

Reusable packaging solution for takeaway: A practice-oriented study for LCA

A Master's thesis by Félix Elkær Nicot & Phuongdan Hoai Truong
Sustainable Design, Aalborg University

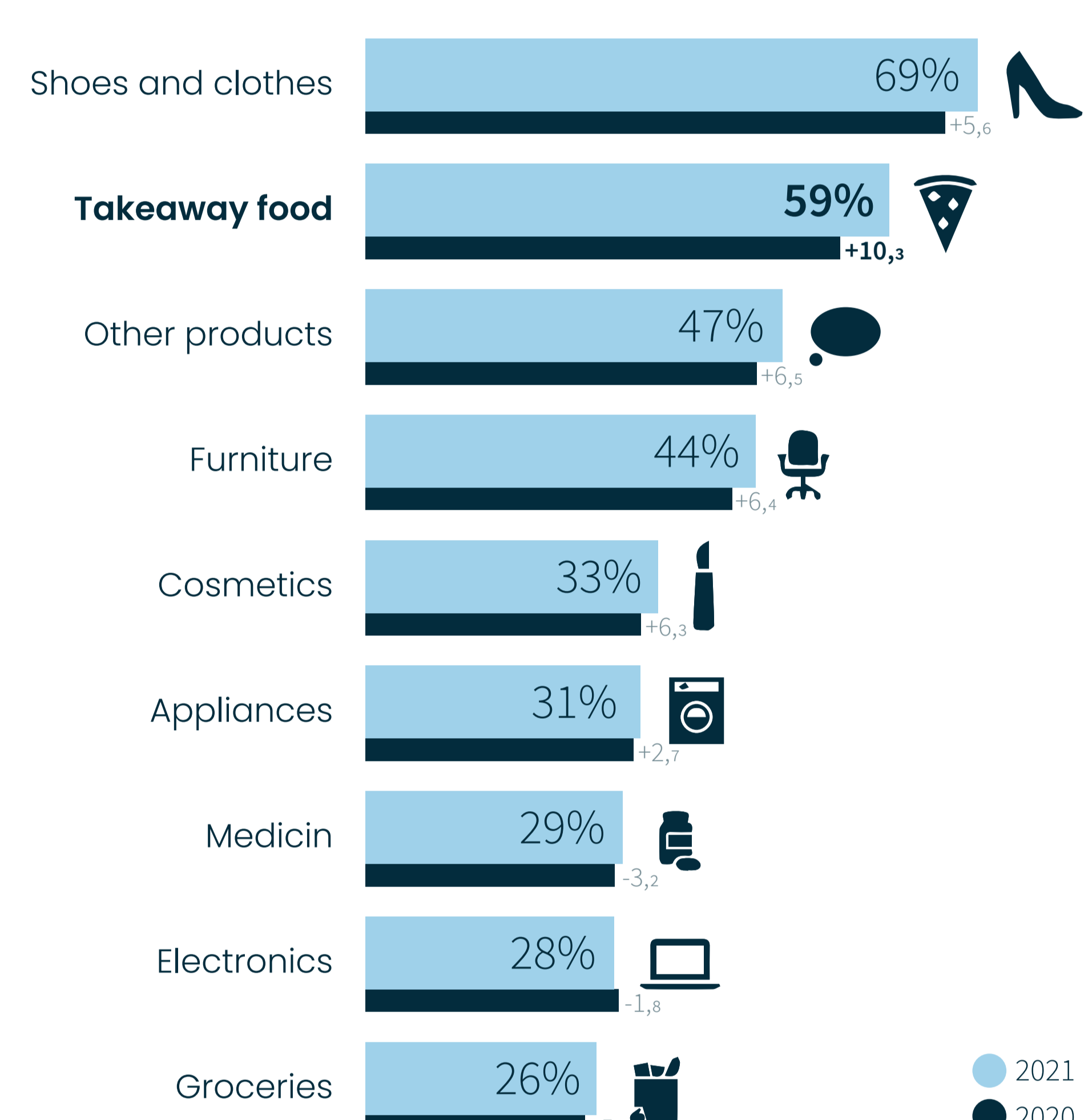


Which SDG does your project relate to?



This project relates to SDG 12 which aims to ensure sustainable consumption and production patterns in society, particularly target 12.5 that aims to: "Substantially reduce waste generation through prevention, reduction, recycling and reuse by 2030".

Online purchases of physical products



What is the concrete problem you have worked with?

This thesis takes a starting point in 'takeaway' food packaging as a case study. In response to a dramatic increase in single-use packaging, reusable packaging solutions have emerged as a more sustainable and circular alternative. Concurrently, numerous Life Cycle Assessments (LCAs) have already assessed these reusable solutions. LCA is a widespread tool for assessing the environmental impact and circular performance of products and systems, e.g. calculating the GHG emissions that a product is responsible for. However, methodological weaknesses have been highlighted in LCA, particularly regarding the modelling of the 'use phase', which is unwarrantedly product-centered and often disregards the social practices relating to the consumption of the given product. A theory that can provide a comprehensive understanding of these social practices and the complex reality in which they exist is Practice Theory. Practice Theory seeks to understand what people do and why. The theory approaches the social world and people's behavior as interconnected, and it provides an understanding of collective actions as a collection of recurring routines that maintain social structures.

This thesis is therefore focused on the following research question: How can Practice Theory improve the modelling of the 'use phase' in Life Cycle Assessment in the context of reusable packaging solutions for takeaway? To answer this, empirical data has been collected through qualitative means, by employing ethnographic methods (participant observations and interviews) and scenario-based workshops, carefully created around a future system for reusable packaging. The empirical data was utilised to conduct an analysis of 'doing takeaway', based on Practice Theory. This analysis highlighted the potential coupling of 'takeaway' practices with existing practices around the Danish deposit return scheme: 'Pant'. Following this, the qualitative data and analytical insights have been used in an LCA, comparing a year of using reusable sushi trays with a year of using single-use sushi trays for takeaway. The assessment indicated promising results for the reusable packaging solution in question, whereof a series of socio-technical recommendations were outlined. Finally, to make the analytical approach of this project broadly applicable, while providing a response to the research question, a framework is proposed - a Practice-oriented framework for LCA. The proposed framework builds upon the conventional 4 phases of LCA, combining steps oriented around Practice Theory that represents the dynamics of social reality.

Allocated processes in LCA modelling

	Day 1	Day 2	Day 3	Day 15	Day 16	Day 17	Day 365
Accumulated flow of trays going out	60	120	180	900	960	1020	21 900
Stockpile of trays	900	840	780	60	60	60	60
Returning trays	0	0	0	0	54	54	54
Replacement trays	0	0	0	0	6	6	6

What is your conclusion and/or solution that can be applied in the 'real' world?

The proposed framework demonstrates the importance of social considerations in LCA modelling by assuring the quality of the assumptions made through iterative and qualitative means. In doing so, the data input can reach a higher degree of accuracy, worthy of representing the usage of the products assessed. Socio-technical recommendations can then be presented to the companies, providing them with the necessary knowledge to tackle some of the other SDGs. To conclude, future research is highly encouraged, which combines other socio-technical perspectives for LCA in other case studies, as well as we see potential in exploring LCA with other methodological approaches to qualitative data collection.

