



[Home](#) > [Vol 3, No 2 \(2009\)](#) > [Chen](#)

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[Table of Contents](#)

Exploring Relatio...

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Henson

Reading Tools

- [Review policy](#)
- [About the author](#)
- [How to cite item](#)
- [Indexing metadata](#)
- [Email the author*](#)

Exploring Relationships between Touch Perception and Surface Physical Properties

Xiaojuan Chen, Fei Shao, Cathy Barnes, Tom Childs, Brian Henson

Abstract

This paper reports a study of materials for confectionery packaging. The aim was to explore the touch perceptions of textures and identify their relationships with the surfaces' physical properties. Thirty-seven tactile textures were tested including 22 cardboards, nine flexible materials and six laminate boards. Semantic differential questionnaires were administered to assess responses to touching the textures against six word pairs: *warm-cold*, *slippery-sticky*, *smooth,-rough*, *hard-soft*, *bumpy-flat*, and *wet-dry*. Four physical measurements were conducted to characterize the surfaces' roughness, compliance, friction, and the rate of cooling of an artificial finger when touching the surface. Correlation and regression analyses were carried out to identify the relationships between the people's responses and the physical measurements. Results show that touch perception is often associated with more than one physical property, and the strength and form of the combined contribution can be represented by a regression model.

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