

The Smart Wardrobe: Technology-Enabled Efficiency and Sustainability in Apparel Consumption and Use

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Introduction

The challenge of building good outfits out of the individual garments in a wardrobe may leave consumers with seemingly too few options [1] despite the numerous pieces and combinations in their wardrobes [2]. A system that could identify good options for a user's physical attributes and preferences from all the outfit permutations possible in their wardrobe would alleviate the cognitive bottleneck of deciding what to wear, while also helping to reduce consumption by providing consumers with “new” outfits built from pre-existing garments. To do this, we must first articulate the relationship between garments and bodies and successful outfits. This research explores the question of how to describe, model, and predict the body- garment- and outfit-level attributes that contribute to user satisfaction with an outfit.

Previous Work

- Investigation of use patterns shows a distinct gap between perceived usage of garments in the wardrobe compared to actual usage in female fashion innovators (Fig 1).

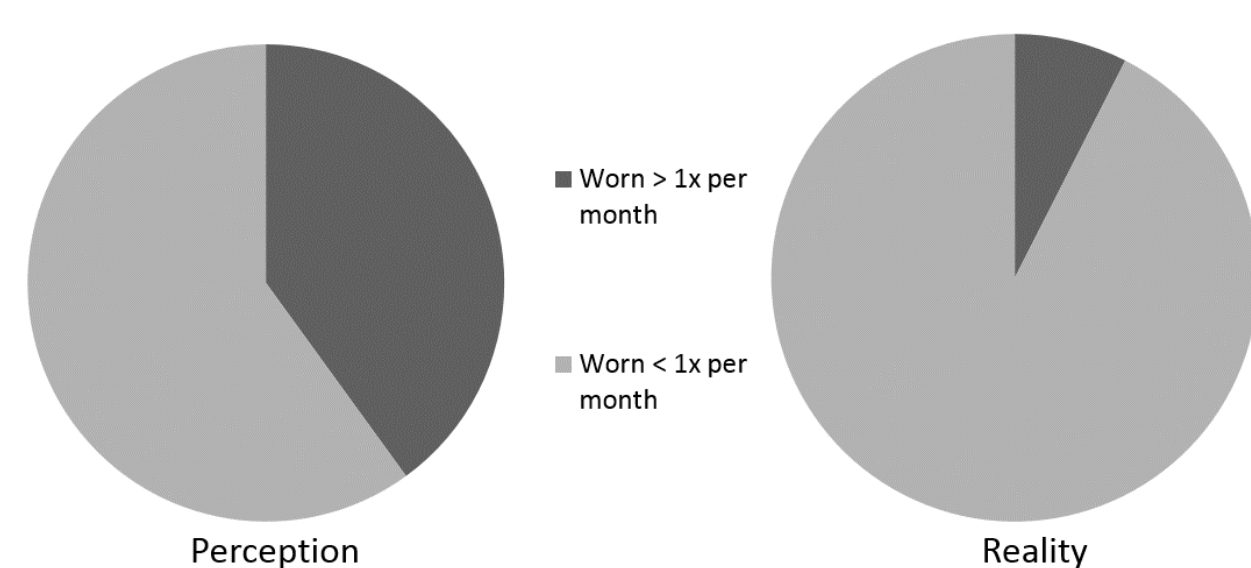


Figure 1. Percentage of “workday” wardrobe in regular (at least 1x) monthly use. [1]

- Daily usage logs show significant under-use of most of the wardrobe (Fig 2) as well as poor utility (Fig 3: number of different garments worn with each garment).

References

[1] L. E. Dunne, J. Zhang, and L. Terveen. 2012. An investigation of contents and use of the home wardrobe. In Proceedings of the 2012 ACM Conference on Ubiquitous Computing (UbiComp '12). ACM, New York, NY, USA, 203-206.

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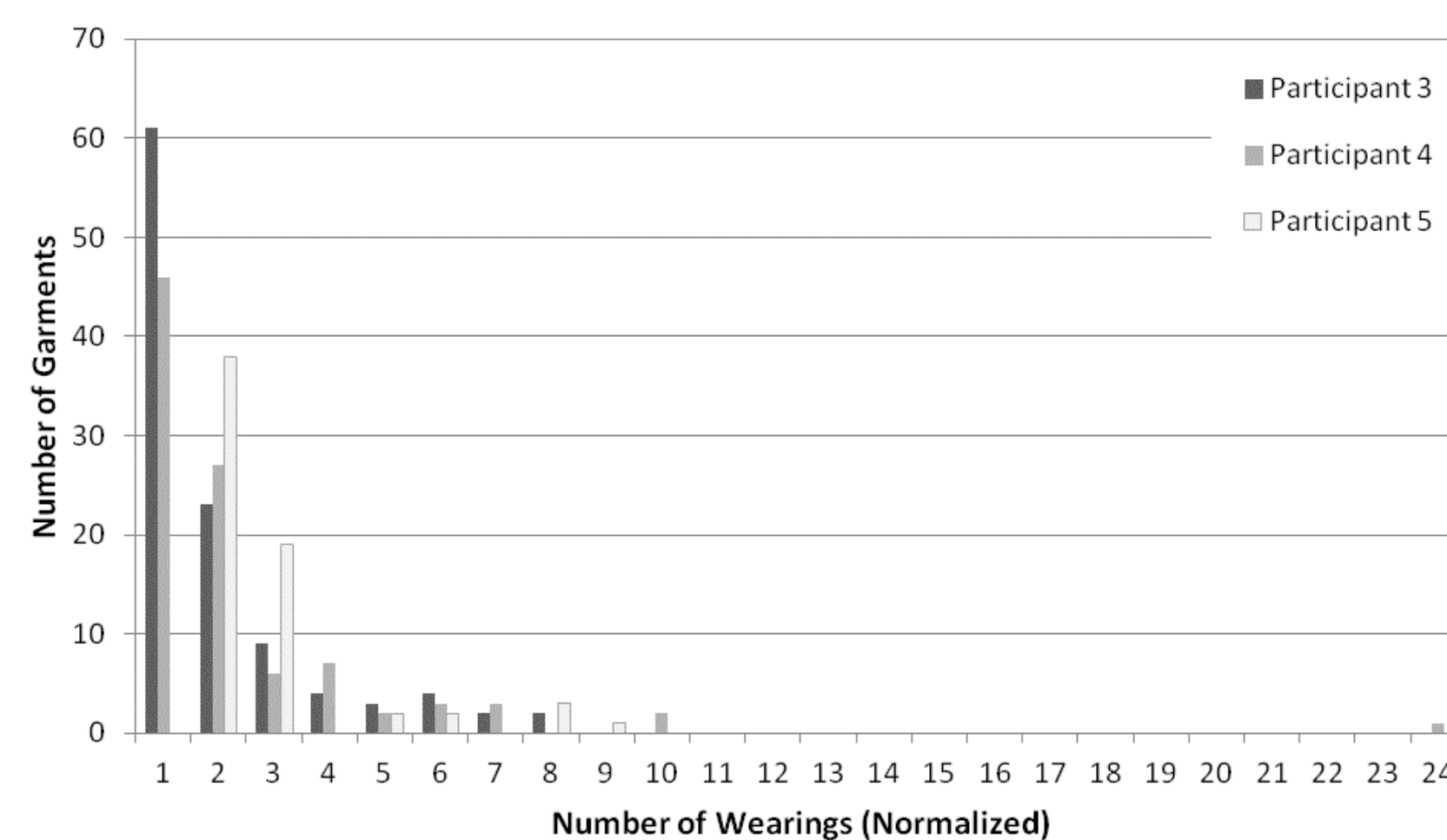


Figure 2. Use patterns in the wardrobe.

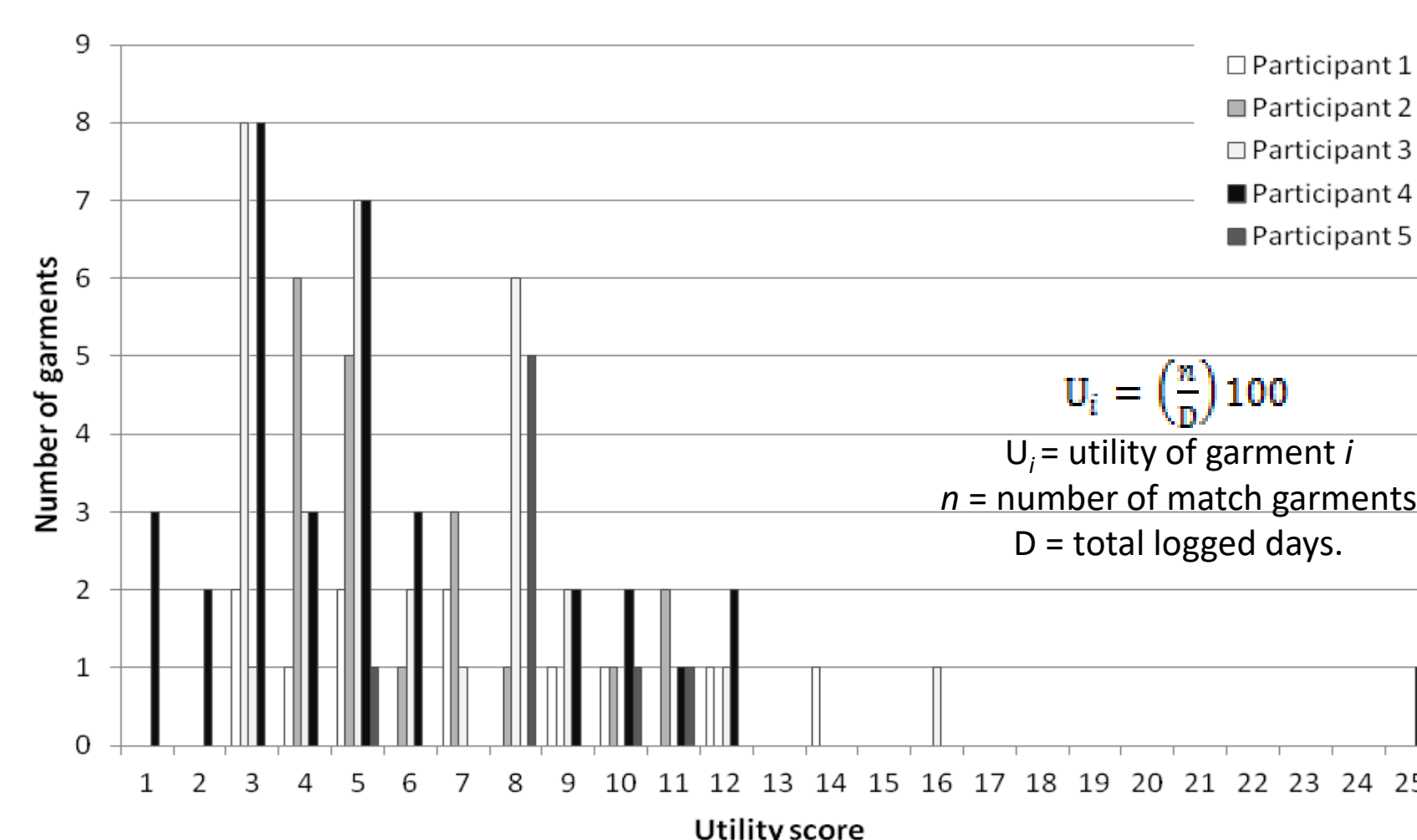


Figure 3. Measured garment utility in the wardrobe

Current Research: Outfit Recommendation

- As seen in Figures 2 and 3, individual garment use is driven by the ability to create a good outfit. Existing recommender approaches focus on recommending individual garments
- A model for outfit-level recommendation (Figure 4) is under development.

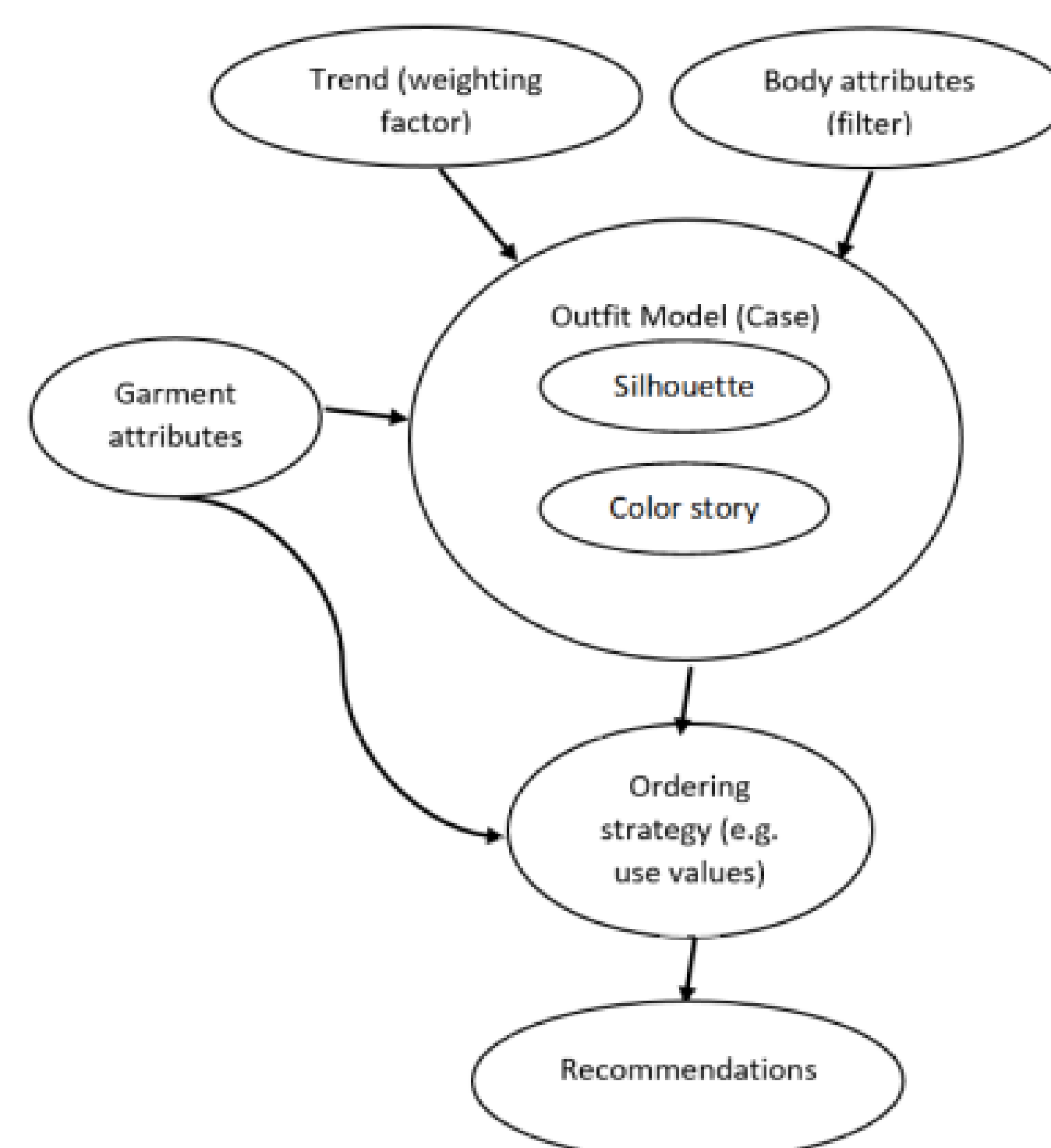


Figure 4. A model for outfit-level recommendation.

Identifying Influential Attributes

- Outfit preference is driven by body attributes, garment attributes, and aesthetic preferences (Fig 5).



Figure 5. Garment-level (top), pairing-level (middle), and outfit-level (bottom) attributes influencing overall aesthetic

- In order to effectively recommend preferred outfits, garment- and outfit-level attributes that predict preferences must be identified.
- State of the art in outfit recommendation is expert opinion. An analysis of the attributes and strategies articulated by a sample of 141 advice books from 1870-present (Fig 6) is underway. Once translated into machine-readable logic, these strategies will be evaluated for their relative predictive accuracy.

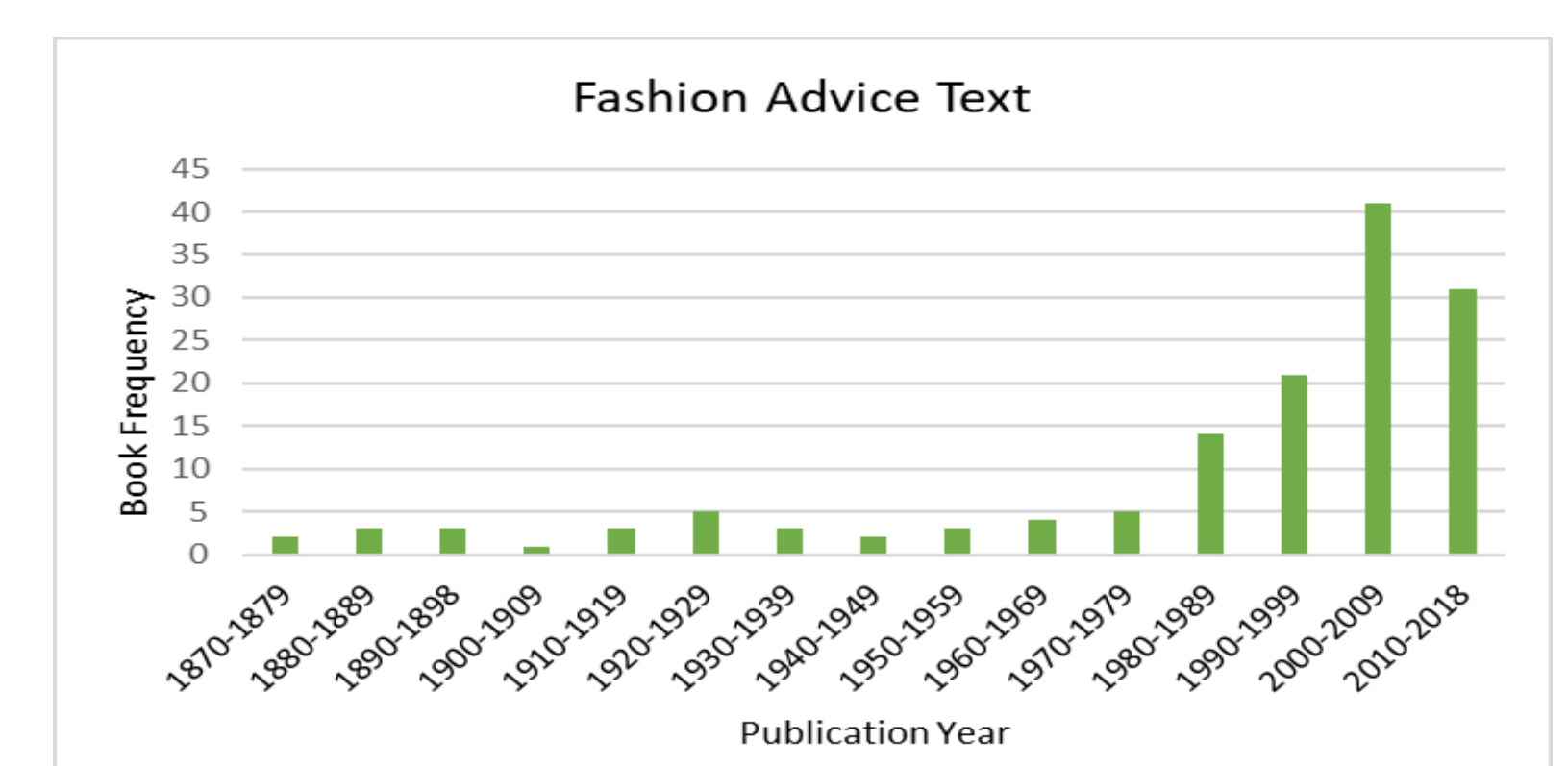


Figure 6. Dressing advice literature published by decade