



Article

# Cultural Differences in Tweeting about Drinking Across the US

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**Abstract:** Excessive alcohol use in the US contributes to over 88,000 deaths per year and costs over \$250 billion annually. While previous studies have shown that excessive alcohol use can be detected from general patterns of social media engagement, we characterized how drinking-specific language varies across regions and cultures in the US. From a database of 38 billion public tweets, we selected those mentioning “drunk”, found the words and phrases distinctive of drinking posts, and then clustered these into topics and sets of semantically related words. We identified geolocated “drunk” tweets and correlated their language with the prevalence of self-reported excessive alcohol consumption (Behavioral Risk Factor Surveillance System; BRFSS). We then identified linguistic markers associated with excessive drinking in different regions and cultural communities as identified by the American Community Project. “Drunk” tweet frequency (of the 3.3 million geolocated “drunk” tweets) correlated with excessive alcohol consumption at both the county and state levels ( $r = 0.26$  and  $0.45$ , respectively,  $p < 0.01$ ). Topic analyses revealed that excessive alcohol consumption was most correlated with references to drinking with friends ( $r = 0.20$ ), family ( $r = 0.15$ ), and driving under the influence ( $r = 0.14$ ). Using the American Community Project classification, we found a number of cultural markers of drinking: religious communities had a high frequency of anti-drunk driving tweets, Hispanic centers discussed family members drinking, and college towns discussed sexual behavior. This study shows that Twitter can be used to explore the specific sociocultural contexts in which excessive alcohol use occurs within particular regions and communities. These findings can inform more targeted public health messaging and help to better understand cultural determinants of substance abuse.

**Keywords:** excessive drinking; social media; Twitter; natural language processing; American Communities Project

## 1. Introduction

Excessive alcohol consumption, including binge and heavy drinking, is responsible for approximately 88,000 deaths per year in the US, making it the third leading preventable cause of death and a major public health concern [1–3]. Binge drinking, generally defined as having five or

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