

Consumption Context Influences User-Generated Product Ratings

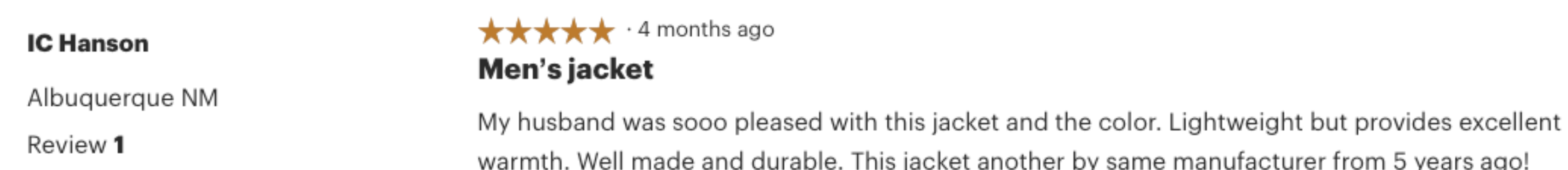
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Summary

- Cold-weather gear receives lower ratings during abnormally cold temperatures
- This cannot be explained by mood—other products don't show the same relationship
- This noise affects **choice**, as noise in ratings creates noise in product search (Study 2)
- This noise **biases** ratings, as noise primarily increases the proportion of negative ratings
 - 5-stars is the mode
- We use 41,349 ratings scraped from REI.com, merged with local weather data from NCEI

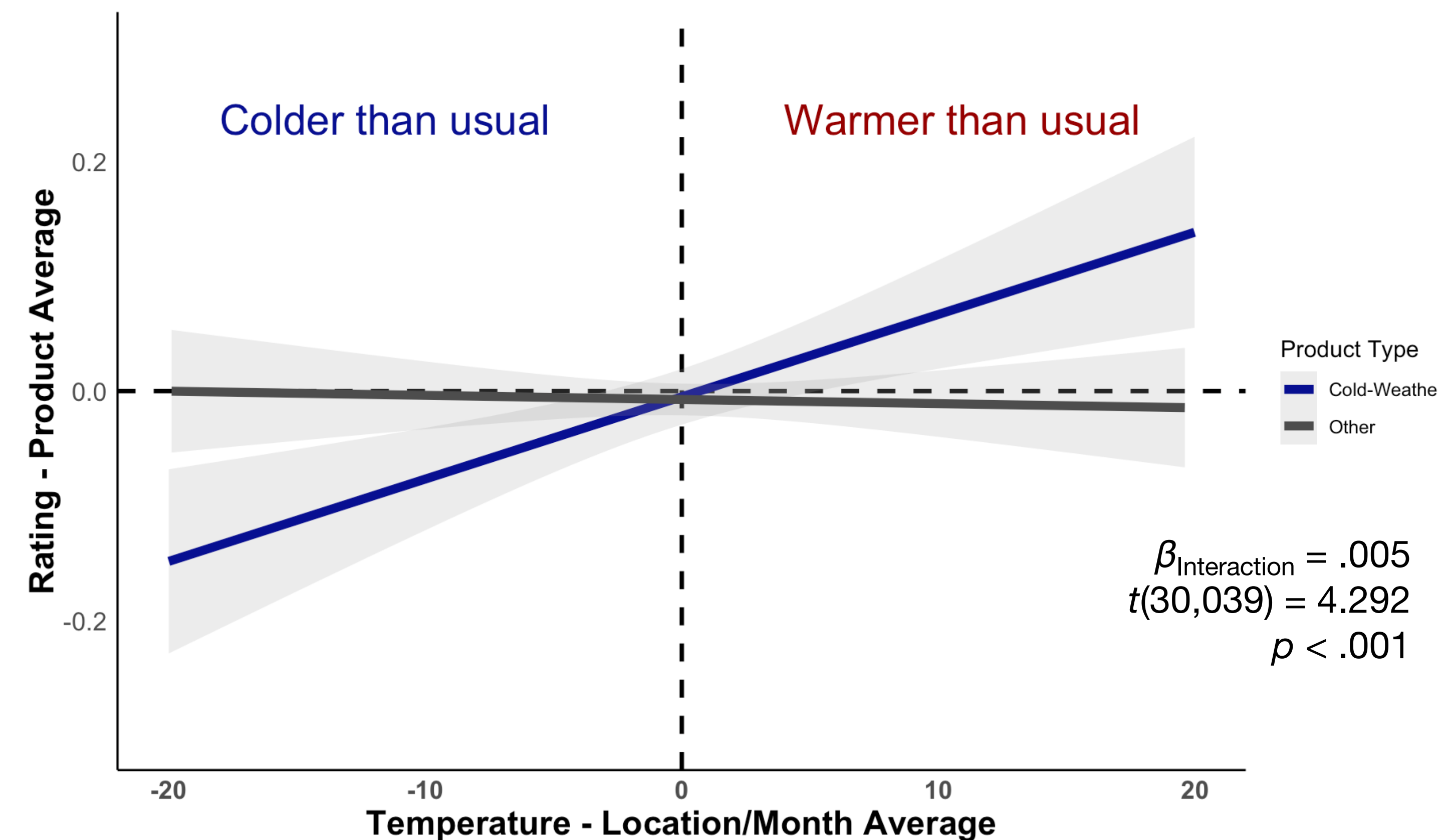
Method

- 100,310 reviews scraped from REI.com



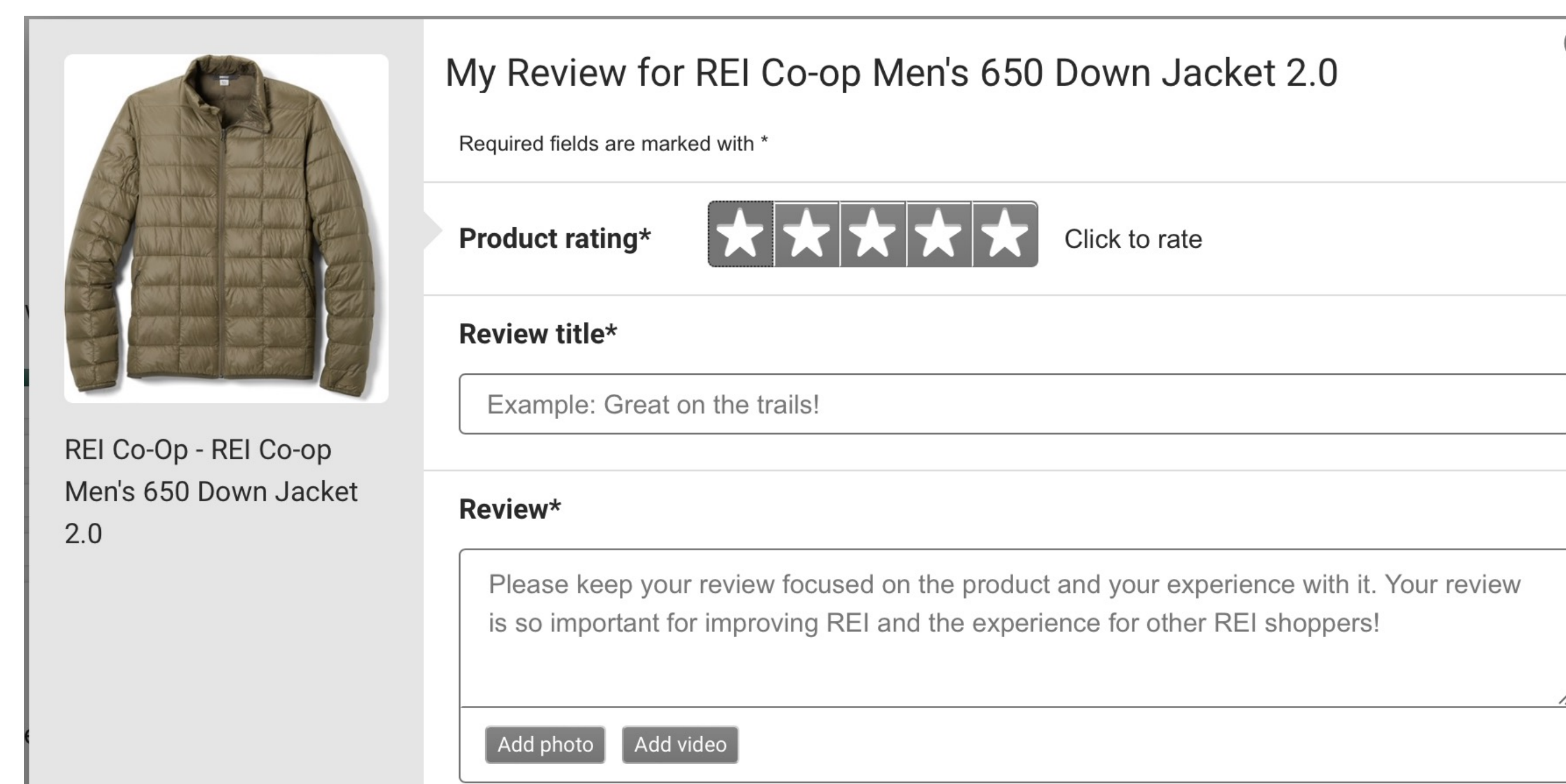
- Parsed locations for 47,078
- Merged 41,349 with recent local weather data
 - 8,448 for cold-weather gear (e.g., jackets, gloves, toques)
- Fixed-effect regression:
 - $Rating = \beta_1 T + \beta_2 CW + \beta_3 TxCW + \gamma LxM + \delta P$
 - T : Average daily mean (last 3 days)
 - CW : Indicator if product was cold-weather gear
 - LxM : Location (weather station) x Month fixed-effect
 - P : Product fixed effect
- β_1 : Effect of temperature on ratings within location/months
- β_3 : Does this relationship differ for cold-weather gear?

Result



- Specification curve analysis: 99.9% (1,726/1,728) revealed positive, significant interaction
- Consistent result with text review sentiment as DV

Why?



- Consumers rate single products in isolation
- No clear instruction about how to rate
- So, they rate what they can **easily evaluate** at the time of rating:
 - General experience: How warm did I feel?
 - Expectation disconfirmation: Did this product meet expectations?

Consequences

Study 2: Search

- This noise in ratings is not washed out by large sample sizes
 - 1/3 of products have 5 reviews or less
 - The median product has 10
- 401 AMT workers search for a winter jacket from 1 of 4 lists:
 - Ordered by raw average rating (m/f)
 - Ordered by weather-adjusted rating (m/f)
- Jackets in later positions were less likely to be searched (consistent with Ursu 2018)
 - $\beta_{LogPosition} = -0.030$, $t(11,570) = -5.144$, $p < 0.001$
- Search correlated at $r = .41$ between conditions

Future Direction: Downward Bias

- The modal rating is 5-stars out of 5
- Any increase in noise should push average ratings downward
- Planned simulation study to demonstrate that larger sample sizes shouldn't "fix" this issue

Resources

- Python code used to scrape reviews and merge weather data available:

www.mattmeister.com

- Alongside all reviews, weather data, and the paper itself
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