

Clothing as a Determinant of Participation among Persons with a Physical Disability: Building a Foundation for Future Innovation

Research Report, 2020



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Table of content

INTRODUCTION	1
METHODOLOGY	2
Objective 1	2
Objective 2	2
PRIMARY RESULTS.....	3
Objective 1	3
Objective 2	3
INTERPRETATION OF RESULTS	5
IMPACT OF THIS PROJECT	6
CONCLUSION	7
REFERENCES	8
APPENDIX A - Dissemination Activities	9
APPENDIX B - Mapping of Raw Scoping Review Data.....	11

INTRODUCTION

Clothing is a standard component of nearly all human societies and is used for a variety of purposes (e.g. social status, sexual differentiation, self-expression¹). However, the daily activity of dressing is not an easy experience for all individuals. In 2017, 22.3% of Canadians aged 15 years and older reported having one or more disabilities hindering their daily activities². The prevalence of disability is considerably higher when comparing older adults to younger adults², and as the aging population is expected to continue rising³, it is imperative to bring our attention to any factor that may contribute to allowing individuals with disabilities to experience continued meaningful involvement in everyday life activities and social roles.

Clothing has the potential to be a powerful tool for innovation as demonstrated by smart textiles and garments that have been created in the recent decade, however, for the most part, these innovative technologies are primarily focused on the sports sector^{4,5}. Research related to clothing in rehabilitation contexts seems to be focused on increasing clinicians' awareness of the clothing needs and considerations for persons with a physical disability along with the effort it requires for them to dress^{6,7,8}. Clothing specially designed for people with physical disabilities who may have difficulty dressing themselves due to an inability to manipulate closures, such as, buttons and zippers, or due to a lack of a full range of motion required for self-dressing, for example, is called Adapted Clothing⁹. Despite the existence of the term, there seems to be minimal uptake of adapted clothing considerations in the mainstream fashion industry since ready-to-wear garments designed to fit 'most' of the population¹⁰ continue to be produced.

While it is essential for mainstream fashion companies to use a more inclusive design approach, there may be a lack of understanding about the importance of clothing in the lives of persons with a physical disability and of their specific needs in terms of clothing design. Therefore, the goal of this project was to better understand how clothing can contribute to a more inclusive society.

More specifically, the objectives of this project were to 1) critically examine how clothing is a determinant of participation of persons with a physical disability, as reported in the scientific and grey literature, and 2) explore the perspectives of representatives from the fashion industry vis à vis adapted clothing as well as factors influencing uptake of knowledge gleaned from the results from the first objective.

METHODOLOGY

Objective 1

A scoping review was conducted to respond to the first objective of examining how clothing is a determinant of participation of persons with a physical disability, as documented in the scientific and grey literature. The scoping review followed the six-steps outlined by Arksey & O'Malley (2005)¹¹ and searched literature published between 1990 and 2018 in six scientific databases and grey literature from a search on Google.

Three independent reviewers filtered articles, keeping only those that contributed to understanding how clothing affects participation for persons 14 years and older with a physical disability. Data from each article were tabulated using the International Classification of Functioning, Disability, and Health (ICF)¹² as a framework. Throughout the entire process, consultations with an intersectoral group of experts (i.e. the research team) were conducted to ensure the validity and relevance of the data. See Esmail, et al. (2018)¹³ for further details on the protocol used for the scoping review.

Objective 2

An exploratory qualitative study was conducted to respond to the second objective of exploring the perspectives of representatives from the fashion industry vis à vis adapted clothing as well as factors influencing uptake of knowledge gleaned from the results from the first objective. Individual semi-structured interviews were conducted with designers currently involved in creating adapted clothes. These individuals were recruited using the results from the grey literature performed as part of the scoping review.

The interview guide was inspired by the scoping review results. It included primarily open-ended questions to better understand the clothing design process in the fashion industry, perceived barriers and facilitators when designing for persons with a physical disability, attitudes of the fashion industry towards adapted clothing, how consumers access adapted clothing on the market, where universal design can play a role in the design process, and visions for the future of adapted clothing design.

This guide was validated and piloted among the team before conducting 45- to 60-minute interviews by phone or video-conferencing. Interviews were transcribed verbatim and the data were analyzed using Braun & Clarke's (2006)¹⁴ six-phase thematic analysis. Prior to any activities related to the interviews, ethics approval was obtained from the Research Ethics Board of the Centre for Interdisciplinary Research in Rehabilitation of Greater Montréal (CRIR-1241-0417) and all participants gave their informed consent.

PRIMARY RESULTS

Objective 1

The scoping review retrieved 57 pertinent articles, primarily from North America (40.4%), Europe (26.3%), and Asia (26.3%). These articles reported a variety of stakeholder perspectives, such as, persons with a physical disability, caregivers, managerial personnel, and health professionals. A large range of conditions/diagnoses were covered (i.e. neurological, musculoskeletal and sensory) and many different types of clothing were discussed (e.g. business wear, casual clothes, undergarments, sportswear) or in some instances, the textile itself (e.g. wool, Lycra) was the focus of the study.

According to our analysis, literature contained documentation linking clothing to all ICF domains; Body functions, Body structures, Activities and Participation, Environmental Factors, and Personal Factors. Over half of the articles (52.6%, n=30) mentioned specific clothing design characteristics (e.g. colour, fabric, fasteners) compared to others evaluating 'ready-to-wear' or 'adapted clothing' as large categories without further specifying.

Otherwise, articles most frequently referred to an interaction between clothing and mobility (38.6%, n=22), self-care (50.9%, n=29), attitudes (24.6%, n=14), and/or services, systems and policies (22.8%, n=13). For example, with regards to attitudes, many people choose their clothing depending on the social role they play. Formal clothes are chosen to demonstrate the capacity to be professional and ready for employment or to honour religious traditions, whilst a dress may demonstrate being young, fun, and ready to socialize¹⁵. Therefore, one could argue that individuals without appropriate attire are unable to engage meaningfully in their everyday life activities and social roles (i.e. working, going to church, socializing with friends). Self-esteem, confidence, and looking "normal" were also important documented personal factors. See Appendix B for a full map of the raw data according to the ICF.

Objective 2

Five interviews were conducted with designers involved in the creation process of adapted clothing in the fashion industry. Participants were female and spanned four decades in age (20s-50s, mean= 40.8 years \pm 11.4). Three participants resided in the United States, one in Canada, and one in France. All participants were highly educated (mean=15.4 years of schooling \pm 0.9) in the disciplines of fashion technique and design, fashion business, or apparel design and manufacturing, with the exception of one participant whose formal education was in history and political science. Two participants were in the early stages of working in fashion (\leq 6 years), one was well experienced in the fashion industry (10-15 years), and two participants had established careers in fashion ($>$ 20 years). Participants were either independent designers

(n=3) or working in partnership with a fashion company (n=2), and one participant lives with a physical disability.

The interview guide structured the results into five topics: 1) process of designing for persons with a physical disability, 2) factors influencing designing for persons with a physical disability, 3) fashion industry attitudes, 4) accessibility to adapted clothing, and 5) future of adapted clothing design. Within these topics, multiple themes were retrieved and sometimes the same theme was found in more than one topic (Figure 1).

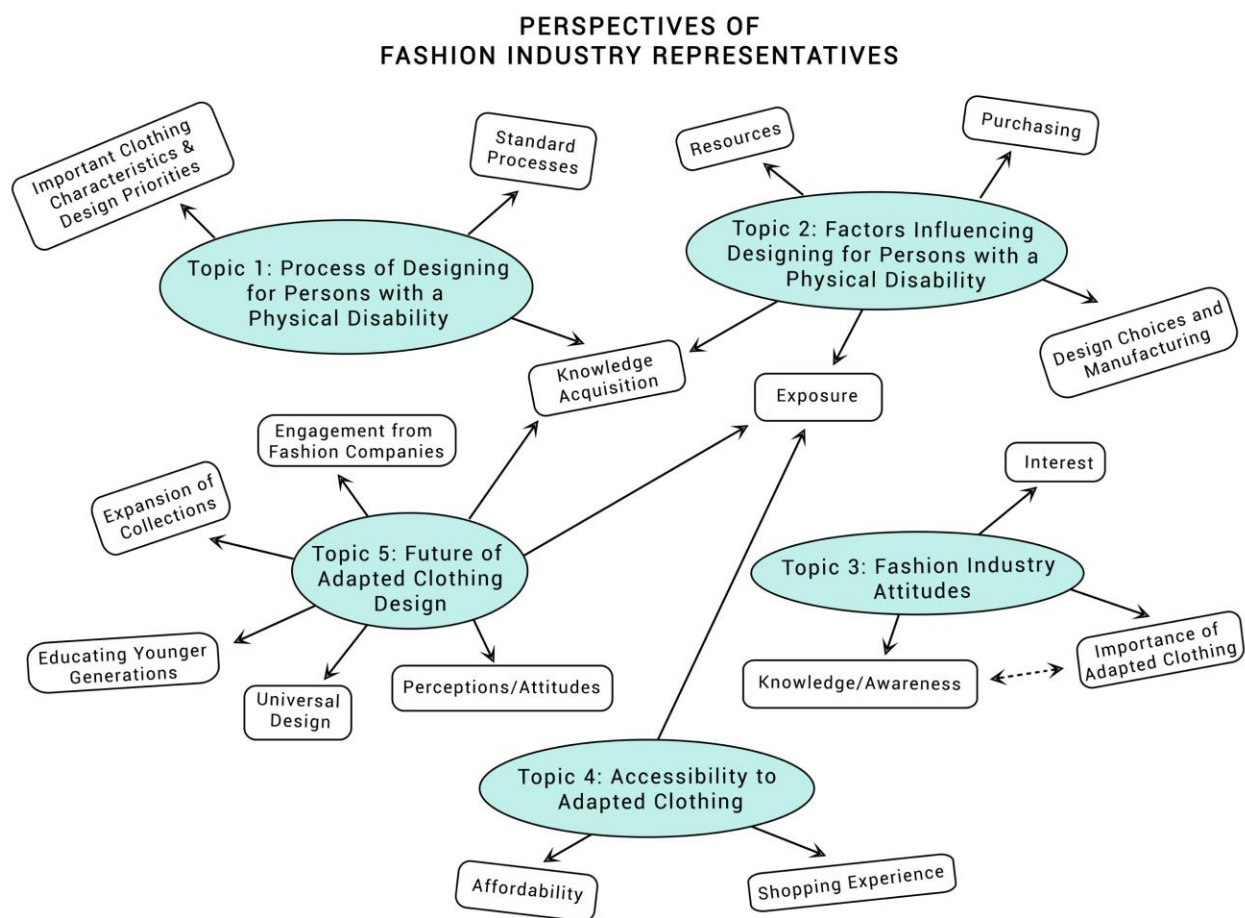


Figure 1. Interview Topics and Themes

First, all participants followed similar processes for creating their adapted clothing products. The process often began with a knowledge acquisition phase, which highlighted what important clothing characteristics and design priorities designers should focus on. Finally, these considerations were integrated into standard processes used when designing typical (i.e. mass-market) clothing.

Second, financial, material and human resources, and media exposure were reoccurring barriers and facilitators for designing for persons with a physical disability. Furthermore, knowledge on consumers' clothing needs, feasibility for manufacturing on a large-scale or even consumers reluctance to purchase garments due to the stigmatized feeling towards 'adapted' clothing played an important role in the idea-to-market process of a garment.

Third, participants revealed a link between the industry's perceived level of importance of adapted clothing and their knowledge/awareness of the needs and size of the population with a physical disability. It was believed that once the knowledge was there, the understanding for its importance increased. However, regardless of the business opportunity or knowledge of the importance for adapted clothing, some companies do not embark unless there is a profound interest for going in that direction.

All participants' clothing products at the time of the interviews were only available online. Participants attested that according to their experience and consumer feedback, pros and cons to shopping online and in-store did not outweigh one versus the other. However, attaining a more affordable price-point and gaining exposure to reach the targeted consumer still requires attention.

Finally, in addition to addressing facilitators and barriers mentioned previously, participants highlighted their desire for the future for a more active engagement from fashion companies, for expanding adapted clothing collections, for educating younger generations, for sharing knowledge on how to design adapted clothing with more designers, and for elevating the perception of adapted clothing within the fashion industry and in society at large.

INTERPRETATION OF RESULTS

The scoping review emphasized the multidimensional and dynamic interaction clothing has on multiple health domains. For a concrete example, one can think of a woman who is paralyzed waist down following a spinal cord injury (body function) who does not go to her best friend's wedding (participation) because she does not have acceptable clothing, and it results in feelings of isolation (personal factors) and long-lasting negative repercussions on their relationship (environmental factors). Given this importance of clothes in our daily lives, adapted clothing is not yet a household term. Therefore, we questioned, among other things, the update of the scientific literature by the fashion industry (i.e. do they know it exists and do they use it?).

After interviewing representatives from the fashion industry, it seems that although scientific literature was not consulted specifically by the designers, they reported using information

similar to that which was gleaned from the literature. For example, in both instances mobility and dressing/undressing were seen as noteworthy design priorities to consider. Furthermore, some important clothing characteristics mentioned in the scientific literature, such as, attention to closures and fastenings on garments, and the importance of fabric choice were also viewed as important to designers. Moreover, accessibility issues when shopping in-store were reported in the literature and by fashion industry representatives even if neither data source provided tangible solutions.

Although the results from the review and the interviews generally converged, there may be a larger body of knowledge documented in the scientific literature that could provide clothing designers with additional important information and allow them to make even more informed design choices. For example, some literature spoke of the importance of fabric choice on temperature regulation, however, it was not mentioned in the interviews, therefore, we are unaware if designers have and use this knowledge.

These results allow us to imagine the usefulness of a closer collaboration between the fashion industry and academic research to support innovative initiatives and increasing the credibility of products on the market while facilitating researcher access to data in the industry. In addition to this mutually beneficial relationship, bringing together scientific research, the fashion industry, disability associations, and consumers, sets the stage for continuing to question best practices in each respective group. This research also puts into question corporate social responsibility of big fashion brands. As the environmental movement continues to grow worldwide, the fast-fashion industry has a large target on their back^{16,17}. One could also question the role of fashion companies towards creating a more inclusive society (i.e. inclusivity practices for hiring persons with a physical disability, designing with and for them, advertising with them, etc.).

IMPACT OF THIS PROJECT

This research opens up Pandora's box on fashion and disability but also brings with it a large range of possibilities for moving both the fields of rehabilitation and fashion to the next level. Given that health professionals such as occupational therapists focus on increasing independence in the activity of dressing/undressing in rehabilitation settings, they may play an important role in bridging the gap between persons with a physical disability and mainstream fashion companies. For example, they could act as consultants for interested designers. Equally important, they could be a resource for their clients with regards to sharing the findings of the scoping review grey literature (i.e. adapted clothing products that exist on the market).

Opportunities for innovation in fashion seem endless and future research could add technology to the inquiry, which was not explored in depth in the above research but is increasingly important elements in rehabilitation (e.g. exoskeletons) and fashion (e.g. smart textiles, wearables). Finally, this research re-enforces the need for more knowledge translation activities among research, industry, and consumers.

CONCLUSION

In conclusion, it is crucial to determine ways to optimize participation of persons with a physical disability. This research is just the tip of the iceberg and underscores the complexity of how clothing can influence participation of persons with a physical disability. Ultimately, clothing can play a crucial role in the lives of persons with a physical disability and addressing their clothing needs by means of integrated knowledge translation activities may unlock many doors to a more inclusive society.

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APPENDIX A - Dissemination Activities

Oral Presentations

1. Esmail, A., Poncet, F., Auger, C., Rochette, A., Dahan-Oliel, N., Labbé, D., Kehayia, E., Billebaud, C., de Guise, E., Lessard, I., Ducharme, I., Vermeersch, O. & Swaine, B. (2019) Clothing Influences Participation of Persons with a Physical Disability: Results from a Scoping Review. Oral Presentation at ALTER-European Society for Disability Research annual conference. Cologne, Germany. 5-6 September 2019.
2. Esmail, A., Poncet, F., Auger, C., Rochette, A., Dahan-Oliel, N., Labbé, D., Kehayia, E., Billebaud, C., de Guise, E., Lessard, I., Ducharme, I., Vermeersch, O. & Swaine, B. (2019) Clothing Influences Participation of Persons with a Physical Disability: Results from a Scoping Review. Oral presentation at the CRIR Student Colloquium: "From research to innovation: Inspiring career paths after graduate studies". Institut de réadaptation Gingras-Lindsay de Montréal. 19 February, 2019.

***Awarded 3rd Place Prize**

3. Esmail, A. (2018) Le vêtement en tant que déterminant de la participation sociale et de l'inclusion chez les personnes ayant une déficience physique : construire les fondements de l'innovation future. Présentation orale à la journée scientifique Andrée Forget. École de réadaptation, Université de Montréal. 16 mai 2018.
4. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, E., Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) Clothing in the everyday life of persons with a physical disability: A scoping review protocol. Oral presentation at the CRIR Student Colloquium: Writing your way to success. Institut de réadaptation Gingras-Lindsay de Montréal. 1 March 2018.

***Awarded 1st Place and People's Choice Prize**

Submitted articles to peer-reviewed journals

1. Esmail, A. Dahan-Oliel, N., Poncet, F., Labbé, D., Rochette, A., Kehayia, E., Auger, C., Ducharme, I. & Swaine, B. (submitted). Fashion Industry Practices in Designing Clothes for Persons with a Physical Disability. *Disability and Rehabilitation*.

Published or Accepted Articles in Peer-Reviewed Journals

1. Esmail, A., Poncet, F., Auger, C., Rochette, A., Dahan-Oliel, N., Labbé, D., Kehayia, E., Billebaud, C., de Guise, E., Lessard, I., Ducharme, I., Vermeersch, O. & Swaine, B. (2020). The role of clothing on participation of persons with a physical disability: a scoping review. *Applied Ergonomics*. 85C(2020)103058. <https://doi.org/10.1016/j.apergo.2020.103058>
2. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, E., Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) The role of clothing on participation of persons with a physical disability: a scoping review protocol. *BMJ Open* 2018;8:e020299. doi: 10.1136/bmjopen-2017-020299

Published Abstracts

1. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, É, Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) Clothing in the everyday life of persons with a physical disability: A scoping review protocol. Poster Abstracts. J Int Soc Phys Rehabil Med 2018;1, Suppl S1:103-557

Poster Presentations

1. Esmail, A., Poncet, F., Auger, C., Rochette, A., Dahan-Oliel, N., Labbé, D., Kehayia, E., Billebaud, C., de Guise, E., Lessard, I., Ducharme, I., Vermeersch, O. & Swaine, B. (2019) Clothing Influences Participation of Persons with a Physical Disability: Results from a Scoping Review. Poster Presentation at REPAR annual conference. Montreal, Canada 16-17 May 2019.
2. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, É, Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) Clothing in the everyday life of persons with a physical disability: A scoping review protocol. E-poster presentation at the 12th International Society of Physical and Rehabilitation Medicine World Congress. 8-12 July, 2018.
3. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, É, Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018). Les vêtements dans la vie quotidienne des personnes ayant une déficience physique : un examen de la portée. Poster presentation at the 16th edition of *Carrefour des connaissances* organized by the CIUSSS Centre-Sud-de-l'île-de-Montréal. 7 June, 2018.
4. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, É, Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) Clothing in the everyday life of persons with a physical disability: A scoping review. Poster presentation at the Concordia University PERFORM annual research conference. 17 May, 2018.

***Awarded Top Poster Prize**

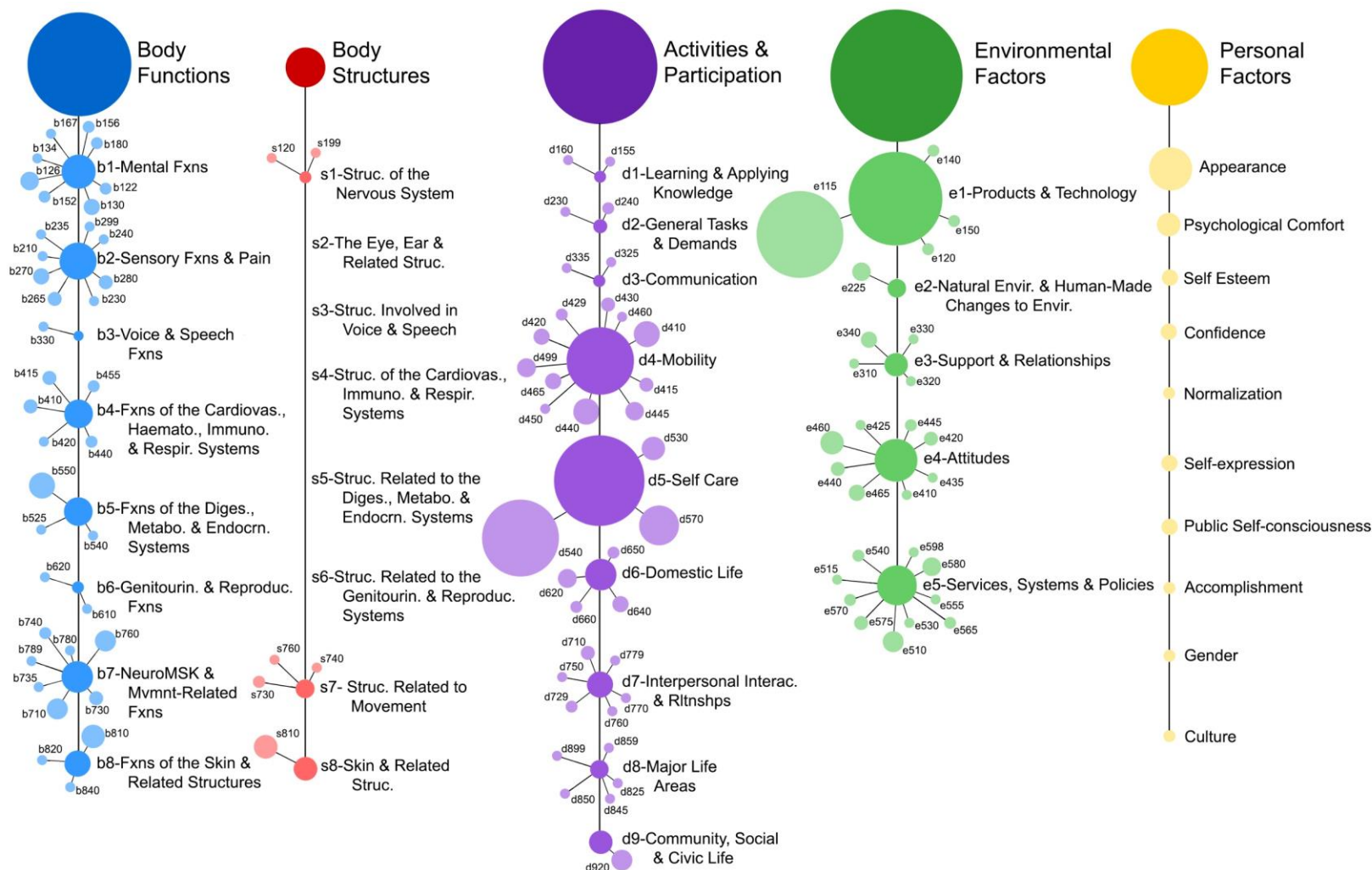
5. Esmail, A., Poncet, F., Rochette, A., Auger, C., Billebaud, C., de Guise, É, Ducharme, I., Kehayia, E., Labbé, D., Dahan-Oliel, N., Lessard, I., Vermeersch, O. & Swaine, B. (2018) Clothing in the everyday life of persons with a physical disability: A scoping review. Poster presentation at the REPAR annual conference. 11 May, 2018.

Theses

1. Esmail, A. (accepted) Research and Industry Practices in Designing Clothes for Optimal Participation of Persons with a Physical Disability. Master Thesis. *School of Rehabilitation, Faculty of Medicine, Université de Montréal.*

APPENDIX B - Mapping of Raw Scoping Review Data

The size of the circle infers the frequency of articles for each code; larger circles indicate a larger number of articles for that particular code.



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