

A meta-analysis of the real-world impact of sustainability labeling on consumer choices

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22 *Full search term 1: Scopus*

23 TITLE-ABS-KEY ("carbon label*" OR "carbon footprint label*" OR "low-carbon label*" OR "carbon emission label*"
24 OR "eco-label*" OR "green label*" OR "GHG label*" OR "greenhouse gas label*" OR "sustainable label*" OR "low
25 emission label*" OR "environmental label*" OR "climate label*" OR "eco-friendly label*" OR "green product label*" OR
26 "greenhouse gas footprint label*" OR "sustainability label*" OR "green marketing label*" OR "environmentally friendly
27 label*") AND TITLE-ABS-KEY ("consumer behavior" OR "purchase behavior" OR "food choice" OR "product choice"
28 OR "actual behavior" OR "real behavior" OR "consumer action" OR "sustainable behavior" OR "pro-environmental
29 behavior" OR "environmental behavior" OR "energy consumption" OR "waste reduction behavior" OR "low-carbon
30 behavior" OR "eco-friendly behavior" OR "transportation behavior" OR "conservation behavior" OR "shopping behavior"
31 OR "green purchasing" OR "sustainable consumption" OR "behavioral outcomes" OR "lifestyle change" OR "decision-
32 making" OR "intention to act" OR "behavioral shift") AND TITLE-ABS-KEY ("field trial*" OR "field study*" OR
33 "experiment*" OR "intervention*" OR "testing" OR "evaluation" OR "randomized controlled trial*" OR "RCT" OR "pilot
34 study*" OR "implementation" OR "real-world trial*" OR "longitudinal study" OR "natural experiment*" OR "quasi-
35 experiment*" OR "behavioral intervention*" OR "controlled experiment*" OR "behavioral trial*" OR "randomized
36 experiment*" OR "intervention study*" OR "impact evaluation" OR "trial study")

37

38 *Full search term 2: Web of Science*

39 TS=("carbon label*" OR "carbon footprint label*" OR "low-carbon label*" OR "carbon emission label*" OR "eco-label*"
40 OR "green label*" OR "GHG label*" OR "greenhouse gas label*" OR "sustainable label*" OR "low emission label*" OR
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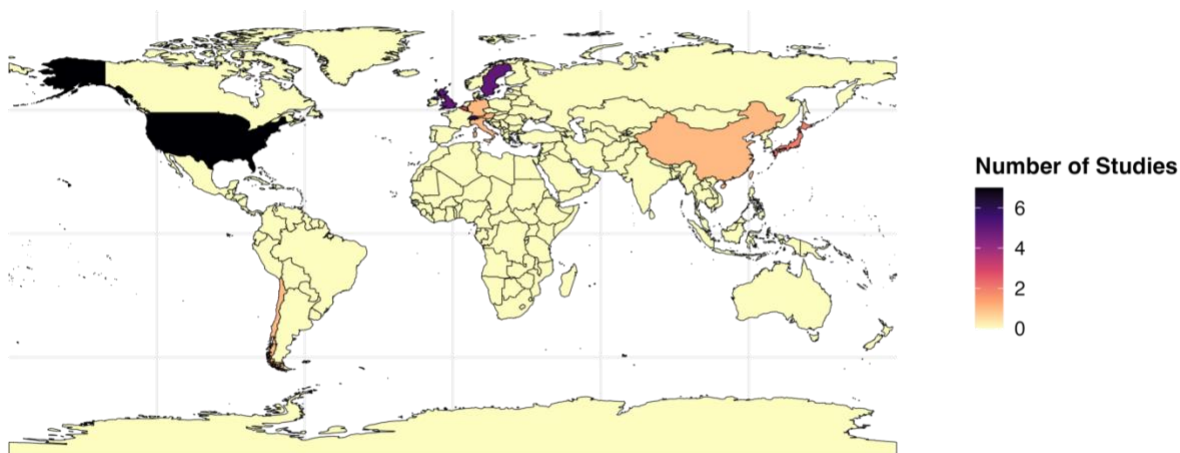
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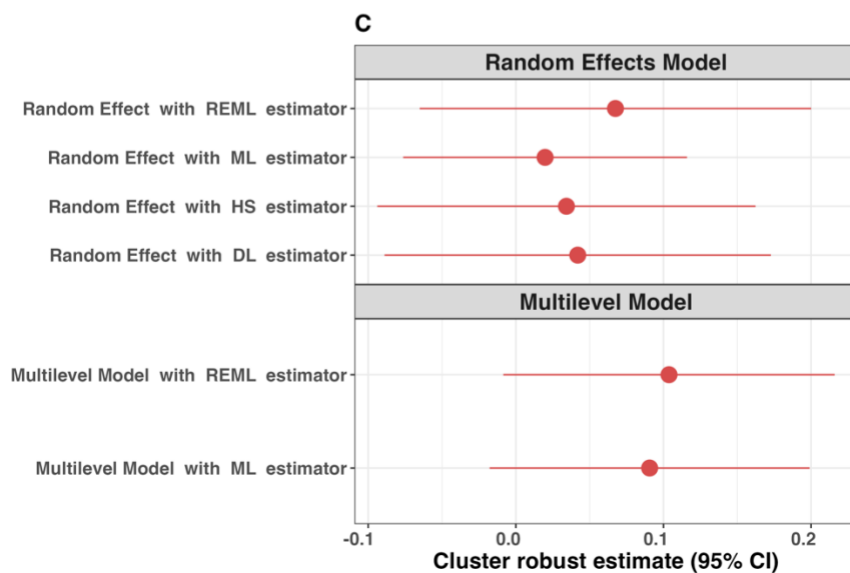
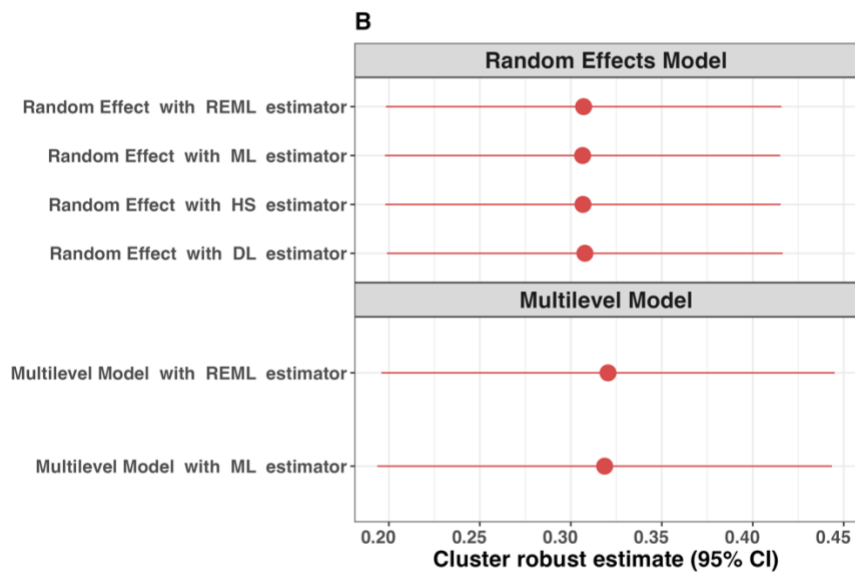
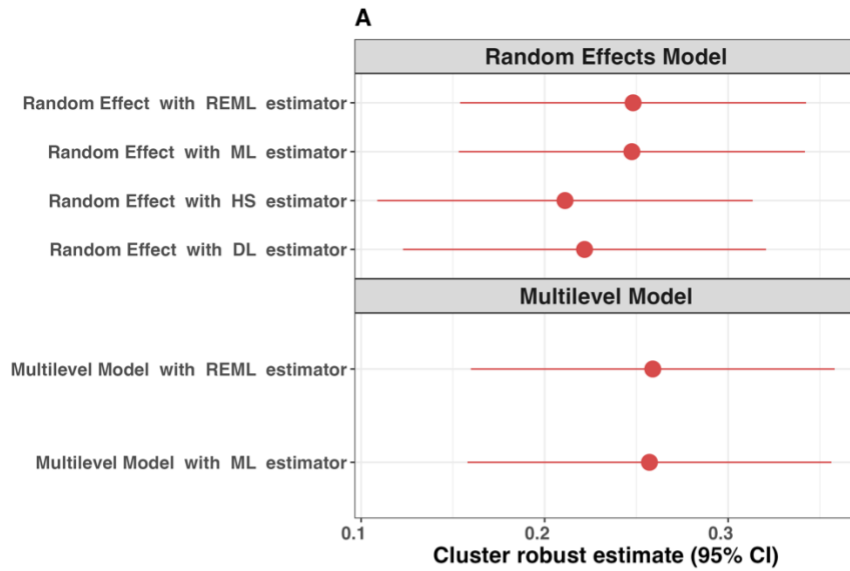
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79 *Supplementary Figure 1: Global distribution of studies included in the meta-analysis.*



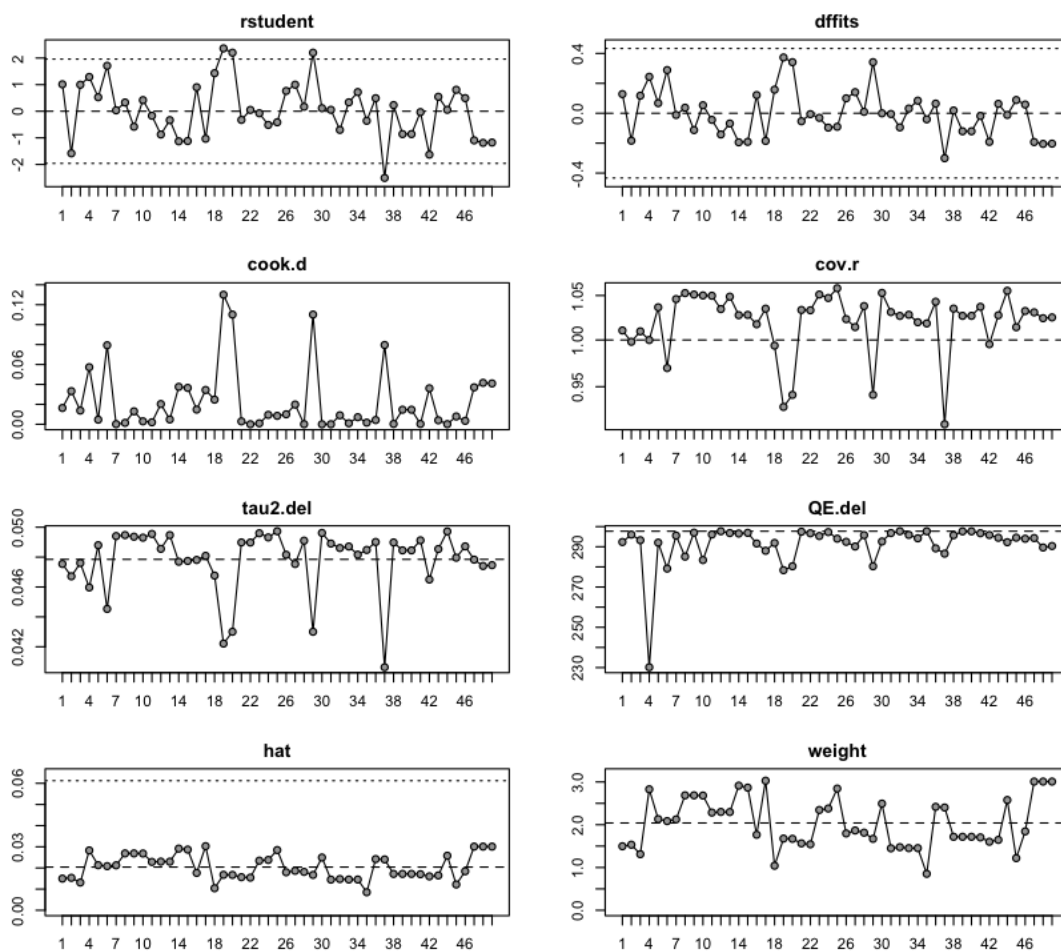
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82 *Supplementary Figure 2: Effect size estimates across different models in all eligible behaviors, online scenarios and*
83 *offline scenarios.*
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85 (A) Effect size estimates using various statistical models in all eligible behaviors. (B) Effect size estimates using
86 various statistical models in online scenarios. (C) Effect size estimates using various statistical models in offline
87 scenarios.



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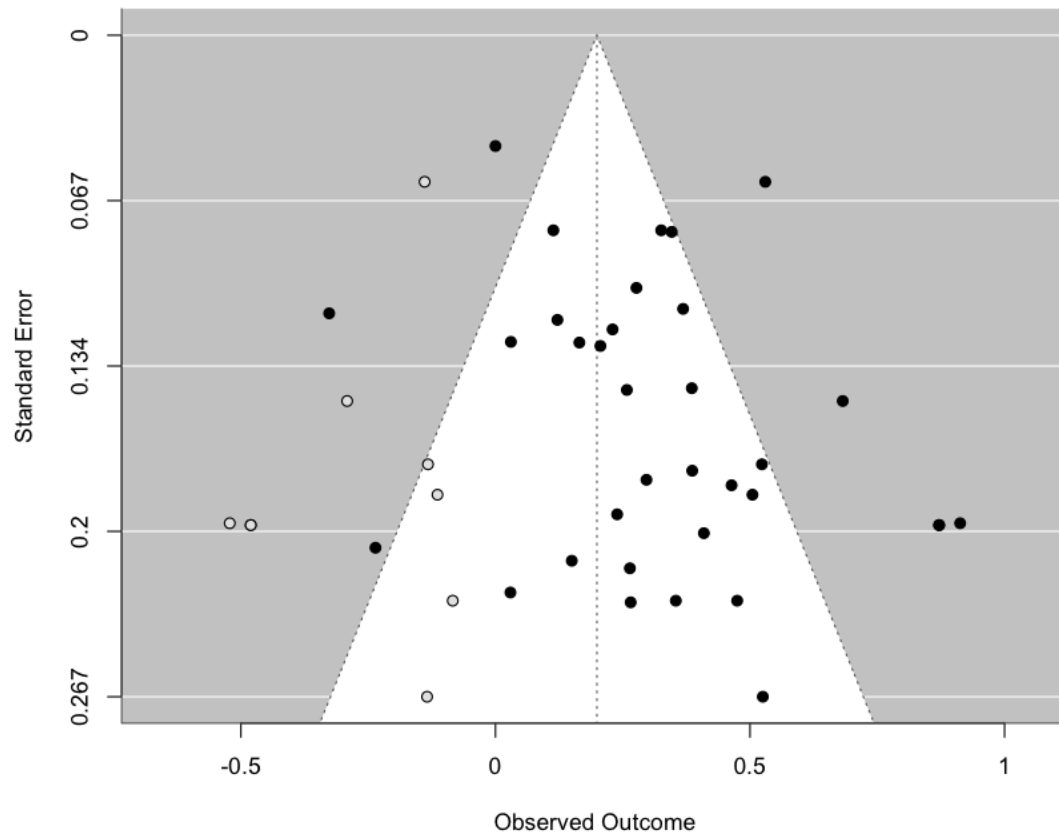
90 *Supplementary Figure 3: Sensitivity analysis of effect size estimates.*



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93 *Supplementary Figure 4: Funnel plot for online scenarios.*



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97 *Table S 1: Explanation of scenario categories in the study.*

Category	Includes	Excludes	Primary Focus
All eligible behaviors	All studies measuring objectively observable behaviors, excluding Likert scale-based.	Studies measuring self-reported behaviors or using Likert scales.	All studies included in the meta-analysis that involve observable behaviors.
Online Scenarios	Studies conducted through online platforms (e.g., websites, apps) or descriptive scenarios where subjects make choices based on imagination.	Offline studies.	Research focused on behaviors in online environments, whether real or imagined.
Offline Scenarios	Studies conducted in physical environments such as school cafeterias, restaurants, food shops, and grocery shops.	Studies conducted in online environments.	Research focused on behaviors in real-world, offline settings.

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Publication Year	Title	Author	Sample Characteristics	Label Type	Type of Product	Country	Scenario
2020	"I'll try the veggie burger": Increasing purchases of sustainable foods with information about sustainability and taste	Piester, Hannah E.; DeRieux, Christine M.; Tucker, Jane; Buttrick, Nicholas R.; Galloway, James N.; Wilson, Timothy D.	Student Population Sample	Sustainability Label	Food Products	USA	School Cafeteria
2022	An Eco-Label Can Matter More Than Buying Green: An Experiment on Consumers' Recycling Behaviour After Tasting Eco-Labeled Coffee	Chao, Yu-Long	General Population Sample	Sustainability Label	Food Products	China Taiwan	Offline Food Shop Or Food Retailer
2024	Behavioral interventions to motivate plant-based food selection in an online shopping environment	Katare, Bhagyashree; Zhao, Shuoli	General Population Sample	Carbon Label	Food Products	USA	Online Shop
2023	Can carbon labels encourage green food choices?	Kühne, Swen J.; Reijnen, Ester; Laasner Vogt, Lea; Baumgartner, Melanie	General Population Sample	Carbon Label	Food Products	Switzerland	Online Shop
2024	Can environmental traffic light warning labels reduce meat meal selection? A randomised experimental study with UK meat consumers	Hughes, Jack P.; Weick, Mario; Vasiljevic, Milica	Student Population Sample	Sustainability Label	Food Products	United Kingdom	Imagined Scenario
2023	Carbon footprint labels involving traffic lights foster sustainable food choices	Holenweger, Geraldine; Stöckli, Sabrina; Brügger, Adrian	General Population Sample	Carbon Label	Food Products	Switzerland	Imagined Scenario
2024	Choice architecture promotes sustainable choices in online food-delivery apps	Lohmann, Paul M; Gsottbauer, Elisabeth; Farrington, James; Human, Steve; Reisch, Lucia A	General Population Sample	Carbon Label	Food Products	UK	Online Shop

2024	Co-designing carbon label interventions in restaurants: insights from a field experiment in a tourism destination	Nowak, Marie; Heldt, Tobias; Lexhagen, Maria; Nordström, Jonas	General Population Sample	Carbon Label	Food Products	Swedish	Restaurant
2019	Consumers underestimate the emissions associated with food but are aided by labels	Camilleri, Adrian R.; Larrick, Richard P.; Hossain, Shajuti; Patino-Echeverri, Dalia	General Population Sample	Carbon Label	Food Products	USA	Imagined Scenario
2022	Do carbon footprint labels promote climatarian diets? Evidence from a large-scale field experiment	Lohmann, Paul M.; Gsottbauer, Elisabeth; Doherty, Anya; Kontoleon, Andreas	Student Population Sample	Carbon Label	Food Products	United Kingdom	School Cafeteria
2024	Effects of environmental and nutritional labels on the dietary choices of consumers: Evidence from China	Sun, Xue; Wang, Rui; He, Pan; Liu, Beibei	Student Population Sample	Carbon Label	Food Products	China	School Cafeteria
2023	Effects of intra- and inter-category traffic-light carbon labels and the presence of a social norm cue on food purchases	Suchier, Johann; Demarque, Christophe; Waroquier, Laurent; Girandola, Fabien; Hilton, Denis; Muller, Laurent	Student Population Sample/General Population Sample	Carbon Label	Food Products	France	Online Shop
2020	Encouraging pro-environmental behaviour through green identity labelling	Schwartz, Daniel; Loewenstein, George; Agüero-Gaete, Loreto	General Population Sample	Sustainability Label	Grocery Products	USA/Chile	Online Shop/Offline Grocery Shop
2019	Environmental Labelling and Consumption Changes: A Food Choice Experiment	Muller, Laurent; Lacroix, Anne; Ruffieux, Bernard	General Population Sample	Carbon Label/Sustainability Label	Food Products	France	Online Shop
2023	Green hotel selection: the effects of social learning and eco-labels	Baniya, Rojan; An, Yuting; Thapa, Brijesh	General Population Sample	Sustainability Label	Hospitality Products	USA	Imagined Scenario
2021	How to induce sales of sustainable and organic food: The case of a	Neumayr, Lambert; Moosauer, Christoph	General Population Sample	Sustainability Label	Food Products	Germany and Austria	Online Shop

	traffic light eco-label in online grocery shopping						
2021	Making the carbon basket count: Goal setting promotes sustainable consumption in a simulated online supermarket	Kanay, Aysegül; Hilton, Denis; Charalambides, Laetitia; Corrége, Jean-Baptiste; Inaudi, Eva; Waroquier, Laurent; Cézera, Stéphane	Student Population Sample	Carbon Label	Grocery Products	France	Online Shop
2023	Please keep ordering! A natural field experiment assessing a carbon label introduction	Casati, Mirta; Soregaroli, Claudio; Rommel, Jens; Luzzani, Gloria; Stranieri, Stefanelle	General Population Sample	Carbon Label	Food Products	Italy	Restaurant
2014	Product Differentiation and Consumer's Purchase Decision-making under Carbon Footprint Scheme	Nishino, Nariaki; Akai, Kenju; Tamura, Haruaki	Student Population Sample	Carbon Label	environmentally friendly products	Japan	Imagined Scenario
2019	Simple Eco-Labels to Nudge Customers Toward the Most Environmentally Friendly Warm Dishes: An Empirical Study in a Cafeteria Setting	Slapø, Helena Berz; Karevold, Knut Ivar	Student Population Sample	Sustainability Label	Food Products	Norway	School Cafeteria
2021	The ABC's of Ecological and Nutrition Labels. The Impact of Label Theme and Complexity on the Environmental Footprint of Online Grocery Choices	Hallez, Lotte; Qutteina, Yara; Boen, Filip; Smits, Tim	Student Population Sample	Sustainability Label	Grocery Products	Belgium	Online Shop
2016	The impact of climate information on milk demand: Evidence from a field experiment	Elofsson, Katarina; Bengtsson, Niklas; Matsdotter, Elina; Arntyr, Johan	General Population Sample	Sustainability Label	Food Products	Sweden	Offline Food Shop Or Food Retailer
2022	The interplay of eco-labels and price cues: Empirical evidence from a large-scale field experiment in an online fashion store	Feuß, Sebastian; Fischer-Kreer, Denise; Majer, Johann;	General Population Sample	Sustainability Label	Fashion Products	Conducted in cooperation with	Online Shop

		Kemper, Jan; Brettel, Malte				a leading European fashion e-commerce player (specific country not stated).	
2023	Traffic-light front-of-pack environmental labelling across food categories triggers more environmentally friendly food choices: a randomised controlled trial in virtual reality supermarket	Arrazat, Laura; Chambaron, Stéphanie; Arvisenet, Gaëlle; Goisbault, Isabelle; Charrier, Jean-Christophe; Nicklaus, Sophie; Marty, Lucile	General Population Sample	Sustainability Label	Food Products	France	Online Shop
2024	Using labels to support climate-friendly lunch purchases – An in-store study	Engström, Ebba; Nilsson Lewis, Astrid; Moberg, Åsa; Vanhuyse, Fedra; Dawkins, Elena; Lambe, Fiona; Sendlhofer, Tina; Ran, Ylva	General Population Sample	Carbon Label	Food Products	Sweden	Offline Food Shop Or Food Retailer

Table S 3: Omnibus ANOVA Test Summary

Term	Df	Sum Sq	Mean Sq	F value	Pr(>F)
scenario	5	0.34507312	0.06901462	1.105290	0.37422857
type_of_product	4	0.78469698	0.19617425	3.141789	0.02545598
sample_characteristics	1	0.30271958	0.30271958	4.848144	0.03398853
TLL	1	0.07616461	0.07616461	1.219799	0.27653097
Residuals	37	2.31029120	0.06244030		

Table S 4: Planned Comparisons Between Subgroups

contrast	estimate	SE	df	t.ratio	p.value
Imagined Scenario - Offline Food Shop Or Food Retailer	- 0.0019621	0.1617577 9	37	- 0.0121301	1
Imagined Scenario - Offline Grocery Shop	- 0.3208889	0.3007879 7	37	- 1.0668276	0.8912623 9
Imagined Scenario - Online Shop	- 0.1472525	0.1173924 5	37	- 1.2543609	0.8071043 1
Imagined Scenario - Restaurant	0.1150286	0.2118907 1	37	0.5428676 6	0.9939356 7
Imagined Scenario - School Cafeteria	0.2829825	0.1988460 1	37	1.4231241 3	0.7130697 9
Offline Food Shop Or Food Retailer - Offline Grocery Shop	- 0.3189268	0.3152326 9	37	- 1.0117186	0.9110704 8
Offline Food Shop Or Food Retailer - Online Shop	- 0.1452904	0.1471210 1	37	- 0.9875568	0.9190154 5
Offline Food Shop Or Food Retailer - Restaurant	0.1169907	0.2090650 5	37	0.5595900 9	0.9930211 6
Offline Food Shop Or Food Retailer - School Cafeteria	0.2849446	0.2020544 9	37	1.4102369 9	0.7207095 4
Offline Grocery Shop - Online Shop	0.1736364	0.2845806 1	37	0.6101483	0.9896241 9
Offline Grocery Shop - Restaurant	0.4359175	0.3436622 2	37	1.2684475 3	0.7998300 2
Offline Grocery Shop - School Cafeteria	0.6038714	0.3699262 6	37	1.6324103 9	0.5831916 9
Online Shop - Restaurant	0.2622811	0.2009395 1	37	1.3052740 2	0.7802659 8
Online Shop - School Cafeteria	0.4302350	0.1722874 5	37	2.4971927 1	0.1511712 2

	0.1679539	0.2440452		0.6882080	0.9821775
Restaurant - School Cafeteria	4	9	37	9	4
environmentally friendly products -		0.3642794		-	0.4206168
Fashion Products	-0.63533	3	37	1.7440734	2
environmentally friendly products -	-	0.2603383		-	0.4919217
Food Products	0.4228612	8	37	1.6242751	1
environmentally friendly products -	-	0.2333562		-	0.9947624
Grocery Products	0.0915936	2	37	0.3925056	9
environmentally friendly products -	-	0.3366089			0.0149667
Hospitality Products	1.1288825	9	37	-3.353691	4
	0.2124688	0.2675758		0.7940510	0.9307143
Fashion Products - Food Products	9	5	37	8	2
	0.5437364	0.2845806		1.9106582	0.3297592
Fashion Products - Grocery Products	1	7	37	6	1
	-	0.3723729		-	0.6774506
Fashion Products - Hospitality Products	0.4935525	2	37	1.3254253	7
	0.3312675	0.1563434		2.1188445	0.2338586
Food Products - Grocery Products	2	8	37	2	4
	-	0.2758945		-	0.0994092
Food Products - Hospitality Products	0.7060214	9	37	2.5590258	2
	-	0.3007879		-	0.0116646
Grocery Products - Hospitality Products	1.0372889	7	37	3.4485718	3
General Population Sample - Student	-	0.1401611			0.0544612
Population Sample	0.2783825	8	37	-1.98616	6
(Non-Traffic Light Design) - Traffic Light	-	0.0965642			0.2765309
Design	0.1066499	8	37	-1.104445	7

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