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Emotional Analysis of Excluded Person Using Review Texts

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Summary

Purpose:

- Detect the social exclusion status of a writer based on review texts.

Study Overview:

- Examined **social exclusion** through participants' written reviews
- Participants experienced **temporary exclusion** via the *Cyberball* task, then wrote reviews of two texts: a *Novel* and a *Product Introduction*

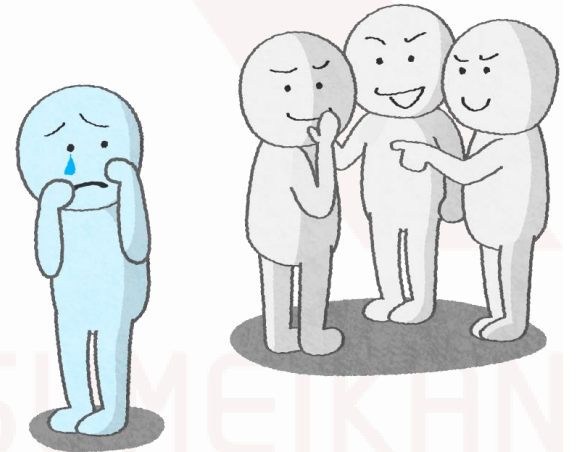
Key Findings:

- **Novel reviews** by excluded participants showed **higher “Anger”** scores
- **Product Introduction reviews** showed **fewer “Neutral”** scores

Background

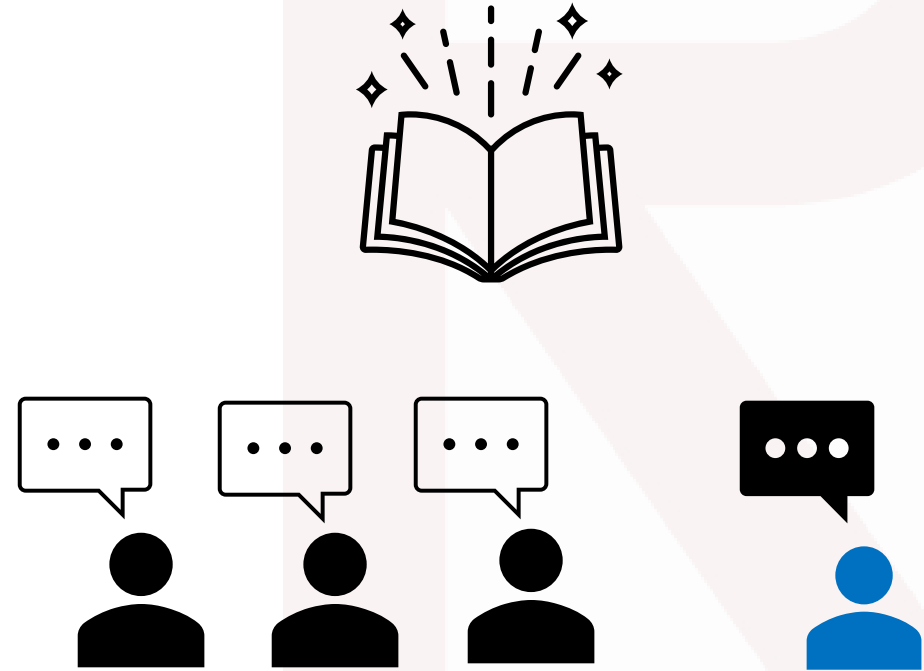
- When social connections weaken due to social exclusion can harm health.
 - social exclusion: being ignored or rejected
- Detection currently depends on self-disclosure, which is difficult for excluded person.

A method to detect exclusion without self-disclosure is needed.



Research Focus

Some previous research suggests
social exclusion affects
the perceptions of group members [1].



Our idea:

Social exclusion may also appear in linguistic expression.

[1] Andrew Reece, Evan W Carr, Roy F Baumeister, and Gabriella Rosen Kellerman. Outcasts and saboteurs: Intervention strategies to reduce the negative effects of social exclusion on team outcomes. PLoS one, 16(5):e0249851, 2021.

Experiment Overview

- Purpose
 - Clarify emotional and linguistic features in review texts under temporary exclusion.
- Hypothesis
 - Social exclusion increases negative and decreases positive emotions.
 - Review texts that excluded person reflected their impressions.
- Subjects
 - Excluded Group: 8 people
 - 6 Males, 2 Females
 - Control Group: 10 people
 - 4 Males, 6 Females



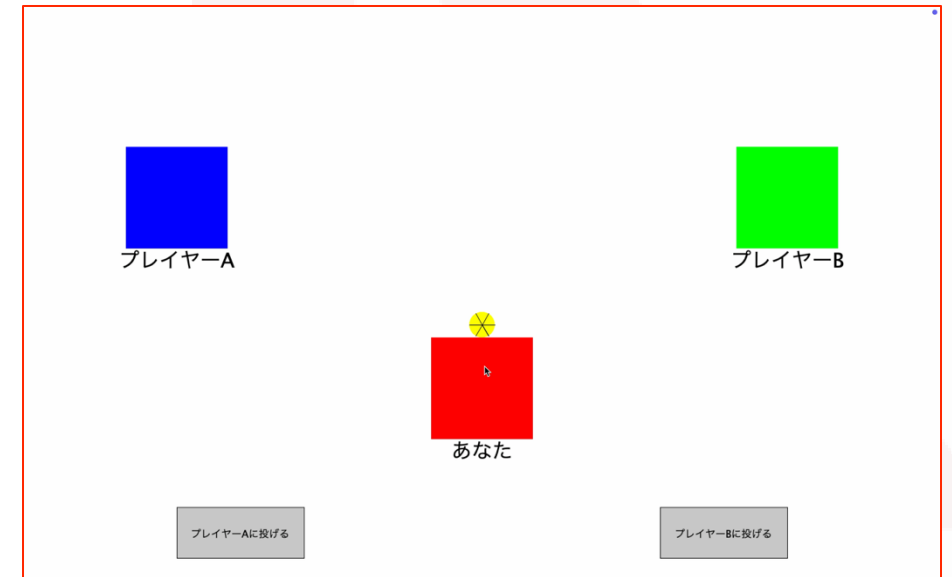
Method

Experimental Process

1. Subjects participate in Cyberball task.
2. Subjects answer questionnaire.
3. Subjects read documents and write reviews.
4. Reviews are analyzed using sentiment and emotional analysis.

Process 1: Subjects participate in Cyberball task

- Inducing a state of temporary social exclusion based on a **Cyberball task**
 - cyber catchball is performed by three people
 - Player A/B is computer agents
 - A total of 60 ball passes are made
 - The subject is informed of the cover story
- Social exclusion stimulus for the excluded group
 - The first 30 balls are distributed randomly
 - only 2 balls are given to the subject, while the agent alone circulates the remaining 28 balls



Process 2: Subjects answer questionnaire

- Subjects answer questionnaire to measuring positive/negative.
 - We used the Japanese edition of the PANAS, the schedule consisted of 8 Positive and 8 Negative affect items.
 - Each item is rated on a 6-point Likert scale.
 - Total scores for PA and NA indicate the level of affect.

Positive Affects (PA)	Negative Affects (NA)
Active	Guilty
Proud	Scared
Strong	Upset
Inspired	Attentive
Determined	Distressed
Excited	Nervous
Alert	Ashamed
Enthusiastic	Irritable

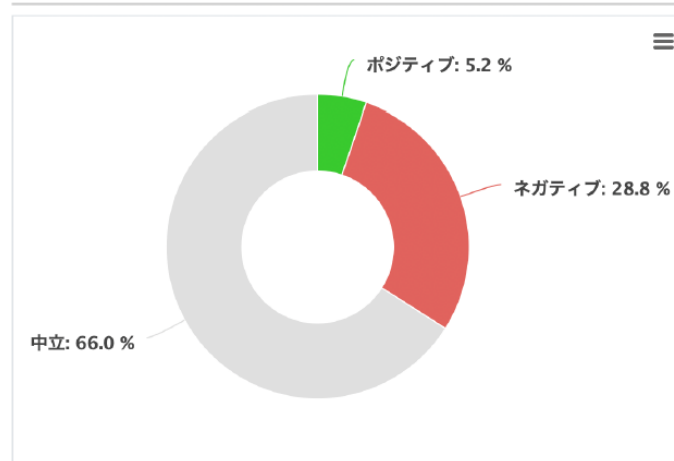
Process 3: Subjects read documents and write reviews.

- Subjects are involved writing a free-form reviews about two types of documents.
 - Reviews are at least 160 Japanese characters.
- Documents:
 1. Story
 - 3,697 characters (8-minute read)
 - From a web novel
 2. Product introduction
 - 2,553 characters (6-minute read)
 - Generated using ChatGPT

Analysis

- The text mining tool is used for sentiment analysis.
 - Review text is analyzed by UserLocal Text Mining Tool*
- Two types of sentiment analysis:
 1. Polarity (positive/negative/neutral ratio)
 2. Emotion (joy, liking, sadness, fear, anger)

ポジネガ



感情



*<https://textmining.userlocal.jp/>

Results : Subjects' Questionnaire

- Negative affect higher in excluded group ($p=0.0426$).
- "Proud" ($p=0.002$) and "Alert" ($p=0.024$) higher in control group.
- "Irritable" higher in excluded group ($p=0.0002$).

Cyberball task affects the excluded group to the negative emotions.

Scale	Excluded Group	Control Group
Guilty	2.00	1.90
Scared	1.75	1.80
Upset	2.87	2.20
Attentive	3.75	3.20
Distressed	3.00	2.00
Nervous	1.87	1.50
Ashamed	1.75	1.50
Irritable	3.37	1.30
Active	3.00	3.40
Proud	1.37	2.60
Strong	2.00	2.40
Inspired	2.37	3.60
Determined	1.75	2.70
Excited	3.25	4.20
Alert	2.87	2.10
Enthusiastic	2.00	1.90
Average _NA	20.62	16.10
Average _PA	19.25	22.20

Results : Impressions of Review texts

- Impressions of review text of Story
 - Anger score significantly higher in excluded group ($p=0.049$).
- Impressions of review text of Product Introduction
 - Neutral score significantly lower in excluded group ($p=0.048$).
 - No significant differences in other emotions.

Emotion Metric	Task	Excluded Group (N=8) Ave(S. D.)	Control Group (N=10) Ave(S. D.)
Positive(%)	Novel	0.10(1.48)	7.09(11.61)
	Product Introduction	21.80(25.70)	8.83(15.30)
Negative(%)	Novel	41.60(21.77)	32.51(21.98)
	Product Introduction	33.70(32.30)	21.80(17.50)
Neutral(%)	Novel	58.28(21.70)	60.40(22.60)
	Product Introduction	44.50(36.39)	69.29(21.27)
Joy	Novel	47.70(11.90)	55.90(18.80)
	Product Introduction	73.90(16.00)	74.70(16.70)
Liking	Novel	33.00(11.90)	35.20(4.47)
	Product Introduction	38.80(16.50)	38.80(10.60)
Sadness	Novel	75.00(15.00)	70.20(17.50)
	Product Introduction	46.60(16.10)	50.9(14.10)
Fear	Novel	54.90(12.00)	56.90(18.00)
	Product Introduction	48.90(17.40)	53.10(20.90)
Anger	Novel	39.26(11.27)	31.68(7.06)
	Product Introduction	41.60(20.20)	32.30(3.21)

Discussion: Emotional Responses to Cyberball Task

Questionnaire results indicated:

- **Lower scores** on “Proud” and “Alert” in the excluded group
 - Suggests **reduced confidence** due to temporary exclusion (*Proud*)
 - May reflect **self-perceived slower reactions** under stress (*Alert*)
- **Higher score** on “Irritable”
 - Consistent with previous findings that **social exclusion induces anger** [2]

the **Cyberball task effectively elicited exclusion-related emotions**

Discussion: Sentiment and Emotional Analysis of Review Texts

Novel reviews

- **Significantly higher “Anger” score** in the *excluded group*
Corresponds with higher *“Irritable”* score in PANAS
 - excluded participants may have **projected their negative feelings** onto the protagonist
 - Participant comments supported this: some reported **strong empathy** with the protagonist’s emotions

Product Introduction reviews

- **lower “Neutral” scores** in the excluded group may indicate **heightened emotional sensitivity** when excluded

Emotional cues in text may reveal **signs of social exclusion**

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