



★ Oral presentation 7.6

# Application of SO-PLS Path Modelling to Investigate Consumer Preferences for Upcycled food

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# Background

- I. Food waste and upcycled product
- II. Consumer expectations and experiences in food consumption
- III. Product information and consumer WTP

# Food waste and upcycled product



**13.3%** OF THE WORLD'S FOOD IS LOST AFTER HARVESTING AND BEFORE REACHING RETAIL MARKETS



**17%** OF TOTAL FOOD IS WASTED AT THE CONSUMER LEVEL





Brewer's spent grain (BSG)  
/ Oat flakes



Changes in  
sensory properties

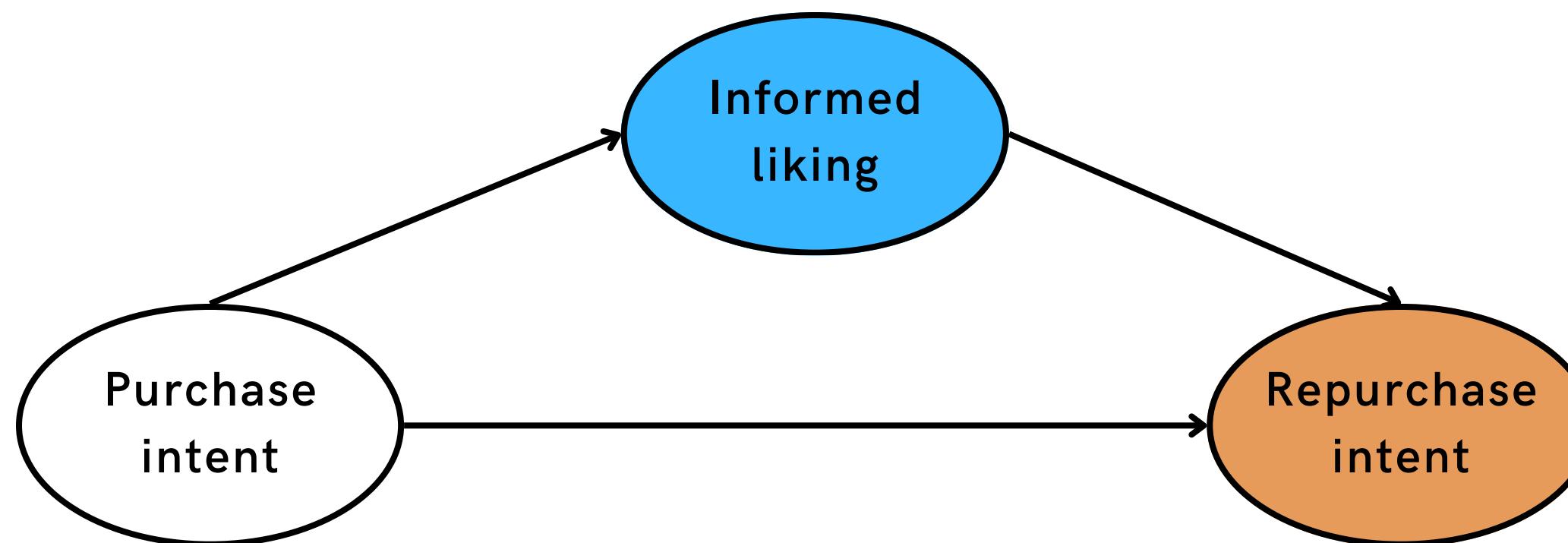


Label information

- Hedonic likings
- Food choices

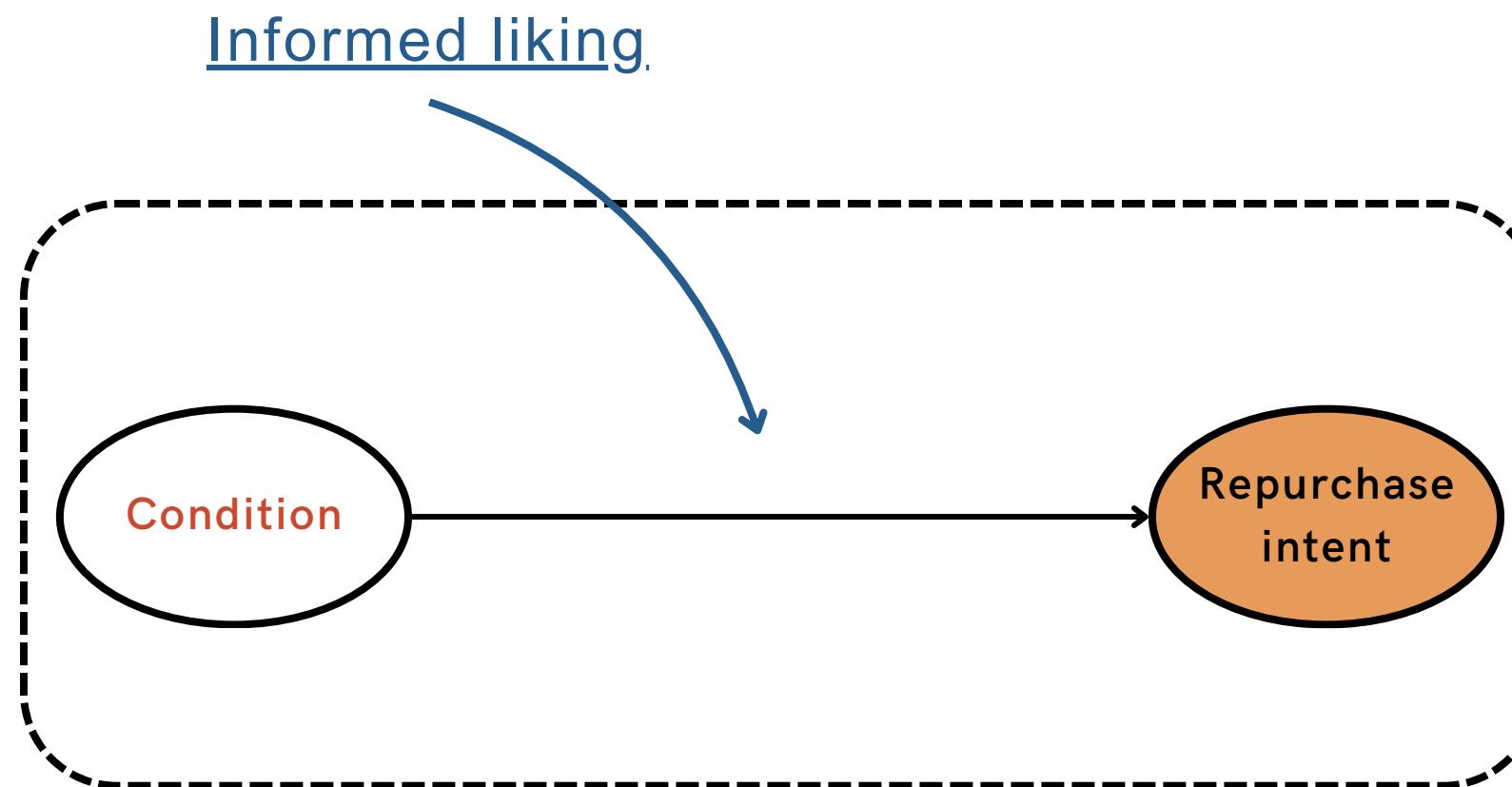
## ***Consumer experience in food consumption***

- (1) the purchase of the product
- (2) the consumption of the product, during which, consumers experience some of its characteristics (e.g. taste)
- (3) the re-purchase of the product, based on satisfaction



**SO-PLS regression**

## Effect of product information on WTP



- **Treatments**
  - control
  - sustainability
  - nutrition
- **Condition (effect coding):**
  - control: -1
  - sustainability, nutrition: 1

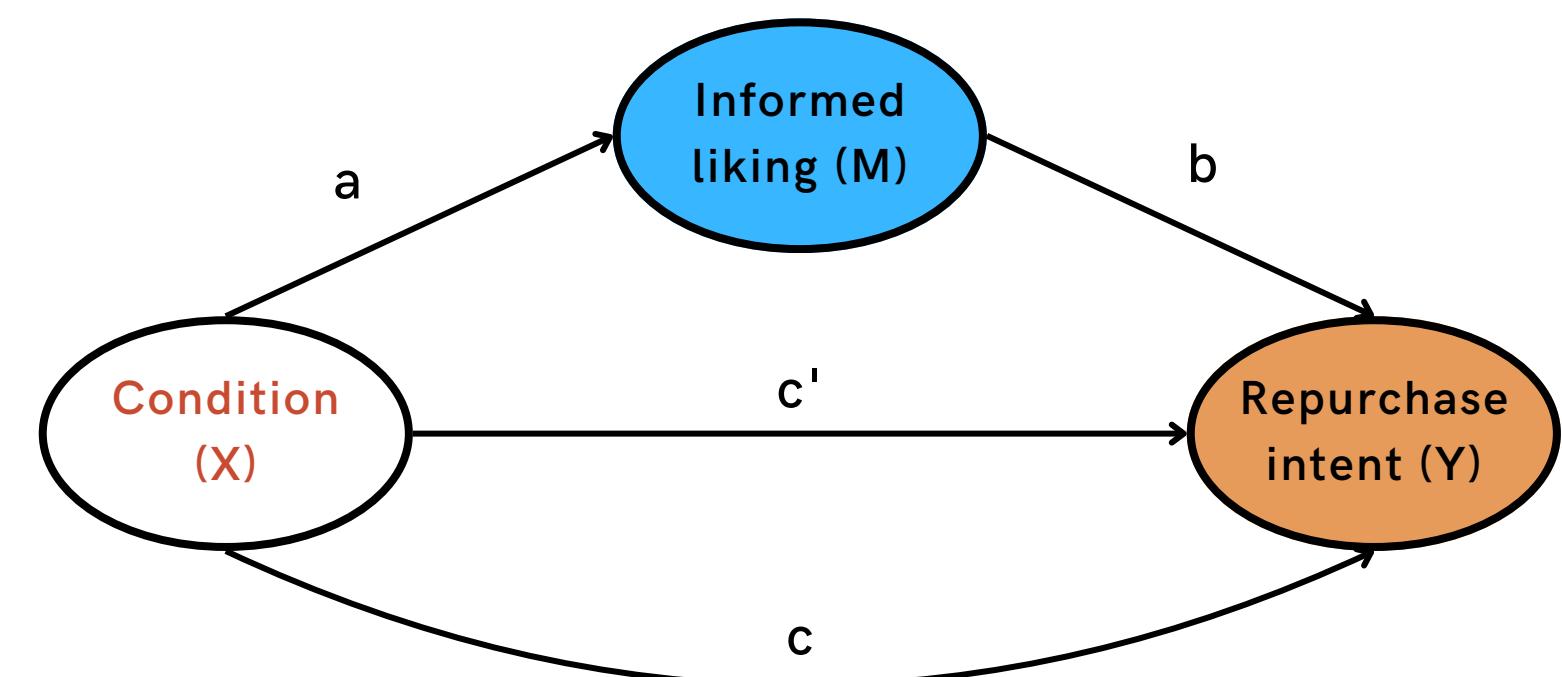
## Condition-Repurchase intent mediated by *Informed liking*

- **Mediation model**

- $Y = cX$
- $M = aX$
- $Y = c'X + bM$

- **Effect:  $X \rightarrow Y$**

- Total effect:  $c$
- Direct effect:  $c'$
- Indirect effect:  $c - c' = a * b$



# Aims of study

- Determine the relation between purchase intent, liking, repurchase intent
- Understand the effect of sustainability and/or nutrition information on consumers' preferences

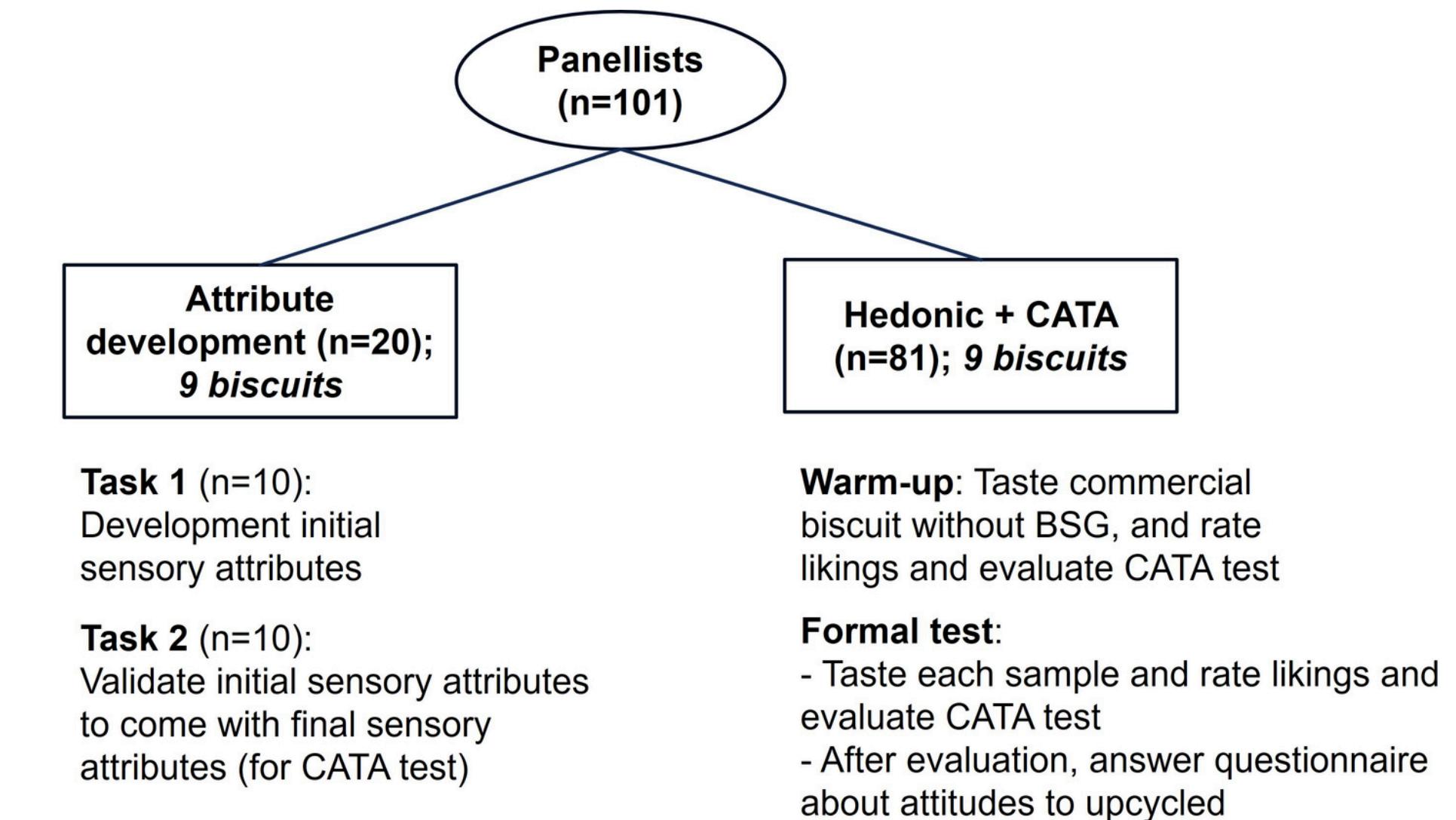
# Experimental design

**Experiment 1:** Determine representative samples

**Experiment 2:** Built prediction model for repurchase intent

## Biscuit formulation

	Oat flakes 0%	Oat flakes 10%	Oat flakes 20%
BSG 0%	NN	NL	NH
BSG 10%	LN	LL	LH
BSG 20%	HN	HL	HH



## Experiment 2



	Oat flakes 0%	Oat flakes 10%	Oat flakes 20%
BSG 0%	NN	NL	NH
BSG 10%	LN	LL	LH
BSG 20%	HN	HL	HH

Sample	Control treatment	Sustainability treatment	Nutrition treatment
NN			
NL			
HL			
HN			

## Experiment 2

	<b>Treatment 1 – Control (n=101)</b>	<b>Treatment 2 – Sustainability (n=102)</b>	<b>Treatment 3 – Nutrition (n=102)</b>
<b>Step 1: General introduction</b>	Introduction of BSG “Brewer’s spent grain (BSG), which is a by-product of the brewing industry”		
<b>Step 2: Benefit information</b>	No further information is provided	Environmental benefits of BSG are provided	Nutritional benefits of BSG are provided
<b>Step 3: Logo introduction</b>	No further information is provided	Upcycled logo is introduced	High-fibre logo is introduced
<b>Step 4: Ranking for purchase intent (<i>without tasting</i>)</b>	Rank purchase intent for 4 samples with different labels	Rank purchase intent for 4 samples with different labels	Rank purchase intent for 4 samples with different labels
<b>Step 5: Tasting samples</b>	Receive and taste 4 samples		
<b>Step 6: Ranking for liking (<i>after tasting with label information</i>)</b>	Rank liking for 4 samples with different labels	Rank liking for 4 samples with different labels	Rank liking for 4 samples with different labels
<b>Step 7: Ranking for repurchase intent (<i>after tasting with label information</i>)</b>	Rank repurchase intent for 4 samples with different labels	Rank repurchase intent for 4 samples with different labels	Rank repurchase intent for 4 samples with different labels



# Main results

**01.**

Sample selection

*Product separation*

**02.**

SO-PLS regression

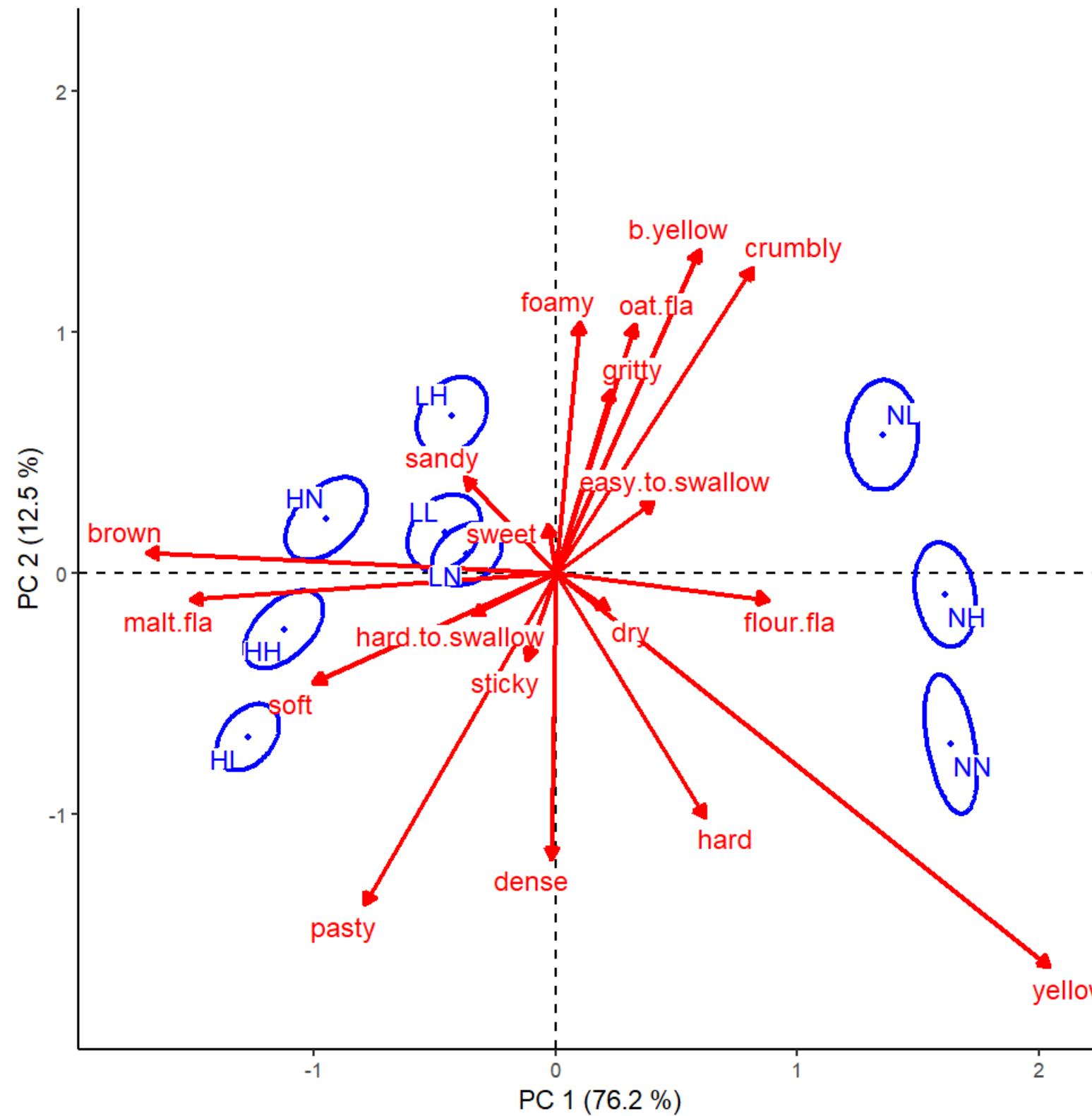
*Purchase - Liking -  
Repurchase*

**03.**

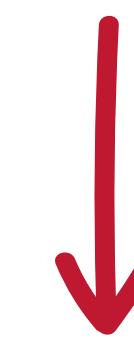
Mediation model

*Condition - Liking -  
Repurchase*

# 1. Product separation



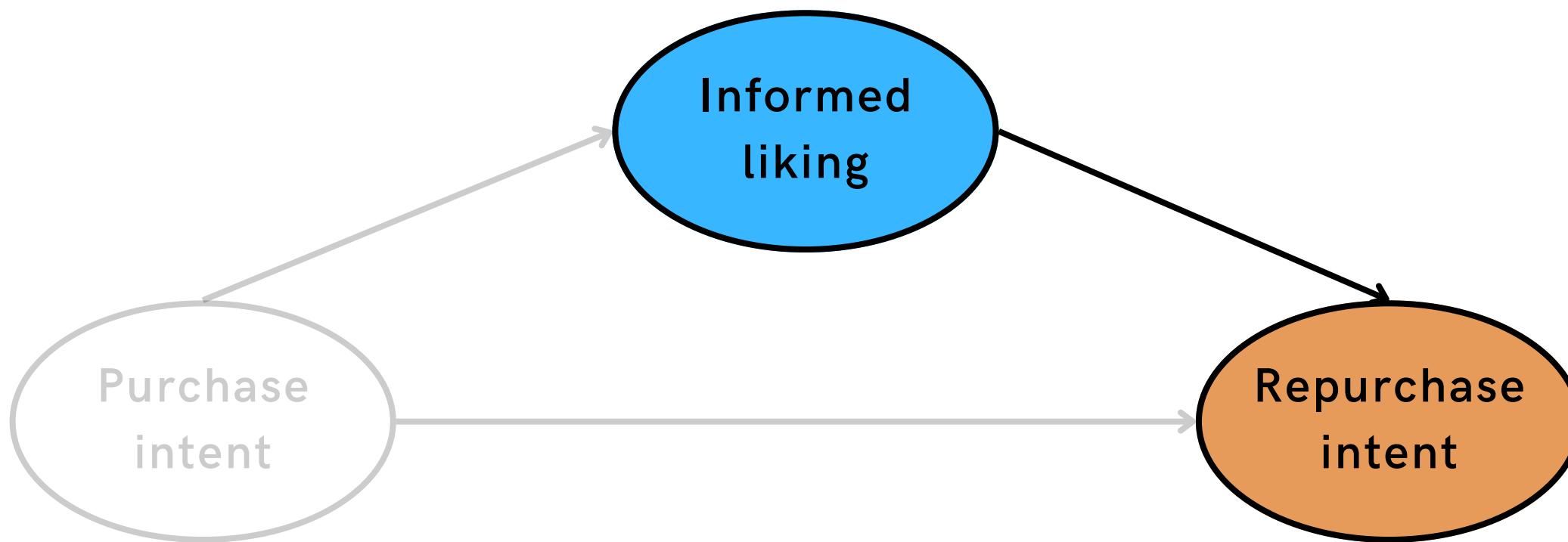
- PC1: oat-flake samples (NL, NH) vs BSG samples (HN, HH, HL)
- PC2: low BSG, high oat-flakes (LH) vs high BSG, low oat-flakes (HL)



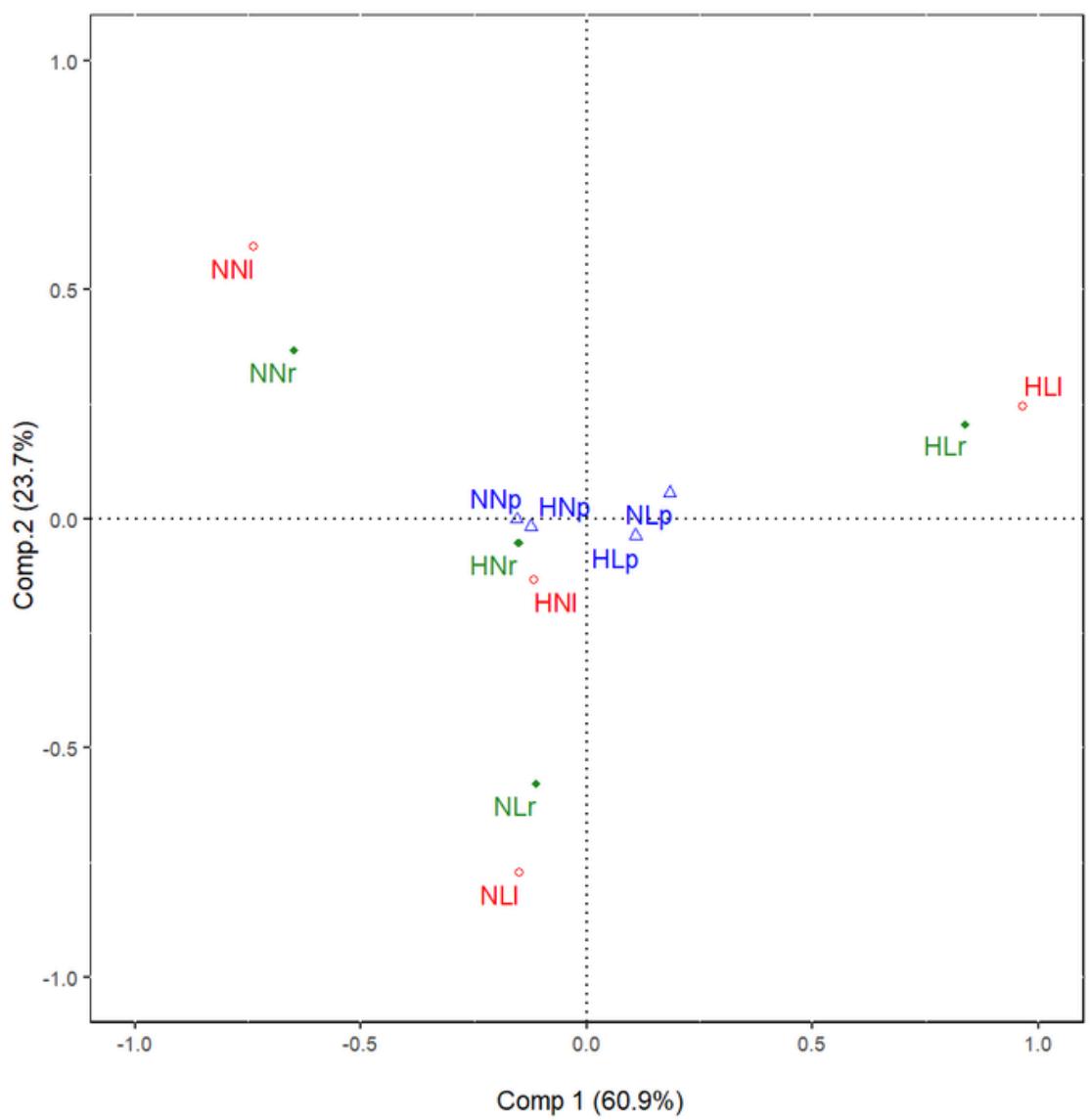
Four samples **NN, NL, HN, HL** are selected

## 2. SO-PLS regression

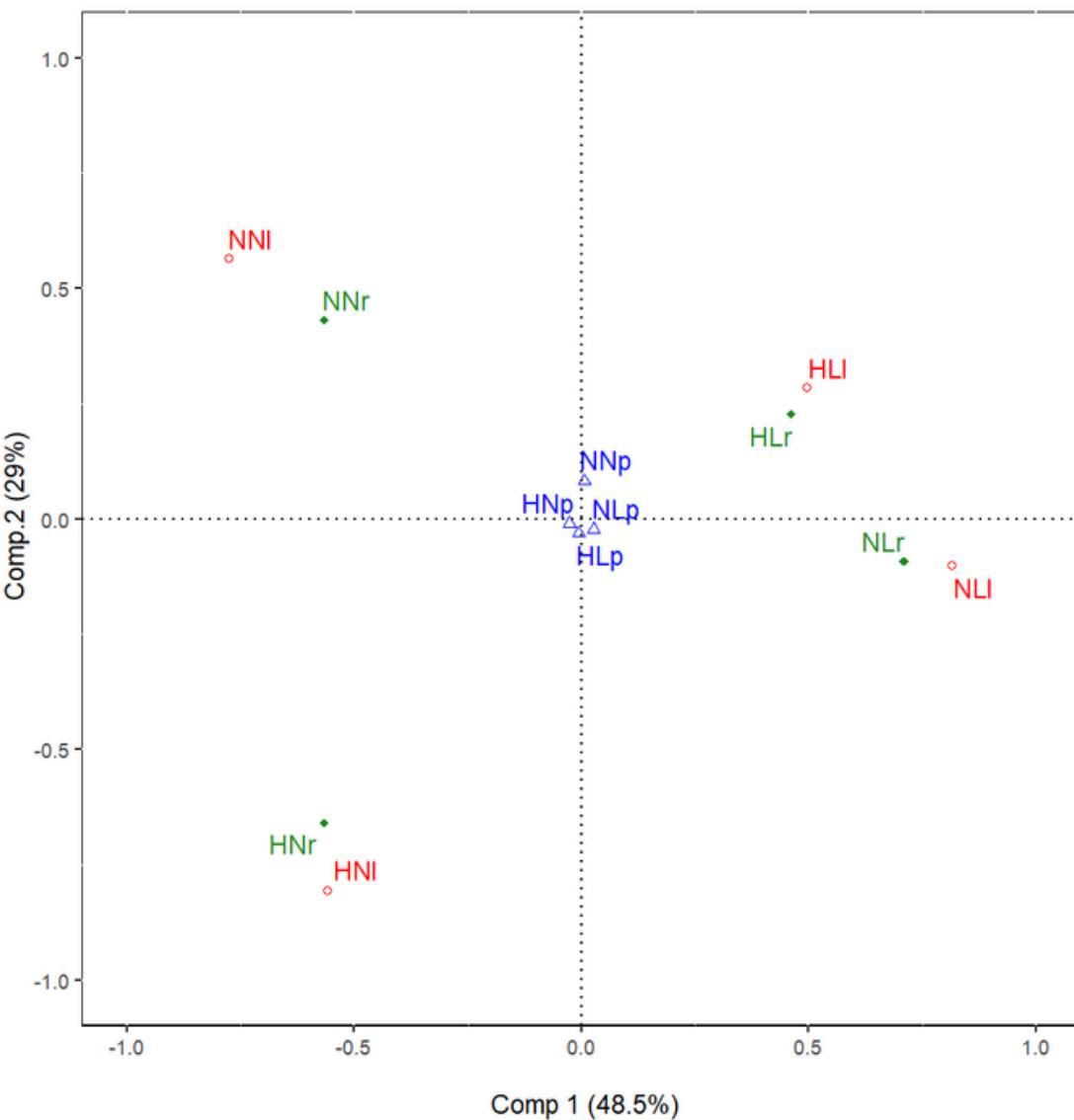
- Based on RMSEP: only the relation “***Informed liking-Purchase intent***” is significant



# SO-PLS regression

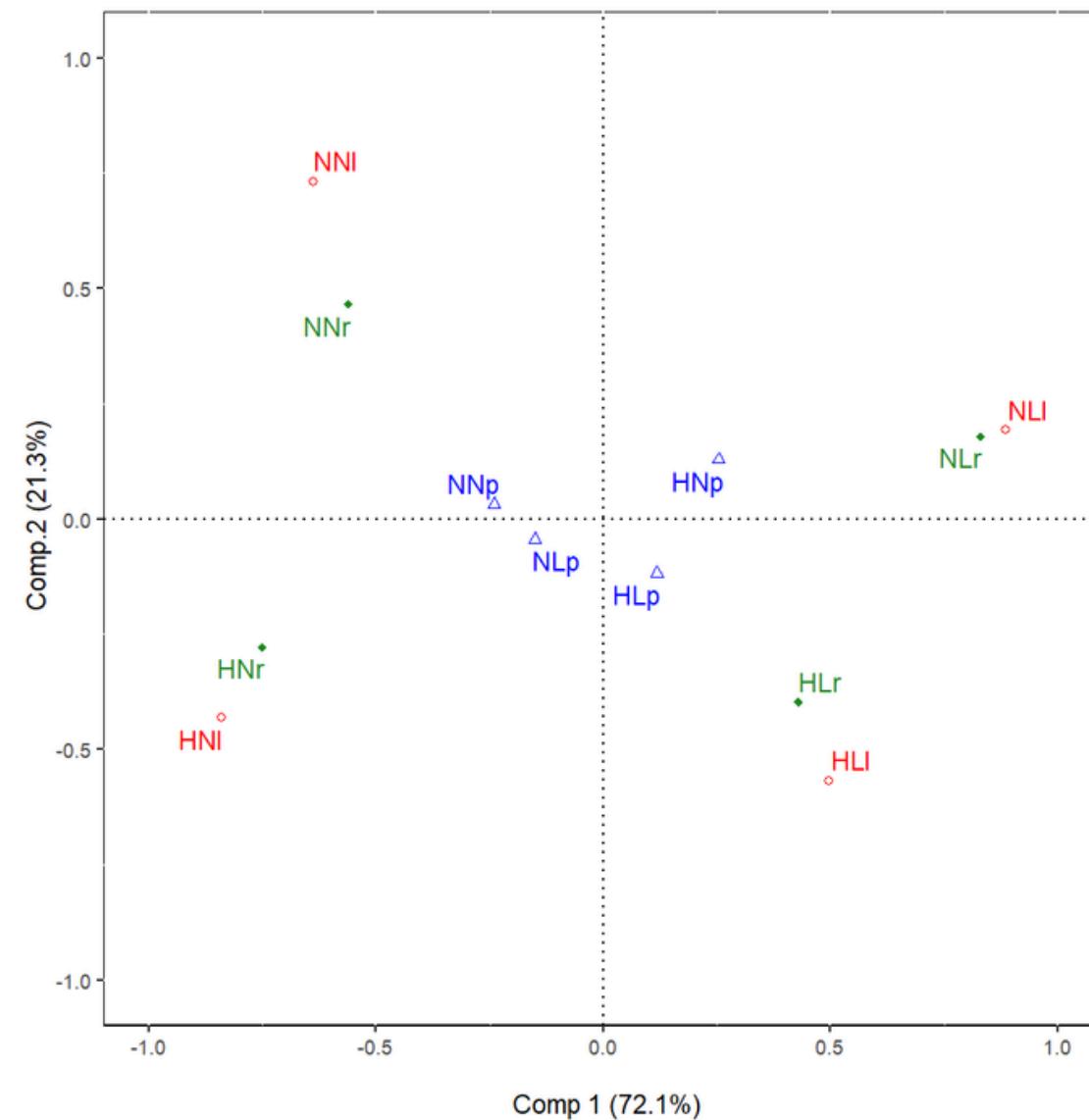


Control



Sustainability

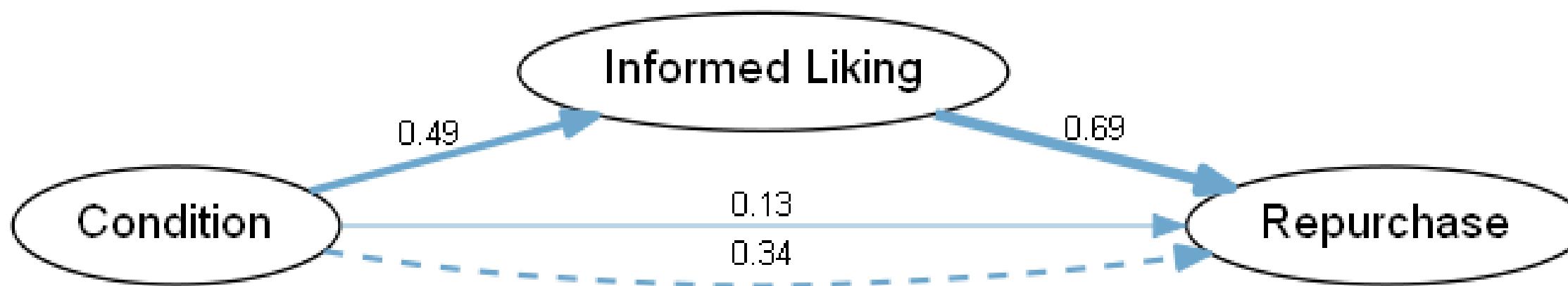
Samples HN, NL



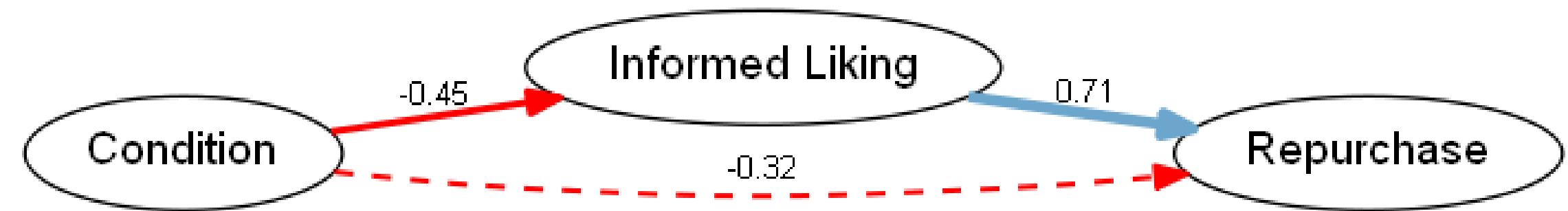
Nutrition

### 3. Mediation model

Sustainability condition



Sample HN

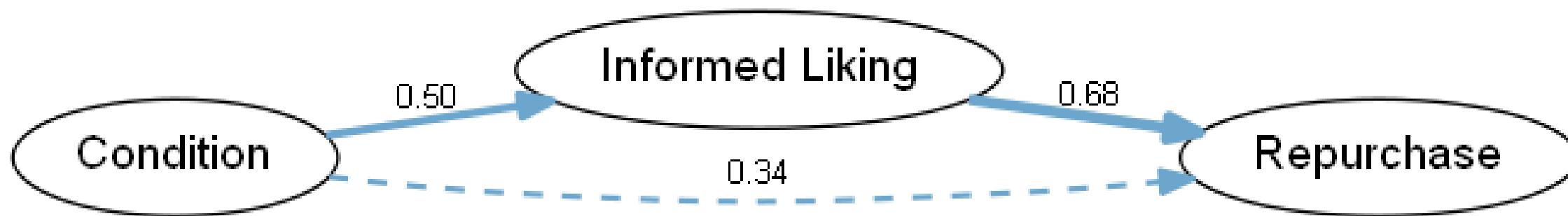


Sample NL

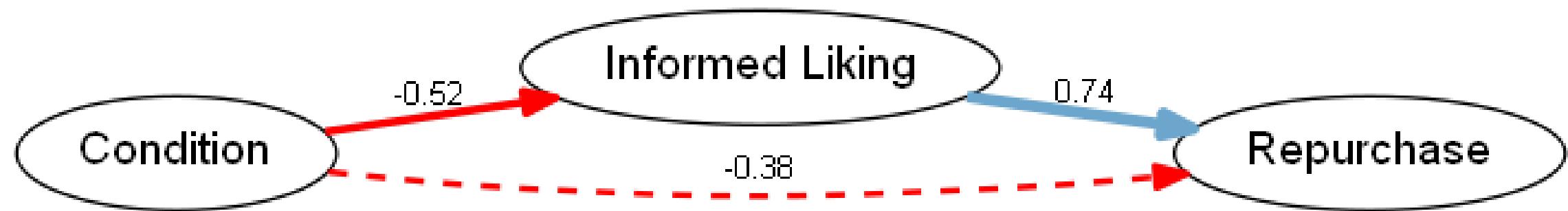
**Solid lines:** total, direct effects

**Dashed lines:** indirect effects

## Nutrition condition



Sample HN



Sample NL

**Solid lines:** total, direct effects

**Dashed lines:** indirect effects

# Mediation effect

- Condition -> informed liking
  - *positive or negative according to product category*
- Condition -> repurchase intent
  - *totally mediated by informed liking*

# Conclusion

1. Repurchase intent is influenced by informed liking rather than purchase intent
2. Provision of information changes repurchase intent through informed liking
3. These relations should be different w.r.t. different motive-based consumer segments and product categories

# Meet Our Teams



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Professor



**Paula Varela**  
Professor



# Thank you!