

EmoBalloon

Conveying Emotional Arousal
in Text Chats with Speech Balloons



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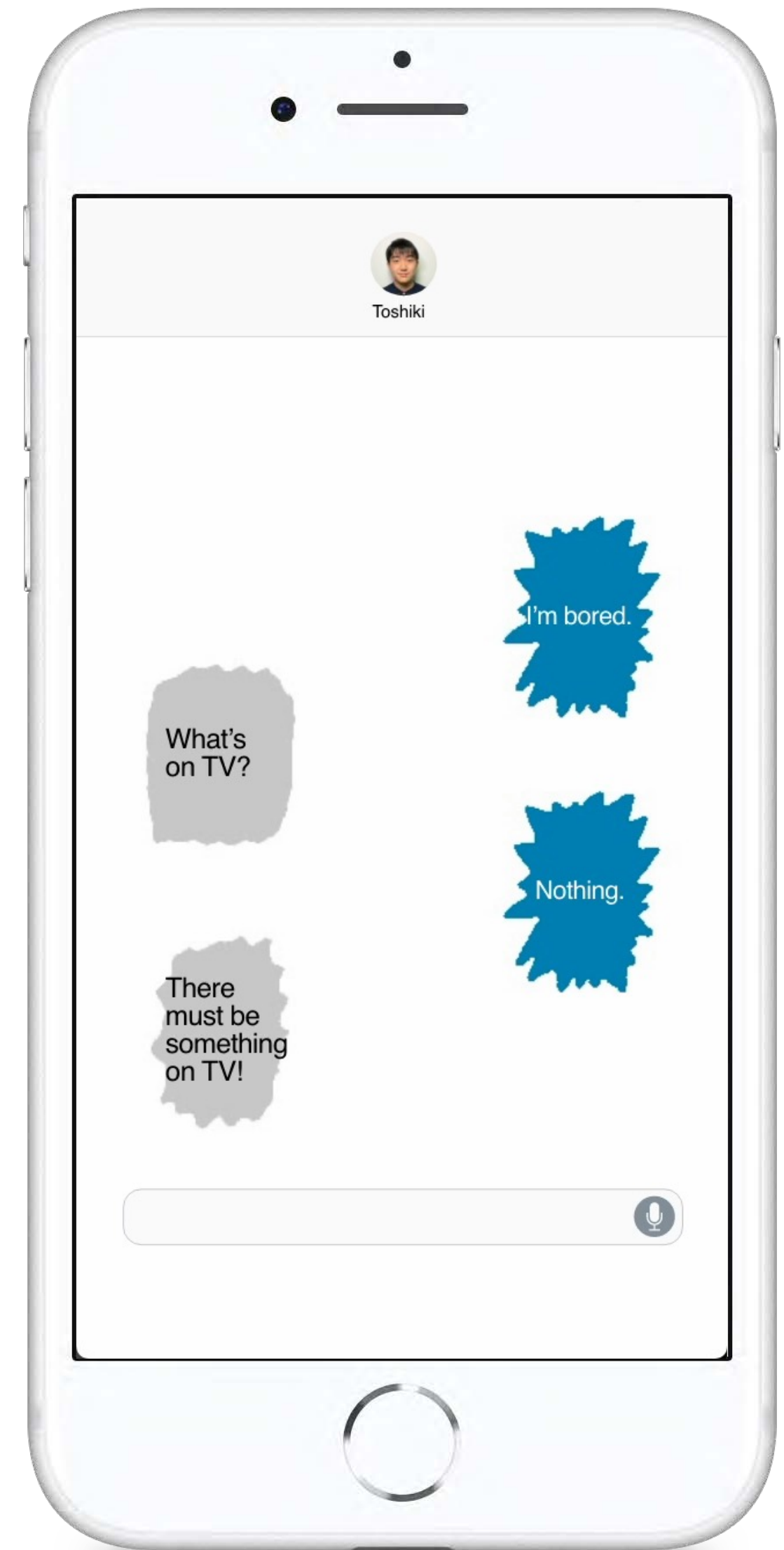
ARI HAUTASAARI



THE UNIVERSITY OF TOKYO

* Both authors contributed equally to this research.

EmoBalloon
is a novel method
to convey
emotional arousal
in text chats



EmoBalloon

Introduction

WhatsApp
Messenger
Wechat
LINE
etc..

Lorem ipsum

10:35 am ✓✓

Lorem ipsum dolor sit amet,

10:42 am

Lorem ipsum dolor

10:33 am ✓✓

Lorem ipsum

10:33 am ✓✓

Lorem

10:33 am ✓✓

Lorem

10:33 am

Lorem ipsum dolor sit

10:33 am ✓✓

WhatsApp

Problem:

Limitations to the transfer of
emotional information

etc...

Lorem ipsum dolor sit amet,

10:42 am

Lorem

10:33 am

in Text Chat

Letters

Emoticons

Stickers

... (is it enough?)

Lorem ipsum

10:35 am ✓✓

Lorem ipsum dolor sit amet,

10:42 am

Lorem ipsum dolor

10:33 am ✓✓

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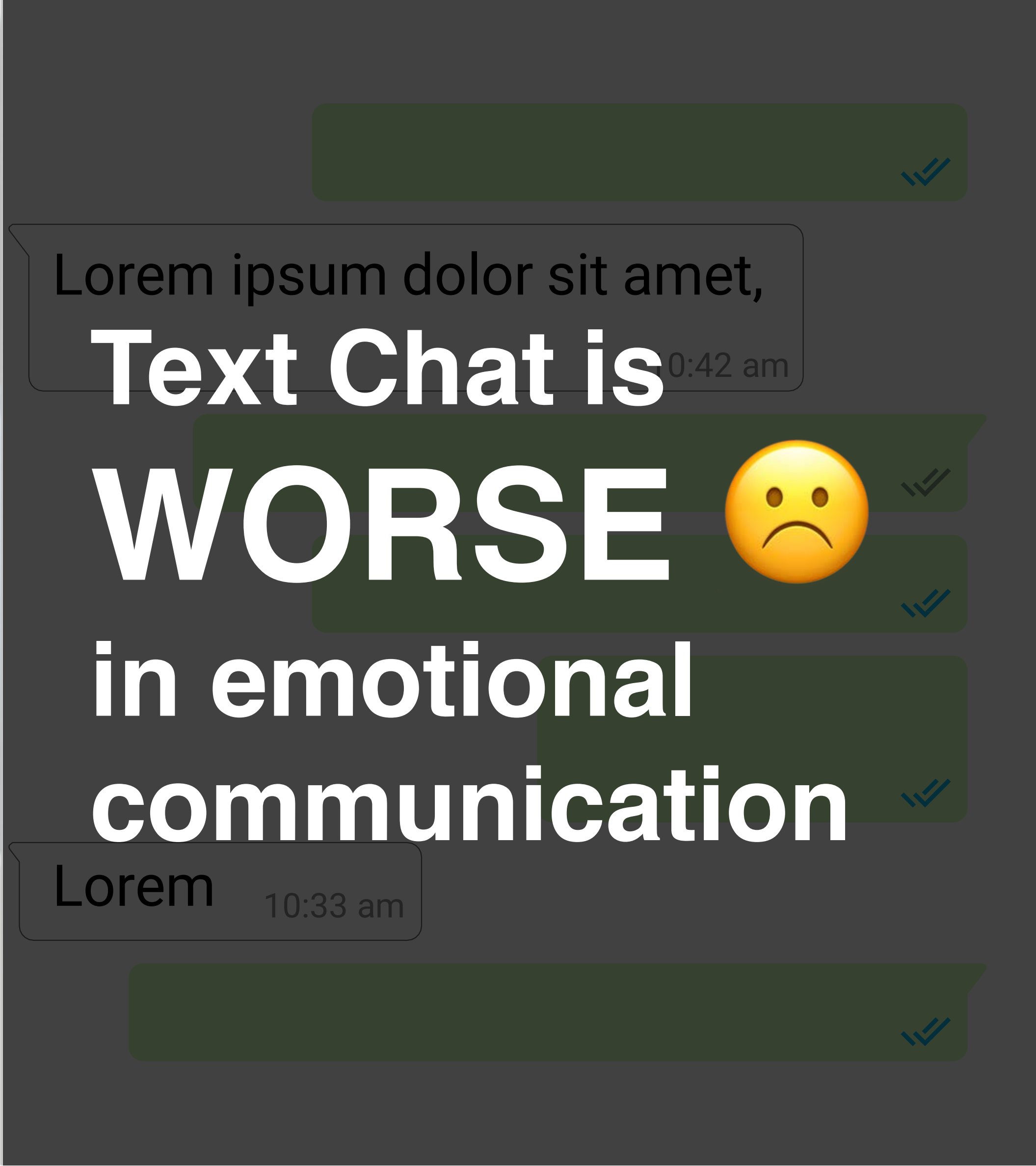


Face-to-Face
and richer media

Contents of talk
Tone of voice
Gestures
Facial expressions
etc...



**Face-to-Face
and richer media is
BETTER 😊
in emotional
communication**



Lorem ipsum dolor sit amet,

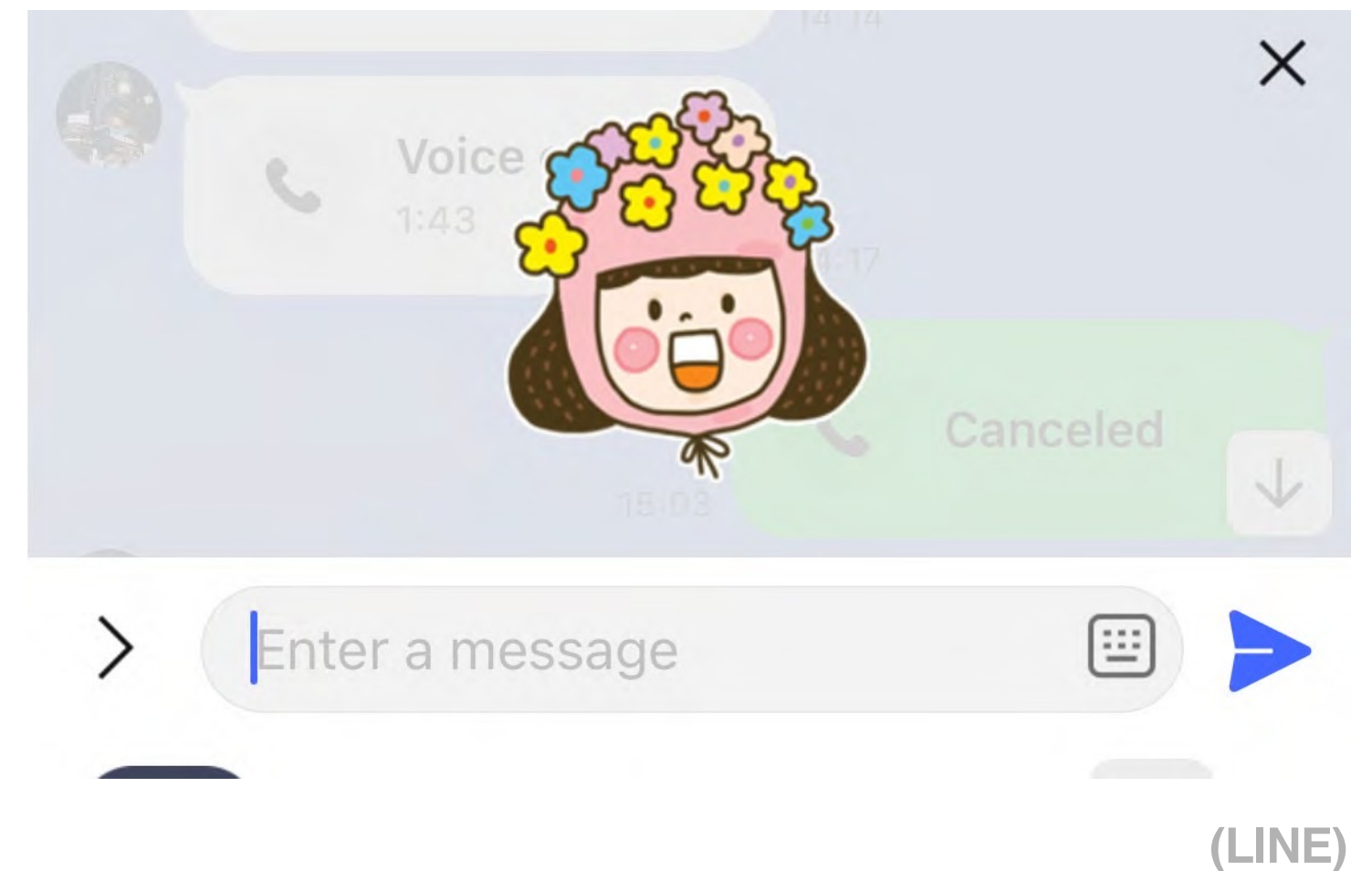
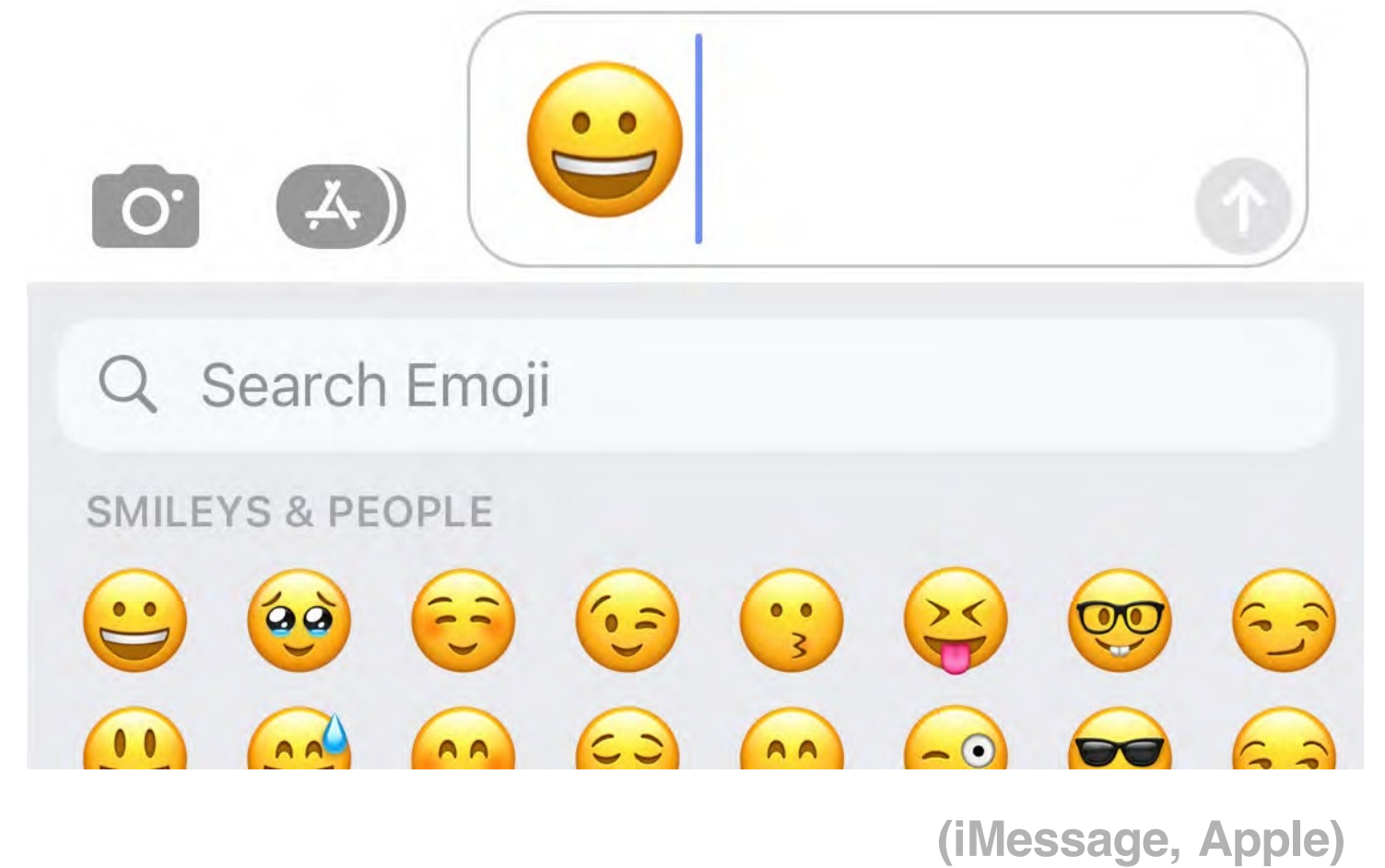
Text Chat is 10:42 am

WORSE 😞

**in emotional
communication**

Lorem 10:33 am

Emoticons
Stickers
Colors
Typeface
etc...



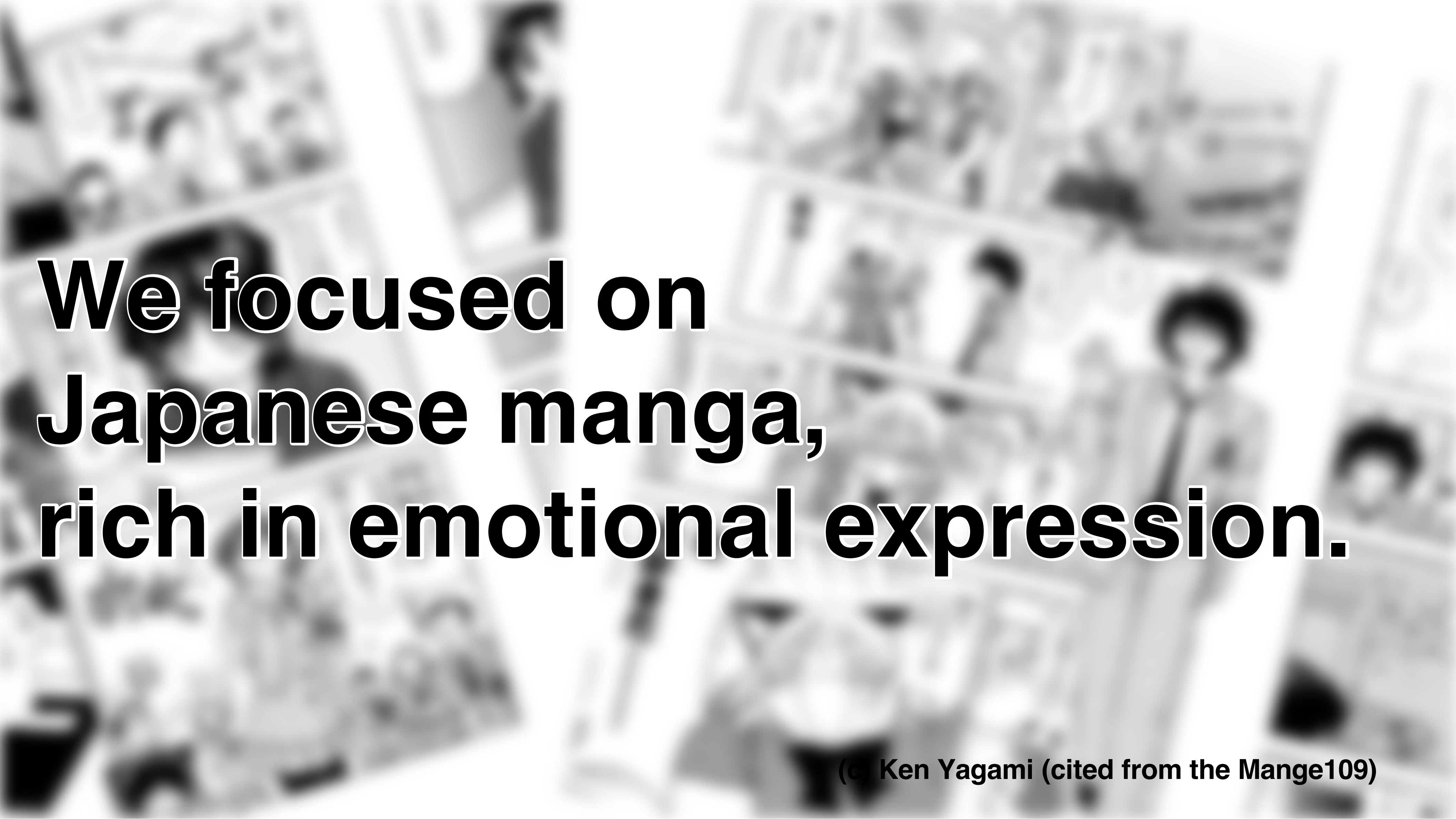
Emoticons
Stickers
Colors
Typeface
etc...



(Chen et. al., 2021)

Typeface	
Positive	i am happy these days!
Negative	I AM HAPPY THESE DAYS
Negative	I GOT FIRED
Positive	i got fired

(Choi and Aizawa, 2019)



**We focused on
Japanese manga,
rich in emotional expression.**

(c) Ken Yagami (cited from the Mange109)



Typeface

Font size

Onomatopoeia

Speech Balloon

etc...

(c) Ken Yagami (cited from the Mange109)

EmoBalloon

Approach

Analyze

the shape of speech balloons
in Japanese manga dataset

Develop

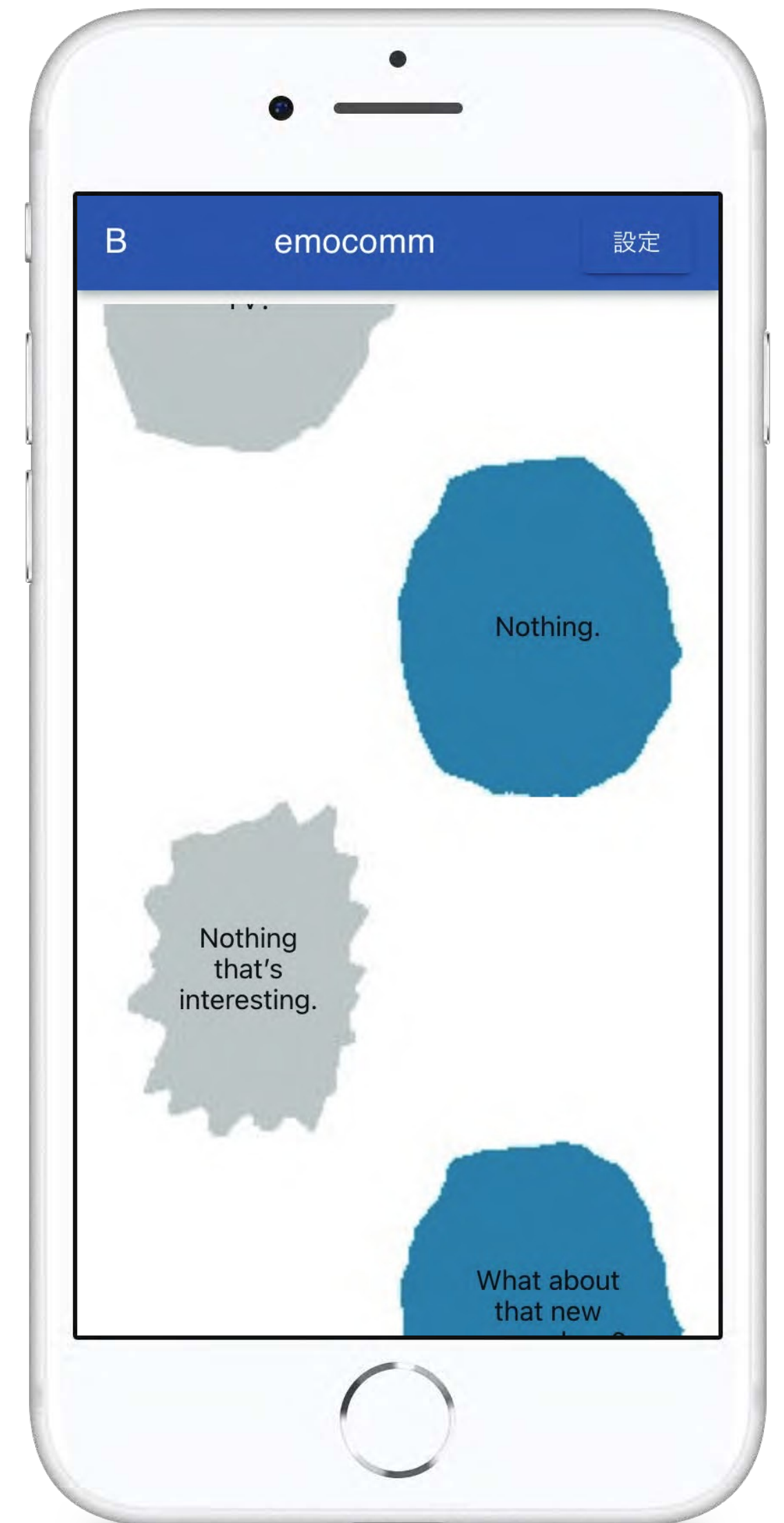
an emotional speech balloon generator with ACGAN

Validate

ACGAN by crowdsourcing

Implement

text chat system with generated speech balloons
called “EmoBalloon”



Analyze

the shape of speech balloons
in Japanese manga dataset

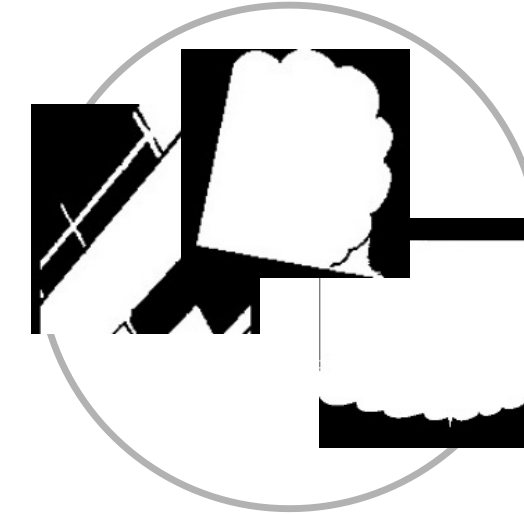


(c) Ken Yagami, Masakazu Ooi, Masako Yoshi, Motoei Shinzawa
(cited from the Manga109)

Detect and classify
speech balloons
into three types

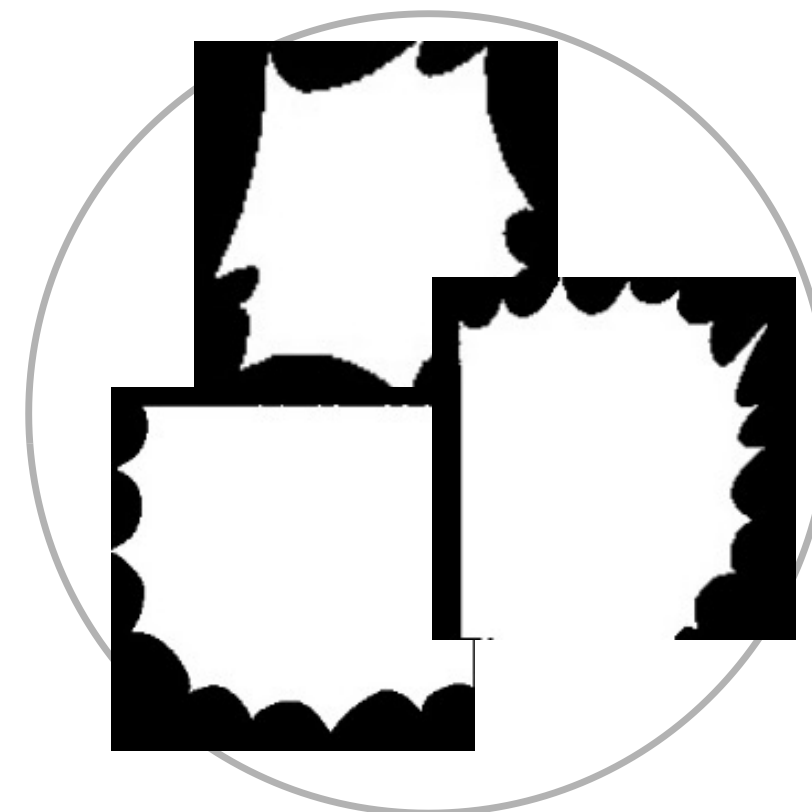
based on Tanaka et. al., (2015)

Others



Round Shape
Neutral Emotion

High Arousal Emotion
Explosion Shape



Analyze

the shape of speech balloons
in Japanese manga dataset



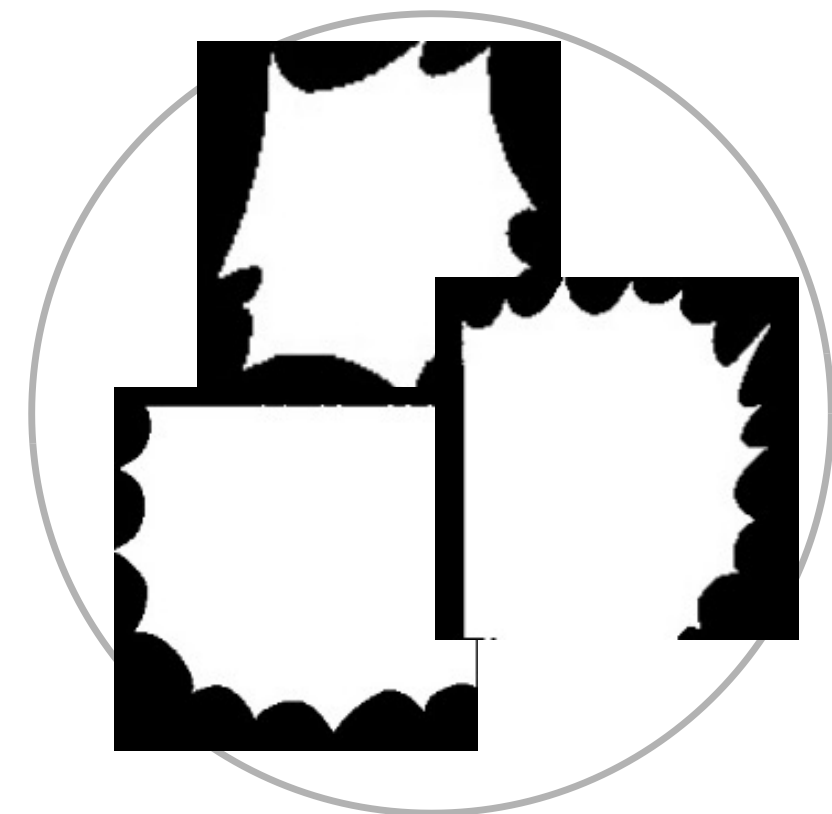
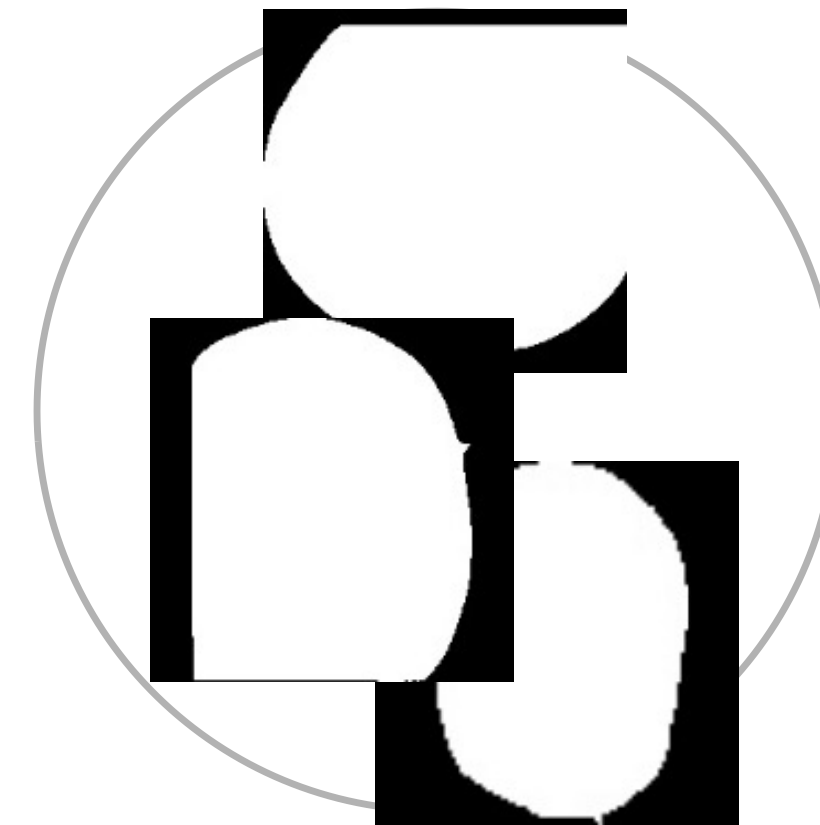
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Round Shape
Neutral Emotion

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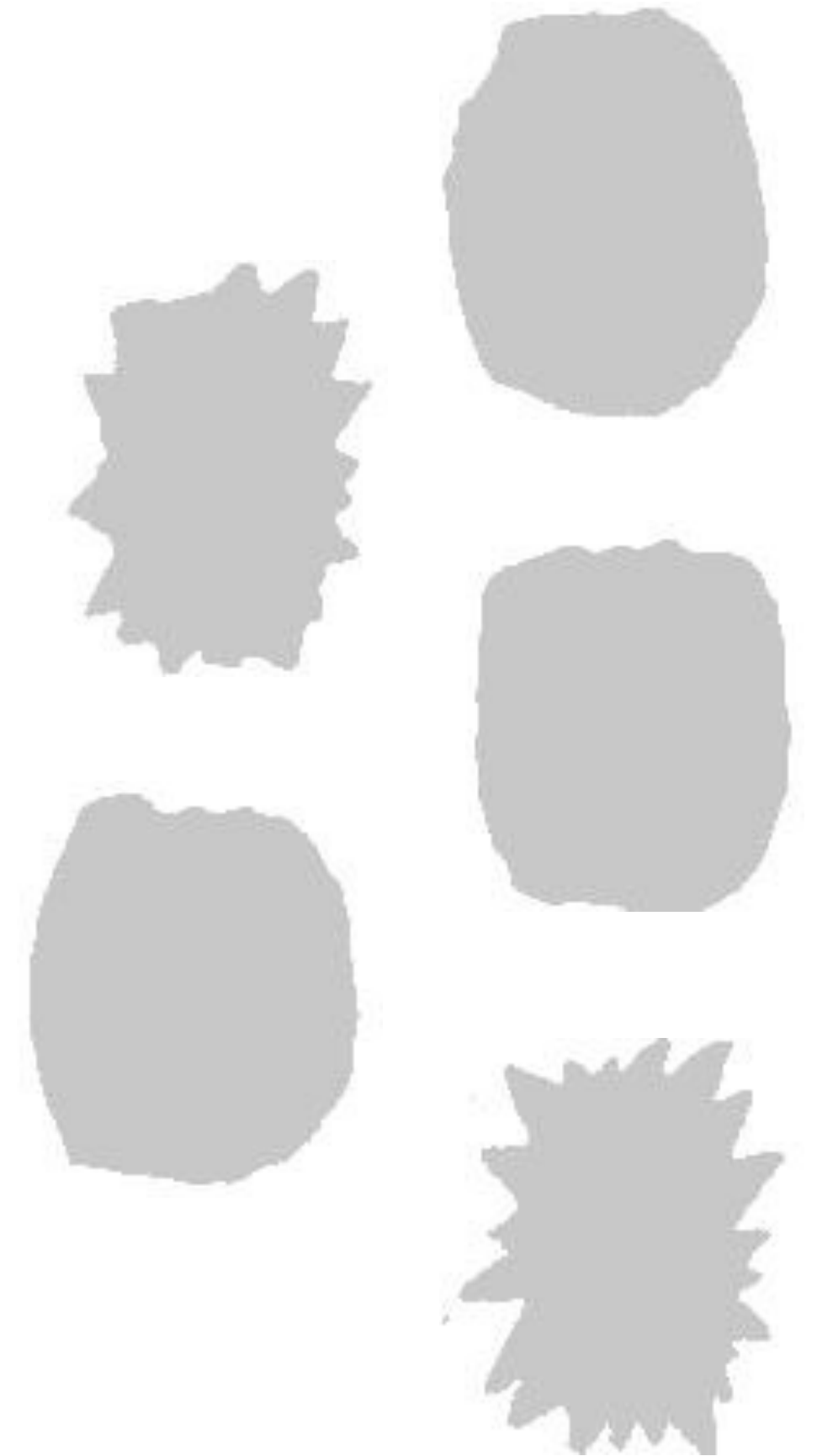


Develop

an emotional speech balloon generator with ACGAN



Trained a generative model (ACGAN)
with rendered 100,000 speech balloon images



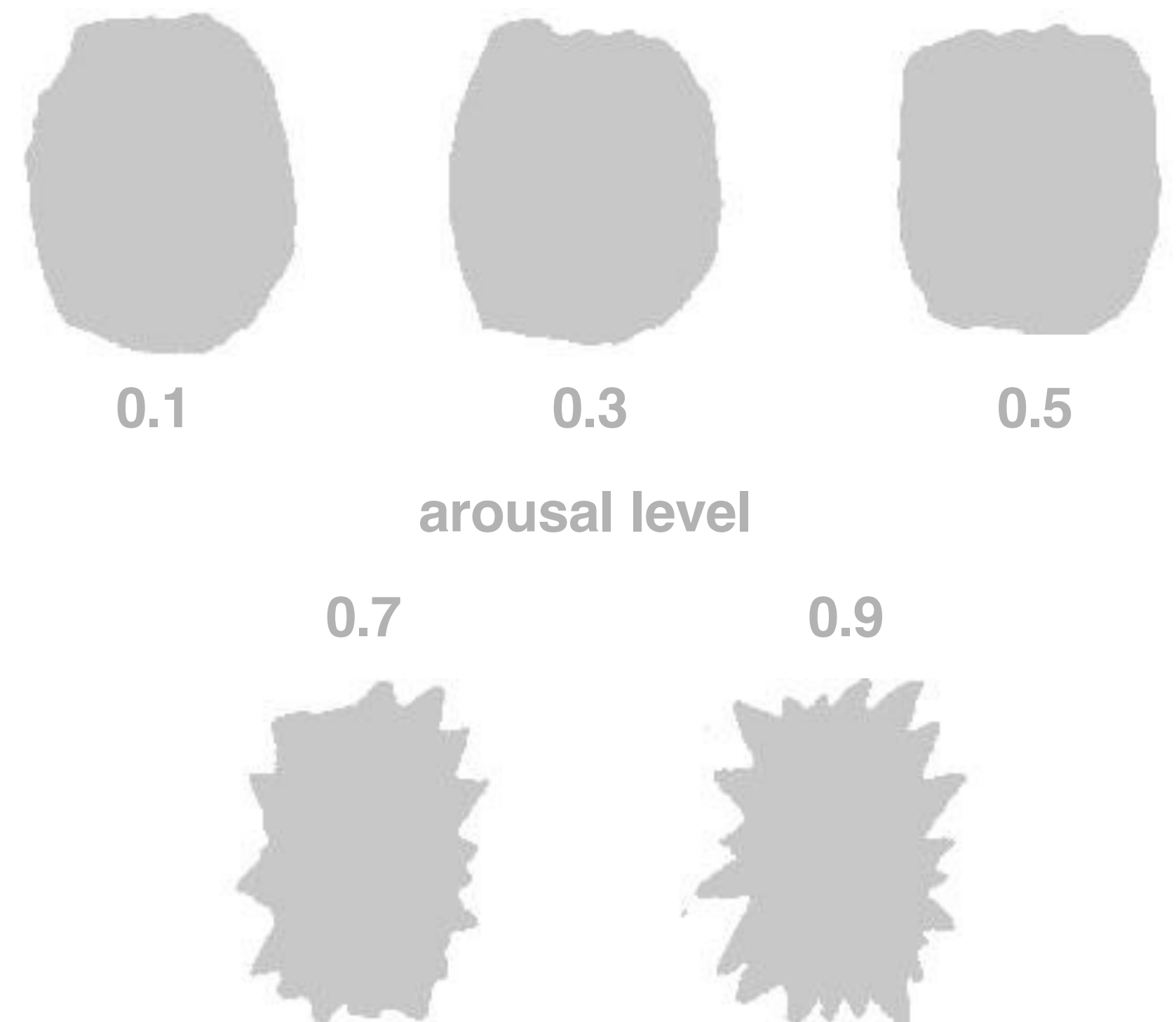
(c) Ken Yagami, Masakazu Ooi, Masako Yoshi, Motoei Shinzawa
(cited from the Manga109)

Validate

ACGAN by crowdsourcing



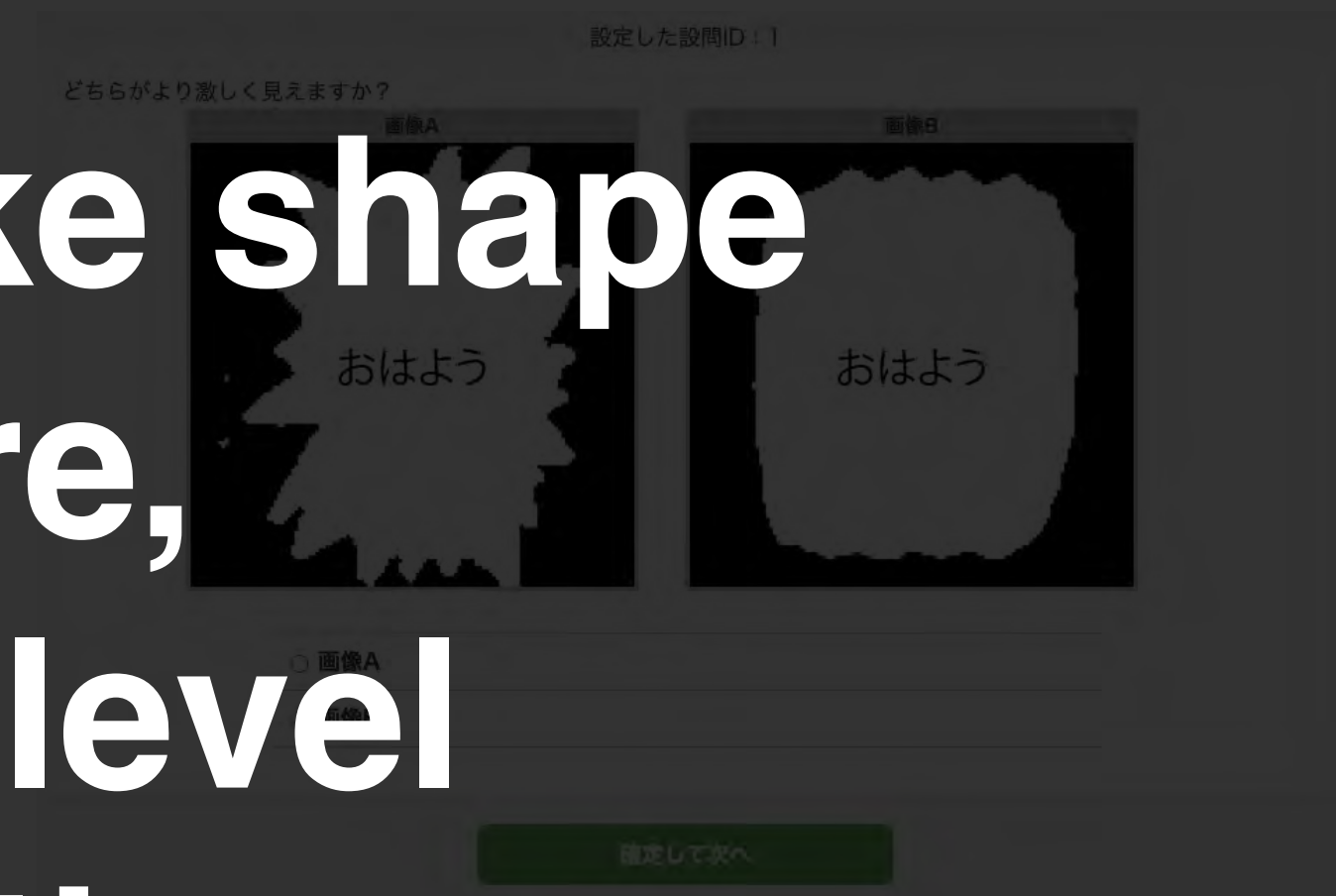
Crowdworkers (n=210)
complete a pairwise comparison
of the generated speech balloons



Validate

ACGAN by crowdsourcing

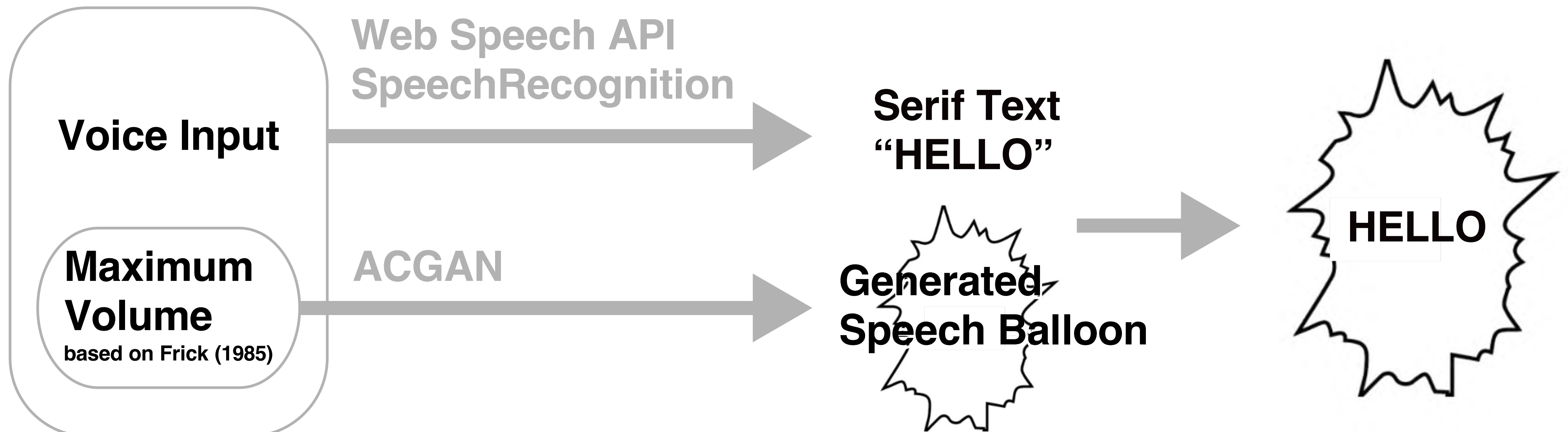
The more explosion-like shape the speech balloons are, the higher the arousal level they are associated with.



Crowdworkers (n=210)
complete a pairwise comparison
of the generated speech balloons

Implement

text chat system with generated speech balloons
called “EmoBalloon”



EmoBalloon

Expreriments

We conducted a controlled experiment
**to investigate the effects
that emotional speech balloons have
on text based communication
in interactive settings.**

Voice input EmoBalloon

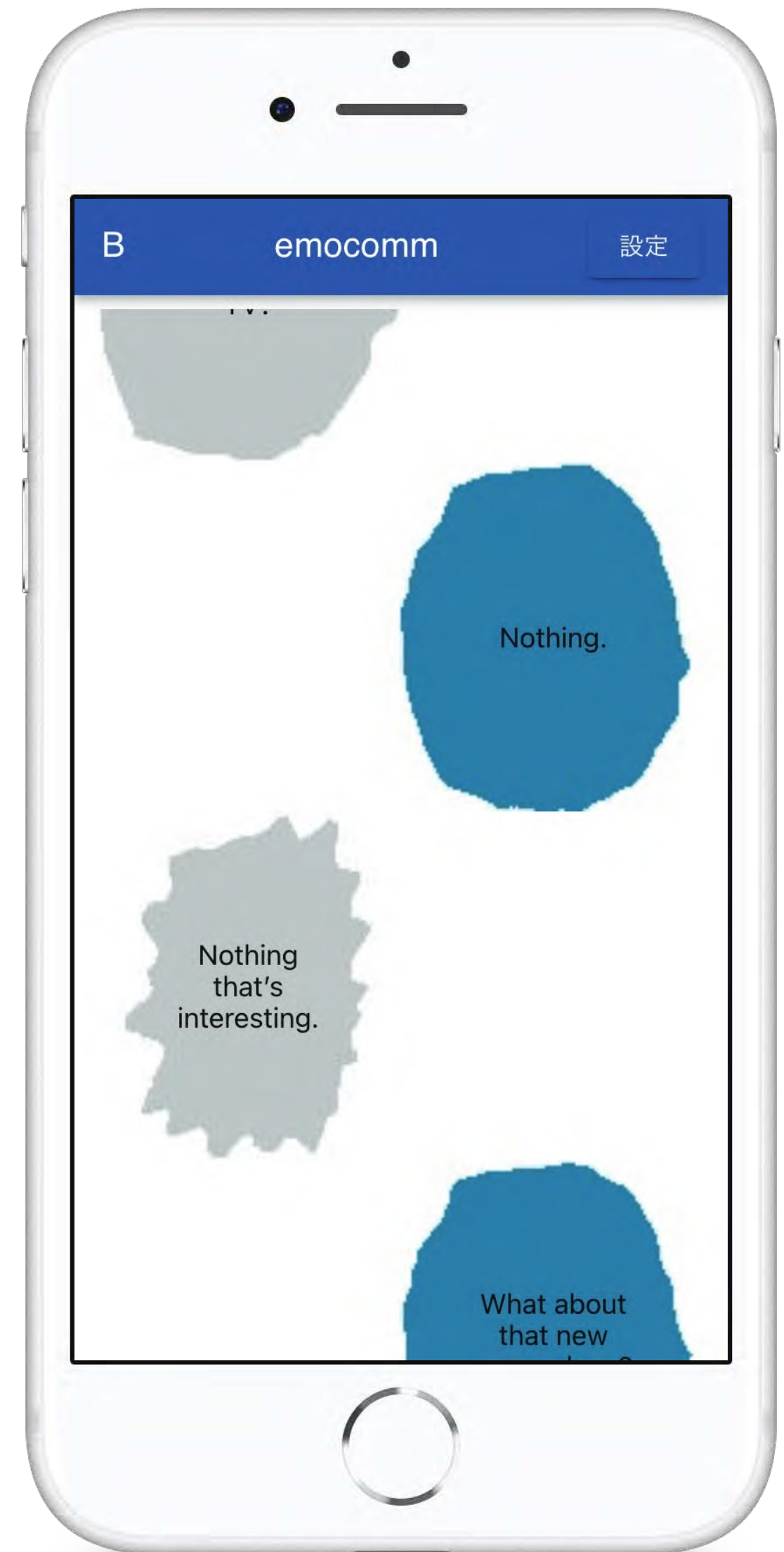
Speech balloons were automatically generated according to the voice input

Manual selection EmoBalloon

The user manually selects speech balloons

Emoticon (control)

Text Only (within subjects)



Voice input EmoBalloon

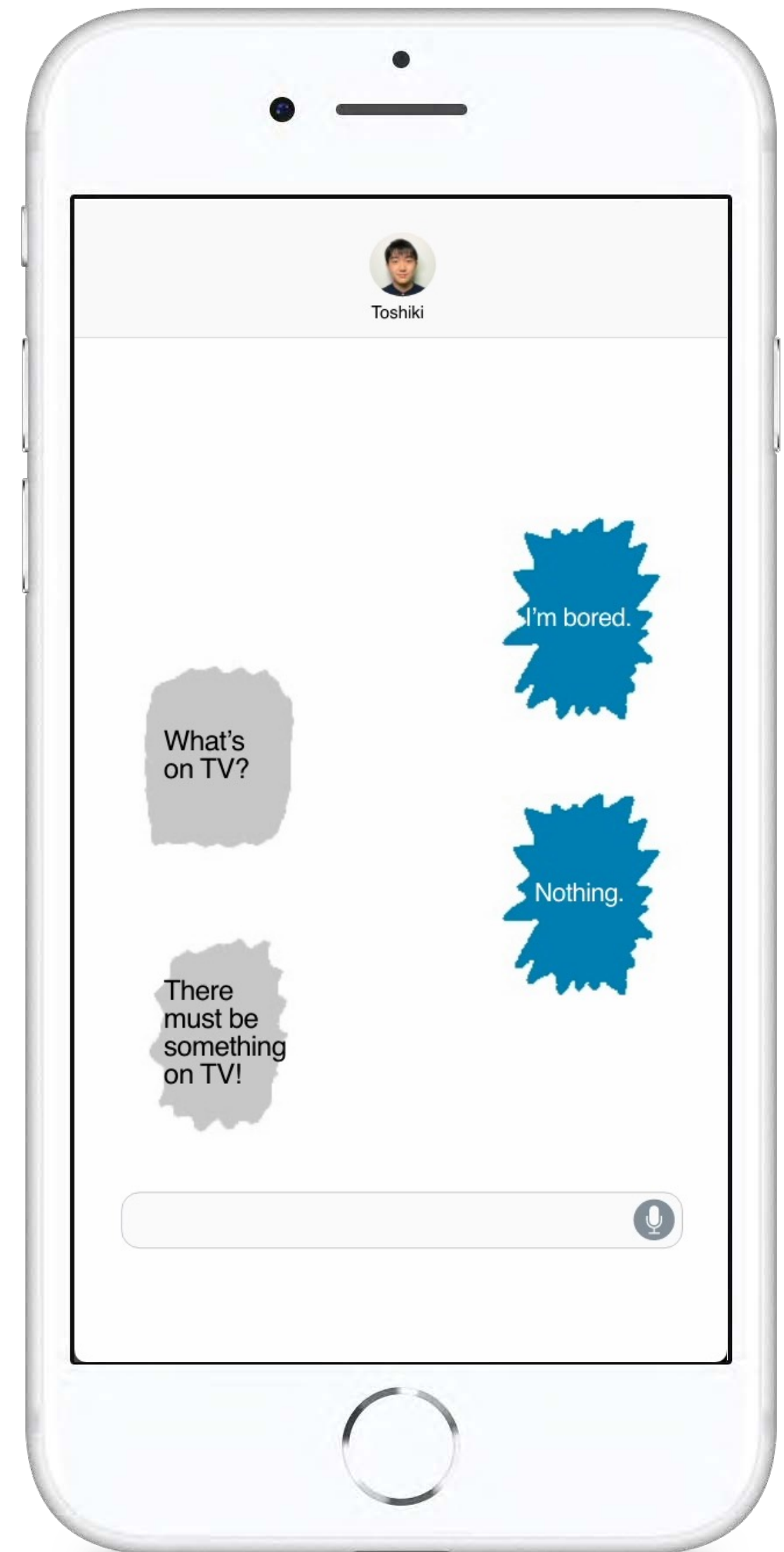
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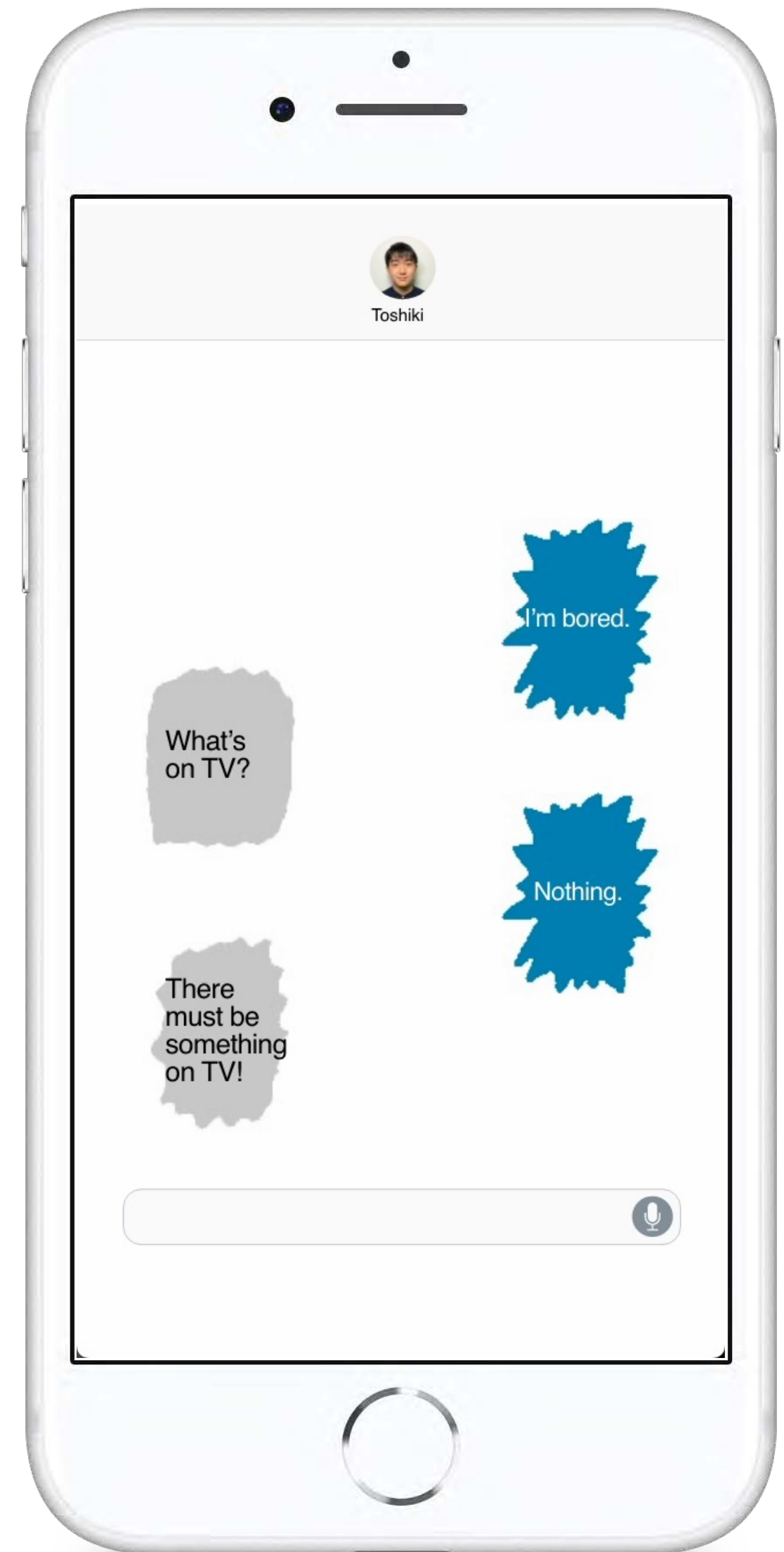
Speech balloons were automatically generated according to the voice input

Manual selection EmoBalloon

The user manually selects speech balloons

Emoticon (control)

Text Only (within subjects)



Voice input EmoBalloon

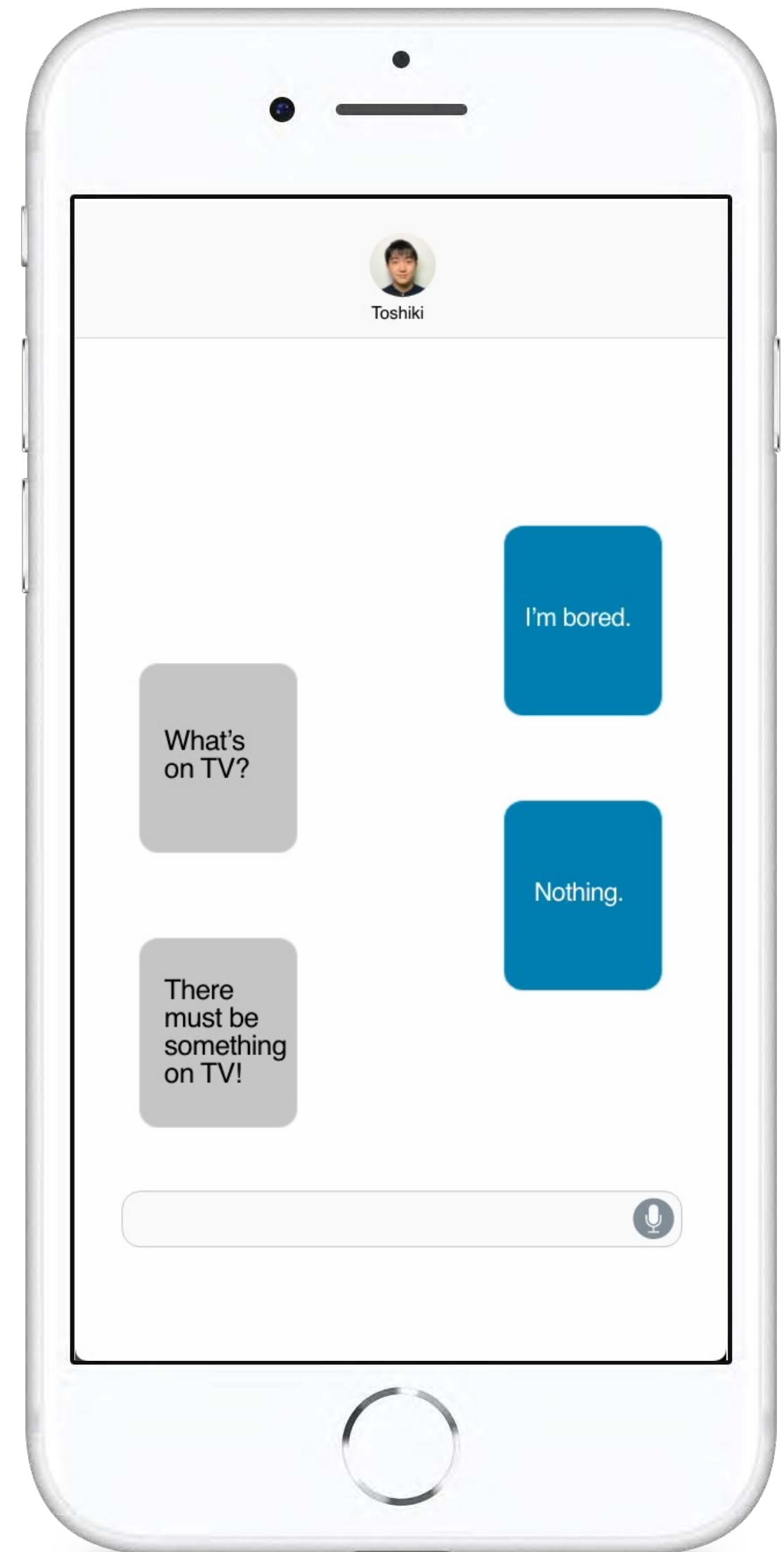
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Voice input EmoBalloon

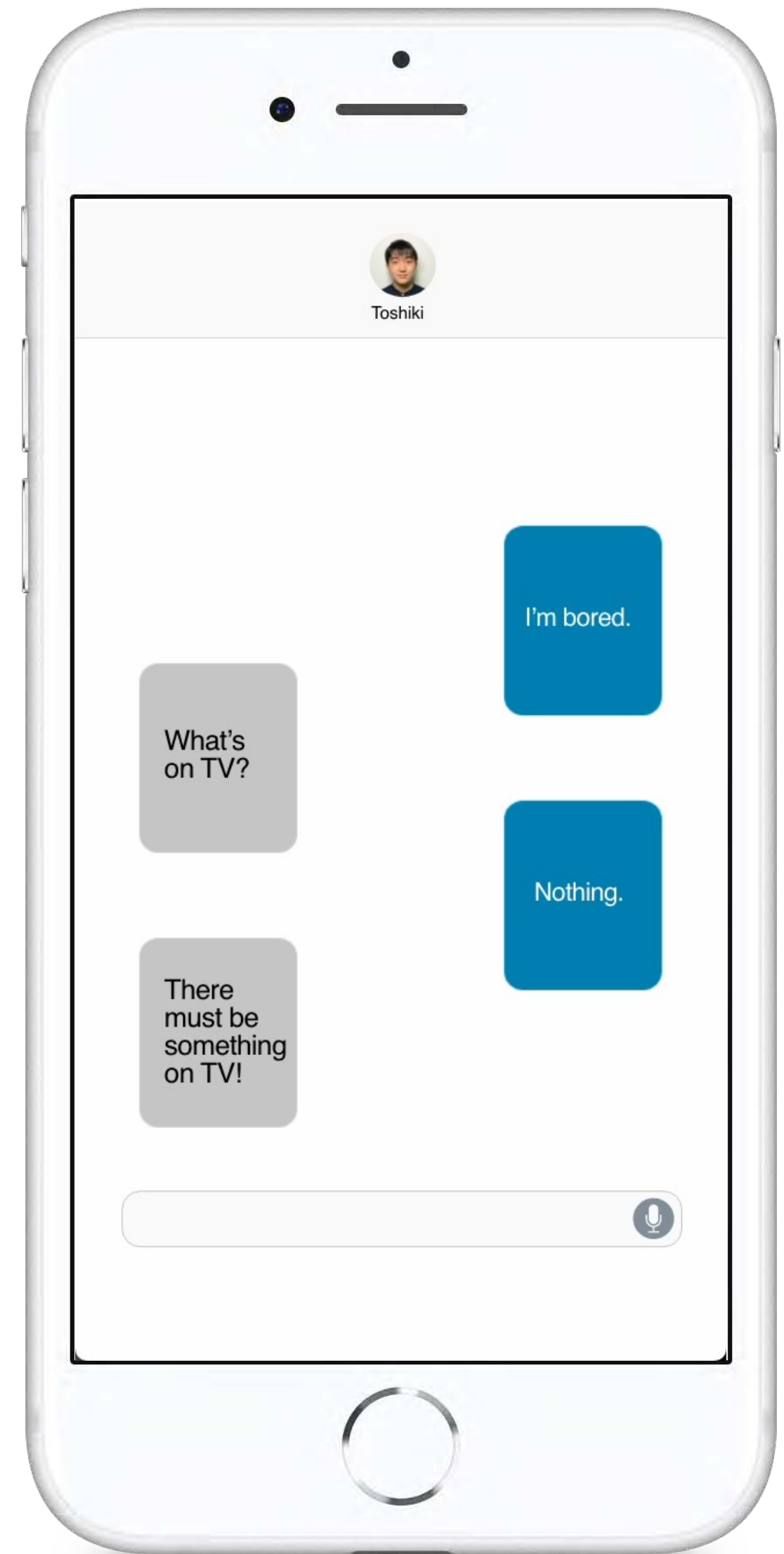
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Text Only (within subjects)



Dialogue script

Japanese participants (n=62) role-played a dialogue script derived from rong-chang ESL Inc. (2021)
with a partner and rated the emotional Arousal (Calm to Excited) and Valence (Negative to Positive) each time a message was sent or received.

Title: What's on TV?

A: 退屈だよ(I'm bored.)

B: テレビで何やってるの？(What's on TV?)

A: 何も(Nothing.)

B: 絶対何かはやっているよ!(There must be something on TV!)

A: 面白いもの何もないんだよね(Nothing that's interesting.)

B: 新しいテレビ番組は？(What about that new game show?)

A: なんのこと？(Which one?)

B: 「ディール・オア・ノーディール」のこと("Deal or No Deal")

A: 冗談でしょう？(Tell me you're joking.)

B: この番組好きなんだよね。(I love that show.)

A: 一回見たことあるけど、もういいかな(I watched it once. That was enough.)

B: 今やってるよ。一緒にみようよ。(It's on right now. Let's watch it together.)

EmoBalloon

Results

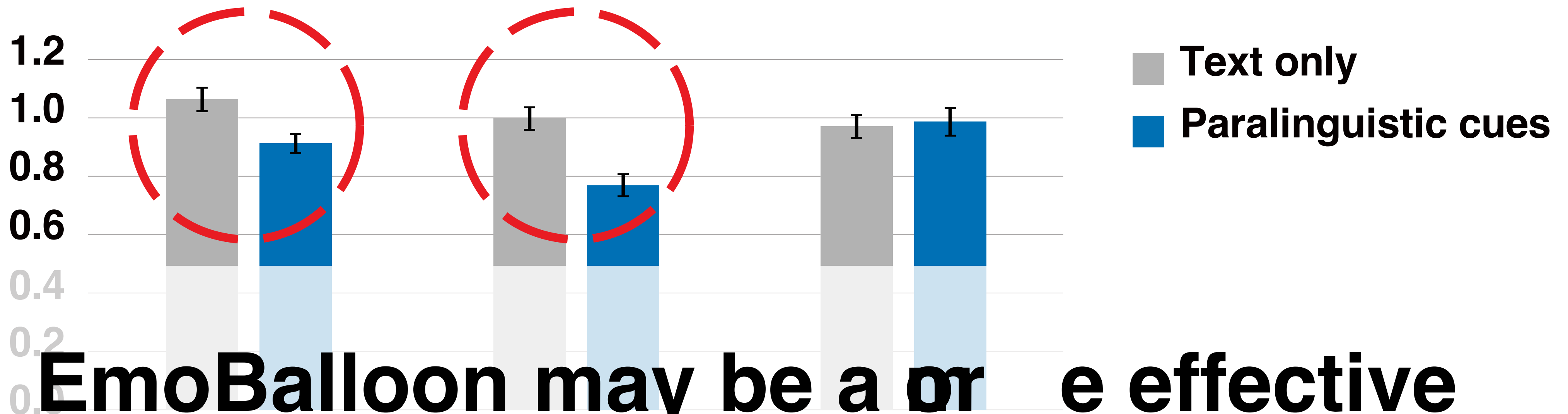
Difference in arousal evaluations

between a message sender and a receiver



Difference in arousal evaluations

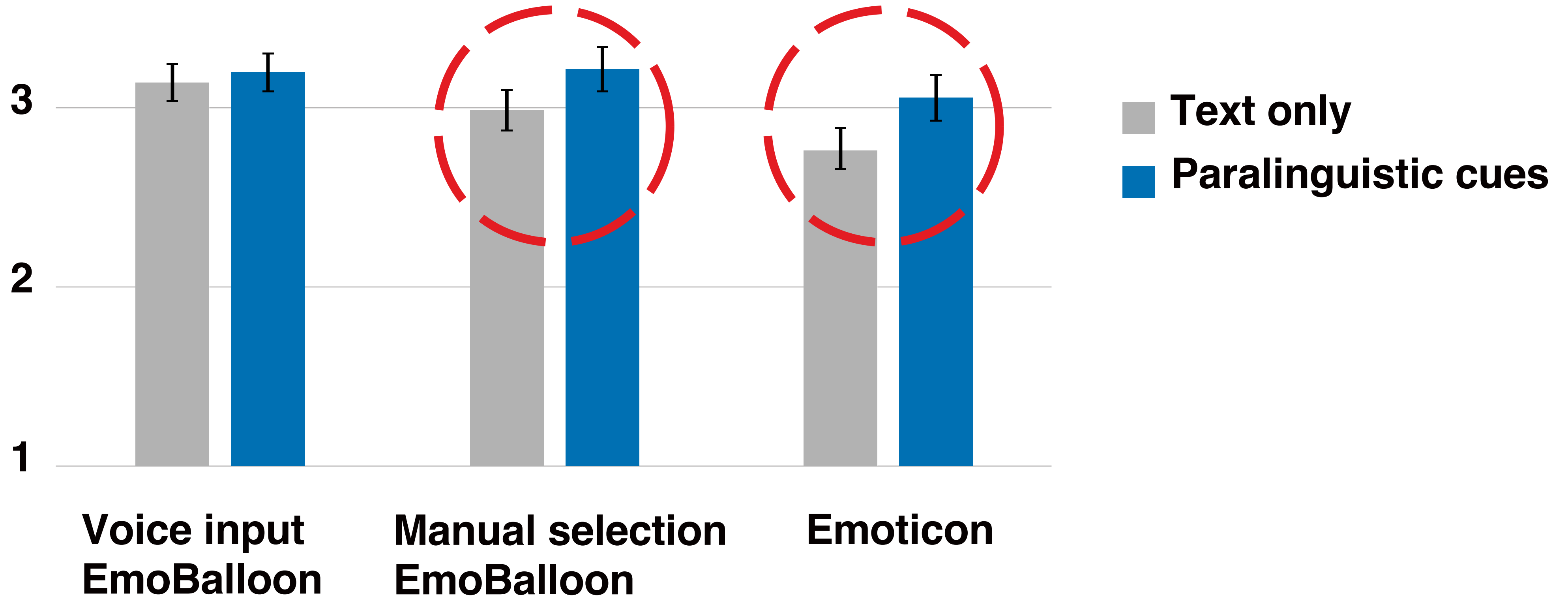
between a message sender and a receiver



EmoBalloon may be a more effective way to convey arousal than emoticons

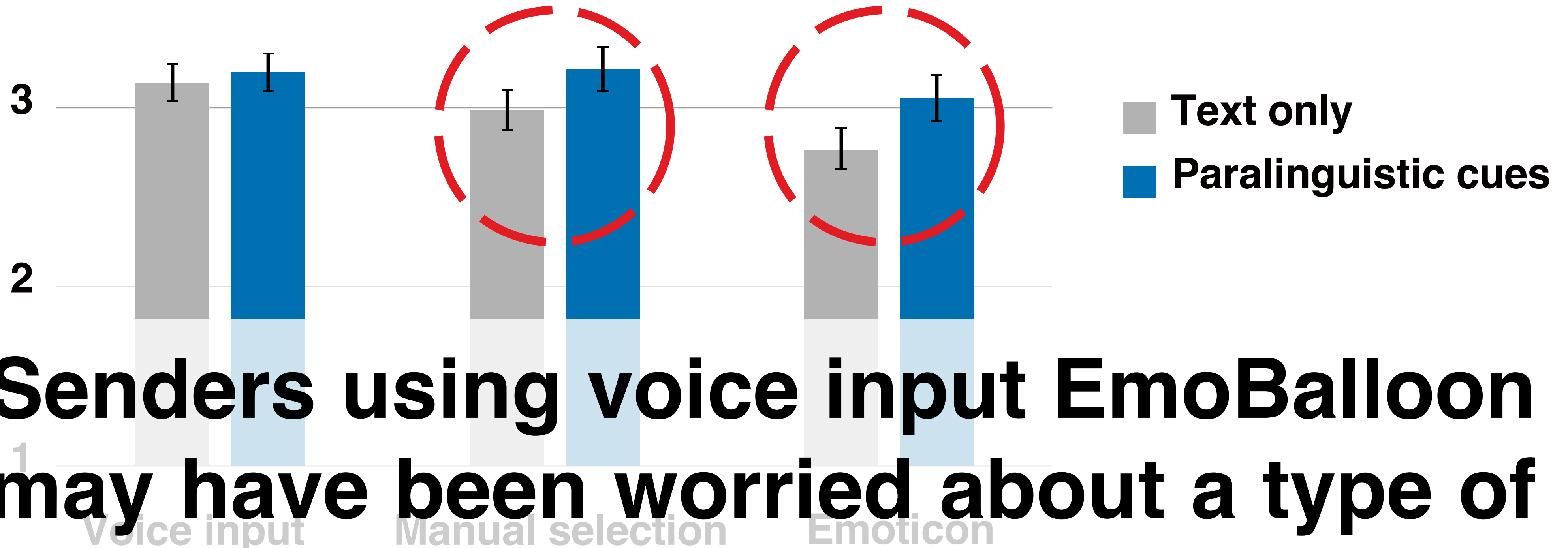
Mean arousal evaluations

by the sender



Mean arousal evaluations

by the sender



Senders using voice input EmoBalloon may have been worried about a type of “negative emotional leak”

Mean valence evaluations

We found that EmoBalloon had no significant effect on receivers' perceptions regarding the emotional valence, unlike emoticons.

	Voice input EmoBalloon			Manual selection EmoBalloon			Emoticon		
	With paralinguistic cues	Without paralinguistic cues	p-value ¹¹	With paralinguistic cues	Without paralinguistic cues	p-value ¹¹	With paralinguistic cues	Without paralinguistic cues	p-value ¹¹
(a) valence evaluated by sender	2.25	2.33	.705	2.35	2.30	.480	2.44	2.00	.510
(b) valence evaluated by receiver	2.16	2.08	.237	2.40	2.20	.621	2.56	2.00	.048
(c) the valence difference between sender and receiver	0.09	0.25	.115	0.15	0.10	.867	0.24	0.24	.157

EmoBalloon

Conclusion

**We focused on Japanese manga
as a means of conveying emotion and**

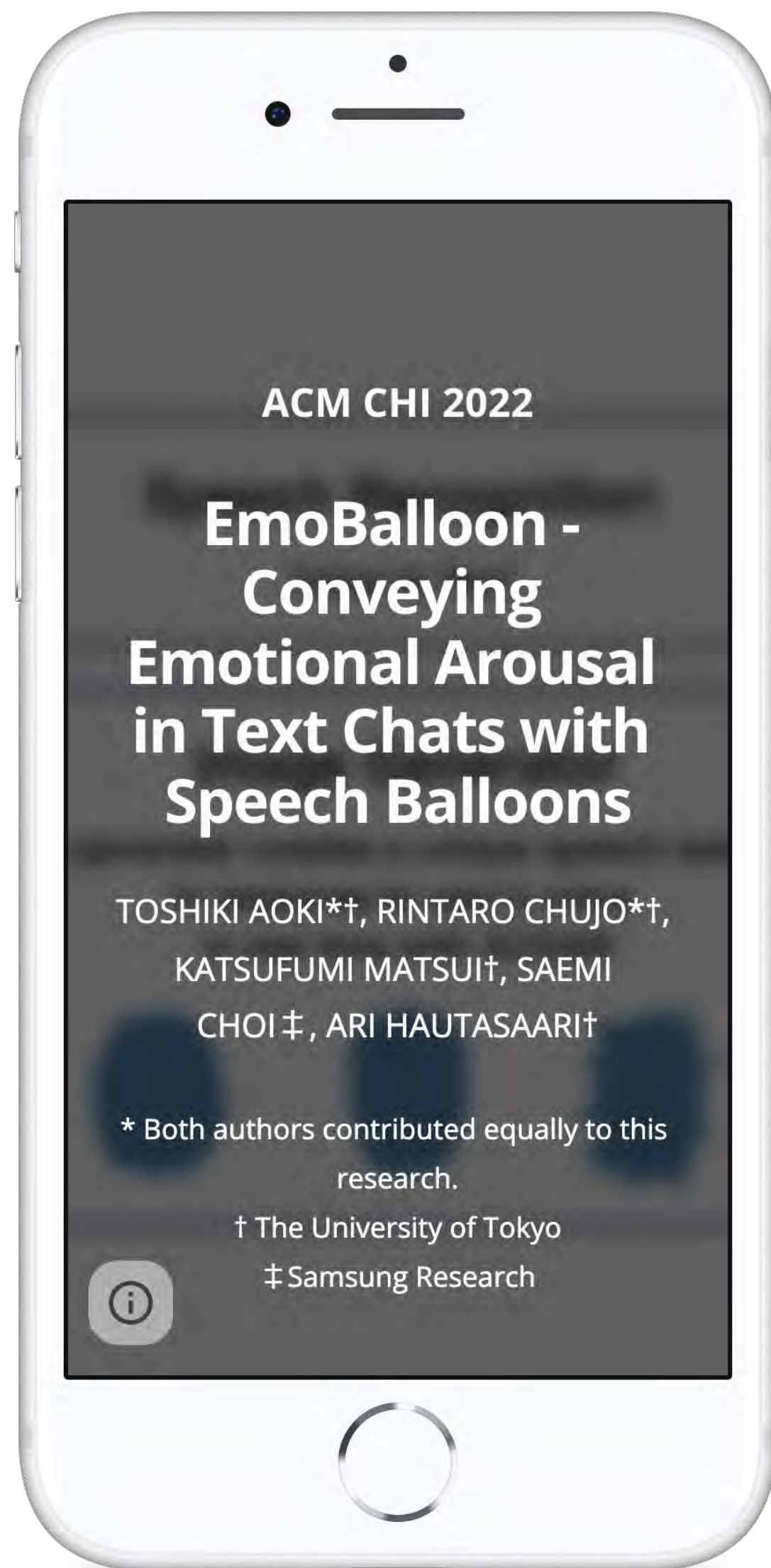
(c) Ken Yagami (cited from the Mangle109)

**We propose EmoBalloon
a novel method
to convey emotional arousal
with speech balloons**

A woman with glasses and a white shirt is looking at a smartphone. The background is blurred, showing what appears to be a cafe or office setting.

Takeaway

- 1. Emotional speech balloons are an effective way to convey emotional arousal in text chats**
- 2. Speech balloon shapes do not affect emotional valence in text chats**



For more details
and results,
please see our paper.



<https://emoballoon.emocomm.net>

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in Text Chats with Speech Balloons

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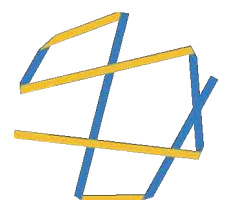
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* Both authors contributed equally to this research.

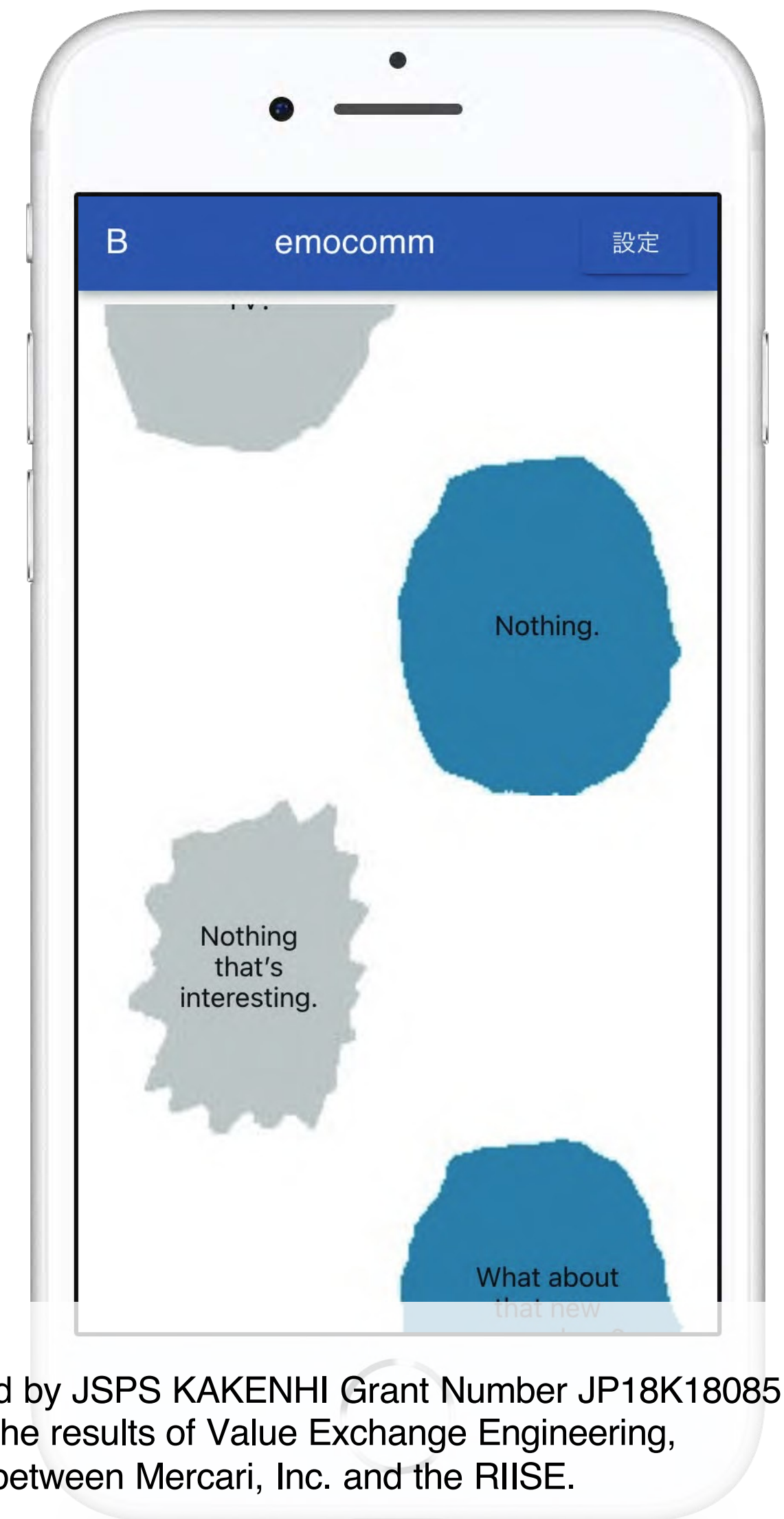


THE UNIVERSITY OF TOKYO



RIISE

インクルーシブ工学連携研究機構
Research Institute for an Inclusive Society through Engineering



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