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Studying clothing consumption volumes through wardrobe studies: a methodological reflection

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Abstract: This paper introduces the relevance of volume-centric research in studies of clothing use. The global production of garments has grown dramatically in recent decades, bringing along significant environmental challenges. However, knowledge is lacking about why people deal with clothing quantities in such varied ways, and what leads some of them to overconsumption. A review of wardrobe research methods shows that there are various approaches to studying garments going in, around, and out of wardrobes. Gathering qualitative insights about specific garments, such as favorite garments, has been quite common. However, in order to advance knowledge about clothing consumption volumes, it is important to look at the wardrobe as a whole and include quantitative aspects. This paper reflects on what approaches and techniques can be used to that end. The reflections are combined with lessons learned from a pilot wardrobe study conducted in Uruguay, Portugal and Norway in 2022 with 20 respondents, concluding with recommendations for volume-centric methods in future wardrobe studies. Rigorous accounts of all garments owned should be combined with registration of items going in and out of the wardrobe over time in order to link accumulation to production and waste volumes. Methods connecting garment quantities with practices of daily use are particularly valuable. One example that has proven successful is piling exercises, a technique where participants are invited to categorize garments in groups according to specific criteria.

Introduction

Growing clothing production volumes are increasingly recognised as the core problem of the apparel sector's environmental impact. Global retail volume is estimated to have doubled during the first 15 years of this century (Euromonitor in Ellen MacArthur Foundation, 2017). Moreover, production concentrates most of clothing lifecycle impacts when a variety of garments are considered (Roos et al., 2015). More garments produced lead to lower clothing utilization and to more textiles ending up in landfills (Niinimäki et al., 2020). Therefore, understanding how consumption practices drive and change as a result of growing volumes is a condition to develop strategies that counter current developments.

Wardrobe studies, understood as methods that "look at the relationship between the individual item of clothing and the larger material totalities" (Klepp & Bjerck, 2014), are common in studying clothing consumption practices including acquisition, use, maintenance, and disposal (See also Fletcher & Klepp, 2017; Guy et al., 2001). However, only a few of previously conducted wardrobe studies use methods that prioritize clothing volumes or quantities. Qualitative studies focusing on favorite garments, for instance, predominate. Studies of unused and forgotten garments, on the other hand, are rare and much needed to grasp common practices in consumerist societies such as material accumulation. Since the various garments in the same wardrobe are known to behave differently in terms of durability, use frequency, and maintenance, an understanding of the dynamics of the wardrobe as a whole, including data on quantities, is central to enable reductions in consumption volumes.

Therefore, this paper calls for a volume-centric approach in wardrobe studies; namely, methods for field research in clothing consumption that focus on quantities. In order to advance such an approach, the next section draws on a semi-systematic scoping review of publications that have employed wardrobe studies. The review is complemented with

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lessons from a wardrobe pilot study conducted by us, the authors of this paper, in Uruguay, Portugal and Norway in 2022. The discussion in the last section combines insights from the review and the pilots to deliver recommendations for future volumes-centric research in wardrobe studies.

Literature review

The search was conducted with terms "wardrobe studies", "wardrobe interview" and "wardrobe audit" in the title, abstract, or full text, through the databases of Scopus, Web of Science, and Google Scholar, and it focused on English language publications. This search resulted in 333 publications after duplicates were removed. In the following step, we selected publications reporting on empirical research about everyday clothing practices only, and excluded non-peer reviewed reports and master theses. This gave 105 publications that are relevant for this methodological reflection. These included, for instance, researchers visiting participants at home and discussing specific clothes with them, self-audits where participants document a section of their wardrobe through online forms, or clothing diaries filled by participants including photographs. Other studies were considered irrelevant. For instance, historical research about the wardrobe of important characters from the past or studies about personal image consultancy methods.

We found that the term "wardrobe studies" is used to refer to a range of methods. "Wardrobe interviews" tend to have a qualitative emphasis and focus on a selection of garments. Lastly, "wardrobe audits" focus on quantities and can be based on parts or the whole wardrobe. These meanings largely coincide with those recommended by Fletcher and Klepp (2017, p. 168) in their attempts to promote a shared language in the field.

In any case, a mixed methods approach is most common, as is studying a section of the wardrobe only. The academic fields represented vary from design and fashion studies to consumption studies. If we look at development in time, the use of wardrobe studies started to increase considerably in 2013 and there were only 5 studies published before that year. Since 2019, more studies have focused on sustainability in relation to clothing

practices, as noted from the conferences or journals where they are published.

After reading all publications with a focus on methods, we selected the studies that counted all the garments in the wardrobe, considering that a whole wardrobe and a quantitative approach are central conditions for volume centric studies in wardrobe research. Table 1 shows the results of this process, leading to 8 studies reported in 12 publications.

The table shows that women are overrepresented in wardrobe studies. Three of the eight studies include women only, and in the other five women are a majority, reaching up to 85% of respondents. Some studies mention difficulty in recruiting male respondents for wardrobe research. The Global North and the UK specifically are overrepresented too, although this may be a result of the focus of the review on English language publications.

All studies show a remarkable variety in the quantity of garments owned by respondents. This finding, we note, highlights the relevance of this kind of research to understand what leads people to manage their clothing in such different ways. The fact that all these studies combine a whole wardrobe quantitative audit with qualitative insights from use is a promising feature in enhancing this understanding.

Not all studies provide details of the methods, but using a template form divided by garment type seems common in the wardrobe audits. Visiting participants at home to guide the counting process costs much time and therefore resources, explaining why only three from the eight studies use such an approach, and the relatively small number of respondents included in them. On the other hand, it improves the reliability of results and ensures that all respondents follow similar criteria, such as counting off season clothes stored somewhere else, or not. Moreover, researchers participating in the counting process can relate quantities to other aspects, such as the kind of clothing owned and how it is stored, providing opportunities to complement audit results with qualitative data in order to explain variety in clothing volumes decisions.

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Publication	Aim	Methods	Results	Sample	Country
Dukes (2019)	Identify unsustainable shopping patterns	• Self-audit • Reporting satisfaction (or not) with the quantity owned • 12 week shopping diary	• 84-313 garments • Respondents did not aim for long-term use, choosing low cost garments • Versatility was common for favorite garments	Six women who purchase clothing frequently	UK
Fletcher (2018)	Mapping the clothing activity in the town of Macclesfield	• Audit including tools and materials used for care and maintenance with researchers • Estimation of garments owned by participants vs audit results.	• 224, 245 and 126 garments respectively • Specific insights for each wardrobe: higher number of items for upper body vs lower body, seasonal storage, etc.	One young woman, one middle-aged woman, one elderly man	UK
Hackney et al. (2021); Willett et al. (2022)	Behavior change in fashion and textile practices through interventions	• Self-estimation vs self-audit • Interview	• 33-340 garments • wardrobe audits are efficient as research interventions	Nine women	UK
Klepp et al. (2019); Laitala and Klepp (2020)	Investigate the wardrobe content in five countries with large clothing markets	• Online survey, self-audit in specific categories • Details about clothing lifespan, active use, occasions, material and laundering collected for some items	• 35-663 garments • Consumers with large wardrobes use their clothes longer • Garments in small wardrobes are used more	1111 women and men aged 18-64	China, Germany, Japan, UK,USA
Maldini (2019); Maldini et al. (2019)	Understand clothing demand in ready-made and personalized garments	• Audit with researcher • Registration of garments acquired and discarded (six months) • Exercises piling garments according to age and use frequency	• Approximately 70-650 garments • No significant relation between personalisation and demand • Insights about the dynamics of the wardrobe over time	24 women, 16 men, aged 22-71	Netherlands
Rhee and Johnson (2019)	Experiential learning activity	• Self-audit • Clothing diet: wearing six clothing items for 30 days	• 38-500 garments • Successful awareness raising about wardrobe size • Limited accuracy of self-audits: 26 participants stopped counting	42 fashion students aged 18-29, 85% women.	USA

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de Wagenaar et al. (2022)	Explore wardrobes to develop reuse interventions	• Self-reported survey through an online course	• 30-713 garments • Respondents had most of upper wear items and footwear • 25% of items in the wardrobe were unused	520 respondents, 78% women, 16% men. Aged 18-51+	Half from Europe, half from all other continents
Woodward (2007); Woodward and Greasley (2017)	Understand everyday consumption practices through wardrobes	• In-depth ethnography over 15 months • Mixed methods: object interviews, wardrobe audits, photography, clothing diaries and participant observation	• 35-182 garments • Older women with higher incomes and more space had more clothes (accumulation) • Central to clothing choices is the dynamic between the clothing worn oftentimes and rarely	27 women	UK

Table 1. Studies including a quantitative report of whole wardrobes.

Five of the eight studies in the table rely on self-reported data, and Laitala and Klepp (2020) and de Wagenaar et al. (2022) are able to include a high number of participants located across the globe through online surveys. But some acknowledge the limitations of data reliability. For instance Rhee and Johnson (2019) and Hackney et al. (2021) interviewed

participants after self-audits, noting that some stopped counting part way, as the high number of clothing felt overwhelming. The limitation of self-reporting may increase if respondents are asked to estimate and count only if possible, as it is the case in online surveys.
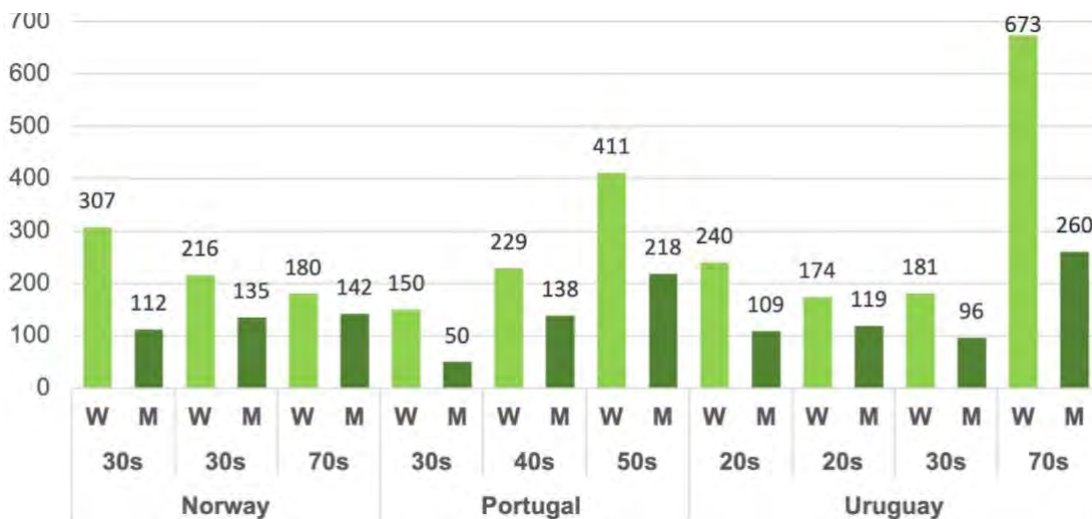
Figure 1. Number of garments owned by respondents in our pilots excluding footwear, accessories such as hats and scarves, underwear, and socks.

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Pilots

In 2022, we conducted a pilot study to test wardrobe methods that could help us understand clothing choices for different occasions, and their relation to consumption volumes. One of the hypotheses underlying this study was that occasions understood as everyday activities demands specific outfits. In addition, there is also a social expectation to vary between outfits for the same occasions. Combined, these characteristics of clothing consumption contribute to high numbers of garments owned.

The pilot was conducted in three countries simultaneously. We recruited participants in pairs, who lived in the same household and identified themselves as a woman and a man respectively. This choice was based on the recruitment of people that were subject to different social expectations associated with gender and dress, while they participated in similar occasions, understood as any activity performed in daily life, such as sleeping, going for a walk, or working from home. Moreover, recruiting in pairs of different genders helped us to include men in the study, with women often taking a linking role. There were 20 participants; three pairs in their thirties and seventies in Norway, three pairs in their thirties, forties and fifties in Portugal, and four pairs in their twenties, thirties and sixties in Uruguay.

The first visit included a whole wardrobe audit (see results in fig. 1), an interview, and an exercise where respondents piled and counted garments according to their suitability for different occasions (figs. 2-3). The piles were documented in a blank form, where respondents self-identified the occasions to be included. Respondents were then invited to submit photographs of their outfits when doing shared activities through an app, and to indicate the occasion of the picture. We named this assignment the "selfie method" (see fig. 4) and asked respondents to send a minimum of 10 pictures in a period of one to two months. During the final interview, some clothing choices documented in photographs were discussed.

Figure 2. A participant going through the piling exercise.

Figure 3. Piles of garments divided by occasions by a participant.

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Figure 4. Respondents reporting an activity together.

Discussion

Reflecting on what approaches and techniques can provide insights on clothing consumption volumes, we note that although all studies in Table 1 include an account of the whole wardrobe, methodological differences and unclarity in the process prevent comparative geographical or historical analysis. For instance some studies include underwear, accessories, and footwear, and others not. Some studies include clothing owned by respondents but stored outside their home, others not, and the clothing types in the forms are not aligned. Hackney et al. (2021) note the difference in the number of garments their participants owned compared to Woodward's (2007) and suggest this may show evidence of increasing clothing consumption linked to fast fashion. However, the small number of respondents and the methodological variety mentioned above often prevent this kind of comparisons. Standardizing the research design of wardrobe audits would enable much needed comparative research. Moreover, aligning methods and incorporating learnings from in-depth fieldwork into self-reported surveys (and vice versa) would help in building a body of knowledge that is at the same time accurate, representative, and feasible.

One lesson learned from our pilots was the importance of combining a whole wardrobe quantitative account with reports of wardrobe

movements over time. This is because the number of garments owned does not necessarily correlate with the pace of inflow (clothing coming into the wardrobe) and outflow (clothing going out of the wardrobe), which are central indicators of clothing consumption's environmental impact (Klepp et al., 2019). Understanding the relationship between both is key.

Another important consideration in the research design is the relation between wardrobe volume and practices of daily use. In the pilots, the selfie method gave us data about everyday dressing decisions, but the study was not designed in a way that we could use this data to understand volumes. Altogether, these two limitations led to a redesign in the final study, where we substituted the "selfie method" for a documentation of wardrobe movements, adding photographs of the items to the method used by Maldini et al. (2019). In this decision, we gained insight about the dynamics of consumption over time, but we lost detailed data about daily use. Connecting daily clothing decisions with volumes, we note, keeps being a challenge in the field. Two of the reviewed studies have used diaries to complement the other methods in connection to wardrobe content, which gives data on certain clothing practices, such as acquisition, and how this relates to the garments already owned (Dukes, 2019; Woodward, 2007).

Asking respondents to classify and count garments in groups, for instance by piling them, has been useful in connecting everyday practices and quantities. This approach is relatively time efficient and can deliver valuable insights. Maldini et al. (2019) found that personalized garments are not used more often or longer than ready made garments through piling. The piling exercise in our pilot indicated that big wardrobes are not related to the specificity and variety of occasions considered by their users. Respondents identifying many different occasions in their wardrobe did not necessarily own more garments, partly questioning the hypotheses motivating the study.

It also showed that the difference in quantity of clothing owned by participants self-identified as men and women (women in all pairs owned more), was bigger for "everyday" and "dressed up" occasions than for other occasions like

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leisure and sports. Compared to gathering user data in real time such as in the selfie method, the disadvantage of piling is the self-reported nature of the piles gathered at a specific moment in time. However, we believe that this approach can be helpful in answering a variety of research questions that connect clothing everyday use practices to consumption volumes.

To conclude, we hope that the reflections gathered here will be of help to place a stronger and more productive focus on consumption volumes in future wardrobe studies, and to allow for a better understanding of the challenges and opportunities in tackling overconsumption and overproduction.

Acknowledgments

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