Chat-Based Customer Service: Using Big-Data to Connect Customer Emotion to Service Operations

Shelly Ashtar
Industrial Engineering and Management, Technion – Israel Institute of Technology

Joint work with:
Daniel Altman, Anat Rafaeli, Galit Yom-Tov (Technion)
I work in customer service, so by all means, please use me as a verbal punching bag. It makes me much more likely to do what you want when you scream your request at me.
Research Questions: What Happens in CHAT Service?

How does customer emotion in chat service influence employees?
Available Research on Effects of Customer Emotion

Limited because ….

⇒ Lots of Self-Report
⇒ Limited External Validity
⇒ Limited Operational Connections

Technology Mediated Service
Great Opportunities!

Rafaeli et al. (2017), *Journal of Service Research*
Yom-Tov and Rafaeli (2017), *Behavioral Operations*
Platform: Chat Based Service

Multiple Data Sets
http://LivePerson.com

Automated Emotion Detection
Natapov et al. (2017)
Tool: Automated Emotion Analyses
Unfolding of Emotion During Interactions

- 390,438 interactions;
- Sectioned into 10 units;
- Emotion in each section;
- Average for all interactions in sample (Telecom)

Yom-Tov et al. (2017), Under Review
Relating Customer Emotion to Service Evaluations

Net Promoter Score: “How likely is it that you would recommend our company to a friend or a colleague?”

1- Not likely
5- Highly likely
Bottom Line: Not That Much Negative Emotion!

439,585 Full Interactions

3,659,053 Customer Messages

Data: 3 Months of Retail Data
• **Presence** of customer POSITIVE emotion **CREATES** FASTER employee response time 30 seconds less for each employee message! (\(b = -29.57, SE = 6.77, p < 0.001\)).

• **NO INFLUENCE** of presence customer NEGATIVE emotion on employee response time (\(b = -8.89, SE = 7.83, p > 0.05\)).
Emotion also Moderates Effects of Workload (#cust words) on Employee Response:

HLM (chats within employee):
- $n=7,147$
- $b=0.12$ ($SE=0.04$,
  $p<0.001$)
- $R^2 = 40.08\%$

Analyses control number of words per message (customer and employee), time waiting for service and service/sales.

Altman, Rafaeli, Yom-Tov (2017) In Progress
Results 2.0: A Look at Causal Effects!

- Transportation data (20,355 interactions from January 2016):
  Time based analysis - Using $T_1$ customer emotion to predict $T_2$ employee behavior.

 Altman, Rafaeli, Yom-Tov (2017) In Progress
Customer Emotion and ....

Employee
UNSCHEDULED Breaks
(up to 15 minutes)

Length

Ashtar, Rafaeli, Yom-Tov (2017) In Progress
Customer Emotion and Employee UNSCHEDULED Breaks

First customer assignment to employee

Beginning of shift

Customer 8 (C8)
Customer 9 (C9)
Customer 10 (C10)
Customer 11 (C11)
Customer 12 (C12)
Customer 13 (C13)

Start of break

Time interval

End of break

DV: Length of break
Customer Emotion and Employee UNSCHEDULED Breaks

- First customer assignment to employee
- Beginning of shift
- Customer 8 (C8)
- Customer 9 (C9)
- Customer 10 (C10)
- Customer 11 (C11)
- Customer 12 (C12)
- Customer 13 (C13)
- Start of break
- End of break
- Employee Workload
- DV: Length of break
Customer Emotion and Employee UNSCHEDULED Breaks

- Customer 8 (C8)
- Customer 9 (C9)
- Customer 10 (C10)
- Customer 11 (C11)
- Customer 12 (C12)
- Customer 13 (C13)

DV: Length of break

Customer Positive Emotion

Customer Negative Emotion

First customer assignment to employee

Beginning of shift

Start of break

End of break

8:00 8:05 ... 12:00 12:05 12:10 12:15 12:20 12:25 12:30 12:35 12:40 12:45 12:50 12:55 13:00 13:05
Customer Negative Emotion INCREASES Length of Breaks

With higher customer negative emotions, high workload leads to longer breaks

\[ b = 38.92^* (17.88) \]

Ashtar, Rafaeli, Yom-Tov (2017) In Progress
Customer Positive Emotion REDUCES Length of Breaks

With higher customer positive emotions, high workload leads to shorter breaks

\[ b = -40.71^* (16.25) \]

Ashtar, Rafaeli, Yom-Tov (2017) In Progress
Automated analyses useful for studying customer emotions

- **Less** negative customer emotions than commonly assumed
- **Emotions in service interactions change over time:**
  - Start negative and become positive
  - Evolution relates to service evaluations
- Customer emotion influences employee behaviors ...
  - **Positive Customer emotion**
    - **REDUCES** employee Response Time;
    - **REDUCES** length of employee breaks;
  - **Customer Negative Emotion**
    - **INCREASES** effects of workload on unscheduled breaks
Thank You

Mahalo

Kiitos

Toda

Grazie

Obrigado

Takk

Gracias

Merci