AFFECT-CX

Daniel David – Oct 2022

The main goal of AFFECT-CX is uncover behavioral signals that might lead to actionable insights. The Debut Group defined Cognitive Resonance as a single score which encapsulates the three main aspects which impact relevant aspects from human interactions: attention economics, mood induction, and value internalization. Based on feedback from a behavioral scientist, this report aggregates the steps needed to compute each one of those features.

1. Introduction

First, we need to define the main data points.

|  |  |  |
| --- | --- | --- |
| Class | Qty | Output |
| Body Alignment | 3 | aligned, misaligned |
| Gaze direction | 3 | straight, away |
| Face emotion | 7 | angry, disgust, fear, happy, sad, surprise, and neutral. |
| Speech emotion | 28 | admiration, amusement, anger, annoyance, approval, caring, confusion, curiosity, desire, disappointment, disapproval, disgust, embarrassment, excitement, fear, gratitude, grief, joy, love, nervousness, optimism, pride, realization, relief, remorse, sadness, surprise, neutral. |
| Pitch | 3 | distress, neutral, excited. |
| Voice Pace | 3 | fast, normal, slow. |

The model considers that any person will be under one of those 7 states of head direction, body direction, gaze direction, face emotion, speech emotion, pitch emotion, and voice pace throughout any interaction. Those 7 categories might change independently from each other. The combination can positively or negatively affect Attention Economics, Mood Induction, and Value Internalization. Consequently, it will also affect the cognitive Resonance Score.

The following chapters map how each data point affects Cognitive Resonance. This mapping process was done with the support from Benan Demir, the lead Behavioral Scientist.

1. Attention Economics
   1. Why is it important?

Higher levels indicate that the user is paying attention to the topic.

* 1. What positively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Body Alignment | - |
| Gaze direction | - |
| Face emotion | Happy, Surprise |
| Speech Emotion | Admiration, Amusement, Curiosity, Excitement, Joy, Realization, Surprise |
| Pitch | Excited |
| Voice Pace | - |

* 1. What negatively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Head direction | Misalignment |
| Gaze direction | - |
| Face emotion | Fear |
| Speech Emotion | - |
| Pitch | - |
| Voice Pace | - |

1. Mood Induction
   1. Why is it important?

Higher levels indicate that the user feels positive about the topic.

* 1. What positively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Body alignment | - |
| Gaze direction | - |
| Face emotion | Happy, Surprise |
| Speech Emotion | Amusement, Desire, Joy, Love, Relief, Surprise |
| Pitch | Excited |
| Voice Pace | - |

* 1. What negatively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Body alignment | - |
| Gaze direction | Away |
| Face emotion | Anger, Disgust, Fear, Sad |
| Speech Emotion | Anger, Annoyance, Disgust, Embarrassment, Grief, Nervousness,  Sadness |
| Pitch | Distress |
| Voice Pace | - |

1. Value Internalization
   1. Why is it important?

Higher levels indicate that the user can understand the topic in depth.

* 1. What positively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Body alignment | - |
| Gaze direction | - |
| Face emotion | - |
| Speech Emotion | Admiration, Approval, Caring, Gratitude, Optimism, Pride, Realization, Remorse |
| Pitch | - |
| Voice Pace | - |

* 1. What negatively affects it?

|  |  |
| --- | --- |
| Class | Output |
| Body alignment | - |
| Gaze direction | - |
| Face emotion | Anger, Disgust |
| Speech Emotion | Anger, Annoyance, Confusion, Disappointment, Disapproval, Embarrassment |
| Pitch | - |
| Voice Pace | - |

1. Cognitive Resonance

Throughout a fixed time, one minute for example, we should verify the output of body alignment, gaze direction, face emotion, speech emotion, pitch, and voice pace several times. For example, if within this minute the client shows the following data point conditions:

* 2 times Confusion – negatively affects Value Internalization
* 1 time Happy – positively affects Mood Induction and Attention Economics
* 1 time Surprise – positively affects Mood Induction and Attention Economics
* 1 time Approval - positively affects Value Internalization

Here we have 2 negative events, 5 positive events. Therefore, we can compute:

1. Feedbacks

A few events should trigger prompts to the end user indicating positive or negative behaviors.

|  |  |  |  |
| --- | --- | --- | --- |
| User | Data Point Condition | Meaning | Prompt |
| Sales Person | Pitch Excited | Positive | Your client is excited about this! |
| Sales Person | Pitch Bored | Negative | Let's lift the spirits up! |
| Sales Person | Gaze Away | Negative | Keep your attention on the call |
| Sales Person | Body misalignment | Negative | Keep your attention on the call |
| Sales Person | Pitch Distress | Negative | Balance your tone. |
| Sales Person | Voice Pace Fast | Negative | Going too fast! Slow your pace. |
| Sales Person | Voice Pace Slow | Negative | Going too slow! Pick up the pace. |
| Sales Person | Voice Pace Normal | Positive | Going great! Keep up the pace. |
| Client | Body alignment | Positive | Nice! Your client agrees with you |
| Client | Body misalignment | Negative | Try a more engaging topic! |
| Client | Pitch Neutral | Positive | Your client is calm |
| Client | Face Expression Happy | Positive | Nice connection! Keep it up |

1. Future Work

Some aspects of left out from this analysis.

* 1. Pitch

The scientific literature defines it as the perceived "highness" or "lowness" of a voice. On the model described previously, the pitch is instead directly linked with the impression it causes on the listener. It is important to not that because a behavioral scientist will describe pitch in frequency terms, but on this paper, I am referring to the emotion that causes the pitch to move from its baseline frequency. Therefore, a better term might be more appropriate here.

* 1. Path to Cognitive Resonance

Ideally, Cognitive Resonance should be an optimal behavioral state, which requires previous steps also to achieve an optimal state. This path acts like an electrical circuit, if any prior component fails, the remaining also fails. In other words, if we do not have attention for example, we would not have either mood induction, value internalization and consequently cognitive resonance.

***Attention Economics → Mood Induction → Value Internalization → Cognitive Resonance***

This reasoning is not currently.

* 1. Additional Data Points

In addition to Body Alignment, Eyes Direction, Face Emotion, Speech Emotion, Pitch, and Voice Pace, other aspects were left out from this initial analysis.

* Related to the face: blinking.
* Related to speech: base and overtone frequencies and other pitch interpretations.
  1. Data Driven Approach

The model currently does not leverage in-house labeled datasets. Instead, it uses industry models that provide outputs that can be used as building blocks to characterize the user's behavior in terms of attention economics, mood induction, value internalization, and consequently, cognitive resonance. The problem with those models is that the training data used to optimize the models have different characteristics from the company's use case, which occur exclusively in business interactions. Under business interactions, people are less likely to have a strong facial and voice expressions.

Ideally, once more data is available, the behavioral team should define a set of relevant events that could be labeled by themselves, by crowd-sourcing services, or even by the user. A precise and clear description of the relevant events would guide labeling and, with labeled datasets, the opportunity to build supervised machine learning models optimized for the company's use case.