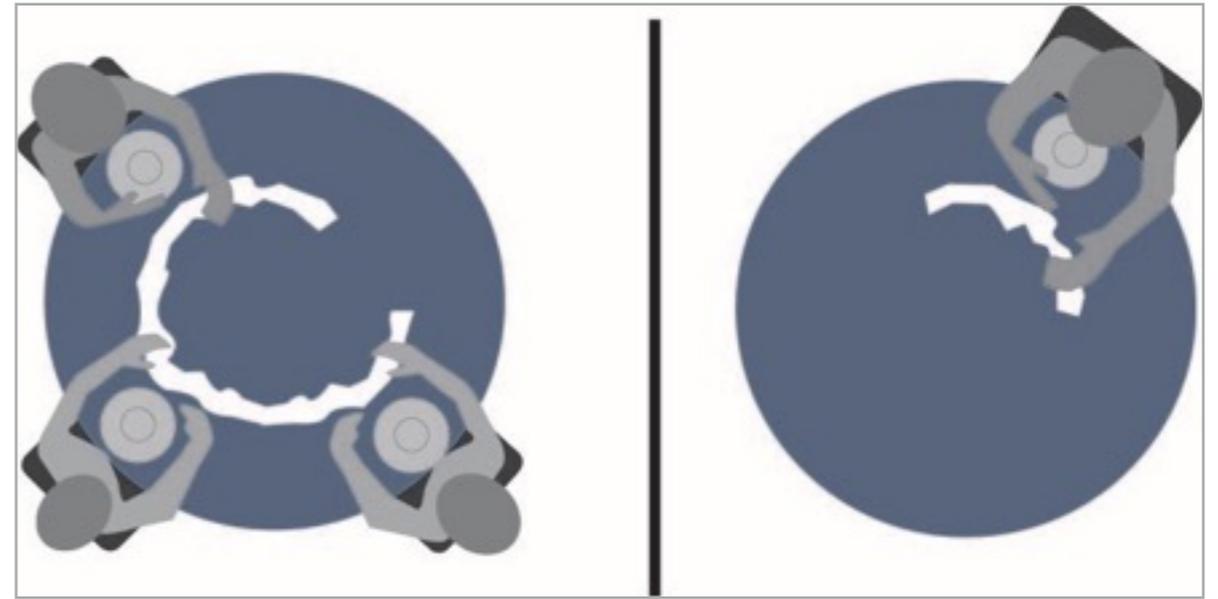
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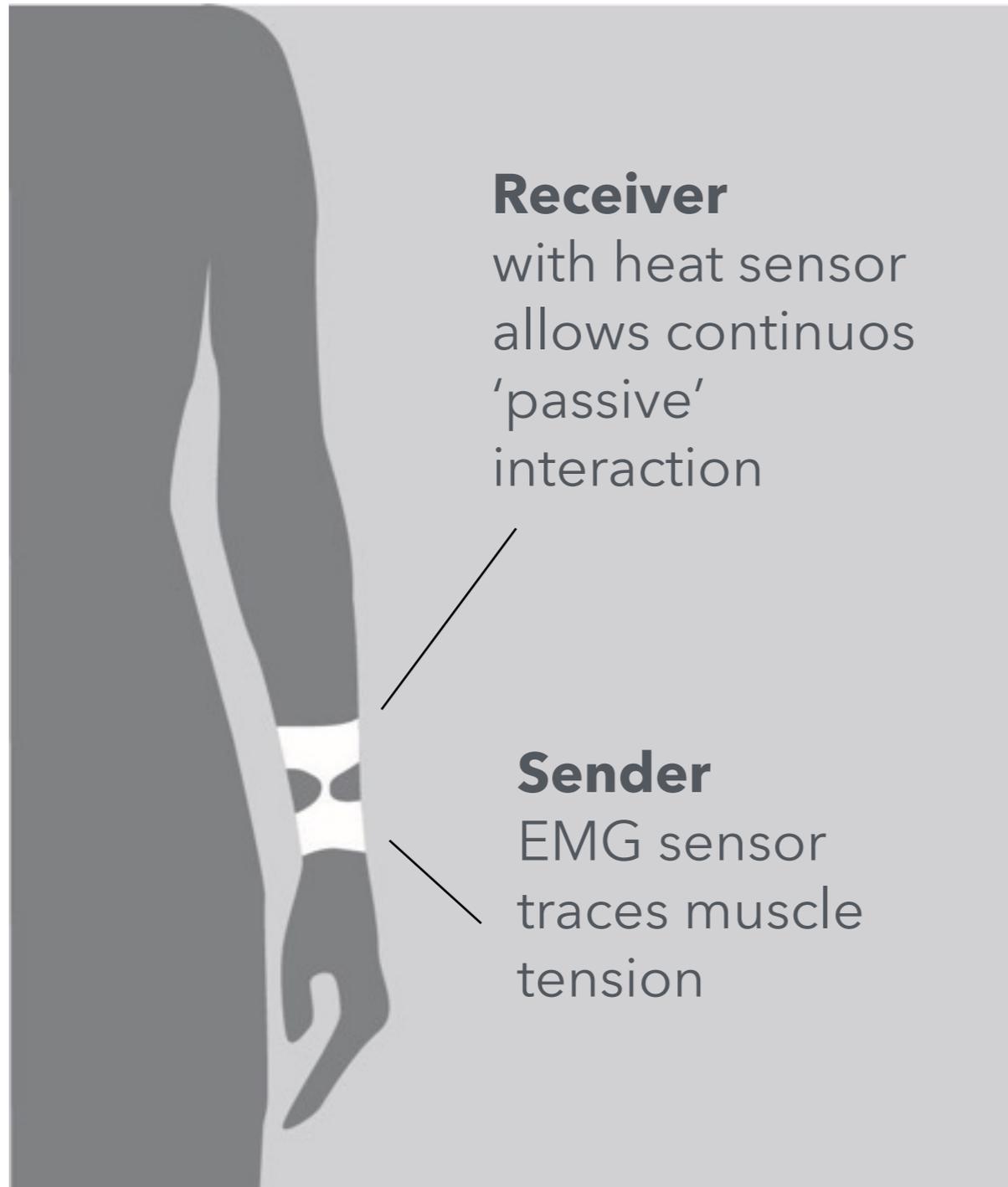
## 'DINNER COMPANION' **DISCRETENESS**

### **INSPIRATION**

Inspired by couples entwining their arms

The gesture was also observed during the family dinner workshop





## 'DINNER COMPANION' **DISCRETENESS**

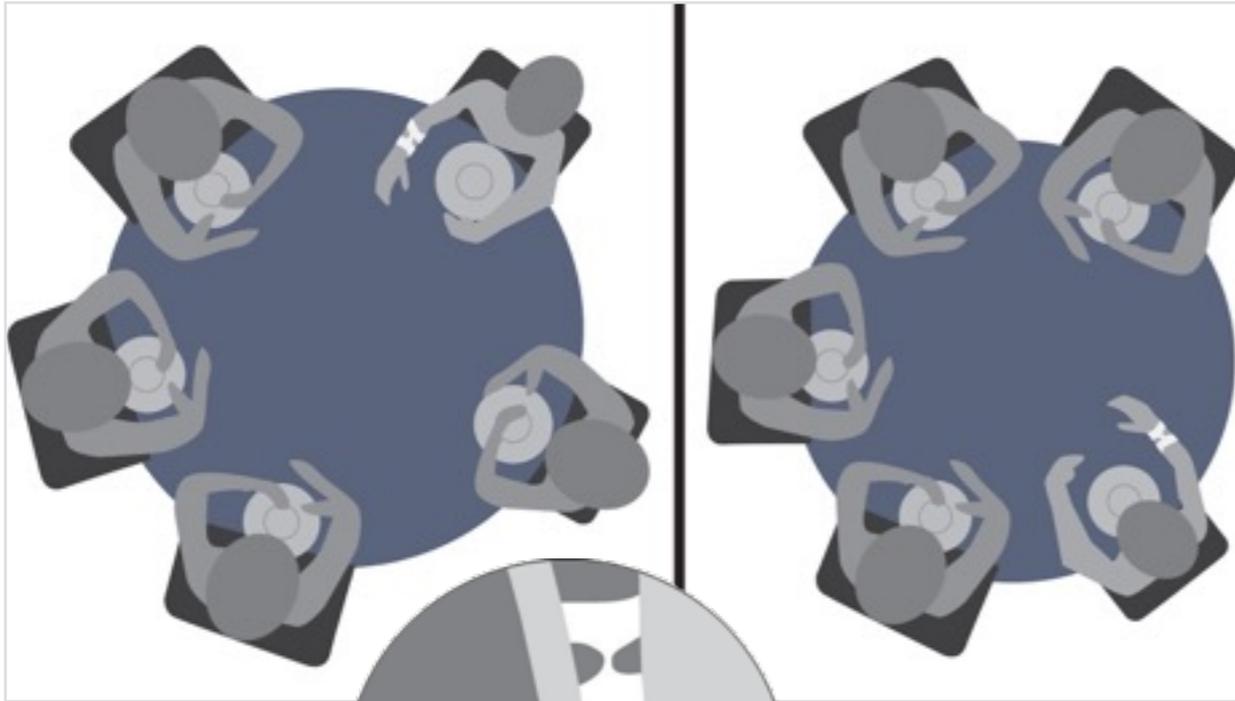
### **MODALITIES**

It relies on both sensory & kinesthetic  
system of sense of touch

Movement (muscle)

Heat - feel each others temperature

## FINAL DESIGN SUGGESTION 3



## 'DINNER COMPANION' DISCRETENESS

### DESCRIPTION

Enables couples remotely 'being there' with each other

Allows 'discrete' interaction





## FUTURE POSSIBILITIES

Refinement  
of design

Explore other  
social activities  
& modalities

Explore  
technologies

User testing

**Thank You**