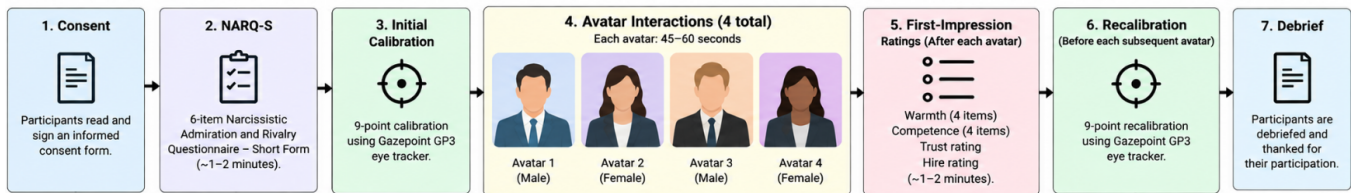


Gaze, Gender, and Grandiosity: An Eye-Tracking Study of Responses to Narcissistic Traits [Proposal]

Faith McKinney
School of Computing
Clemson University
Clemson, SC, USA
fmckinn@clemson.edu

Andrew Duchowski
School of Computing
Clemson University
Clemson, SC, USA
duchowski@gmail.com



Abstract

First impressions can form quickly from short social interactions and can influence how a person is perceived even with limited information. Grandiose narcissistic traits, such as superiority, entitlement, self-promotion, and dominance, may be especially noticeable during an initial encounter. However, less is known about how observers visually respond to these behaviors while forming their impressions. This study will use eye tracking to examine visual attention to the eye region while participants watch short job-interview-style videos in which realistic AI avatars display either grandiose narcissistic or neutral traits. Participants will view four avatars, two male and two female, while their gaze is recorded using a Gazepoint GP3 60 Hz eye tracker. A single area of interest (AOI) encompassing both eyes and the surrounding eye region will be used to measure visual attention. After each video, participants will rate the avatar on warmth, competence, trust, and willingness to hire. Participants will also complete the six-item Narcissistic Admiration and Rivalry Questionnaire Short Scale (NARQ-S) before the experiment to measure their own levels of grandiose narcissistic traits. The study will investigate whether the expression of grandiose narcissistic traits changes visual attention to the eyes and whether differences in gaze are associated with immediate social judgments. Avatar gender will also be considered as a possible factor in these responses.

Keywords

eye tracking, grandiose narcissism, first impressions, visual attention, social perception, human-computer interaction

ACM Reference Format:

Faith McKinney and Andrew Duchowski. 2026. Gaze, Gender, and Grandiosity: An Eye-Tracking Study of Responses to Narcissistic Traits [Proposal]. In . ACM, New York, NY, USA, 5 pages. <https://doi.org/10.1145/nnnnnnn.nnnnnnn>

1 Introduction

People regularly form impressions of others after only brief interactions. A short conversation can influence whether someone appears trustworthy, competent, friendly, or like someone a person would want to interact with again. These impressions can be especially important in settings such as job interviews, where individuals have a limited amount of time to communicate both their qualifications and their personality.

Grandiose narcissism provides an interesting context for studying these first impressions because many of its characteristics are expressed socially. Traits such as superiority, entitlement, self-promotion, and dominance may become noticeable during even a short interaction. Previous research has examined how narcissistic traits relate to attention and social behavior, but less is known about the visual response of the person observing someone who displays these traits. Examining the observer's gaze may provide information about the interaction that is not fully captured through self-reported impressions alone.

The goal of the proposed study is therefore to examine how observers visually and socially respond to grandiose narcissistic behavior during a brief conversational encounter. Eye tracking will be combined with immediate first-impression ratings to examine both where participants direct their attention and how they evaluate the person they are viewing.

The proposed study will examine gaze behavior while participants watch brief job-interview-style videos of AI-generated avatars. The videos will present either grandiose narcissistic or neutral behavior while controlling the general setting and structure of the interaction. Based on previous research on narcissism, visual attention, and first impressions, the following hypotheses are proposed:

- H1.** Participants will demonstrate significantly different patterns of visual attention to the eye region when viewing avatars displaying grandiose narcissistic traits compared with avatars displaying neutral traits. Differences will be examined through eye-region dwell time, proportion of viewing time, fixation count, and time to first fixation.

- H2.** Avatars displaying grandiose narcissistic traits will receive significantly different first-impression ratings of warmth, competence, trust, and willingness to hire compared with neutral avatars.
- H3.** Participants' attention to the eye region will be significantly associated with their first-impression ratings of the avatars.
- H4.** The effect of grandiose narcissistic traits on participants' visual attention and first-impression ratings will differ depending on the gender of the avatar.

The hypotheses are intentionally nondirectional because previous research suggests that narcissistic behaviors can produce complex responses during initial encounters. Behaviors associated with grandiose narcissism may sometimes be interpreted as confidence or social presence rather than immediately producing a negative impression. Avatar gender is included as an additional factor to examine whether responses to comparable grandiose behaviors differ depending on the gender of the person displaying them.

2 Background

2.1 Grandiose Narcissism

Narcissism is commonly discussed as a multidimensional personality trait rather than a single behavior. Grandiose narcissism is associated with characteristics such as an elevated sense of self, superiority, dominance, entitlement, and a desire for recognition. Back et al. proposed the Narcissistic Admiration and Rivalry Concept, which separates grandiose narcissism into two related pathways. Narcissistic admiration involves assertive self-enhancement and self-promotion, while narcissistic rivalry involves antagonistic self-protection and the devaluation of others [Back et al. 2013]. This distinction is particularly useful for the present study because both self-promotional and antagonistic behaviors can become visible during social interactions.

Research also suggests that grandiose narcissism cannot be understood only in terms of negative outcomes. Stefanova et al. examined grandiose narcissism using eye tracking and found relationships between grandiose narcissism, cognitive performance under stress, and patterns of attention distribution [Stefanova et al. 2024]. Their findings demonstrate that narcissism can be associated with measurable differences in attention and reinforce the usefulness of eye tracking when studying narcissistic traits.

Other eye-tracking research has connected narcissism with selective visual attention. Grapsas et al. examined visual attention toward status- and affiliation-related information and found that agentic narcissism was associated with increased attention toward status-related stimuli [Grapsas et al. 2024]. This supports the broader idea that narcissistic traits can be reflected in patterns of visual attention. However, both of these studies primarily concern the attention of the individual who possesses narcissistic traits. The current study instead focuses on the observer's attention when another person displays those traits.

The social effects of narcissism during first encounters are also more complicated than simply producing dislike. Back et al. found

that narcissism was associated with greater popularity at zero acquaintance after brief self-introductions [Back et al. 2010]. Observable verbal and nonverbal behaviors contributed to these impressions. This suggests that behaviors associated with narcissism may initially be interpreted as confidence, charm, or social presence rather than immediately producing rejection. Because of this, the current study will not assume that grandiose behavior will automatically cause participants to look away from the speaker's eyes or evaluate the speaker negatively.

Gender may also be relevant when examining responses to narcissistic behavior. A meta-analysis by Grijalva et al. found gender differences in narcissism, particularly for some components of narcissistic expression [Grijalva et al. 2015]. Although the present study does not assume that male and female avatars should display different levels of grandiosity, this literature provides additional motivation for examining whether comparable grandiose behaviors are perceived differently depending on the gender of the person displaying them.

2.2 First Impressions From Brief Interactions

People can form impressions from surprisingly short samples of another person's behavior. Carney, Colvin, and Hall examined first impressions using behavioral segments ranging from 5 to 300 seconds [Carney et al. 2007]. Although accuracy depended on the characteristic being judged and generally increased with additional exposure, the researchers found that 60 seconds provided a useful balance between judgment accuracy and exposure length. This supports the use of approximately 45- to 60-second encounters in the proposed study. The videos provide enough time for participants to observe meaningful verbal and behavioral information without turning the experiment into an extended social interaction.

First impressions can also develop from conversational information rather than physical appearance alone. Holleran, Mehl, and Levitt investigated stranger judgments based on brief samples of natural conversations [Holleran et al. 2009]. After listening to several short conversational segments, strangers were able to make behavioral judgments that showed meaningful levels of accuracy. Their findings demonstrate that the content and behavior present in conversation provide information that observers can use when forming impressions of unfamiliar people.

Research using interview-style speech is especially relevant to the current experiment. Ambady, Krabbenhoft, and Hogan examined thin-slice judgments using brief audio clips taken from interviews with sales managers [Ambady et al. 2006]. Participants were able to form judgments about characteristics related to interpersonal skill, task-related skill, anxiety, personality, motivation, and trustworthiness from limited information. This work is closely related to the proposed job-interview setting because it demonstrates that even short samples of interview behavior can provide enough information for observers to develop socially relevant impressions.

Together, this research supports the use of short interview-style avatar encounters as a method of studying first impressions. Rather than asking participants to judge a static face, the proposed experiment gives participants verbal and behavioral information that more closely resembles how impressions form during real social interactions.

2.3 Eye Tracking and Social Attention

Eye tracking provides an objective method for examining which parts of a visual stimulus receive attention and for how long. Romaniuk, Mühlhans, and Ansoorge used eye-tracking measures alongside self-reports to study visual attention during social encounters [Romaniuk et al. 2026]. Their results showed that measured gaze and participants' reports of what captured their attention only partially overlapped. This distinction is important for the proposed study because participants may report a particular impression of an avatar while their gaze behavior provides additional information about how they responded during the interaction.

The present study will therefore focus on a single AOI encompassing both eyes and the immediately surrounding eye region. Measures including total dwell time, proportion of viewing time within the AOI, fixation count, and time to first fixation will provide different perspectives on participants' attention to this socially important region.

2.4 Measuring Participant Narcissism and First Impressions

Participants' own narcissistic traits may influence how they respond to someone displaying similar characteristics. To account for this possibility, the proposed study will use the Narcissistic Admiration and Rivalry Questionnaire Short Scale (NARQ-S). Leckelt et al. developed and validated the six-item NARQ-S as a brief measure of narcissistic admiration and narcissistic rivalry [Leckelt et al. 2018]. The short length makes it appropriate for use before an eye-tracking experiment because it can be completed quickly without adding a lengthy personality assessment to the session.

The NARQ-S will be used to measure participants' own levels of grandiose narcissistic traits rather than to diagnose Narcissistic Personality Disorder. Leckelt et al. reported representative means of 2.03 for narcissistic admiration and 1.77 for narcissistic rivalry, with standard deviations of 1.09 and 0.88, respectively [Leckelt et al. 2018]. For the present study, unusually elevated scores will be defined as more than two standard deviations above these representative means, corresponding to average scores above 4.21 for admiration or 3.53 for rivalry. This screening criterion is intended to reduce the possibility that unusually elevated narcissistic traits in the observer influence responses to the experimental stimuli.

First impressions following each avatar will be measured using warmth and competence ratings. Aragonés et al. developed reliable warmth and competence scales that can be used to evaluate individual people [Aragonés et al. 2015]. Their warmth scale includes the traits kind, pleasant, friendly, and warm, while their competence scale includes competent, effective, skilled, and intelligent. These dimensions provide a structured way to capture participants' immediate interpersonal impressions.

Two additional study-specific ratings will ask participants how willing they would be to trust and hire the person. These questions are particularly relevant to the job-interview context and will be presented using Likert-type response scales rather than simple yes-or-no choices. Together, the eye-tracking and survey measures will allow the study to compare what participants visually attend to with how they consciously evaluate each avatar.

3 Methodology

3.1 Apparatus

Eye movements will be recorded using a Gazepoint GP3 eye tracker operating at 60 Hz, with a manufacturer-reported gaze accuracy of approximately 0.5–1 degree of visual angle under ideal conditions. Gazepoint Control will be used for eye-tracker setup and calibration. A nine-point calibration will be completed before the first avatar and repeated before every subsequent avatar interaction. Recalibrating before each video is intended to reduce measurement error caused by calibration drift and maintain consistent gaze accuracy throughout the experiment.

PsychoPy will be used to conduct the experiment and present the video stimuli. It will control stimulus presentation and the sequence of the experimental trials. Participants will view the stimuli on the same laboratory display under consistent viewing conditions.

A single static AOI will be defined around the eye region of each avatar. The AOI will include both eyes and the immediately surrounding region, including the eyebrows, as one combined area rather than treating the left and right eyes separately. Because the avatars will remain largely stationary during each video, the eye region will be kept in a consistent position to support the use of a static AOI.

The primary gaze measures will include total dwell time within the eye AOI, proportion of total viewing time directed toward the eye AOI, fixation count within the AOI, and time to first fixation on the AOI. Figure 1 provides an example of the planned eye-region AOI.

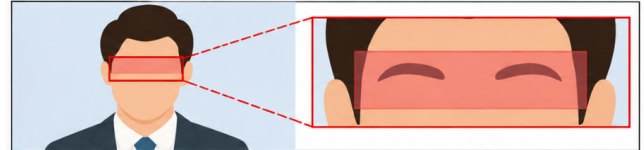


Figure 1: Example of the eye-region area of interest (AOI). Both eyes and the surrounding eye region are treated as a single AOI for calculating eye-tracking measures including dwell time, proportion of viewing time, fixation count, and time to first fixation.

3.2 Stimulus

Four 45- to 60-second interview-style videos will serve as the primary experimental stimuli. The videos will be created using avatars provided through HeyGen. Two avatars will be male and two will be female. Figure 2 shows an example of one of the female avatars that will be used in the experiment. The avatars will be presented in a consistent interview-style setting with limited head and body movement so that facial positioning remains as stable as possible for eye tracking.

Scripts will be developed in matched grandiose and neutral versions. The construction of the grandiose scripts will be grounded in previous literature describing the behavioral and interpersonal expression of grandiose narcissism. The scripts will incorporate characteristics such as superiority, entitlement, self-promotion, dominance, status-seeking, and dismissiveness toward others [Back et al.



Figure 2: Example of a female avatar that will be used to create the interview-style video stimuli in HeyGen.

2013; Grapsas et al. 2020; Miller et al. 2017]. Research examining how narcissistic individuals perceive themselves and their reputations will also inform how self-enhancing statements are expressed within the scripts [Carlson et al. 2011].

The scripts will also draw from research examining how narcissistic traits become observable during interpersonal encounters. Previous work has demonstrated that narcissism can initially contribute to positive social impressions, while the interpersonal consequences of narcissistic behavior may become more negative over time [Back et al. 2010; Leckelt et al. 2015]. These findings will help guide the balance between self-confidence, self-promotion, superiority, and antagonistic behaviors in the grandiose condition rather than constructing the avatars as uniformly negative.

Because avatar gender is included as an experimental factor, the scripts will remain behaviorally equivalent across male and female avatars. Previous meta-analytic research has identified gender differences in narcissism [Grijalva et al. 2015]; however, the present experiment is designed to examine whether observers respond differently when comparable grandiose behaviors are displayed by male and female avatars rather than intentionally making the behaviors themselves different by gender.

Grandiose behaviors will be introduced early enough in each video to provide sufficient time for participants' visual responses to be recorded after the traits become apparent. Neutral scripts will communicate comparable job-interview information without the grandiose language or behaviors. Scripts will be matched as closely as possible in approximate length, topic, speaking pace, and amount of information so that the primary intended difference is the presence or absence of grandiose narcissistic behavior.

Each avatar will have both a grandiose and neutral script available during stimulus development. However, an individual participant will see each avatar only once. Across participants, condition assignment will be counterbalanced so that an avatar is not permanently associated with either the grandiose or neutral condition. This design helps separate the effect of the behavioral condition from characteristics of an individual avatar.

3.3 Subjects

The study is expected to recruit approximately 20–30 participants from the university population, although the final sample size will

depend on recruitment availability during the data-collection period. Participants must be at least 18 years old and have normal or corrected-to-normal vision sufficient for reliable eye tracking. Participants of any gender will be eligible to participate. Individuals whose gaze cannot be calibrated reliably will not continue with the eye-tracking portion of the study.

Before beginning the eye-tracking trials, participants will complete the six-item NARQ-S [Leckelt et al. 2018]. The questionnaire measures narcissistic admiration and narcissistic rivalry and should require approximately one to two minutes to complete. It will be used as a brief screening measure of participants' own grandiose narcissistic traits rather than as a diagnostic measure of Narcissistic Personality Disorder. Based on the representative sample reported by Leckelt et al., unusually elevated scores will be defined as more than two standard deviations above the reported mean. This corresponds to an average score above 4.21 for narcissistic admiration or above 3.53 for narcissistic rivalry. Participants exceeding either threshold will be excluded from the eye-tracking experiment.

3.4 Experimental Design

The experiment will use a repeated-measures, within-subjects design in which each participant views four avatars. The stimulus set will always contain two male and two female avatars. Across the four encounters, participants will view both grandiose and neutral presentations. There is no primary between-subjects experimental condition.

Condition assignment will be counterbalanced across participants so that the same avatar can appear in the grandiose condition for some participants and the neutral condition for others. Each participant will see an individual avatar only once. Presentation order will also be randomized or counterbalanced to reduce order effects.

The primary independent variable will be behavioral condition, with two levels: grandiose narcissistic and neutral. Avatar gender will be included as an additional factor to examine whether visual attention or first impressions differ when the same general behaviors are displayed by male versus female avatars.

The primary objective dependent variables will be gaze measures within the eye-region AOI, including dwell time, proportion of viewing time, fixation count, and time to first fixation. Subjective dependent variables will include warmth and competence scores as well as trust and hire ratings.

After each avatar, participants will complete eight validated warmth and competence items based on Aragonés et al. [Aragonés et al. 2015]. Four items will measure warmth and four will measure competence. Participants will also answer one trust question and one hire question using Likert-type scales. These ratings will be collected immediately after each interaction so that they represent the participant's impression of that specific avatar rather than a comparison made after seeing all four.

The study will examine whether gaze behavior differs between grandiose and neutral conditions and whether gaze measures are associated with the participant's first-impression ratings. Avatar gender will additionally be examined as a factor that may contribute to these responses.

3.5 Procedures

After arriving at the laboratory, participants will receive information about the study and complete informed consent. Participants will then complete the six-item NARQ-S before beginning the eye-tracking portion of the experiment.

The participant will be seated in front of the experimental display and Gazepoint GP3. The researcher will position the participant appropriately for eye tracking and complete an initial nine-point calibration using Gazepoint Control. Calibration quality will be checked before continuing.

Before the first video, participants will be instructed to watch each avatar naturally as if they were observing a candidate responding during a job interview. They will not be instructed to focus on any particular part of the avatar's face so that attention to the eye region is not intentionally encouraged. Participants will also be informed that they will answer a short set of questions about their impression of the person immediately after each video.

The participant will then view the first 45- to 60-second avatar video through PsychoPy while gaze data are recorded. Immediately after the video, the participant will complete the warmth, competence, trust, and hire ratings for that avatar.

Before the second avatar appears, the GP3 will be recalibrated using the same nine-point procedure. This process will be repeated before the third and fourth avatar interactions as well. Therefore, every avatar will be preceded by a fresh calibration rather than relying on a single calibration performed at the beginning of the session.

Each participant will complete the following general sequence: informed consent, the six-item NARQ-S, initial eye-tracker calibration, an avatar interaction, first-impression ratings, and recalibration before the next avatar. The interaction, rating, and recalibration process will continue until all four avatars have been viewed. The four-avatar sequence will always contain two male and two female avatars, while behavioral condition and presentation order will be counterbalanced.

Following the fourth set of ratings, participants will be debriefed and thanked for their participation.

4 Results

Results will be added following data collection and analysis. Planned analyses will compare eye-region gaze measures between grandiose and neutral conditions and examine relationships between gaze behavior and warmth, competence, trust, and hire ratings. Avatar gender will also be considered in the analysis.

5 Discussion

This section will interpret the results in relation to previous research on grandiose narcissism, visual attention, and first-impression formation. Particular attention will be given to whether changes in attention to the eye region correspond with changes in participants' reported social judgments and whether these patterns differ by avatar gender.

6 Conclusion

The conclusion will summarize the primary findings and their implications for understanding how people visually and socially respond to grandiose narcissistic traits during brief interpersonal encounters.

References

- Nalini Ambady, Mary Anne Krabbenhoft, and Daniel Hogan. 2006. The 30-Sec Sale: Using Thin-Slice Judgments to Evaluate Sales Effectiveness. *Journal of Consumer Psychology* 16, 1 (2006), 4–13. doi:10.1207/s15327663jcp1601_2
- Juan I. Aragonés, Lucía Poggio, Verónica Sevillano, Raquel Pérez-López, and María-Luisa Sánchez-Bernardos. 2015. Measuring Warmth and Competence at Inter-Group, Interpersonal and Individual Levels. *International Journal of Social Psychology* 30, 3 (2015), 407–438. doi:10.1080/02134748.2015.1065084
- Mitja D. Back, Albrecht C. P. Küfner, Michael Dufner, Tanja M. Gerlach, John F. Rauthmann, and Jaap J. A. Denissen. 2013. Narcissistic Admiration and Rivalry: Disentangling the Bright and Dark Sides of Narcissism. *Journal of Personality and Social Psychology* 105, 6 (2013), 1013–1037. doi:10.1037/a0034431
- Mitja D. Back, Stefan C. Schmukle, and Boris Egloff. 2010. Why Are Narcissists So Charming at First Sight? Decoding the Narcissism-Popularity Link at Zero Acquaintance. *Journal of Personality and Social Psychology* 98, 1 (2010), 132–145. doi:10.1037/a0016338
- Erika N. Carlson, Simine Vazire, and Thomas F. Oltmanns. 2011. You Probably Think This Paper's About You: Narcissists' Perceptions of Their Personality and Reputation. *Journal of Personality and Social Psychology* 101, 1 (2011), 185–201. doi:10.1037/a0023781
- Dana R. Carney, C. Randall Colvin, and Judith A. Hall. 2007. A Thin Slice Perspective on the Accuracy of First Impressions. *Journal of Research in Personality* 41, 5 (2007), 1054–1072. doi:10.1016/j.jrp.2007.01.004
- Stathis Grapsas, Eddie Brummelman, Mitja D. Back, and Jaap J. A. Denissen. 2020. The "Why" and "How" of Narcissism: A Process Model of Narcissistic Status Pursuit. *Perspectives on Psychological Science* 15, 1 (2020), 150–172. doi:10.1177/1745691619873350
- Stathis Grapsas, Foteini Spantidaki Kyriazi, and Michael Dufner. 2024. Eyes on the Prize: Narcissism and Visual Attention to Status and Affiliation. *Personality Science* (2024). doi:10.1177/27000710241257758
- Emily Grijalva, Daniel A. Newman, Louis Tay, M. Brent Donnellan, P. D. Harms, Richard W. Robins, and Taiyi Yan. 2015. Gender Differences in Narcissism: A Meta-Analytic Review. *Psychological Bulletin* 141, 2 (2015), 261–310. doi:10.1037/a0038231
- Shannon E. Holleran, Matthias R. Mehl, and Stephanie Levitt. 2009. Eavesdropping on Social Life: The Accuracy of Stranger Ratings of Daily Behavior from Thin Slices of Natural Conversations. *Journal of Research in Personality* 43, 4 (2009), 660–672. doi:10.1016/j.jrp.2009.03.017
- Marius Leckelt, Albrecht C. P. Küfner, Steffen Nestler, and Mitja D. Back. 2015. Behavioral Processes Underlying the Decline of Narcissists' Popularity Over Time. *Journal of Personality and Social Psychology* 109, 5 (2015), 856–871. doi:10.1037/pspp0000057
- Marius Leckelt, Eunike Wetzel, Tanja M. Gerlach, Robert A. Ackerman, Joshua D. Miller, William J. Chopik, Lars Penke, Katharina Geukes, Albrecht C. P. Küfner, Roos Hutteman, David Richter, Karl-Heinz Renner, Marc Allroggen, Courtney Brecheen, W. Keith Campbell, Igor Grossmann, and Mitja D. Back. 2018. Validation of the Narcissistic Admiration and Rivalry Questionnaire Short Scale (NARQ-S) in Convenience and Representative Samples. *Psychological Assessment* 30, 1 (2018), 86–96. doi:10.1037/pas0000433
- Joshua D. Miller, Donald R. Lynam, Courtland S. Hyatt, and W. Keith Campbell. 2017. Controversies in Narcissism. *Annual Review of Clinical Psychology* 13 (2017), 291–315. doi:10.1146/annurev-clinpsy-032816-045244
- Oleksandra Romaniuk, Jörg Mühlhans, and Ulrich Ansorge. 2026. What Captures Women's Visual Attention and What They Remember in Romantic Encounters: Eye-Tracking Metrics and Self-Reports. *Frontiers in Psychology* 17 (2026). doi:10.3389/fpsyg.2026.1773619
- Vasilena Stefanova, Christoph Scheepers, Paul Wilson, and Kostas A. Papageorgiou. 2024. Grandiose Narcissism Associates with Higher Cognitive Performance Under Stress Through More Efficient Attention Distribution: An Eye-Tracking Study. *PLOS ONE* (2024). doi:10.1371/journal.pone.0302644