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Emotional Face Perception is Altered Depending on the Presence of Absence of Context

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ABSTRACT

People engage in countless social interactions throughout the day in which perceiving emotion is critical. So what are the sources of information that individuals rely on to perceive emotion? Prior studies have typically emphasized how emotion perception is driven by expressions on the face. Yet a small and growing literature is beginning to take into account other sources of information, such as bodily posture. In the present experiment, we examine how knowledge of the situation can serve as a critical source of information. 52 participants were asked what emotion they saw in emotional expressions portrayed by acclaimed character actors, elicited in response to rich vignette prompts. On one block, participants viewed the face alone. On another block, perceivers were able to form an expectation based on the vignette used to elicit the expression. Block order was counterbalanced. Our prediction was that dynamics of emotion perception based on face exposure only were different from when face exposure is preceded by a contextual situation. Both gaze to and judgments about the faces varied depending on whether an expectation was already in place prior to viewing it (i.e., block condition). These findings indicate that face perception is an "event" driven process rather than a stimulus driven process. People base social and emotion perception on "models" to process and predict the information around them. These findings could have multiple implications in domains as diverse as health (e.g., social processing deficits in autism spectrum) and **marketing (e.g., utility of automated face detection without context).**

Background

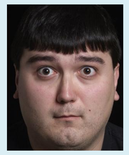
- Perceiving emotions is an important process in our daily life. When we engage in social interactions we infer what others are feeling and this guides how to respond and react appropriately to others.
- Much psychological research has emphasized the face as a primary driver of social perception. Yet a parallel literature suggests that other forms of context, such as bodily posture and action, vocalizations, situational knowledge, and culture, all impact social perception from the face [1].
- However, the role of context may have been underestimated in this prior work, due to the widespread use of caricatured facial actions that do not reflect the range and complexity of real-world emotion expressivity [2]. We are thus interested in looking into the impact of context in emotion perception from stimuli that have more naturalistic qualities- poses by high quality actors.
- We were also inspired by an event perception view [3], which indicates that expectations from the context should also impact how we perceptually sample information from the environment. As a result, we employed eye-tracking in this research (Study 2).

Stimuli

Caricatured

"Pose Fear."

" Widen your eyes, furrow and raise your eyebrows."



Professional

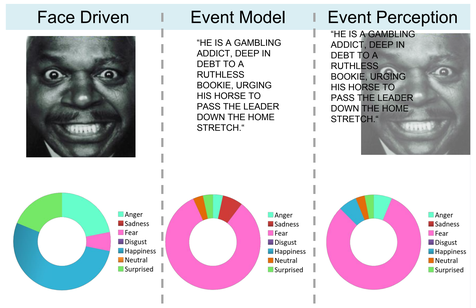
"You are a central post office superintendent who just heard gunshots being fired from down the hall."

- Unlike other studies that use caricatured portrayals of emotions that occur infrequently in everyday life [2], we used expressions generated by professional actors.
- High quality acted portrayals of emotion have more realism due to their nuanced, un-stereotyped form [4].
- The stimuli were taken from *In Character: Actors Acting*, a collection of context-driven facial portraits by photographer Howard Schatz.
- The actors were provided with specific scenarios to immerse in and emoted for the camera.
- This departs from the typical portrayal paradigm where posers are provided with an emotion word or directions for the pose.
- The actors' professional judgment of each scenario's emotional tone helped to preserve authenticity.

Method & Results: Study 1

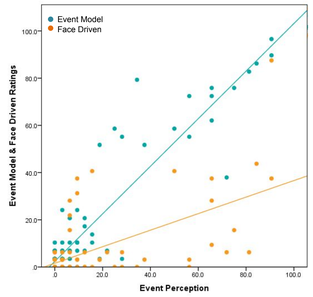
- **Study 1** data was collected online (via Amazon's Mechanical Turk) in a between subjects design.
- Participants either rated 1) faces alone, 2) a situation description or 3) faces plus a situation description. N=40 in each condition.
- Participants selected from a list of 7 emotion words (anger, fear, sadness, disgust, neutral, surprise and happiness) the most applicable.

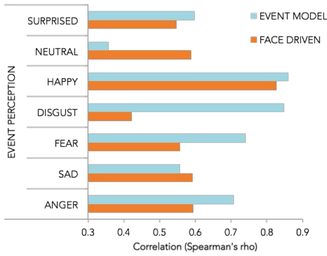
Example Categorical Shift



- Ratings of faces and situations together were more similar (i.e., more correlated) to ratings of contexts alone than faces alone.
- Contexts were a stronger determinant of emotion perception than facial expression.
- Nearly 50% of faces showed a "categorical" shift after being paired with a context

Rating Correlations

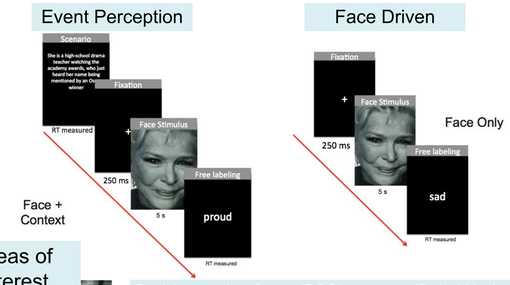




Method: Study 2

- **Study 2** data was collected in the lab using a computer based eye-tracking system (Applied Science Laboratory's Eye-Trac 6) in a within subjects design.
- Northeastern Undergraduate Participants were shown a) 32 faces + situations and b) the same 32 faces alone (block order counterbalanced).
- Participants freely labeled the emotion perceived in the target.

Study 2 Trial Structure



Calculated POG

Areas of Interest

Participant point of gaze (POG) was quantified within Areas of Interest (AOIs) on the face: eyes, nose, and mouth.
# of fixations (as a percent of total fixations) and average duration of fixations were calculated for each Area of Interest (AOI) and submitted to analysis.

Results: Study 2

- Data were analyzed using Analysis of Variance (ANOVA). We examined the impact of Block Type (whether or not an experimental block contained only photos of the actors --**Face** Condition, or if it contained both a photo and a contextual situation--**Situated Face** Condition), Block order (which block the participant did first), and the Area of Interest (**Nose, Eyes, Mouth**).

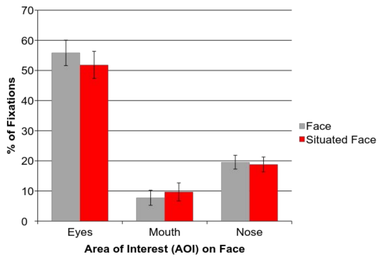


Fig 1. Block x AOI interaction: $F(2, 54)= 5.572$, $p=.006$, $\eta p2 = .171$. Follow up t-tests revealed significant differences between face and situated face blocks for eyes and mouth ($p<.05$), but not nose ($p>.05$) AOIs.

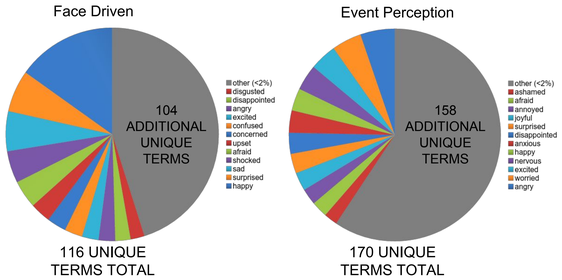


Fig 2. Freely produced labels in the event perception block are more diverse than in the face-driven block. These findings suggest that event perception leads to more differentiated predictions.

Discussion

- We observed that patterns of fixation were different for the two blocks, with an increased fixation on the mouth region for the event perception block. This result indicates that face perception is an event driven process and not just driven by the facial stimulus alone.
- We can also conclude that people base social and emotion perception on models that guide how to process and predict information, consistent with an event perception framework.
- These models have the surprising impact of broadening out the types of social predictions made, potentially leading to more nuanced instances of social perception.
- Further research is needed to investigate the patterns of fixation in this paradigm, including whether more specific patterns are guided by the type of event model that a perceiver brings online from the context.

References

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