



A Study on Application of Enclothed Cognition in Apparel Design

Szuyao Lin^(✉)

Graduate School of Creative Industry Design,
National Taiwan University of Arts, New Taipei City, Taiwan
cynszlin@gmail.com

Abstract. This study is designed to investigate the application of enclothed cognition in apparel design based on the study that extended from clothing psychology. Using the potential of the systematic influence that clothes have on wearers' psychological process, the purpose is to seek the relationship between clothing, psychology, and cognitive and behavioral response. The study explores the current influence and interpretation of clothing on psychology, and by taking the perspective of enclothed cognition to make further relevant acknowledged and developmental research. In addition, with the goal of implementing affecting factors for apparel design, and to refer to product design concept. This study verifies not just the visual impacts that clothing bring to the wearers, but also the spiritual satisfaction. Then, by the process of re-designing the clothing, this study attempts to arouse the public awareness and reinterpret the meaning for apparel design in a social and cultural aspect. The study integrates the literatures reviews on the application for clothing psychology, cultural product design model and emotional design for developing the research framework. Through case study of two apparel brands, the study analyses and explores the use of their current designing process in a literary framework. This study is attempted to provide a farsighted thinking method for the apparel design industry. The contribution of this study lies in: (1) Expanding the multi-directional plasticity development of apparel design and psychology at the academic and practical levels. (2) Through the research and exploration of this study, constructing the framework for apparel design that go beyond the function and usability benefit and also bring emotional benefit for the product as a reference in relevant creative fields.

Keywords: Clothing psychology · Enclothed cognition ·
Cultural product design · Emotional design

1 Introduction

1.1 Background

Nowadays, the modern society is changing faster and in the age of advance in information technology, everyone has the opportunity to appear oneself. Usually when observing a person, at the first glance, our subconscious mind will depend on the first impression: appearance. Regardless of whether the person is aware or not, the

appearance also affects our perception and judgment of others. Many people know how we wear that affecting how others perceive themselves. There have been many researches on clothing psychology which is mainly to explore how to use clothing to shape the way that others see themselves. The most common example is the clothing for business wears. Theoretical studies have shown that proper dressing in particular occasion is important for the social relationship, and that the choice of clothing is actually more than expected [5].

As they say, “Clothes are the second layer of skin” can be explained as clothing is an extension of oneself, which is also the medium used to show oneself to the outside world. However, a new study by the APS-The Association for Psychological Science found that clothes may not only affect the way others see us but the clothes people wear will also affect how the wearer perceives oneself. Through out the cognitive process, we influence the way we think [14]. Therefore, in the relationship between clothing, psychology, and cognition and behavior, there are many potential possibilities and it is an area worthy for further discussion.

What if we can change our mood simply depending on what clothes we wear? A recent research called encloded cognition by Northwestern University, which is the systematic influence that clothes have on wearers’ psychological process: what you wear influence how you think and feel [1]. Clothing can both reflect and generate an emotional state [11]. Whether the clothes can be used to influence the thinking and feelings of the wearers, such as the function that many emotion design products in the market or not. The study is characterized to research the emotional concern in the process of conception and production for apparel design.

1.2 Motivation and Objective

Clothing is ubiquitous. It is in touch with our body almost every moment. The majority of people face the situation everyday: what to wear. Enormous researches have shown that clothing is more than simply a trend comes and goes as a material benefits [2]. The intimate connection between clothing and wearers could be considered deeply more as a spiritual satisfaction. With the development of society, clothing has long been more than just a tool to protect the body, protect the cold from the heat, and defend against external aggression. In the fast fashion era, clothing has gradually become a symbol of people’s self-expression. In daily life, through various styles of dressing, different clothing can be chosen according to different occupations, personality, age and other factors [6].

Clothing can be said to be omnipresent, and it is in contact with our bodies almost every moment. It can be seen that its influence and importance cannot be neglected, and there is an absolute mutual influence between clothing and human emotions. Mostly everyday, the first choice that most people face to start the day is: “What do you want to wear today?” Therefore, what if we can affect our feeling simply depends on the “clothes” we wear on our bodies? Using clothing as a medium to influence one’s own cognition and even behavior, the standard of wearing clothes is not only one’s “current feelings” but the concept of “hoping how to feel” toward you is the main motivation to this study.

Buying clothing is a very common consumer behavior nowadays. People might purchase them on impulse or perhaps in order to meet the needs of special occasions, but people buy a piece of clothing for certain reason at that moment. Every piece of clothing carries a story or gives a specific emotion. However, with the fast fashion culture that under the condition of lowering the quality to maintain the speed of changing seasons, the emotional added value that clothing should have has gradually lose its meaning just like any other disposable products. This study aims for the motives to change the public's awareness and reinterpret the meaning of clothing that it can bring people not only the visual influence but also show the spirit of satisfaction and execution in the real industry.

This study explores the possibility for application of enclothed cognition in apparel design. In the conception and production process of cultural product design that adding the emotional connection between the clothing itself and the wearers. The objectives of this study is to (1) Adding value to the emotional cognition in design process through the relationship between clothing and psychology. (2) Introducing emotional design attributes into apparel design. (3) Providing new innovative thinking and design framework for the apparel industry. (4) Based on experimental results and conclusions that might develop industrial business model that meets the needs of market demands.

2 Literature Review

2.1 Clothing Psychology/Enclothed Cognition

Karen Pine, the famous British psychologist has discovered through more than five years of researches that people's dressing is closely related to their mental state. What one's wearing can not only reflect wearer's psychological changes but also regulate one's emotions to achieve special effects of improvement [4]. As early as 2012, the study by Northwestern University proposed the theory that clothing affects people's psychological state is called Enclothed Cognition. It is found the subjects who are dressed in laboratory white coat that they think its the doctors' coat performance is better than the one who think its the painters' coat, as shown in Fig. 1.

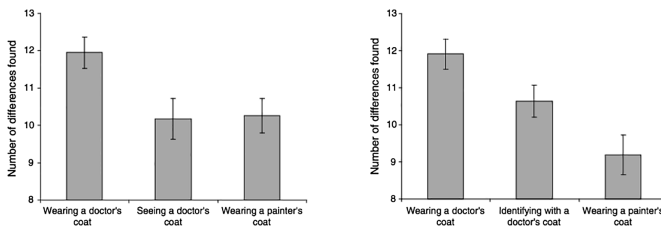


Fig. 1. Sustained attention: number of differences found in the comparative visual search tasks, as a function of experimental condition [1]

The results show that people's acknowledge toward the dressing's characteristics which in turn that affects their cognition and behaviors afterward. The study presents a

potentially unifying framework to integrate the past findings and captures the diverse influences that clothing have on the wearers by proposing that enclothed cognition involves the co-occurrence of two independent factors: (1) the symbolic meaning of the clothes and (2) the physical experience of wearing them [1]. This theory is widely used in many clothing-related researches in the apparel industry for dressing effects, casual dresses, sportswear, and professional uniforms. By mean of giving the clothing a specific identity which could guide the behavior and the differences in dressing is equivalent to a sign of different identity of conversions [13].

2.2 Cultural Product Design

Cultural product design, which is a process of rethinking the cultural features and then redefining them for the purpose of designing the product that can in accordance with the society and at the meanwhile can satisfy consumers culturally and aesthetically [3]. By using the cultural features to add non-rational value to the products could increase the economic of the society over the market, and also connect the specific characteristics of a particular culture. As cultural creativity has become a critical issue among the design industry, a cultural product design framework is shown as Fig. 2, which is proposed for combining cultural levels, layers and design features in order to facilitate the understanding of cultural product design [9].

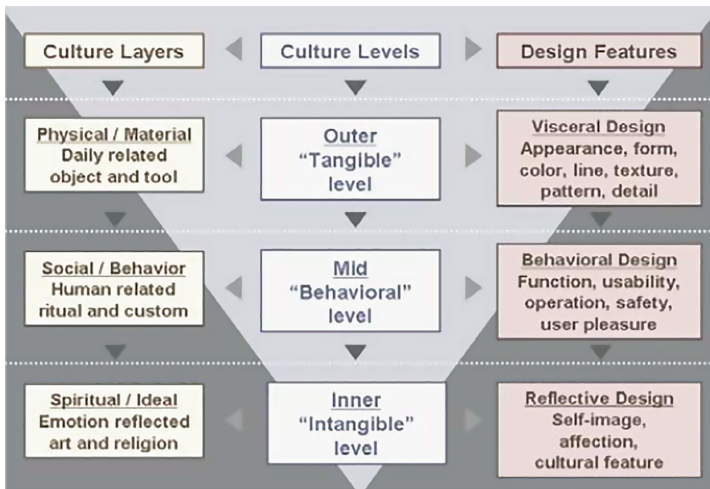


Fig. 2. Three layers and levels of cultural objects and design features [9]

As shown in Fig. 2 offers the framework for cultural objects, in this study would be the clothing and in which is classified into three layers: (1) physical or material culture, (2) social or behavioral culture, and (3) spiritual or ideal culture. Furthermore, these three layers of culture can be matched into three cultural levels as shown. While three design features can be identified according to the corresponding cultural objects as:

(1) the intangible level, containing reflective emotions and feelings, (2) the behavioral level, dealing with function and usability, and (3) the tangible level, handling with color, texture, shape, decoration, pattern, quality, and surface detail [9]. While cultural factors have become important issues for various design fields, this study attempts to take the cultural product design model as a valuable reference and use in apparel design, as clothing is a major cultural objects widely as it is an universal design.

2.3 Emotional Design

Understanding the emotions consumers feel about the products can help the designers make the most of its designs in the market. Emotional Design by Donald Norman states why attractive things work better in which he explains the important of aesthetics in inducing an emotional judgment that would enhances the products' usability. The emotions which affect the consumers' behaviors are based on three aspects of design: (1) visceral, the pre-conscious reaction, mostly are the product appearance, (2) behavioral, the conscious use and experience with the product like functionality and usability, and (3) reflective, the interpretation and understanding of the product, including both the emotional and cognitive reaction like personal memories and experiences [12]. His theory interprets how design affects emotions and how emotions affect consumers' decisions which has changed the designing process in the industry.

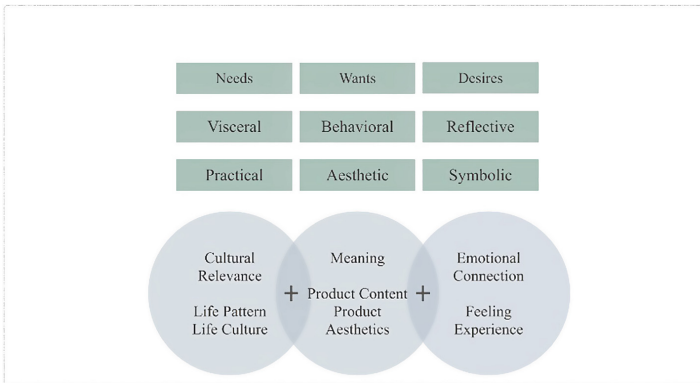


Fig. 3. The evolution of consumers' behaviors from needs to desires [8]

The purpose of products design is to meet the physiological and psychological needs of human beings through conception and production of designing. Therefore, in addition to the functions that the products are designed and manufactured according to engineering, whether the products can meet the expectations of users psychologically should be importantly considered as well during the designing process [8]. By taking Norman's idea and to refer to product design, the mutual relations is shown as Fig. 3, where the product functions are divided into three categories: (1) practical function that meet the visceral needs, (2) aesthetic function that accomplish the behavioral wants,

and (3) symbolic function that fulfill the reflective desires. The emotional design has established a crucial relation between affective and cognitive reaction, thus cognition drives our affective states, our emotions, and hence influencing our behavior [12].

3 Methodology

The study integrates the literatures reviews on the application for clothing culture and psychology, cultural product design model and emotional design for the conceptual model of the research process, as shown in Fig. 4. Various informations are collected academically and industrially in order to form useful knowledge toward the study. By applying the acknowledge of enclothed cognition and adding the creative value which referring to emotional design to developing the research framework. Furthermore, through case study of two apparel brands that originated from the concept, the study analyses and explores the use of their current design process to evaluate within a literary framework as the research assessment. The study attempts to use the four steps scenario method for the design process and validate the prototype using evaluation grid method.

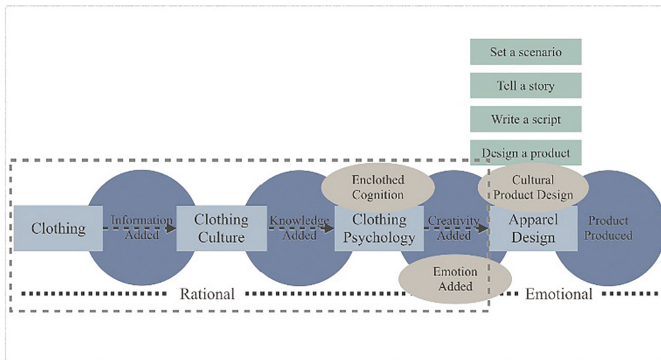


Fig. 4. A broad overview of the research process

3.1 Research Framework

The framework of the study is revised and combined from Lin's cultural product design and Norman's emotional design as shown in Fig. 5. Considering apparel for not just rational consume which only fulfill consumers' expectation and cognition in visceral and behavioral design aspect, it is more importantly for the emotional experience that focus in reflective design aspect for the wearers. Through the research, the idea of designers' creativity toward the sensibility of inner emotion for the users are become a crucial added value for apparel design. As the concept of enclothed cognition is to describe the systematic influence that clothing have on the wearers' psychological processes [1]. The study offers a potentially integrated framework to combine the past acknowledge and examine three different design impacts though the design process.

And thus the research particularly will focus on the reflective design which includes both the emotional and cognitive reaction between the designers and the product which emphasizes the wearers’ self-images, memories, experiences, and culture [9].

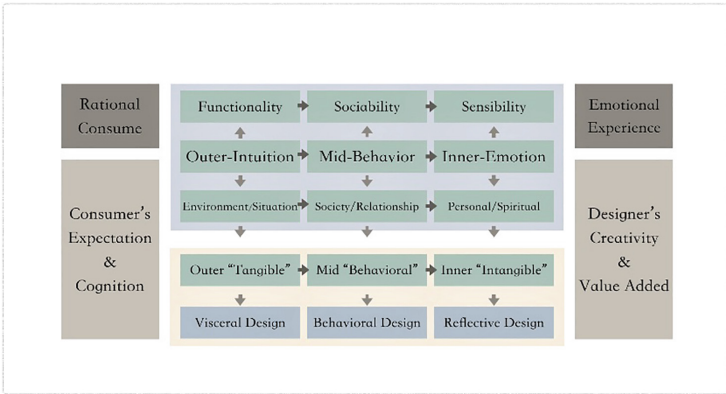


Fig. 5. Research framework for application of encloded cognition in apparel design

3.2 Case Study-1 “Abstract_”: Clothes Made from Your Emotional Data

Danish designers, Bjørn Karmann in interaction design, Kristine Boesen in textiles design and Julie Helles Eriksen in fashion design together created with a concept that they thread your feelings into customized and unique piece of ready-to-wear garments. Instead of only designers participating in the design process before the manufacturing, the idea is to let the end-users involved in the design process simply by collecting data into generating patterns from their own personal stories and face expression, as shown in Fig. 6.

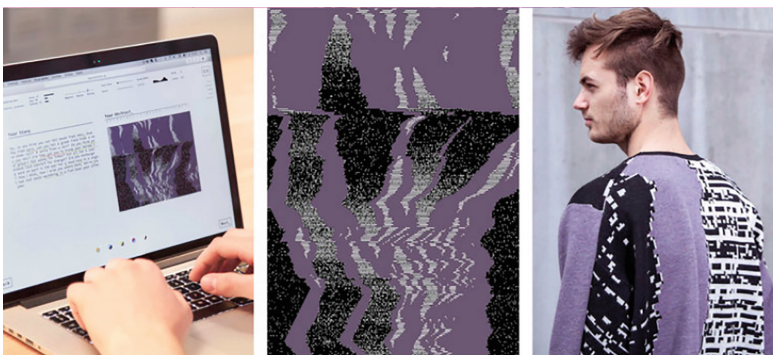


Fig. 6. The design process of “Abstract_”

The concept offers the customers a different connection to the clothing they are purchasing in which that gives reflective aspect of their inner emotion for the sensibility. This design process that involved typing a story about your own, and then

following up the data gained from the pace of keystrokes (what and how is written) combined with facial expression. The picked up data will then translate into a unique patterned material, as shown in Fig. 7 only from this specific information [7].



Fig. 7. Color samples and textiles made from user-generated stories

The data affects all the elements, such as color, thread thickness and knitted rhythm in order to make a piece of garment. The material is then transformed from the customers' personal pattern into a textiles piece of garment, as shown in Fig. 8. With "Abstract_", the clothes are produced on the demand of personal desires in which it at the basis of the concept is a deeper concern for human nature as they said. For the garment silhouette, it even reflects human error and features the uneven shapes in asymmetrical cuts, as shown in Fig. 8.



Fig. 8. Final outfit; materials created from user-generated stories

3.3 Case Study-2 “Enclothed Cognition”: Clothes Inspired from Behavioral Psychology

Enclothed Cognition is an experimental project from fashion designer Bregje Cox and visual artist Mark King. They created the collection which is inspired by the theory of Enclothed Cognition. The concept of the design process is particularly about the garment’s symbolic meaning combined with the physical experience of wearing it and how it affect the wearer’s performance both in cognition and behavior. They also attempt to increase the public awareness within the clothes we wear, the environment we at, and the human mind we are [10]. Human behavioral psychology and biology are crucial elements in their design process which that offers behavioral and reflective aspects of physical and emotional response for the sociability and sensibility: how clothes impact our everyday performance and how we feel. During the design process, the garment’s meaning is formed with the physical experiences of wearing it and the space relationship with the environment. Furthermore, for the symbolic meaning of the garment, they enrich the pattern inspired from the human nature and scientific principles, such as cell migration and landscape surface, as shown in Fig. 9.



Fig. 9. Final outfits, materials created from cellular pattern and spatial concern

Behavioral psychology are a great source for pattern. As shown in Fig. 10, the collection takes the imitation that the pattern occurring at the cellular level to create the feeling of wearing a second skin to bring the awareness that are happening subconsciously guide our behavior.

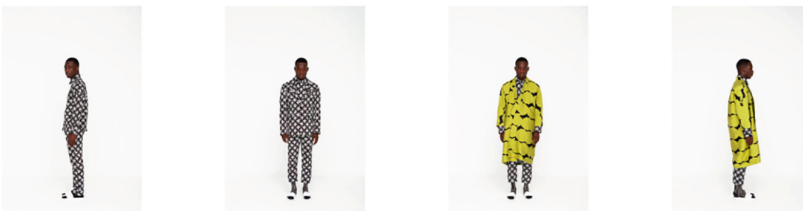


Fig. 10. Menswear collection for Summer/Spring 2019

Although the collection is more like an experimental concept, it surely arouse the public acknowledge in the apparel industry. As they mentioned, it not just the patterns: but also the silhouettes of the clothes, the design structures, how the fabric feels on the skin and what experience that provides the wearers a different but significant way of thinking in the design process in apparel design. By adding the behavioral and reflective aspect in the design, the clothes are evolved from purely functional aesthetics.

4 Discussion

The result and analysis from both case studies show that the apparel industry is taking a different pathway for the design process. The concept that takes the meaning of design into a different level of what the end-users can have influence on from the product consumed. The value in apparel design for the primitive purpose, which is mainly physical and functional are taking over by the innovation in design that are more social and spiritual satisfaction. As clothing is the most approachable products and applied to mostly each one of us, the emotional design aspect should be considered more in a sustainable and conscous way. As shown in Fig. 11, the research purpose and future conception for this study is listed as the conceptual framework. What we are wearing is a more powerful way not just to express one's personality and style, but on a higher level there might be something to convey and to put to use as a spiritual product. At the meantime, if people could build a stronger emotional connection to the product personally, the usage term of it might last longer in a better environmentally friendly way.

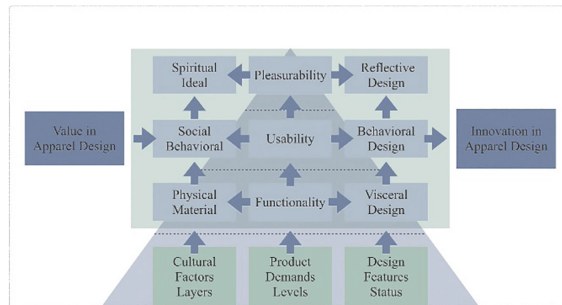


Fig. 11. Research future conception

5 Conclusion and Suggestion

As we continue to develop the potential framework around clothing psychology and apply into for academic and industrial design purpose. This study aims to arouse public consumers with awareness that how we could affect oneself purely by what we are using and surrounded by. Norman has addressed that the role of appealing aesthetic in eliciting a positive emotional state resulting in enhanced usability and user performance

[12]. Nowadays with the rapid developed technologies, design has become omnipresent in mostly every objects. That is in the case we should emphasize the element of human nature in design, which is design for feeling. The study attempt to execute the product design for future implementation that generated by the study result and combined with scenario method for design process. The evaluation grid method revised for the apparel design, as shown in Fig. 12 will be taken as the validation for the prototype.

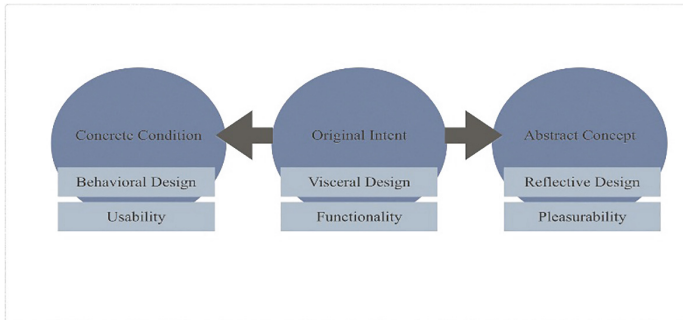


Fig. 12. Validation concept for apparel design product

The contribution of this study lies in: (1) Expanding the multi-directional plasticity development of apparel design and psychology at the academic and practical levels. (2) Through the research and exploration of this study, constructing the framework for apparel design that go beyond the function and usability benefit and also bring emotional benefit for the product as a reference in relevant creative fields. Furthermore, as what we wear could affect the way we think and act, there is a potential to use clothing as a healing object for emotion controlled. Whether the clothes to uplift depression, inspire attention, slow anger or achieve calm in the status, the study has aimed to discourse to the apparel industry that this research framework as a reference for designing something aesthetics but also well-being for the human nature. It is the future vision cross over between design and social science.

References

1. Adam, H., Galinsky, A.: Encllothed cognition. *J. Exp. Soc. Psychol.* **48**(4), 918–925 (2012). <https://doi.org/10.1016/j.jesp.2012.02.008>
2. Baumgartner, J.: *You are What You Wear: What Your Clothes Reveal About You*, 1st edn. Da Capo Lifelong Books, New York (2012)
3. Ho, M.C., Lin, C.H., Liu, Y.C.: Some speculations on developing cultural commodities. *J. Des.* **1**(1), 1–15 (1996)
4. Howlett, N., Pine, K., Cahill, N., Orakçioğlu, I., Fletcher, B.: Unbuttoned: the interaction between provocativeness of female work attire and occupational status. *Sex Roles* **72**(3–4), 105–116 (2015). <https://doi.org/10.1007/s11199-015-0450-8>

5. Hutson, M., Rodriguez, T.: Dress for success: how clothes influence our performance. *SA Mind* **27** (2016). <https://doi.org/10.1038/scientificamericanmind0116-13a> (2016)
6. Karl, K., Hall, L., Peluchette, J.: City employee perceptions of the impact of dress and appearance. *Publ. Pers. Manag.* **42**(3), 452–470 (2013). <https://doi.org/10.1177/0091026013495772>
7. Kesa, I.: Wear clothes made from your emotional data (2015). https://www.vice.com/en_us/article/qkwwbq/wear-clothes-made-from-your-emotional-data. Accessed 30 Jan 2018
8. Lin, R., Hsieh, H.-Y., Sun, M.-X., Gao, Y.-J.: From ideality to reality - a case study of Mondrian style. In: Rau, P.-L.P. (ed.) *CCD 2016. LNCS*, vol. 9741, pp. 365–376. Springer, Cham (2016). https://doi.org/10.1007/978-3-319-40093-8_37
9. Lin, R.: Transforming Taiwan aboriginal cultural features into modern product design: a case study of a cross-cultural product design model. *Int. J. Des.* **1**(2), 45–53 (2007)
10. Martin, N. (ed.): *Science in Style* (2018). <http://designerisland.com/stories/science-in-style>. Accessed 30 Jan 2018
11. Moody, W., Kinderman, P., Sinha, P.: An exploratory study. *J. Fashion Mark. Manag.: Int. J.* **14**(1), 161–179 (2010). <https://doi.org/10.1108/13612021011025483>
12. Norman, D.A.: *Emotional Design: Why We Love (or Hate) Everyday Things*, 3rd edn. Basic Books, New York (2003)
13. Sarada-Joshi, G.: 7 ways your clothes change the way you think (2016). <https://brainfodder.org/psychology-clothes-enclothed-cognition/>. Accessed 30 Jan 2018
14. Slepian, M., Ferber, S., Gold, J., Rutchick, A.: The cognitive consequences of formal clothing. *Soc. Psychol. Pers. Sci.* **6**(6), 661–668 (2015). <https://doi.org/10.1177/1948550615579462>