Smoking's effect on hangover symptoms

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**Abstract**

Epidemiological, laboratory, and clinical research consistently suggest that drinking and smoking are highly comorbid, with significant public health outcomes. However, the more proximal consequences of co-occurring drinking and smoking, such as hangover, have seldom been studied. The current study sought to examine the unique and shared variance attributable to hangover, and to determine if there is an interaction between drinking and smoking in predicting hangover. Smokers (n = 115, reporting 100 lifetime cigarettes and past month smoking: age 18-19; 57% female; 96% Caucasian) completed a daily web-based survey for 8 weeks to assess history of prior day alcohol and tobacco use as well as current day hangover symptoms. Prior day number of drinks (M = 2.55, SD = 4.74) and number of cigarettes (M = 7.16, SD = 6.67) were assessed. We also created a variable reflecting percent smoking above usual, computed by dividing current day smoking quantity by the mean of smoking quantity across the 56 days (M = 1.00, SD = 0.75). Current day hangover was constructed by taking a mean across 5 items: tired, headache, nauseated, weak, and difficulty concentrating on things, each ranging from (1) not at all to (5) extremely (r = 0.92). Data were analyzed using multilevel models with periodicity (weekday vs. weekend) and sex controlled. Both smoking quantity and percent smoked above usual uniquely predicted hangover (β = 0.62; β = 0.37; ps < 0.001 with nearly as strong of magnitude as did drinking quantity (β = 0.68, p < 0.01). When drinking quantity was controlled, both smoking quantity and percent smoked above usual uniquely and strongly predicted hangover (std. β = 0.12; std. β = 0.07; ps < 0.001). Most noteworthy was the finding that percent smoked above usual and drinking quantity interacted in a synergistic fashion to predict hangover (β = 0.04, p < 0.001) and headache (β = 0.04, p < 0.001).

**Introduction**

• Drinking and smoking are highly comorbid.
  - Epidemiological work shows that alcoholics are more likely to smoke than non-alcoholics and social drinkers are more likely to smoke than non-drinkers (Bien & Burge, 1990; Giulvè et al., 1995; Isbarn & Matarazzo, 1990).
  - Field studies have shown that drinking and smoking are likely to occur together (Stithman et al., 1994).

• There is a significant public health outcome of joint usage (e.g., esophageal, laryngeal, and oral cancers).
  - However, the more proximal consequences of co-occurring drinking and smoking, such as hangover, have seldom been studied.

• Assessed history of prior day smoking and drinking quantity vs. non-drinking days (M = 5.14, SD = 1.17; p < 0.001).

• Participants reported experiencing a hangover on 19% of the days (β = 11.1, p < 0.01), controlling for sex (β = 0.09; p < 0.001).

**Methods**

**Participants (N=115)**

- Smokers over-sampled (100 lifetime cigarettes/smoke past-month)
  - 57% female
  - 96% Caucasian
  - 90% were age 18 or 19

**Procedure**

- Baseline assessment
  - Assessed substance use, motivations for substance use, family history of substance use, personality, mood
  - Daily web-based 26-item survey
  - 8 weeks
  - Assessing history of prior-day alcohol and tobacco use, mood, and stress, as well as current-day hangover

**Measures**

- Drinking (prior day)
  - Number of drinks (M = 2.55, SD = 4.74)
  - Smoking (prior day)
  - Number of cigarettes (M = 7.16, SD = 6.67)

**Hangover (current day)**

- Percent smoking above usual
  - Computed by dividing current day smoking quantity by the mean of smoking quantity across the 56 days (M = 1.00, SD = 0.75)
  - Hangover (current day) (Slutske, Piasecki, & Hunt-Carter, 2003)

- Computed a mean across 5 items: tired, headache, nauseated, weak, and difficulty concentrating on things

**Results**

- Significant interaction between sex and number of cigarettes (β = 0.11; standardized β = 0.13).

- Women showed a stronger association between number of cigarettes and hangover.

- The same pattern was observed for percent smoked above usual (β = 0.09; p < 0.01; standardized β = 0.07).

- Replacing hangover with headache showed similar (but slightly larger) effects.

**Family history of alcoholism**

- No interactions were observed.

**Conclusion**

- Although smoking has never been considered as a potential source of hangover, it explained a good deal of unique variance in hangover and interacting in predicting drinking.

- Tobacco and nicotine as well as smoking make a direct pharmacologic contribution to hangover expression.

- Smoking is pharmacologically potent in its own right, and may contribute to hangover symptomatology.

- The acute systemic effects of nicotine and tobacco smoke include central nervous system effects such as headache, dizziness, and insomnia, gastrointestinal effects such as nausea, vomiting, diarrhea, and dry mouth, and musculoskeletal effects (Palmer, Buchanan & Feudals, 1992).

- Tobacco use and hangover are behavioral markers of an underlying genetic liability for sensitivity to drug effects.

- That is, smoking has no pharmacological effect on hangover, but is a marker of an underlying risk for substance use problems, including heavy drinking.

- Women were more susceptible to both the effects of smoking and the synergistic effects of drinking and smoking on hangover.

- Nearly identical effects were observed for headache as for hangover, suggesting that headache serves as a proxy for hangover.

**References**


**Figure 1**

Illustrative graph of the interaction between smoking and drinking on predicting hangover. Note: This controls for periodicity (weekday versus weekend) and sex. *p = 0.09***, ***p = 0.001