



Exploring the clothing overconsumption of young adults: An experimental study with communication interventions

Julia de Koning^{a,**}, Mariangela Lavanga^{b,*}, Wouter Spekkink^c

^a Erasmus University Rotterdam, Design Impact Transition (DIT), PO BOX 1738, 3000 DR, Rotterdam, the Netherlands

^b Erasmus University Rotterdam, Erasmus School of History, Culture and Communication ESHCC, Design Impact Transition (DIT), PO BOX 1738, 3000 DR, Rotterdam, the Netherlands

^c Erasmus University Rotterdam, Erasmus School of Social Sciences - ESSB, PO BOX 1738, 3000 DR, Rotterdam, the Netherlands

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ABSTRACT

The increase in clothing consumption per capita in the last decades presents substantial environmental and societal challenges. Young adults, heavily influenced by advertisements and new trends via social media, emerge as substantial contributors to the escalating issue of clothing overconsumption. This research aims at better understanding the drivers of clothing consumption for young adults and the policy interventions that can be designed to change clothing overconsumption behaviour. This study employs a survey experiment with communication interventions using different framing strategies. In doing so, the study focuses on the potential impact of communication interventions on the clothing consumption rates of young adults. The study showed that a communication intervention can motivate young adults to purchase less clothing and gives an initial insight into how to implement this type of intervention. Moreover, it provides initial evidence that intervention strategies inspired by sufficiency can be effective. This research calls for more transformative policies to stimulate sustainable consumption that go beyond promoting sustainable alternatives.

1. Introduction

Clothing consumption has increased enormously over the last decades (Amed et al., 2021; Ellen MacArthur Foundation, 2015; Maldini et al., 2017; Blas Riesgo et al., 2024). This can primarily be attributed to the increased clothing production (Amed et al., 2021; Ellen MacArthur Foundation, 2015), a race to the bottom towards low production costs overseas (Bick et al., 2018), the wide adoption of the fast fashion model, and the recent rise of ultra-fast fashion. The fast fashion paradigm emphasizes rapid response times, fast changing collections and affordable and trendy items (Caro & Martínez-de-Albéniz, 2015; Niinimäki et al., 2020), with ultra-fast fashion making this process even faster. These trends fuel clothing overconsumption. Ciornea (2020) defines clothing overconsumption as “behaviour that implies frequent purchase of more apparel than needed and substitution of clothes while they are functional, due to reasons such as social integration, status communication, personal desire to be fashionable, impulsive purchase” (p. 30).

Clothing overconsumption has major environmental and social implications, making fashion and textiles the fourth most impactful

category in terms of primary resource consumption and greenhouse gas emissions (European Environment Agency, 2019). However, it is often overlooked in the efforts to transition the fashion industry towards a more sustainable future (c.f. Buchel et al., 2022 for a sustainability transition analysis of the fashion industry and its persistent social and environmental challenges). Whitmarsh et al. (2021) argue for focussing on high-emitting groups and high impact behaviour to address climate issues. Given that clothing overconsumption significantly contributes to clothing waste, resource-intense production and hinders sustainable bioeconomic initiatives in the industry (Ciornea, 2020), it is a crucial target for interventions. This approach aligns with the sufficiency theory, which states that asserting greener substitutes is not enough and that a fundamental shift from continuous consumption is crucial to instigate systemic change (Gossen and Heinrich, 2021; García-Ortega et al., 2023).

Young adults are a high emitting group in clothing overconsumption, as they are heavily influenced by advertisement and new trends via social media and they are the main target group of fast fashion companies (Martin and Bush, 2000; Diddi et al., 2019). Young consumers

* Corresponding author.

** Corresponding author.

E-mail addresses: julia.dekoning@eur.nl (J. de Koning), Lavanga@eshcc.eur.nl (M. Lavanga), spekkink@essb.eur.nl (W. Spekkink).

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often engage in impulsive clothing consumption (Pradipto et al., 2016), and are still very much unaware of the negative effects of their consumption behaviour (Lunblad and Davies, 2016; Morgan and Birtwistle, 2009). The general awareness of the negative implications of the fashion industry is growing (Gazzola et al., 2020), but fast fashion is still perceived as the norm (Park and Li, 2020; Lunblad and Davies, 2016).

Existing research on clothing consumption behaviour among young adults focuses on the reasons behind their engagement in sustainable clothing consumption behaviours, or the lack thereof (Didi et al., 2019; McNeill and Venter, 2019; Khan et al., 2024). Moreover, it often supports sustainable consumption behaviour that use sustainable substitutes, such as second-hand clothing or renting, instead of targeting the consumption rate (c.f. Hur, 2020; Shrivastava et al., 2021; Iran et al., 2019). When looking into changing consumption behaviour, researchers focus on what type of clothing is consumed and how it is disposed. For instance, Preuit and Yan (2016) examined the effect of an educational module on slow fashion on Canadian students, and found no significant change in consumption intentions, possibly due to high prices of slow fashion items.

Studies focussing on clothing overconsumption have only recently made a surge (Vesterinen and Syrjälä, 2022). The focus is mainly on analysing current efforts in reducing clothing overconsumption (Freudenreich and Schaltegger, 2020; Gossen and Heinrich, 2021), arguing for sufficiency in the fashion industry (García-Ortega et al., 2023; Ciornea, 2020) and for establishing limits to production and consumption (Sharpe et al., 2022; Coscieme et al., 2022). There is still little empirical research to identify possible ways to actively influence the high emitting behaviour of clothing overconsumption. In this study, the goal is to build upon current knowledge of clothing overconsumption and explore how clothing overconsumption behaviour can be addressed for young adults. The overarching goal is to better understand the drivers of clothing consumption for young adults and what policy interventions can be designed to change clothing consumption behaviour of young adults. Therefore, the research question is: *To what extent can a behaviour intervention influence the behaviour intention of young adults to reduce their clothing consumption rate?*

To answer this question, the COM-B accompanied by the Behavioural Change Wheel is used to assess clothing overconsumption behaviour and determine a fitting intervention. This analysis showed that a communication intervention is fitting for this issue. Therefore, this study examined the impact of a communication intervention on the intended clothing consumption rate of young adults through a survey experiment. The experiment enables the assessment of the causal relation of the communication intervention on young adults' intended clothing consumption rate. By conducting this study, a contribution is made to the debate on clothing overconsumption behaviour, sustainable consumption communication and the still very small amount of experimental research within the policy sciences (c.f. Bouwman and Grimmelikhuijsen, 2016 for a review of experiments in public administration).

The rest of the paper is structured as follows. First, the theoretical background of the paper is introduced, with a focus on behaviour change and interventions. Second, the methodology is described, and the experiment design and execution are explained in detail. Third, the results of the experiment are presented and thoroughly analysed. Lastly, the conclusions, limitations, and discussion are provided.

2. Theory: the COM-B model as a basis for interventions

2.1. The COM-B model for behaviour change

This study explores the potential influence of a communication intervention on clothing consumption rate behaviour. To do so, a behavioural model is employed to gain an understanding of clothing overconsumption and the factors that influence it. This study uses the COM-B model for behavioural change constructed by Michie et al. (2011) within the Behaviour Change Wheel (BCW) theory, a framework

dedicated to providing a comprehensive systemic approach to designing interventions. The COM-B model is chosen for this study as it provides a comprehensive basis for designing an intervention, due to its connection with the BCW. The BCW “claims to be the most comprehensive and practically useful behaviour change framework available” (Kolodko et al., 2021, p.1), integrating insights from 19 different behaviour change frameworks (Michie et al., 2011). While the BCW has its roots in psychology, it goes beyond a focus on individual determinants of behaviour by also including conditions in the social and physical environment of individuals (Wilson and Marselle, 2016). The COM-B model that is at the centre of the BCW framework explicitly includes habitual behaviours and unconscious influences, where other frequently used frameworks, such as the Theory of Planned Behaviour, the Norm Activation Theory and the Trans-Theoretical Model, emphasize rational, conscious decision-making (Whitmarsh et al., 2021). Given that clothing consumption often falls into the realm of habitual behaviour (Ertekin and Atik, 2015), the COM-B model seems a more suitable model for addressing this case.

The COM-B model (Fig. 1) outlines three essential elements for any behaviour: capability, motivation, opportunity. Capability refers to the physical or psychological ability of an individual to perform a behaviour, encompassing knowledge, skills, strength, and stamina. Motivation refers to the internal processes that energize and direct behaviour. It can be either reflective motivation, involving conscious decision-making and goal-setting, or automatic motivation, involving habits, desires, and impulses. Opportunity refers to the external factors that enable or facilitate a behaviour, such as accessibility, affordability, social acceptability, and the availability of time and resources.

The COM-B model requires identification of a target group and target behaviour (Michie et al., 2014). In this study the target group is young adults, and the target behaviour is reducing clothing consumption. To design an effective behavioural intervention, it is essential to assess to what extent young adults already have the necessary capabilities, motivations, and opportunities for reducing their clothing consumption.

2.1.1. Capability

According to the Behaviour Change Wheel (BCW) theory of Michie et al. (2014) the first step is to determine the capability of the target group. This involves paying attention to factors such as their awareness of the behaviour, skills and knowledge, and understanding of the benefits and costs of the behaviour (Michie et al., 2014). The target behaviour is fairly simple: buying less clothing. Therefore, most physical, and psychological capabilities are present.

However, the young adult target group does lack awareness and knowledge regarding the negative external effects of clothing consumption. Several studies show that young people are still often unaware of the negative effects of their purchasing behaviour (Lunblad and Davies, 2016; Morgan and Birtwistle, 2009). The awareness of the negative environmental and societal implications of the fashion industry is growing (Gazzola et al., 2020), but fast fashion is still perceived as the norm (Park and Li, 2020; Lunblad and Davies, 2016). Clothing

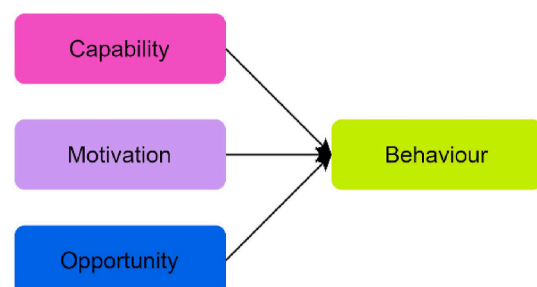


Fig. 1. The COM-B model for behaviour change (own elaboration from Michie et al., 2011).

overconsumption can also have a negative effect on one’s mental health. According to [Ekici et al. \(2018\)](#), excessively engaging in shopping activities can result in a decline of overall life satisfaction. Additionally, [Prothero et al. \(2010\)](#) suggest that consumers feel overwhelmed by too many choices, leading to feelings of exhaustion or apathy.

2.1.2. Motivation

The motivation to perform the target behaviour can be measured by determining if the target group get satisfaction out of the target behaviour, whether it fits with the target group’s self-identity, if it conflicts with a current habit or routine, and if it is a priority ([Michie et al., 2014](#)). Clothing consumption is heavily connected to self-identity ([Joy et al., 2012](#); [McNeill and Venter, 2019](#)). Therefore, when looking into clothing purchasing behaviour, it is important to include egoistic values such as self-expression and self-esteem ([Lubland and Davies, 2016](#); [McNeil & Moore, 2015](#)). For example, [Manchiraju and Sadachar \(2014\)](#) found a negative relationship between self-enhancement personal values, such as hedonism and achievement, and behavioural intention towards ethical fashion consumption.

Purchasing clothing is often seen as a habit: people have become accustomed to making frequent purchases and they anticipate the availability of new products in stores on a weekly basis. In their ‘Fashion Detox’ research, [Ritch et al. \(2020\)](#) found that habit is one of the main challenges of consumers to refrain from purchasing clothing. Similarly, [Joyner Armstrong et al. \(2016\)](#) discovered that habitual shopping behaviour contributed to challenges participants faced in refraining from clothing consumption. It can be difficult to let go of the convenience and habit of everyday consumption ([Ertekin and Atik, 2015](#)). Consumption is often considered as an enjoyable activity, making it even more difficult to change ([Schor and Holt, 2011](#); [Arnold and Reynolds, 2003](#)).

Research on whether young adults prioritize purchasing less clothing is limited. However, the consumption rate of young adults is high ([Morgan and Birtwistle, 2009](#)) and the research of [Diddi et al. \(2019\)](#) suggests that even for young adults who intend to consume clothing sustainably, buying less clothing is not a popular focus. In their focus groups, they found out that young adults enjoy the activity of shopping for clothing and that buying fewer clothing means to them less style. This is in line with [McNeill and Moore \(2015\)](#) study where they argue that personal sacrifice is often avoided when it comes to sustainable fashion consumption. Thus, buying clothing is closely tied to one’s self-identity, as it is often habitual behaviour, and reducing one’s clothing consumption rate is not perceived as a priority.

2.1.3. Opportunity

To determine if young adults have the opportunity to buy less clothing, it is useful to consider whether it is a normal behaviour in their social circle, if they can afford it, whether they have the time, if they have support, if it is accessible and so on ([Michie et al., 2014](#)). Purchasing less clothing may come with no costs to the target group (in terms of time or moneywise) and will not decrease their disposable income. There are also many social media platforms that promote sustainable clothing consumption behaviours and sustainable fashion ([Vinted](#); [Good On You](#); [Fashion For Good](#)).

However, fashion and clothing consumption is a social activity ([Briceno and Stagl, 2006](#)). In the social environment of young adults, purchasing less clothing may not be seen as a normal behaviour. Little research can be found about the direct response young adults receive on purchasing less clothing. The research by [Bin Said et al. \(2022\)](#), showed that when young consumers are asked if people who they deemed important were concerned about their clothing, only 5,5 percent answered yes. This indicates minimal pressure on clothing within close social relationships. In a wider social network, there can be more pressure on purchasing clothing. However, because insufficient knowledge exists on whether young adults feel pressured to purchase more clothing from their social network, this study argues that there is sufficient

opportunity for young adults to purchase less garments. Additionally, there are feedback loops present between individual behaviour and social norms. Through these feedback loops "there is the possibility that changing individual behaviour could contribute to a wider reshaping of social norms and practices, which could in turn influence other people’s behavior" ([Nielsen et al., 2021](#), p. 131).

[Table 1](#) provides a comprehensive overview of the areas requiring changes, delineating the connections to the capabilities, motivations, and opportunities available for young adults to reduce their clothing consumption. In the next section, the study explores suitable interventions capable of influencing these aspects.

2.2. Communication behaviour intervention

A behaviour change intervention is a set of actions designed to change a particular behaviour pattern ([Michie et al., 2011](#)). To design a behaviour change intervention, this research uses the Behaviour Change Wheel (BCW) framework of [Michie et al. \(2014\)](#). This framework provides a systematic approach to understanding behaviour change and designing fitting behaviour change interventions. [Fig. 2](#) illustrates the BCW and its three layers: the COM-B model (capability, motivation, opportunity), the intervention functions and the policy categories.

In the previous section, the **three components** of the COM-B model (capability, motivation, opportunity) have been assessed ([Table 1](#)), and this highlighted a need for change within the capability and motivation of young adults towards the reduction of their clothing consumption rate.

To determine the intervention type(s) that are needed for addressing the changes, the BCW provides an overview of each intervention **function** and what COM-B target it can address. For changing the capability of the target group, intervention functions can be education and enablement. Education involves informing and explaining to increase the understanding and knowledge of the target group. Given that this study has identified a need for increased awareness within the capability component, education emerges as the most suitable function to influence this aspect. When considering how to influence motivation, the functions identified via the COM-B model can be persuasion, incentivisation and coercion. However, coercion or incentivisation (rewarding or punishing) are not considered realistic intervention function for influencing clothing overconsumption. Persuasion is described as highlighting, proposing, or arguing to enhance the attractiveness of the target behaviour. Given that the needs for change at the motivation component are related to priority, identity and habits, persuading is deemed the most effective function to influence motivation.

[Michie et al. \(2014\)](#) identify seven **policy categories** or, in other words, type of interventions in the BCW that can effectively address the different functions of a behaviour intervention. According to the BCW, the policy categories that match the two functions that have been identified above (educational and persuasive) are: communication/marketing, guidelines, regulation, legislation, and service provision. As a guide to identifying the correct policy category or type of intervention, [Michie et al. \(2014\)](#) recommend the use of the APEASE criteria: “Affordability, Practicality, Effectiveness and cost-effectiveness, Acceptability, Side-effects/safety, and Equity”. The two categories,

Table 1
Overview of areas of change linked to the three components of the COM-B model (own elaboration).

COM-B component	Need for change
Capability	<ul style="list-style-type: none"> • More awareness and knowledge on clothing overconsumption behaviour and its effects
Motivation	<ul style="list-style-type: none"> • Fashion purchasing is heavily intertwined with self-identity • Shopping for clothing can be considered a habit • Slowing down one’s consumption rate is not seen as a priority
Opportunity	<ul style="list-style-type: none"> • No need identified

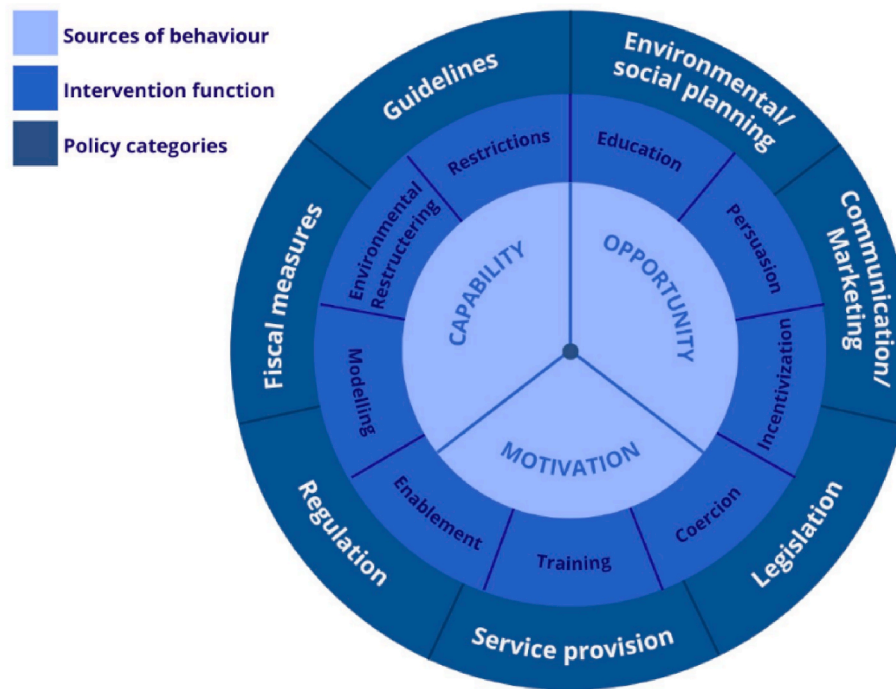


Fig. 2. Behaviour Change Wheel (own elaboration from Michie et al., 2011).

service provision and guidelines, are not effective in this case. Since clothing consumption happens both on- and offline on a large scale, it is hard to design an effective, cost-efficient service intervention that influences the clothing consumption rate. Guidelines are mostly effective within workspaces, such as hospitals (Michie et al., 2014), not for large scale problems such as clothing overconsumption among young adults. Both legislation and regulation are possible suitable ways to influence clothing overconsumption behaviour. However, this type of intervention will likely lack acceptability from the businesses, consumers, and other stakeholders. Additionally, as the case of clothing overconsumption is a complex, large-scale issue, creating legislation and regulation in this area can be resource intensive.

A “communication” intervention instead is deemed suitable in this case, as it is affordable, widely used in previous research and is deemed acceptable by consumers (Goworek et al., 2012; Hur and Siddall, 2022). Diddi et al. (2019) advocate for the use of social media communication to change the clothing consumption of behaviour of young adults. Moreover, Fisher et al. (2021) call for more research on sustainable consumption communication, specifically beyond the current product-related focus on business-to-consumer communication.

2.3. Behaviour intention

Measuring the effect of a behaviour intervention can be challenging, particularly for this research, as evaluating the influence of a communication intervention on the clothing consumption rate of young adults poses a considerable long-term and challenging measurement task. To address this, researchers often turn to behaviour intention as a reliable proxy. Behaviour intention refers to an individual’s motivation or willingness to perform a specific behaviour (Ajzen, 1991; Ajzen and Fishbein, 1980). In this study, the intention of young adults to decrease their consumption rate is considered a practical and insightful measurement variable for assessing the effect of a communication behaviour intervention. Hence, the central hypothesis of this study is.

H1. A communication behaviour intervention targeting the motivation and capability of young adults to purchase less clothing will cause their intended clothing consumption rate to decrease.

2.4. Framing and recommendations

Different strategies can be adopted to create a communication behaviour intervention. The COM-B model highlighted the need for change for the capability and motivation of young adults. For the capability, young adults lack in awareness of their clothing consumption behaviour and its impacts. Therefore, the designed intervention should include information about clothing overconsumption behaviour and its effects. Information can be presented in different ways, which can influence the effectiveness of the message conveyed. For example, the designed intervention for clothing overconsumption can include information stating that purchasing 6 garments costs 40 kg of CO₂ or that purchasing 6 less garments per year saves 40 kg CO₂ (Milieu Centraal, n.d.). These differences are called framing and can be used strategically when deploying a communication intervention. Framing theory suggests that the way the information is framed influences the response of individuals (Tversky and Kahneman, 1981). Therefore, the second hypothesis of this research is.

H2. The impact of a communication intervention on the intended clothing consumption rate of young adults depends on the information framing strategy used.

Four relevant frames will be explained below.

2.4.1. Positive versus negative frames

The use of positive and negative framing is the most well-known example of framing. This research uses a similar approach to positive vs. negative framing as Moon et al. (2016). Positively framed information will disclose the positive effects of the target behaviour, while negatively framed information will disclose the negative effects of not doing the target behaviour. Several scholars suggest that behaviour change can occur by approaching current behaviour from a negative angle (Pol et al., 2007; Tiemeijer et al., 2009). This is because negative information tends to be more memorable. Therefore, the first sub-hypothesis of hypothesis 2 is.

H2a. Young adults are more likely to decrease their intended clothing consumption rate when the information on clothing purchasing

behaviour is framed negatively in comparison to positive.

2.4.2. Social versus historical frames

Another framing strategy relates to social and historical benchmarks. Here, comparisons are made to inform the target group of their behaviour. Historic benchmarks compare data over time of a general group, whilst social benchmarks are made within a group, on a certain moment (Olsen, 2017). Several experiments have shown that benchmarks matter when presenting information, especially when the target group has little knowledge on the subject (Mussweiler, 2003; Olsen, 2017; Charbonneau and Van Ryzin, 2013). Because the historic difference in consumption behaviour in the current fashion system surpasses the current social difference between young adults and the rest of the population, it is hypothesized that using a historical frame will be more effective than using a social frame. Within these framing techniques a negative comparison is used, as this shows to be more effective according to Olsen (2017). The second sub-hypothesis is therefore.

H2b. Young adults are more likely to decrease their intended clothing consumption rate when the information uses a historical benchmark, in comparison to a social benchmark.

2.4.2.1. Recommendations. The COM-B model indicates a need for motivation-related change as clothing consumption is considered a habit, has a strong connection with self-identity and reducing it is not a priority for young adults. Motivation can be addressed by creating recommendations for decreasing one’s clothing consumption rate. Albaracín et al. (2018) found out that an intervention without any behavioural recommendations is very unlikely to cause behavioural change and stated that the recommendations need to be comprehensible and have contextual and acting potential. The contextual potential involves the consideration of the underlying factors of behaviour, which have already been identified in the COM-B model. For the acting potential, Albaracín et al. (2018) suggested that communication interventions will cause actual action, when the messages incorporate elements such as concept activation, belief and attitude formation, emotional responses, behavioural skills, and perceptions of control. In summary, effective communication interventions must contain framed information and recommendations that target the motivation and capability of young adults.

Based on the theoretical framework and the two hypothesis that are identified, Fig. 3 shows the conceptual model employed in this research.

3. Research design and methodology

This section provides a comprehensive explanation of the methodology employed in this study.

3.1. Survey experiment design

Experiments enable testing hypothesized causal relationships by performing a manipulation and measuring the effect on the dependent variable (Aguinis and Bradley, 2014). The experimental method is suitable for this study, as it aims to assess the causal relationship between a communication intervention and young adults’ intended clothing consumption rate. More specifically, this study employs a survey experiment, which combines survey data with individual decision-making experiments (Morton and Williams, 2010). This method combines the strengths of both approaches, ensuring generalizability and valid causal inference, as well as external and internal validity (Aguinis and Bradley, 2014). The survey experiment takes the form of a basic design, where the respondents are randomly assigned to a treatment (control or active) and afterwards the dependent variable is measured. Four different information framing techniques are used that were identified in section 2.4: positive, negative, social, and historic interventions.

The survey includes five interventions: four differently framed communication interventions and one control intervention. Randomization is used to assign participants in the experiment to one of the five groups (Morton and Williams, 2010). After the randomization, the respondent is shown the intervention accordingly. For the slides of the intervention, a timer of 5 s is added, to ensure that the respondent does not skip the viewing of the intervention. The complete flow of the survey experiment is shown in Fig. 4.

3.2. Operationalization

The independent variable in this survey experiment is the communication intervention. The assessment of the COM-B model showed that young adults are still lacking awareness and knowledge of their behaviour, necessitating interventions that provide information about overconsumption and its effects. Additionally, the model showed that young adults’ motivation to reduce their consumption rate is insufficient. Therefore, the interventions are designed to be appealing and include recommendations for future behaviour (Albaracín et al., 2018).

The interventions consist of four images, two addressing capability and two addressing motivation. This research aims not to design a perfect campaign, but to assess young adults’ response to communication interventions by simulating a real-life campaign. Hence, previous campaigns and articles are used in these designs. All designs are made in Canva and use the visuals of Canva. Fig. 5 shows an example of the four images that were designed for the positively framed intervention and used in the survey experiment. In this intervention, the positive frame is implemented by amplifying the positive effects of reducing your clothing consumption on the environment and your mental health. Conversely, the negatively framed intervention highlights the negative effects on both the environment and mental well-being. The intervention recommendations were implemented by adding two images on tips for future behaviour. These two images are included in and remain the same for each of the framed interventions. The control intervention contains basic information on sewing techniques. As a result, the survey contains five interventions, each of them including four images.

The dependent variable in this study is the intended clothing consumption rate, and this variable is operationalized by consulting current literature. Bin Said et al. (2022) and Preuit and Yan (2016) both utilized Likert scales to assess attitudes toward slow fashion and purchase intentions. Based on the current literature, the intended clothing consumption rate is first operationalized as: “In the future, I intend to purchase less clothing.”, with a five-point Likert scale ranging from

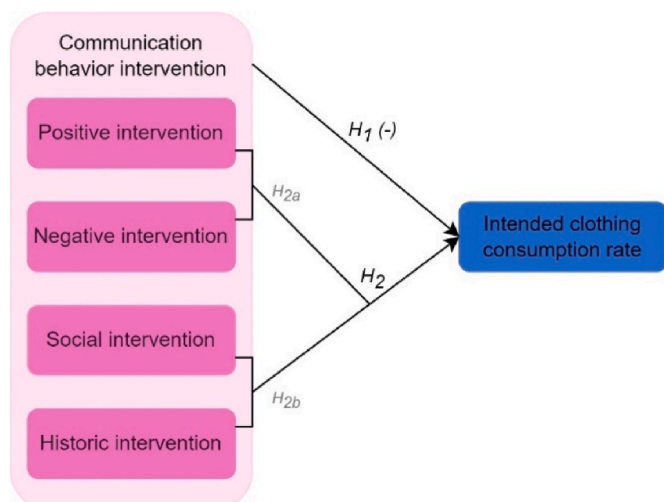


Fig. 3. Conceptual model (own elaboration).

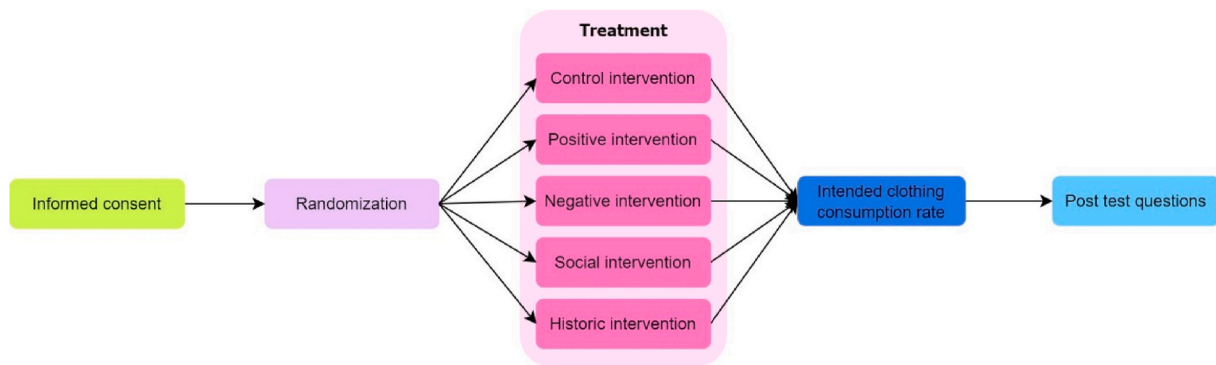


Fig. 4. Survey experiment flow (own elaboration).



Fig. 5. Positively framed communication intervention (own elaboration).

strongly disagree to strongly agree. Considering the intention-behaviour gap in sustainable fashion, a question on the likelihood of decreasing clothing consumption is included, rated on a 5-point Likert scale. Additionally, participants are asked to specify the percentage of intended decrease, with options of 0%, 10%, 25%, and 50% or more. These choices were informed by pilot testing with students to enhance reliability.

To ensure representativeness of the experimental groups and of the success and randomization, three control variables are used: gender, environmental concern, and consumption rate. These variables are chosen as they may influence the outcome of the study. To check if the respondents fall into the target group of young adults the control variables of age and student are also added to the survey. The survey questions of the control variables and the dependent variable can be found in [Appendix A](#).

3.3. Data collection and respondents

The experiment requires five groups of respondents. According to the G-power, a minimum of 305 respondents is needed to ensure a valid effect (effect size = 0.2; power = 0.8; alpha = 0.05; groups = 5). The data was collected by sharing a Q-code during several lectures at the Erasmus University Rotterdam (EUR) and sharing the survey online in the month of April 2023. Three different lectures from public administration, communications, and arts, media and culture were available for conducting the survey experiment. Online the survey was shared in WhatsApp groups of different studies. The survey experiment had a total of 357 respondents.

The data was checked for usability, age (18–25), and if they were students at the EUR. The dataset contained enough EUR-students to have the desired the G-power. For experiments it is good to have a homogeneous group, because a more accurate comparison between the control and experimental conditions is ensured by minimizing variability within the respondent group ([Morton and Williams, 2010](#)). Therefore, the responses of the non-students and the students at other institutions were removed, which left 310 useable responses for the analysis. However, only using students as respondents also provides a limitation, as students can respond differently to a manipulation ([Charness and Kuhn, 2010](#)).

The respondents mostly identified as female (73,87%). However, this distribution is not necessarily a problem for this research as women generally have a higher consumption rate ([Morgan and Birtwistle, 2009](#)). The respondents had an average consumption rate of 30 items per year, which is significantly lower than the Dutch average of 46 ([Maldini et al., 2017](#)). On average, the respondents showed to be moderately concerned with the environment. To test the hypothesis of this research, the data is analysed using a one-way ANOVA.

4. Results and discussion

In this section, the results from the survey experiment will be presented and discussed. Before testing the hypotheses, the measurement instruments were checked, and equivalence testing was done. The outcomes of these tests are shown in [Appendix B](#). Based on the outcomes, the three questions that measured the behaviour intention to reduce the clothing consumption rate were combined into one variable by creating a factor-based score, using the average of the three variables ([DiStefano](#)

et al., 2009).

To test hypothesis 1 of this study, a one-way ANOVA test was executed to compare the means of the behaviour intention change variable between the different frame groups. The differences between the means are visualized in Fig. 6 and the entire outcome of the ANOVA test is shown in Table 2. The results show that there is a significant difference ($p < 0.05$) between the control and historic frame, the control and negative frame, and the control and positive frame. There was no significant difference between the control and the social frame ($p = 0.052$). Because significant differences between control and communication frames have been found, **hypothesis 1 is supported**. Communication interventions have a negative effect on the intended clothing consumption rate of young adults.

To determine the second hypothesis of this study, the same analysis is used. The same multiple comparisons table is used, but the focus is on the difference between the frames instead of the difference between control and the frames. The results of the multiple comparisons between the frames are shown in Table 2. Here, there are no significant differences present between the differently framed interventions. Thus, the framing strategies do not exhibit significant differences between each other and **hypothesis 2 is not supported** based on the statistical results.

The experiment results indicate that the respondents who were exposed to information on overconsumption and recommendations to reduce overconsumption were more likely to answer that they intend to decrease their clothing consumption rate, except for the respondents that were shown the socially framed intervention. The intervention, designed based on the BCW, proved effective. However, the framing of the communication interventions did not affect the interventions effectiveness, which is surprising when looking at previous research on framing strategies. For example, negative framing often shows to be more effective than positive framing (Pol et al., 2007; Tiemeijer et al., 2009).

4.1. Discussion

The findings of this study suggest that a communication intervention can act as an effective strategy in motivating young adults to purchase less, heightening their awareness of the effects of clothing consumption and ultimately reducing clothing overconsumption. Three of the four designed interventions proved to be effective in influencing the intent of the respondents to consume less clothing. The study and its results have important implications for theory, methods, policy and practice.

For theory, this research contributes to the limited amount of literature on reducing clothing overconsumption. By delving into behaviour change interventions that can foster sufficiency and decrease

Table 2

ANOVA Results - Multiple Comparisons Table (own elaboration).

ANOVA Results				
(I) Intervention	(J) Intervention	Mean Difference (I-J)	Std. Error	Sig.
Control	Historic	-,52688*	,17494	,023
	Negative	-,51984*	,17713	,029
	Positive	-,50858*	,17357	,030
	Social	-,47388	,17357	,052
Historic	Negative	,00703	,17642	1000
	Positive	,01830	,17286	1000
	Social	,05299	,17286	,998
Negative	Positive	,01126	,17507	1000
	Social	,04596	,17507	,999
Positive	Social	,03470	,17148	1000

overconsumption, this study supports the move towards a sustainable bio-economic system (Ciornea, 2020), a wellbeing economy approach to fashion or the so called “wellbeing wardrobe” (Sharpe et al., 2022; Pugh et al., 2024), as well as the overall betterment of the environmental and social sustainability transition of the sector. It also answers to the call of Fisher et al. (2021) for more research on sustainable consumption communication, specifically beyond the current product-related focus on business-to-consumer communication.

Furthermore, the research offers empirical support of the Behaviour Change Wheel. This theory is usually applied within the health policy domain (NICE - National Institute for Health and Care Excellence), while this research shows the value of this framework for other policy domains - specifically sustainability transitions, where behaviour change is an essential component and where comprehensive behavioural models are needed (Whitmarsh et al., 2021).

In terms of methodological contributions, this study adds onto the still very small amount of experimental research within the policy sciences (Bouwman and Grimmelikhuijsen, 2016). The study shows that experimental research can play an important role in policy creation. It gives governmental actors the possibility to test the effectiveness of policy actions before their implementation and this is especially key for governmental communications that is sensitive to perception.

When looking into the policy and practical implications of the study, this research contributes to broadening the scope of fashion and clothing industry policies by addressing overconsumption and going beyond looking into more sustainable substitutes. The findings suggest that influencing the clothing consumption rate of young adults can be considered as a viable policy strategy to transition the fashion industry to a more sustainable future. Young adults showed to be open to reducing their consumption rate when confronted with information and recommendations. Moreover, the study shows that communication

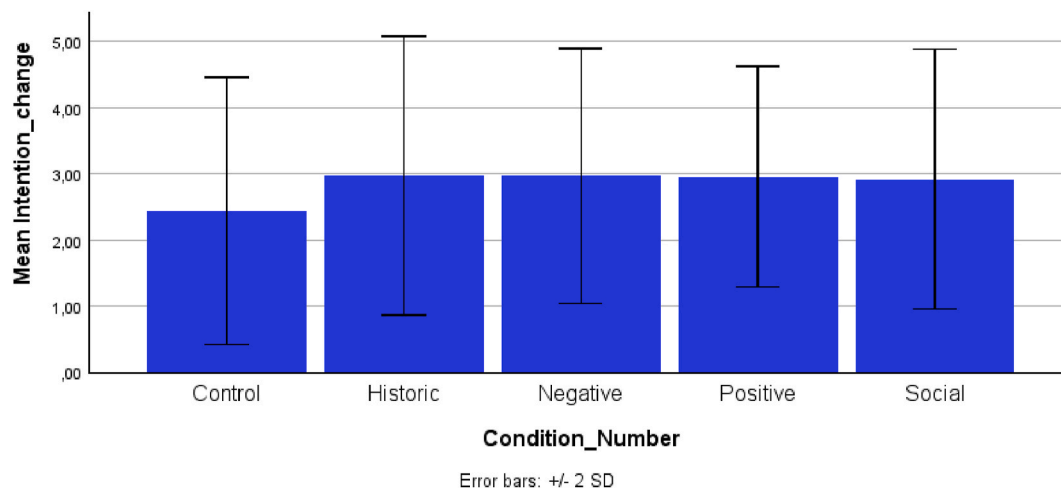


Fig. 6. Intention to consume less clothing for the different frame groups (own elaboration).

interventions have the potential to act as one of the policy instruments that can be used to effectively address overconsumption. It provides an insight for policymakers into how these interventions could be implemented.

Future research recommendations emerge from the limitations of this study. The survey experiment showed that there is no difference in the effectiveness of the different framing strategies in this case. This implies that a communication intervention targeting that addresses clothing overconsumption is enough in itself to influence the intentions of young adults to reduce clothing consumption, regardless of the framing used. However, individual factors may influence the effectiveness of the different types of framing of a communication intervention. Hence, an extended version of the experiment could explore the relationships between framing and different personality traits. Moreover, this research could address why the socially framed intervention did not show significant effect on the intended clothing consumption rate in this study, given that this result in the current study was only marginally above the significance boundary. Additionally, a replication of the experiment could add a more explicit manipulation check and change the respondent group, choosing for a more heterogeneous group and/or conducting the experiment in a different country.

Secondly, a limitation of the study lies in the usage of behavioural intention as a measurement of the effect of communication interventions. Intentions do not always translate into actual behaviour, and the intention-behaviour gap is often acknowledged in sustainable fashion consumption research (Jacobs et al., 2018; Johnstone, 2014; Hassan et al., 2014). Research indicates that price heavily influences clothing purchase decisions for sustainable fashion products (Bianchi and González, 2021; Blas Riesgo et al., 2023). Even though price may not play a key role in the case of clothing overconsumption, it cannot be stated with certainty that the behaviour intention is an exact indicator for future behaviour. Therefore, future research should delve into what happens next and engage in longitudinal-experimental studies: does or to what extent the actual behaviour change, and what factors contribute to deviating from one's intentions?

Thirdly, a limitation arises from the assessment of this study of the capability, motivation and opportunity in the COM-B model related to the case of clothing overconsumption. While opportunity is deemed sufficient and no need for change is highlighted due to the limited research on social acceptance of decreasing one's clothing consumption, this study cannot exclude the possibility that there are still points for change present in the case of clothing overconsumption of young adults. One of the strengths of using the COM-B model is its inclusion of external factors. Therefore, it is recommended that future research looks deeper into the social opportunity of young adults to decrease their consumption rate.

Finally, this study focused on a specific intervention category. While the BCW is a comprehensive model for identifying effective interventions, exploring only one intervention may limit the scope of addressing clothing overconsumption. Previous research suggests that governmental communication campaigns are more effective when combined with other complementary interventions (Whitmarsh, 2021; Dienst Publiek en Communicatie, 2011). Therefore, future research could use other alternative and complementary interventions to address clothing overconsumption. This could also be combined with research into the opportunity of young adults to consume less, as highlighted before.

5. Conclusion

Clothing overconsumption is a phenomenon that has not been researched widely, whilst it is a key aspect of the sustainability transition of the fashion industry (García-Ortega et al., 2023; Gossen and Heinrich, 2021). The aim of the study was to explore the effect of an intervention on the clothing consumption rate of young adults by conducting an experiment with communication interventions using different framing strategies. The results provide a better understanding of the effect of communication interventions on the attitudes of young adults regarding clothing consumption.

The findings from the experiment indicate that communication interventions with varied framing techniques can affect the behaviour intention of young adults towards the reduction of their clothing consumption rates. The survey showed that differences in framing do not make a significant difference for the effect of the communication intervention on these behaviour intentions. In conclusion, a communication behaviour intervention that addresses the motivation and capability of young adults to reduce their clothing purchases decrease their intended clothing consumption rate.

Experimental research proved to be an effective methodological approach to enrich the field of sustainability transitions in the fashion industry.

Sustainable consumption in fashion will be difficult to achieve if we solely rely on strategies that promote green growth, such as increasing the availability and production of sustainable alternatives. The study presented here provides initial evidence that intervention strategies inspired by sufficiency, that is, focused on reducing consumption, can be effective. Consequently, there is scope for more transformative policies that go beyond promoting sustainable alternatives, and instead move towards promoting a reassessment of personal needs and avoidance of excessive consumption (Bocken and Short, 2016). The results of the study thus encourage the deployment of sufficiency-inspired strategies to stimulate sustainable consumption. The results also call for further research to expand the evidence base for such strategies in order to enhance the environmental and social sustainability of the fashion industry.

CRedit authorship contribution statement

Julia de Koning: Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Mariangela Lavanga:** Writing – review & editing, Writing – original draft, Validation, Supervision, Project administration, Methodology, Formal analysis, Conceptualization. **Wouter Spekkink:** Writing – review & editing, Writing – original draft, Supervision, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Survey questions

Table A.1
Control and dependent variables (own elaboration)

Variables	Specification	Question/statement	Source
Intended clothing consumption rate	<ul style="list-style-type: none"> • Intention • Likelihood of change • Decrease percentage 	<p><i>In the future I intend to purchase less clothing.</i> (1 = completely disagree - 5 = completely agree)</p> <p><i>How likely are you to purchase less clothing in the future?</i> (1 = very unlikely - 5 = very likely)</p> <p><i>How much do you intend to decrease your clothing consumption in the future?</i> (1 = 0% 2 = 10%, 3 = 25, 4 = 50% or more)</p>	Adapted from Bin Said et al. (2022) and Preuit and Yan (2016)
Control variables			
Age		Select your age: (18–25) (26–29) (30–39) (40+)	
Gender		What gender do you identify as? (female, male, non-binary, I don't want to share)	
Student		Select which statement applies to you: (EUR-student, student at other institution, not student)	
Environmental concern		To what extent are you concerned with your environmental impact? (1 = not at all - 5 = extremely)	Adapted from Morgan and Birtwistle (2009)
Clothing consumption rate	<ul style="list-style-type: none"> • Consumption frequency • Consumption amount 	<p><i>How often do you purchase clothing?</i> (Once a week, once a month, twice a year, once a year)</p> <p><i>On average, how many clothing items do you buy per purchasing moment?</i> (1–20 or more)</p>	Adapted from Morgan and Birtwistle (2009) and Chen-Yu and Seock (2002).

Appendix B. Measurement instruments and equivalence testing

To check the measurement instruments, a reliability test and a factorial test were executed. For the reliability test, the Cronbach's Alpha is calculated. Taber (2018) claims that a survey is reliable if the Cronbach alpha score is higher than 0.7 and the questions on intended consumption rate with a score of 0.860 are thus considered reliable.

The intended consumption rate was measured using three different questions. It is expected that these factors load onto the same construct, and thus a principal component analysis is executed. Beforehand the question on decrease percentage is transformed from a 4-point scale to a 5-point scale using the formula: 5-point scale = $\{[(5 - 1) * (4\text{-point scale score} - 1)] / (4 - 1)\} + 1$. This is done to ensure that all three questions are weighted equally in the factor analysis. To determine if factor analysis is suitable for this research, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's test of sphericity is calculated. Based on the criterium of Kaiser (1974), the KMO score of 0.7 is adequate. Barlett's test is also significant and thus it can be concluded that the factor analysis is appropriate for this research.

The outcome of the factor analysis is shown in Table B1. Because the factor loadings do not vary much, the three questions are reduced to one variable by creating a factor-based score, using the average of the three variables (DiStefano et al., 2009).

Table B.1
Component matrix (factor loadings) (own elaboration)

Component Matrix	
	Intended clothing consumption rate
In the future I intend to purchase less clothing.	0.904
How likely are you to purchase less clothing in the future?	0.905
How much do you intend to decrease your clothing consumption in the future?	0.847

Extraction Method: Principal Component Analysis.

When randomization is used during data collection, it is important to test if this was successful. Equivalence testing is done by comparing the means of the variables gender, environmental concern and consumption rate of each framing group. The results of the equivalence testing are presented in Table B2 and show that there are no significant differences between the characteristics of each of the groups, and therefore there are no adjustments necessary before the hypothesis will be tested.

Table B.2
Equivalence tests (own elaboration)

Intervention	N	Gender (% Female)	Environmental concern	Consumption rate (items/year)
Control	61	78.7 %	3.21	25.13
Historic	62	72.6 %	3.31	30.65
Negative	59	79.7 %	3.34	29.90
Positive	64	64.1 %	3.36	31.97
Social	64	75.0 %	3.39	33.50
Total	310	73.87%	3.32	30.28
		Chi square = 16.194	ANOVA	ANOVA
		P = 0.183	F = 0.316	F = 0.488
			P = 0.867	P = 0.744

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