



# Online Shopping Behavior Study Based on Multi-granularity Opinion Mining: China Versus America

**Abstract** With the development of e-commerce, many products are now being sold worldwide, and manufacturers are eager to obtain a better understanding of customer behavior in various regions. To achieve this goal, most previous efforts have focused mainly on questionnaires, which are time-consuming and costly. The tremendous volume of product reviews on e-commerce Web sites has seen a new trend emerge, whereby manufacturers attempt to understand user preferences by analyzing online reviews. Following this trend, this paper addresses the problem of studying customer behavior by exploiting recently developed opinion mining techniques. This work is novel for three reasons. First, questionnaire-based investigation is automatically enabled by employing algorithms for template-based question generation and opinion mining-based answer extraction. Using this system, manufacturers are able to obtain reports of customer behavior featuring a much larger sample size, more direct information, a higher degree of automation, and a lower cost. Second, international customer behavior study is made easier by integrating tools for multilingual opinion mining. Third, this is the first time an automatic questionnaire

investigation has been conducted to compare customer behavior in China and America, where product reviews are written and read in Chinese and English, respectively. Our study on digital cameras, smartphones, and tablet computers yields three findings. First, Chinese customers follow the Doctrine of the Mean and often use euphemistic expressions, while American customers express their opinions more directly. Second, Chinese customers care more about general feelings, while American customers pay more attention to product details. Third, Chinese customers focus on external features, while American customers care more about the internal features of products.

**Keywords** Sentiment analysis · Opinion mining · Customer behavior study · Automatic questionnaire generation

## Introduction

With the rapid development of e-commerce, more and more businesses are operating on a global scale. For manufacturers, customer behavior plays a key role in decision making regarding product design and marketing. It is also important for transactional enterprises to conduct questionnaire-based surveys of customer behavior. Most existing research on customer behavior is conducted via manually administered questionnaires, which is expensive, time-consuming, and prone to error. Nowadays, there is a tremendous volume of product reviews available on e-commerce Web sites, and manufacturers are attempting to understand user preferences by accessing online customer reviews. For example, C&A Marketing<sup>1</sup> analyzes

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