

Psychological influences on fruit and vegetable purchases in a supermarket - a field experiment

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Background

- Healthy food consumption, such as an increase in fruit and vegetable (F&V) intake, is beneficial for health outcomes [1].
- **Emotions**, including **stress levels**, have emerged as a **key nonconscious** driver for healthy food choices in previous research [2].
- However, these findings have not been tested in a **real-world food shopping** setting yet.

Objectives

1. **Test** whether an **affective** (in some cases combined with a **cognitive**) **nudge** can influence healthy food purchases at the POS.
2. **Identify** whether **emotional states change** during the food shopping trip.
3. **Analyse** how **stress** levels influence healthy food shopping behaviors in the supermarket.



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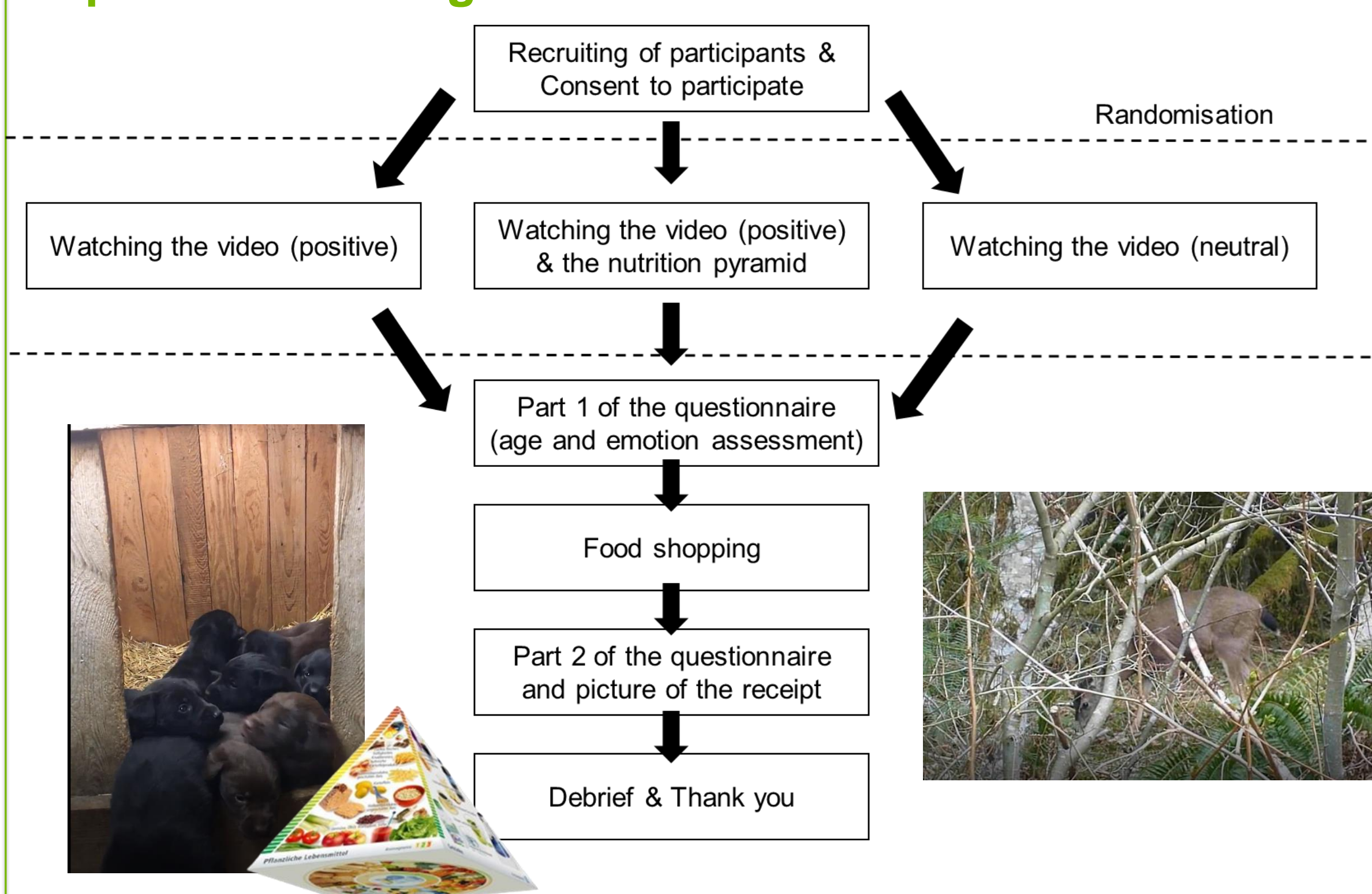
Methods

- Field experiment in a **supermarket** in Germany conducted in 2024
- Participants (N=241) were **randomly allocated** to one of three conditions:
 - Positive emotion induction
 - Positive emotion induction + health information
 - Neutral emotion induction (control)
- **Emotional states** and **stress levels** were recorded via a questionnaire (SAM [3] and PSS-10 [4] scales)
- **Purchases** were recorded based on photos of the **receipts**
- **F&V quantity** and **variety** were calculated as an indicator for **healthy food purchases**
- Analysis using one-way ANOVAs, Wilcoxon signed-rank test, Spearman's rank correlation, and multivariate regression analysis



Picture: own image

Experimental design



Pictures: own image, <https://www.youtube.com/watch?v=VafWbXazXI>, <https://www.bzfe.de/essen-und-gesundheit/ernaehrungspyramide>

Results

Objective 1:

Differences between the three conditions:

- **Positive** emotion induction (N=89)
- **Positive** emotion induction + **health information** (N=79)
- **Neutral** emotion induction (N=73)

→ **No significant** ($p > 0.05$) **differences** were found in terms of:

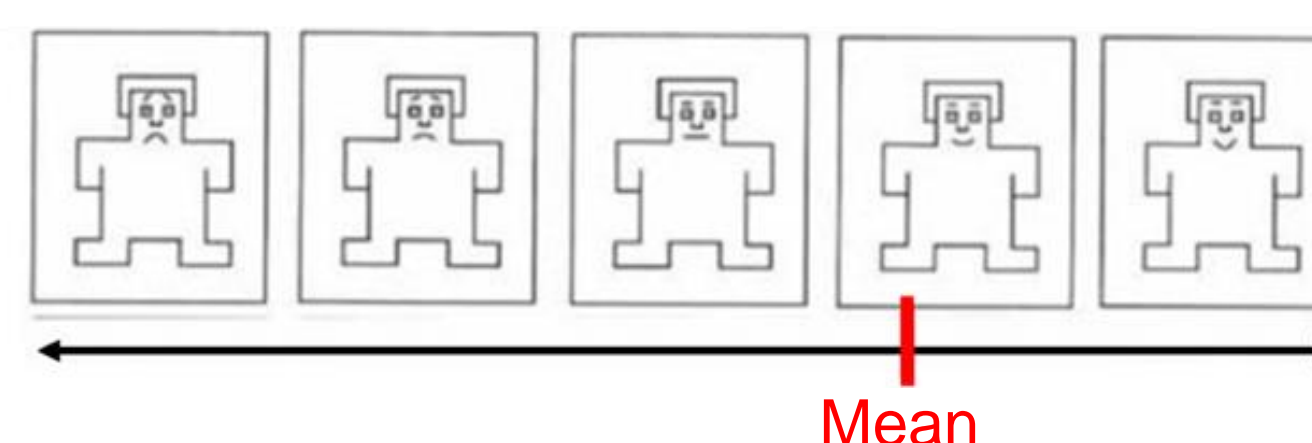
- **Emotional states** (valence ratings)
- **Stress levels**
- **Healthy food shopping behaviours**

→ The emotion induction via videos may not have been successful due to different reasons, e.g.

- Baseline valence scores were already quite high
- Distracting environment of the supermarket; being exposed to multiple external stimuli
- Positioning of the nudge at the entrance rather than the F&V section itself

Objective 2:

- Generally **high valence** scores:



- **Emotional states** before and after the food shop (as indicated by self-reported valence scores on the SAM-Scale) were compared:

→ A Wilcoxon signed-rank test for paired samples revealed significant differences between valence scores before (Mdn=7) and after (Mdn=6) the food shop ($Z=2.84$, $p=.004$, $r=0.26$). Direction of changes:

-	=	+
31.5%	48.5%	19.9%

Objective 3:

- Generally low stress levels: Median value of PSS-10 scores: **2.7** (on a 5-point scale)
- Multivariate multiple regression to assess the effect of stress on multiple outcome variables
- The overall multivariate model was statistically significant (Wilks' $\Lambda=0.882$, $F(9, 231)=3.44$, $p<0.001$, $\eta^2_p=0.118$)
- Stress levels were found to significantly influence: **valence scores** ($B=-0.638$, $SE=0.172$, $p<0.001$), **F&V quantity** ($B=-621.67$, $SE=280.98$, $p=0.032$), and **F&V variety** ($B=-0.759$, $SE=0.379$, $p=0.044$)

→ Higher stress levels relate to:

- Less positive emotions (valence)
- Less amount of F&V purchased
- Less F&V variety

Conclusion & Implications

- The findings highlight the need to **reduce stress at the POS**, potentially through **environmental design elements** like layout, scent, music, and/or product presentation to **increase healthy food purchases** – and underline the broader **value** of incorporating **stress management techniques** (e.g., mindfulness exercises) into daily life.
- The results additionally suggest that a high proportion of participants **shifted to more negative emotional states** during the **course of their shopping trip**.
- **Retailers** aiming to support health and sustainability goals may benefit from these findings by **creating a shopping environment** that **reduces stress** and **enhances positive mood**.

References

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- [4] Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress. *Journal of Health and Social Behavior*, 24(4), 385-396.



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