GAZING INTO LANGUAGE

UNVEILING COGNITIVE PROCESSES WITH EYE-TRACKING

Eye-tracking serves as a powerful tool to uncover the intricate interplay between language and cognition (Yarbus, 1967; Henderson et al., 2007; Huettig et al., 2011; Conklin & Pellicer-Sánchez, 2022), providing a window onto the cognitive processes involved in understanding and producing language, both at the level of a given speech community or at the individual level (e.g. when addressing cognitive (dis)abilities, or linguistic proficiency). By monitoring eye movements, researchers can examine, in real-time, how attention is allocated during linguistic tasks, shedding light, for instance, on:

1. Language processing dynamics for people with language disorder: Eye-tracking helps identify patterns in gaze behaviour that correspond to different stages of cognitive processing, including for populations with language disorders such as aphasia (Dickey, 2007; Yee et al., 2008) or dyslexia (Desroches et al., 2006; Huettig & Brouwer, 2015).

2. Lexical and Semantic Access: Studying eye movements reveals the time course of accessing lexical and semantic information (Sedivy et al., 1999; De Groot et al., 2016)

3. Syntactic Processing: Eye-tracking research uncovers the intricacies of syntactic processing, including how (complex) sentence structures influence parsing and comprehension (Tanenhaus et al., 1995; Clifton & Staub, 2011). This also applies to second language acquisition (e.g., Frenck-Mestre, 2005).

4. Pragmatic Inferences: Eye-tracking is particularly relevant to study how context and background knowledge influence language understanding (Ryskin et al., 2019; Sun & Breheny, 2020)

5. Discourse Processing: Eye-tracking is used to investigate how readers or listeners maintain discourse coherence and track referential expressions (see Altamimi & Conklin (2024) or Robert & Siyanova (2013) on L2 speakers).

6. Language Acquisition: Eye-tracking allows researchers to observe how children and adults process language input differently and how this develops with language experience (e.g., Ambridge & Rowland, 2013; Joseph et al., 2013; Mani & Huettig, 2014; Tribushinina & Mak, 2016)

7. Linguistic relativity: Researchers rely on eye-tracking to measure the cognitive impact of linguistic differences on how the speakers allocate their visual attention in both verbal and non-verbal contexts (e.g., as for Motion events, see Hohenstein, 2005; Papafragou *et al.,* 2008; Soroli & Hickmann, 2010; Soroli et al., 2019; Lesuisse, 2022; Lesuisse & Lemmens, 2023).

Call for Papers:

We invite submissions for the upcoming conference entitled "Gazing into Language: Unveiling Cognitive Processes with Eye-Tracking". This interdisciplinary event aims to explore the diverse applications of eye-tracking methodologies in linguistics research. Researchers are encouraged to submit contributions addressing, but not limited to, the following topics:

- Eye-tracking studies on language comprehension and production
- Eye-tracking in discourse analysis and pragmatics
- Eye movements in bilingualism and language acquisition
- Cross-linguistic differences in eye gazing patterns
- Eye-tracking applications in psycholinguistics and neurolinguistics
- Technology and methodological advancements in eye-tracking research
- Cognitive and computational models using eye-tracking data

Invited keynote: Prof. Kathy Conklin, University of Nottingham.

Submission Guidelines:

Abstracts should be no more than 400 words.
Abstracts should include 3-5 keywords.
Presentations (20min) can be in English or in French.

Important Dates:

Abstract Submission Deadline: May, 17th 2024
Notification of Acceptance: June, 14th 2024
Conference Date: September, 20th 2024

Conference Location: Campus Condorcet, Aubervilliers, France.

Conference Website: https://gazing-into-language.sciencesconf.org

We look forward to a stimulating exchange of ideas and insights at the intersection of eye-tracking and linguistics.

GAZING INTO LANGUAGE

ORGANISER

Mégane Lesuisse (Université Paris 8, UR TransCrit)

SCIENTIFIC COMMITTEE

(to be confirmed)

References

Altamimi, A. & K. Conklin. (2024) The Effect of Congruency and Frequency of Exposures on the Learning of L2 Binomials. *Languages.* 9(1):9.

Ambridge, B. & C.F. Rowland. (2013). Experimental methods in studying child language acquisition. *WIREs Cogn. Sci.* 4, 149–168.

Sun C. & R. Breheny. (2020). Another look at the online processing of scalar inferences: an investigation of conflicting findings from visual-world eye-tracking studies. *Language, Cognition and Neuroscience*, 35:8, 949-979.

Clifton, C. & A. Staub. (2011). Syntactic influences on eye movements during reading. In S. Liversedge, I. Gilchrist, S. Everling (eds.) *Oxford Handbook on Eye Movements*. Oxford University Press.

Conklin, K. & A. Pellicer-Sánchez. (2022). Eye-tracking In : S. Li, P. Hiver & M. Papi (eds.) The Routledge Handbook of Second Language Acquisition and Individual Differences. N-Y : Routledge. 441-453.

De Groot, F., F. Huettig & C. Olivers. (2016). When meaning matters: The temporal dynamics of semantic influences on visual attention. *J. Exp. Psychol. Hum. Percept. Perform*. 42, 180–196.

Desroches, A.S., M.F. Joanisse & E.K. Robertson. (2006). Specific phonological impairments in dyslexia revealed by eyetracking. *Cognition.* 100, B32–B42.

Dickey, M., J. Choy, & C. Thompson. (2007). Real-time comprehension of wh- movement in aphasia: Evidence from eyetracking while listening. *Brain Lang.* 100, 1–22.

Frenck-Mestre, C. (2005). Eye-movement recording as a tool for studying syntactic processing in a second language: a review of methodologies and experimental findings. *Second Language Research.* 21(2), 175–198.

Henderson, J. M., J. R. Brockmole, M. S Catelhano & M. Mack. (2007). Visual saliency does not account for eye-movements during visual search in real-world scenes In R. P. G. Van Gompel, M. H. Fisher, W. S. Murray and R. L. Hill. (eds.) Eye-movements: a window on mind and brain. Amsterdam: Elsevier. 537-562.

Hohenstein, J. (2005). Language-related motion events similarities in English and Spanish- speaking children. *Journal of Cognition and Development* 6: 403-425.

Holmqvist, K., M. Nystrom, R. Andersson, R. Dewhurst, H. Jarodzka & J. Van de Weijer. (2015). *Eye-tracking: a comprehensive guide to methods and measures*. Oxford.

Huettig, F. & S. Brouwer. (2015). Delayed Anticipatory Spoken Language Processing in Adults with Dyslexia—Evidence from Eye-tracking. *Dyslexia* 21, 97–122.

Huettig, F., J. Rommers, & A. Meyer. (2011). Using the visual world paradigm to study language processing: A review and critical evaluation. *Acta Psychol.* 137, 151–171.

Joseph, S., K. Nation, & S. Liversedge. (2013). Using Eye Movements to Investigate Word Frequency Effects in Children's Sentence Reading. *Sch. Psychol. Rev.* 42, 207–222.

Lesuisse, M. (2022). Exploring the conceptualisation of locative events in French, English and Dutch: Insights from eye-tracking on two recognition tasks. Yearbook of the German Cognitive Linguistics Association/Jahrbuch der Deutschen Gesellschaft für Kognitive Linguistik, 10, 121–158.

Lesuisse M & M. Lemmens. (2023). Looking differently at locative events: the cognitive impact of linguistic preferences. *Language and Cognition*. Published online. 1-29.

Mani, N. & F. Huettig. (2014). Word reading skill predicts anticipation of upcoming spoken language input: A study of children developing proficiency in reading. *J. Exp. Child Psychol. 1*26, 264–279.

Papafragou, A., J. Hulbert, & J. Trueswell. (2008). Does language guide event perception? Evidence from eye movements. *Cognition* 108: 155-184.

Rayner, K. (1992). Eye movements and visual cognition. Scene perception and reading. Springer series in neuropsychology. New-York: Springer.

Roberts, L. & A. Siyanova. (2013). Using eye-tracking to investigate topics in L2 acquisition and L2 sentence and discourse processing. S*tudies in Second Language Acquisition*, 35(2), 213-235.

Ryskin, R., C. Kurumada, & S. Brown-Schmidt (2019). Information Integration in Modulation of Pragmatic Inferences During Online Language Comprehension. *Cogn Sci.* 00: 1–35.

Sedivy, J., M. Tanenhaus, C. Chambers, & G. Carlson. (1999). Achieving incremental semantic interpretation through contextual representation. *Cognition*, 71, 109–147.

Soroli, E. & M. Hickmann. (2010). Language and spatial representations in French and in English: Some evidence from eye-movements. In G. Marotta, A. Lenci, L. Meini and F. Rovai (eds.), *Space in Language.* 581-597.

Soroli, E., M. Hickmann & H. Hendricks. (2019). Casting an eye on motion-events: eye- tracking and its implications for typology In M. Aurnague and D. Stosic (eds.) *The semantics of dynamic space in French: Descriptive, experimental and formal studies on motion expression.* Amsterdam: John Benjamins. 381-438.

Sun, C. & R. Breheny. (2020). Another look at the online processing of scalar inferences: an investigation of conflicting findings from visual-world eye-tracking studies. *Language, Cognition and Neuroscience*, 35:8, 949-979.

Tanenhaus, M., M. Spivey, K. Eberhard, & J. Sedivy. (1995). Integration of visual and linguistic information in spoken language comprehension. *Science*, 268, 1632–1634.

Tribushinina, E. & W. Mak. (2016). Three-year-olds can predict a noun based on an attributive adjective: Evidence from eye-tracking. J. Child Lang. 2016, 43, 425–441.

Yarbus, A. L. (1967). Eye movements and vision. New York: Plenum Press.

Yee, E., S. Blumstein & J. Sedivy. (2008). Lexical-Semantic Activation in Broca's and Wernicke's Aphasia: Evidence from Eye Movements. *J. Cogn. Neurosci.*, 20, 592–612.

GAZING INTO LANGUAGE

UNVEILING COGNITIVE PROCESSES WITH EYE-TRACKING

L'oculométrie est un outil extrêmement performant pour appréhender l'étroite interaction entre le langage et la pensée (Yarbus, 1967; Henderson et al., 2007; Huettig et al., 2011; Conklin & Pellicer-Sánchez, 2022). Elle permet notamment de mieux comprendre les processus cognitifs impliqués dans la compréhension et la production du langage, tant au niveau d'une communauté linguistique donnée qu'au niveau des individus (par exemple, pour les déficiences cognitives ou de compétences linguistiques). En analysant les mouvements oculaires, nous pouvons suivre, en temps réel, la manière dont l'attention est allouée au cours de tâches linguistiques, ce qui éclaire, par exemple, les points suivants:

1. Les dynamiques de processus linguistiques chez les personnes souffrant de troubles du langage: L'oculométrie permet d'identifier certains schémas dans le mouvement oculaire qui correspondent à différentes étapes du traitement cognitif, y compris pour les populations souffrant de troubles du langage tels que l'aphasie (Dickey, 2007; Yee et al., 2008) ou la dyslexie (Desroches et al., 2006; Huettig & Brouwer, 2015).

2. Accessibilité lexicale et sémantique: L'étude des mouvements oculaires dévoile le déroulement de l'accès à l'information lexicale et sémantique (Sedivy et al., 1999; De Groot et al., 2016).

3. Traitement syntaxique: La recherche sur l'oculométrie révèle les subtilités du traitement syntaxique, y compris la manière dont les structures de phrases (complexes) influencent l'analyse syntaxique et la compréhension (Tanenhaus et al., 1995; Clifton & Staub, 2011). Cela s'applique également à l'acquisition d'une seconde langue (par exemple, Frenck-Mestre, 2005).

4. Inférences pragmatiques: L'eye-tracking est particulièrement pertinent pour étudier la façon dont le contexte et les connaissances de fonds influent sur la compréhension de la langue (Ryskin et al., 2019; Sun & Breheny, 2020).

5. Traitement du discours: Le suivi oculaire est utilisé pour étudier les modalités selon lesquelles les lecteurs ou les auditeurs maintiennent la cohérence du discours et traquent les expressions référentielles (voir Altamimi & Conklin (2024) ou Robert & Siyanova (2013) sur les locuteurs L2).

6. Acquisition du langage: L'eye-tracking permet aux chercheurs d'observer la différence de traitement de l'input linguistique par les enfants et les adultes et son évolution au fil de l'expérience linguistique (par exemple, Ambridge & Rowland, 2013; Joseph et al., 2013; Mani & Huettig, 2014; Tribushinina & Mak, 2016).

7. Relativité linguistique: Les chercheurs s'appuient sur l'oculométrie pour mesurer l'impact cognitif des différences linguistiques sur la manière dont les locuteurs allouent leur attention visuelle aussi bien dans des contextes verbaux que non verbaux (par exemple, comme pour les

événements du mouvement, voir Hohenstein, 2005; Papafragou et al., 2008; Soroli & Hickmann, 2010; Soroli et al., 2019; Lesuisse, 2022; Lesuisse & Lemmens, 2023).

Appel à communications:

Nous vous invitons à soumettre des propositions de communication pour la prochaine journée d'étude intitulée "Gazing into Language: Unveiling Cognitive Processes with Eye-Tracking". Cet événement interdisciplinaire vise à explorer les nombreuses utilisations de la technologie de l'oculométrie dans la recherche en linguistique. Les chercheurs sont encouragés à soumettre des contributions abordant, sans s'y limiter, les sujets suivants:

• Les études d'eye-tracking sur la compréhension et la production de la langue
• L'oculométrie dans l'analyse du discours et la pragmatique
• Les mouvements oculaires dans le bilinguisme et l'acquisition des langues
• Les différences interlinguistiques dans les mouvements oculaires
• Les applications de l'oculométrie en psycholinguistique et en neurolinguistique
• Les avancées technologiques et méthodologiques dans la recherche utilisant l'oculométrie
• Les modèles cognitifs et computationnels utilisant des données d'eye-tracking

Conférencier invité: Prof. Kathy Conklin, University of Nottingham.

Instructions pour la soumission des résumés:

Les résumés ne doivent pas dépasser 400 mots.
Les résumés doivent inclure 3 à 5 mots-clés.
Les présentations (20 minutes) peuvent être en anglais ou en français.

Dates importantes:

Date limite de soumission des résumés: 17 mai 2024
Notification d'acceptation: 14 juin 2024
Date de la conférence: 20 septembre 2024

Lieu de la conférence: Campus Condorcet, Aubervilliers, France.
Site de la conférence: https://gazing-into-language.sciencesconf.org

Nous nous réjouissons à l'idée d'un échange stimulant d'idées et de perspectives à la croisée de l'eye-tracking et de la linguistique.

GAZING INTO LANGUAGE
ORGANISATRICE
Mégane Lesuisse (Université Paris 8, UR TransCrit)

COMITÉ SCIENTIFIQUE
(à confirmer)

References

Altamimi, A. & K. Conklin. (2024) The Effect of Congruency and Frequency of Exposures on the Learning of L2 Binomials. *Languages.* 9(1):9.

Ambridge, B. & C.F. Rowland. (2013). Experimental methods in studying child language acquisition. *WIREs Cogn. Sci.* 4, 149–168.

Sun C. & R. Breheny. (2020). Another look at the online processing of scalar inferences: an investigation of conflicting findings from visual-world eye-tracking studies. *Language, Cognition and Neuroscience*, 35:8, 949-979.

Clifton, C. & A. Staub. (2011). Syntactic influences on eye movements during reading. In S. Liversedge, I. Gilchrist, S. Everling (eds.) *Oxford Handbook on Eye Movements*. Oxford University Press.

Conklin, K. & A. Pellicer-Sánchez. (2022). Eye-tracking In : S. Li, P. Hiver & M. Papi (eds.) The Routledge Handbook of Second Language Acquisition and Individual Differences. N-Y : Routledge. 441-453.

De Groot, F., F. Huettig & C. Olivers. (2016). When meaning matters: The temporal dynamics of semantic influences on visual attention. *J. Exp. Psychol. Hum. Percept. Perform*. 42, 180–196.

Desroches, A.S., M.F. Joanisse & E.K. Robertson. (2006). Specific phonological impairments in dyslexia revealed by eyetracking. *Cognition*. 100, B32–B42.

Dickey, M., J. Choy, & C. Thompson. (2007). Real-time comprehension of wh- movement in aphasia: Evidence from eyetracking while listening. *Brain Lang*. 100, 1–22.

Frenck-Mestre, C. (2005). Eye-movement recording as a tool for studying syntactic processing in a second language: a review of methodologies and experimental findings. *Second Language Research*. 21(2), 175–198.

Henderson, J. M., J. R. Brockmole, M. S Catelhano & M. Mack. (2007). Visual saliency does not account for eye-movements during visual search in real-world scenes In R. P. G. Van Gompel, M. H. Fisher, W. S. Murray and R. L. Hill. (eds.) Eye-movements: a window on mind and brain. Amsterdam: Elsevier. 537-562.

Hohenstein, J. (2005). Language-related motion events similarities in English and Spanish- speaking children. *Journal of Cognition and Development* 6: 403-425.

Holmqvist, K., M. Nystrom, R. Andersson, R. Dewhurst, H. Jarodzka & J. Van de Weijer. (2015). *Eye-tracking: a comprehensive guide to methods and measures*. Oxford.

Huettig, F. & S. Brouwer. (2015). Delayed Anticipatory Spoken Language Processing in Adults with Dyslexia—Evidence from Eye-tracking. *Dyslexia* 21, 97–122.

Huettig, F., J. Rommers, & A. Meyer. (2011). Using the visual world paradigm to study language processing: A review and critical evaluation. *Acta Psychol*. 137, 151–171.

Joseph, S., K. Nation, & S. Liversedge. (2013). Using Eye Movements to Investigate Word Frequency Effects in Children's Sentence Reading. *Sch. Psychol. Rev*. 42, 207–222.

Lesuisse, M. (2022). Exploring the conceptualisation of locative events in French, English and Dutch: Insights from eye-tracking on two recognition tasks. *Yearbook of the German Cognitive Linguistics Association/Jahrbuch der Deutschen Gesellschaft für Kognitive Linguistik*, 10, 121–158.

Lesuisse M & M. Lemmens. (2023). Looking differently at locative events: the cognitive impact of linguistic preferences. *Language and Cognition*. Published online. 1-29.

Mani, N. & F. Huettig. (2014). Word reading skill predicts anticipation of upcoming spoken language input: A study of children developing proficiency in reading. *J. Exp. Child Psychol. 1*26, 264–279.

Papafragou, A., J. Hulbert, & J. Trueswell. (2008). Does language guide event perception? Evidence from eye movements. *Cognition* 108: 155-184.

Rayner, K. (1992). Eye movements and visual cognition. Scene perception and reading. Springer series in neuropsychology. New-York: Springer.

Roberts, L. & A. Siyanova. (2013). Using eye-tracking to investigate topics in L2 acquisition and L2 sentence and discourse processing. S*tudies in Second Language Acquisition*, 35(2), 213-235.

Ryskin, R., C. Kurumada, & S. Brown-Schmidt (2019). Information Integration in Modulation of Pragmatic Inferences During Online Language Comprehension. *Cogn Sci*. 00: 1–35.

Sedivy, J., M. Tanenhaus, C. Chambers, & G. Carlson. (1999). Achieving incremental semantic interpretation through contextual representation. *Cognition*, 71, 109–147.

Soroli, E. & M. Hickmann. (2010). Language and spatial representations in French and in English: Some evidence from eye-movements. In G. Marotta, A. Lenci, L. Meini and F. Rovai (eds.), *Space in Language*. 581-597.

Soroli, E., M. Hickmann & H. Hendricks. (2019). Casting an eye on motion-events: eye- tracking and its implications for typology In M. Aurnague and D. Stosic (eds.) *The semantics of dynamic space in French: Descriptive, experimental and formal studies on motion expression*. Amsterdam: John Benjamins. 381-438.

Sun, C. & R. Breheny. (2020). Another look at the online processing of scalar inferences: an investigation of conflicting findings from visual-world eye-tracking studies. *Language, Cognition and Neuroscience*, 35:8, 949-979.

Tanenhaus, M., M. Spivey, K. Eberhard, & J. Sedivy. (1995). Integration of visual and linguistic information in spoken language comprehension. *Science*, 268, 1632–1634.

Tribushinina, E. & W. Mak. (2016). Three-year-olds can predict a noun based on an attributive adjective: Evidence from eye-tracking. J. Child Lang. 2016, 43, 425–441.

Yarbus, A. L. (1967). Eye movements and vision. New York: Plenum Press.

Yee, E., S. Blumstein & J. Sedivy. (2008). Lexical-Semantic Activation in Broca's and Wernicke's Aphasia: Evidence from Eye Movements. *J. Cogn. Neurosci.*, 20, 592–612.