‘It’s not what you say, it’s how you say it’: The role of emotional vocal signals in shaping entrepreneurial pitching outcomes

Jarrod Ormiston, Deniz Iren, Jermain Kaminski, Michael Leyer, Stefano Bromuri
Emotions & entrepreneurship
Passion
(Cardon et al 2009; Cardon et al 2017)

"If you don't know what your passion is, realize that one reason for your existence on earth is to find it."

- Oprah Winfrey -
"The only way to do great work is to love what you do. If you haven’t found it yet, keep looking. Don’t settle. As with all matters of the heart, you’ll know when you find it."

- Steve Jobs

Love
(Branzei & Zietsma, 2004)
Joy
(Welpe et al 2012)
Compassion
(Grimes et al 2013; Miller et al 2012)
Empathy

(Bacq & Alt, 2018)
Anger

(Doern and Goss, 2014)
Grief
(Patzelt & Shepherd, 2011)
Mixed emotions
Mixed emotions

Anxiety  Frustration  Anger  Worry  Disappointment  Impatience  FEAR
Emotions & investment decisions

(Chen et al 2009; Mitteness et al 2012; Parhankangas & Ehrlich 2014; Clarke et al 2018, Shane, Drover, Clingingsmith & Cerf 2019)
Is leadership language ‘rewarded’ in crowdfunding? Replicating social entrepreneurship research in a rewards-based context

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ABSTRACT

Rewards based crowdfunding (where individuals provide funding for a campaign in exchange for a pre-specified reward) represents one of the largest forms of crowdfunding to date. While an emerging stream of research examines how the rhetoric used in crowdfunding campaigns impacts funding success, a number of studies examining language used in crowdfunding have only been explored in the context of social crowdfunding campaigns that rely on very different audiences, funding amounts, and project goals. To build knowledge surrounding the relationship between the rhetoric used in rewards-based crowdfunding and potential campaign success we replicate a number of rhetoric approaches previously examined in social contexts. Specifically, we examine the efficacy of charismatic rhetoric, political rhetoric, entrepreneurial orientation rhetoric, and virtue rhetoric in a sample of 1000 campaigns drawn from Kickstarter. Our replication results reveal relatively little consistency across contexts underscoring the value of replication to understand boundary conditions of important entrepreneurial phenomena.
Table 2a
Replication of Allison et al. (2013).

<table>
<thead>
<tr>
<th>Original Hypothesis</th>
<th>Results</th>
<th>Replication Hypothesis</th>
<th>Results</th>
<th>Replicate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1. There is a negative correlation between use of accomplishment rhetoric and the speed with which individual investors fund microloans.</td>
<td>Supported</td>
<td>There is a negative correlation between use of accomplishment rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>Yes, for 2/3 DVs</td>
</tr>
<tr>
<td>Hypothesis 2. There is a positive correlation between use of blame rhetoric and the speed with which individual investors fund microloans.</td>
<td>Supported</td>
<td>There is a positive correlation between use of blame rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 3. There is a positive correlation between use of present concern rhetoric and the speed with which individual investors fund microloans.</td>
<td>Supported</td>
<td>There is a positive correlation between use of present concern rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 4. There is a positive correlation between use of leveling rhetoric and the speed with which individual investors fund microloans</td>
<td>Not supported</td>
<td>There is a positive correlation between use of leveling rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>Yes</td>
</tr>
<tr>
<td>Hypothesis 5. There is a negative correlation between use of concrete rhetoric and the speed with which individual investors fund microloans.</td>
<td>Not supported</td>
<td>There is a negative correlation between use of concrete rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>Yes</td>
</tr>
<tr>
<td>Hypothesis 6. There is a positive correlation between use of tenacity rhetoric and the speed with which individual investors fund microloans.</td>
<td>Not supported, significant but in opposite direction</td>
<td>There is a positive correlation between use of tenacity rhetoric in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 7. There is a negative correlation between use of rhetorical variety and the speed with which individual investors fund microloans.</td>
<td>Supported</td>
<td>There is a negative correlation between use of rhetorical variety in rewards based campaigns and crowdfunding performance.</td>
<td>Success: Supported</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Table 3a
Replication of Anglin et al. (2014).

<table>
<thead>
<tr>
<th>Original Hypothesis</th>
<th>Results</th>
<th>Replication Hypothesis</th>
<th>Results</th>
<th>Replicate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1. Collective focus rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Supported</td>
<td>The collective focus rhetoric of rewards based campaigns will be positively related to crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>Yes, for 2/3 DVs</td>
</tr>
<tr>
<td>Hypothesis 2. Temporal orientation rhetoric will be positively related to the number of days needed for a venture to receive funding, thus speed to funding is lengthened.</td>
<td>Supported</td>
<td>Temporal orientation rhetoric will be positively related to the number of days needed for a venture to receive funding, thus speed to funding is lengthened.</td>
<td>Success: Supported</td>
<td>Yes</td>
</tr>
<tr>
<td>Hypothesis 3. Followers' worth rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Not supported; significant, but in opposite direction</td>
<td>Followers' worth rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is lengthened.</td>
<td>Success: Supported</td>
<td>No, opposite results found.</td>
</tr>
<tr>
<td>Hypothesis 4. Similarity to followers' rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Supported</td>
<td>The similarity to followers' rhetoric of rewards based campaigns will be negatively related to crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 5. Values and moral justification rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Supported</td>
<td>The values and moral justification rhetoric of rewards based campaigns will be negatively related to crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 6. Tangibility rhetoric will be positively related to the number of days needed for a venture to receive funding, thus speed to funding is lengthened.</td>
<td>Not supported</td>
<td>The tangibility rhetoric of rewards based campaigns will be negatively related to crowdfunding performance.</td>
<td>Success: Supported</td>
<td>Yes, for 2/3 DVs.</td>
</tr>
<tr>
<td>Hypothesis 7. Action-oriented rhetoric will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Not supported</td>
<td>The action-oriented rhetoric of rewards based campaigns will be negatively related to crowdfunding performance.</td>
<td>Success: Supported</td>
<td>No</td>
</tr>
<tr>
<td>Hypothesis 8. Language reflecting adversity will be negatively related to the number of days needed for a venture to receive funding, thus speed to funding is shortened.</td>
<td>Not supported; significant, but in opposite direction</td>
<td>The language reflecting adversity of rewards based campaigns will be negatively related to crowdfunding performance.</td>
<td>Success: Not supported</td>
<td>Yes, for 1 DV</td>
</tr>
</tbody>
</table>

1 Note that a negative relationship with the number of days needed to receive funding in the original hypotheses is a positive indicator of crowdfunding performance.
Table 4a
Replication of Moss et al. (2015).

<table>
<thead>
<tr>
<th>Original Hypothesis</th>
<th>Results</th>
<th>Replication Hypothesis</th>
<th>Results</th>
<th>Replicate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1: The extent to which microenterprises signal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) conscientiousness</td>
<td>Not supported; significant, but in opposite direction</td>
<td>The extent to which rewards-based campaigns crowdfunding campaigns signal</td>
<td>1) conscientiousness</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
</tr>
<tr>
<td>2) courage</td>
<td>Not supported; significant, but in opposite direction</td>
<td>2) courage</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>3) empathy</td>
<td>Not supported; significant, but in opposite direction</td>
<td>3) empathy</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>4) integrity</td>
<td>Not supported</td>
<td>4) integrity</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>Yes</td>
</tr>
<tr>
<td>5) warmth</td>
<td>Not supported; significant, but in opposite direction</td>
<td>5) warmth</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>and, 6) zeal</td>
<td>Not supported</td>
<td>and, 6) zeal is positively associated with the likelihood that investors will fund microloan ventures.</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>Yes</td>
</tr>
<tr>
<td>Hypothesis 2: The extent to which microenterprises signal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) autonomy</td>
<td>Supported</td>
<td>The extent to which rewards-based campaigns crowdfunding campaigns signal</td>
<td>(1) autonomy</td>
<td>Success: Not supported Amt. Raised: Not supported significant in opposite direction. Backers: Not supported</td>
</tr>
<tr>
<td>(2) competitive aggressiveness</td>
<td>Supported</td>
<td>(2) competitive aggressiveness</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>(3) innovativeness</td>
<td>Not supported</td>
<td>(3) innovativeness</td>
<td>Success: Not supported Amt. Raised: Not supported significant in opposite direction. Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>(4) proactiveness</td>
<td>Not supported</td>
<td>(4) proactiveness</td>
<td>Success: Not supported Amt. Raised: Not supported significant in opposite direction. Backers: Not supported</td>
<td>No</td>
</tr>
<tr>
<td>and, (5) risk taking to microlenders is positively associated with the likelihood that investors will fund microloan ventures.</td>
<td>Supported</td>
<td>and (5) risk taking is positively associated with crowdfunding performance.</td>
<td>Success: Not supported Amt. Raised: Not supported Backers: Not supported</td>
<td>No</td>
</tr>
</tbody>
</table>

Differences in control variables. To make our relationship robust we included key control variables known to impact crowdfunding performance in the rewards context of Kickstarter (i.e. staff pick, past campaigns created, microenterprises signal that investors will fund microloan ventures). However, such variables are either not used or do not exist in the Kiva context. Empirical subtleties might also play a role in the differences in study findings across contexts could be related to the operationalization of factors unique to Kickstarter. Once again, this underscores how differences in populations and samples of each sample. Empirical generalizations seek to follow the design of previous studies where possible, but may have notable differences due to differences in populations.

Hypothesis 1: The extent to which microenterprises signal that adversity rhetoric exhibits a negative relationship with crowdfunding performance, which is consistent with the original hypothesis.

Hypothesis 2: The extent to which rewards-based campaigns crowdfunding campaigns signal that adversity rhetoric exhibits a positive relationship with crowdfunding performance, which is consistent with the original hypothesis.
anger
1. eyebrows down and together
2. eyes glare
3. narrowing of the lips

disgust
1. nose wrinkling
2. upper lip raised

happiness
A real smile always includes:
1. crow's feet wrinkles
2. pushed up cheeks
3. movement from muscle that orbits the eye

sadness
1. drooping upper eyelids
2. losing focus in eyes
3. slight pulling down of lip corners
It does not only count what you say, but how you say it.
How do emotions and opportunity confidence in voice signals used by entrepreneurs influence pitching success?
Affective reactivity (Mitteness et al 2012)
Judges’ decision-making behaviour is influenced by emotional stimuli that manifest during pitches

Opportunity confidence (Dimov 2010)
Entrepreneur’s self efficacy and honesty aligns with the emotions they display
Methodological challenges...
Retrospective surveys
Emotions are dynamic

Happy
Emotions are dynamic

Happy
Emotions are dynamic

Surprise
Emotions are dynamic

Fear
Emotions are dynamic

Happy
Ekman’s (1999) basic emotions
Fear
Angry
Disgust
Sad
The data
Techcrunch Battlefield

20+ events
2011-2019
683 pitches

34 winners
113 finalists
474 contestants

5-9 minutes
Analysis
(preliminary, smaller sample)
Audio Recordings
683 Techcrunch Pitches
20+ events
2011 - 2019

Outcomes
Winner | Finalist | Non-Finalist

Emotions
Mean | Std. Dev. | Kurtosis | Skewness

Classification
(Decision Tree)
Pre-trained model: 28,000 labeled emotions in 3s clips from customer call centers. Average recall = 0.67, average precision = 0.67.
Henkel et al. (2020, JSR)
Recognising Emotions in Speech using Deep Recurrent Neural Networks

Audio
(15 seconds)
Recognising Emotions in Speech using Deep Recurrent Neural Networks

Extracts numerical features from speech (e.g. tonality, chroma, timbre, rhythm)

PyAudioAnalysis

Audio (5 seconds)
Recognising Emotions in Speech using Deep Recurrent Neural Networks

Extracts numerical features from speech (e.g. tonality, chroma, timbre, rhythm) with PyAudioAnalysis

Audio (15 seconds) → Classifies emotions
Recognising Emotions in Speech using Deep Recurrent Neural Networks

Extracts numerical features from speech (e.g. tonality, chroma, timbre, rhythm) with PyAudioAnalysis

Classifies emotions

Emotion prob.
Testing the model: Emotion Annotation
In-sampling accuracy: 0.83
Average
the overall amount of emotions shown in a pitch

Standard deviation
the spread of the distribution of emotions throughout the pitch

Skewness
the distance of emotions away from mean of zero
skewed left = lower frequency of strong emotion,
skewed right = a high frequency of strong emotions

Kurtosis
the prominence of emotions throughout the pitch
(high kurtosis = small amount of strong emotion, and absence of weak emotions, low kurtosis = high variability of emotion)
Anatomy of a typical pitch

Fear
nervous/excited

Happiness
Positivity about the idea

Surprise
Surprising innovation/unexpected question

[Graph showing the peaks and troughs of different emotions over time]
(Non-finalists, Finalists, Winners)
(Non-finalists, Finalists, Winners)
(Non-finalists, Finalists, Winners)
(Non-finalists, Winners and Finalists)

- **kurt_fear ≤ 48.933**
  - gini = 0.499
  - samples = 149
  - value = [78, 71]
  - class = Loser

  True

- **kurt_anger ≤ 49.519**
  - gini = 0.464
  - samples = 115
  - value = [73, 42]
  - class = Loser

  False

- **skew_fear ≤ 7.416**
  - gini = 0.251
  - samples = 34
  - value = [5, 29]
  - class = Finalist-Winner
exhibiting fear and surprise as a distinct emotional display in voice signals assists in creating suspense and tension throughout a pitch.
emphasizing anger could highlight the importance of the problem they are addressing and their passion and commitment for tackling these issues.
Peaks of these emotions rather than the overall spread of emotions that influence pitching success.

Displaying extreme emotions, i.e., bundling the emotional feeling in few but well picked moments, seems to be important for captivating the audience and leaving an impression among judges to be remembered.
Contributions
Capturing emotions dynamically
Corr (Emotions in voice, Pitching success)
Asymmetry & Emotions
(Lindebaum & Jordan, 2014)
Asymmetry & Emotions
(Lindebaum & Jordan, 2014)
Asymmetry & Emotions (Lindebaum & Jordan, 2014)
Emotional arcs in entrepreneurial presentations

The Six Emotional Arcs - Kurt Vonnegut (1981)

**Rags to Riches**
This is the prototypical happy story. It's common in creation tales in different world religions: gods create great things, culminating with humans. It's also common in children's stories.

- *The Importance of Being Earnest: The Jungle Book*

**Man in the Hole**
The main character has a problem and falls deep into until he climbs his way out.

- *The Wonderful Wizard of Oz*
- *Through the Looking Glass*
- *The Secret Garden*

**Cinderella**
Up, down and up again is the story that Vonnegut recognized in both Cinderella and the New Testament, bringing him to study story shapes. It is one of the most common shapes in Western storytelling.

- *King Solomon's Mines*
- *Star Wars*

**Tragedy**
In Tragedies, the main character starts in a positive state, but as the story evolves, the situation goes worse and worse. Kafka and Shakespeare were masters of tragedy.

- *Hamlet*
- *The Picture of Dorian Gray*
- *The Metamorphosis*

**Icarus**
Icarus is another type of tragedy, but here everything starts going well for the protagonist before turning.

- *Garden of Eden*
- *A Christmas Carol*

**Oedipus**
The opposite of the Cinderella story, Oedipus is the modern tragedy, where the protagonist fights for his sake but ends up losing.

- *Frankenstein*
- *The War of Worlds*
Emotional arcs in entrepreneurial presentations

Limitations
Felt emotions vs Emotional displays vs Residual feelings
Measuring Audience and Actor Emotions at a Theater Play through Automatic Emotion Recognition from Face, Speech, and Body Sensors

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² Politecnico di Milano, Via Lambruschini, 4/B, 20156, Milan, Italy
³ University of Pisa, Largo Lucio Lazzarino, 56122, Pisa, Italy

Abstract We describe a preliminary experiment to track the emotions of actors and audience in a theater play through machine learning and AI. During a forty-minute play in Zurich, eight actors were equipped with body sensing smartwatches. At the same time, the emotions of the audience were tracked anonymously using facial emotion tracking. In parallel, also the emotions in the voices of the actors were assessed through automatic voice emotion tracking. This paper demonstrates a first fully automated and privacy-respecting system to measure both audience and actor satisfaction during a public performance.
Thank you!