



Needs Assessment of Female and Male Scuba Diver's Wetsuit

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Keywords: Scuba diving, wetsuit, functional garment

Introduction: The mysteries of the underwater environment have always attracted people, and since the 1950's scuba diving has been a growing recreational sport in the U.S. (Outdoor Foundation, 2013); however, scuba diving requires certification prior to participation. Learning about the hazards of the sport, usage of dive equipment, and other various underwater skills are needed in order to obtain certification. Additionally, wearing a wetsuit is essential for thermal regulation, abrasion protection, and buoyancy while in the water. Although a number of studies have been done on other types of functional garments (Dickson & Pollack, 2000; Mitchka, Black, Heitmeyer, & Cloud, 2009), no research studies has been conducted on scuba divers' wetsuit needs. Wetsuit studies are needed to properly meet the needs of this consumer market. Therefore, the study purpose was to assess male and female scuba divers' satisfaction level with the wetsuit, and their functional, aesthetic, and expressive wetsuit needs based on the scuba diving commitment level. To identify the functional, expressive, and aesthetic attributes of wetsuits, FEA Consumer Needs Model (Lamb & Kallal, 1992) was used. Research questions examined are: (1) What are scuba divers' satisfaction level with FEA attributes of their current wetsuit based on the scuba diving commitment level? (2) What are scuba divers' opinions of wetsuit availability in the market with selected attributes based on the scuba diving commitment level? (3) What are the gender differences in scuba divers' satisfaction level with FEA attributes of their current wetsuit? (4) What are the gender differences in scuba divers' opinions of wetsuit availability in the market with selected attributes?

Method: A total of 114 participants including 89 males and 25 females were recruited by solicitations sent to members from dive shops, a diving magazine/newsletter, and an international diver training organization. The mean of the participants' age was 48 with the majority being Caucasian (86.3%). The online survey included 7 items measuring scuba diving commitment level on 5-point scales. First, participants rated their satisfaction level of selected attributes of their own wetsuit that they wear most frequently on a 7-point scale (1=*very dissatisfied*, 7=*very satisfied*). Second, participants rated how frequently they can find a new wetsuit with selected attributes in the market on a 7-point scale (1=*never*, 7=*every time*). Seventeen selected items measuring functional, aesthetic, and expressive attributes of wetsuit were adopted and modified from previous studies on other types of functional garments (Dickson & Pollack, 2000; Mitchka et al., 2009). Some examples of functional attributes included thermal properties, fit, and ease of movement; aesthetic attributes included design, uniqueness, and attractiveness; and expressive attributes included 'wetsuit to look confident' and 'wetsuit to define your role as a driver'.

Results: Exploratory factor analyses were conducted for satisfaction and wetsuit availability measures. Both measures were subdivided into three factors: functional, aesthetic, and expressive. Reliabilities were within acceptable ranges (from .68 to .92). To test how the level of scuba

diving commitment is related to divers' satisfaction with wetsuit attributes and wetsuit availability, the sample was divided into three commitment levels: low (N=35), medium (N=42), and high (N=34). MANOVA showed a significant multivariate main effect for commitment levels on scuba divers' satisfaction, [$F(6, 21) = 4.626, p < .0001$] but no significant main effect on wetsuit availability [$F(6, 166) = .56, p = .76$]. ANOVA revealed a significant main effect for commitment levels on satisfaction with functional [$F(2, 111) = 10.77, p < .0001$] and expressive [$F(2, 111) = 3.61, p < .05$] attributes of wetsuits, but no significant difference was found for satisfaction with aesthetic attributes of wetsuits. Post-hoc analyses further demonstrated that scuba divers with medium and high level commitment are significantly more satisfied (High: $M=5.98$; Med: $M=5.65$) with functional aspects of wetsuits they own than those with low commitment (Low: $M=4.99$). In the case of satisfaction with expressive aspects of wetsuits, significant difference was found in between high ($M=4.85$) and medium ($M=4.33$) commitment groups. Overall, results suggest that more highly committed scuba divers tend to be more satisfied with wetsuits they own for its functionality and expressiveness. Gender differences in satisfaction and wetsuit availability were also tested. MANOVA revealed a significant gender difference in wetsuit availability [$F(3, 88) = 4.031, p < .01$] but no significant difference was found in satisfaction [$F(3, 110) = 1.290, p = .281$]. Further analyses showed a significant main effect for gender on wetsuit availability considering functional [$F(1, 92) = 5.541, p < .05$] and aesthetic attributes [$F(1, 92) = 11.299, p < .001$]. Results indicate that male scuba divers (functional: $M=5.30$; aesthetic: $M=4.82$) tend to have more positive opinions on wetsuit availability considering its functional and aesthetic aspects than female counterparts (functional: $M=4.61$; aesthetic: $M=3.86$).

Conclusion: The study findings demonstrated that there are some differences in wetsuit needs based on scuba diver's level of commitment and gender. It could be that higher committed divers participate in the sport on a more regular basis, and thereby own a wetsuit with better functionality as a direct result of understanding what fit, mobility, and/or comfort aspects that best satisfy them while diving. Additionally, higher committed scuba divers may spend more time researching for a wetsuit to fulfill their underwater needs than a lower committed diver. Male scuba divers represent approximately 66% of the diving population (PADI, 2014) and wetsuit manufacturers may have more variety based on this, which would limit the variety of wetsuits available for females. The female form is also inherently more difficult to fit which could contribute to the lower female satisfaction of wetsuit availability. Thus, this study is beneficial for the wetsuit manufactures to better understand consumers with different needs.

References: Dickson, M. A., & Pollack, A. (2000). Clothing and identity among female in-line skaters. *Clothing and Textiles Research Journal*, 18(2), 65-72.

Lamb, J. M., & Kallal, M. J. (1992). A conceptual framework for apparel design. *Clothing and Textiles Research Journal*, 10(2), 42-47.

Mitchka, J., Black, C., Heitmeyer, J., & Cloud, R. M. (2009). Problem Structure Perceived Dance Practicewear Needs of Adult Female Dance Students. *Clothing and Textiles Research Journal*, 27(1), 31-44.

Outdoor Foundation. (2013). *2013 Outdoor recreation participation report*. Retrieved from <http://www.outdoorfoundation.org/research.participation.2013.html>

PADI. (2014). *Worldwide corporate statistics 2014: Data from 2008-2013*. Retrieved from http://www.padi.com/scuba/uploadedFiles/About_PADI/PADI_Statistics/PADI%202014%20WW%20Statistics.pdf