Multiliteracies and semiotics

Entrevista concedida a Marisa Mendonça Carneiro

Entrevistado: Len Unsworth

Marisa Mendonça Carneiro
marisaufmg@gmail.com
https://orcid.org/0000-0003-1217-2160
Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brasil

Professor Len Unsworth is the Research Director of Educational Semiotics in English and Literacy Pedagogy in the Institute for Learning Sciences and Teacher Education (ILSTE) at the Australian Catholic University (ACU) in Sydney. Len has been involved in educational research for over 30 years, including nine recent Australian Research Council funded projects. His key research interests include: literacy and learning in school curriculum areas; literature for children and adolescents; literacy development in the English curriculum K-12; and the pedagogic role of explicit knowledge about language and the meaning-making resources of images and image-language interaction in both paper and digital media texts, including animation and film. Prior to commencing at ACU in 2014, Len was Professor in Education at Griffith University, following earlier roles as Head of the School of Education at the University of New England and Head of the School of Development and Learning in the Faculty of Education at the University of Sydney.

ENTREVISTA

Your research throughout the years has taken Science education and infographics as one of your main research interests. What is/was the motivation behind it?

I first became interested in science infographics decades ago when I was examining information books on science for primary school age children and noticed that many of these books contained images presenting inaccurate information and/or images that were irrelevant, peripheral or condescendly comedic (Unsworth, 1993). I felt this amounted to some parts of the publishing industry not treating young learners with respect and that some scholarly reporting of the situation was necessary. This led me to pursue disciplinary literacy development in school science and examining the ways in which images and language worked together in the multimodal discourse of science (Unsworth, 1997) because, at that time it seemed that there was limited pedagogic attention to the multimodal nature of science texts in developing young students reading to learn. Then with the advent of electronic texts such as CD ROMs, it became apparent to me that the ways in which language and dynamic images interacted to communicate scientific knowledge was something teachers needed to understand in order to develop students' capacity to learn from these new media (Unsworth, 1999, 2004). I have maintained this research trajectory on the digital multimodal discourse of school science and continue to coordinate research into areas such as animations in science education (Unsworth, 2020). Working with international colleagues prompted interest in cross cultural comparisons of science infographics (Y. Ge et al., 2017; Ge et al., 2014; Y.-P. Ge et al., 2017; Ge et al., 2018a; Ge et al., 2018b). As I continued to work in this area I became aware that, although some work on multimodal literacy in science was occurring in the primary and junior secondary school, there was a paucity of research in this area in the senior high school biology, chemistry and physics subjects so this became a more recent focus of my work (Martin & Unsworth, 2024; Ngo et al., 2022; Unsworth & Herrington, 2023; Unsworth et al., 2022).

In 2001 you published a book titled "Teaching multiliteracies across the curriculum: changing contexts of text and image in classroom practice", in which you approached multiliteracy pedagogy in several areas, including early school years and English teaching. What, if any, has changed in the way you approach multiliteracy in areas such as English teaching?

Most of my work on multimodality and English teaching has been in contexts where English is the official language of education in school systems. After 2001 I began to look more at multimodal digital literacy and its interaction with traditional paper media literacy in English teaching. This included children's literature and film as well as new forms of e-literature for children (Barton & Unsworth, 2014; Unsworth, 2006a, 2008, 2013; Unsworth et al., 2005). Digital multimodal composition also became and continues as an important dimension of my ongoing research. This included research into the classroom use of new animation software for children (Chandler et al., 2010; Chandler et al., 2012; Mills & Unsworth, 2018; O'Brien et al., 2010; Rutherford et al., 2011; Unsworth & Mills, 2020). More recently I have worked on children's coding of animated movies using Scratch (Unsworth,

2024). I've also been concerned about the lack of any significant attention to multimodal literacy in large-scale, high-stakes standardized tests of literacy (Unsworth, 2014; Unsworth & Chan, 2008, 2009; Unsworth et al., 2019; Unsworth et al., 2004). Since 2001 I have done a little work in the area of teaching multimodal literacy in English as an additional language (Ngo et al., 2012; Unsworth, 2006b; Unsworth & Bush, 2010; Unsworth & Mills, 2020)

How do you think other school subjects, such as Geography and History for instance, may benefit from your approach on educational semiotics, such as the analysis of infographics you proposed on your latest book "Reading Images for Knowledge Building - Analyzing Infographics in School Science", co-authored by J.R. Martin?

The disciplinary discourses of school subjects are quite distinctive, especially in the senior high school years (Martin, 2020; Martin & Matruglio, 2020; Shanahan & Shanahan, 2017; Unsworth et al., 2022), however knowledge of the linguistic and multimodal resources that are drawn on in distinctive ways in different subjects can inform subject specific literacies. This applies to the role of infographics in different subject areas. In Reading Images for Knowledge Building (Martin & Unsworth, 2024) for example, we discuss the visual representation of activity, composition (part/whole relations) and classification. Understanding the complexity of different visual representations of classification and to some extent composition is very important in history texts. We also discuss iconization in images in science where the conceptual meaning of entities represented in images is backgrounded and the significance of the entity in symbolizing the values of certain social groups is foregrounded. This is clearly significant in history in images such as the man standing in front of the convoy of tanks in Tiananmen Square in 1989, whose symbolic meaning has become foregrounded over its conceptual or literal meaning. Our discussion of the visual representation of activity is illustrated with infographics about climate change and the greenhouse effect (Chapter 9), which indicates the relevance of this underlying semiotic knowledge to geography. The section on aesthetics in images (pp. 174-75) includes images of wind patterns at different latitudes around the earth and our discussion of the use of cartoons is highly relevant to their use in history teaching. So many of the foundational approaches to infographic analyses in Reading Images for Knowledge Building can be related to subject areas other than science. Having said that, different subjects also have their distinctive infographic forms such as time visualizations in history (Coffin & Derewianka, 2009; Derewianka & Coffin, 2008).

In 2006 you proposed a framework that provided us with a theoretical description of the interaction between language and image in ideational meaning-making by analyzing school science materials. What should we take into consideration if we want to conduct an intermodal analysis of news that are published online?

The semiotic framework underpinning my work has been built on the systemic functional linguistic and social semiotic theories promulgated by scholars such as Michael Halliday, Jim Martin, Gunther

Kress and Theo van Leeuwen (as I indicate further below). A colleague at the University of New South Wales, Dr Helen Caple, whose work is also built on these theories has specialized in the analysis of contemporary news stories. Helen's publications provide excellent detailed frameworks for the analysis of news stories (Bednarek & Caple, 2012; Caple, 2008a, 2008b, 2010; Caple, 2013). There are a number of other systemic functional semiotic analyses of news stories that may be useful (Abbas & White, 2021; Economou, 2008, 2012; Macken-Horarik, 2003; Tavassoli et al., 2019; White, 2014). Further work on online news following the same theoretical perspective has been done by John Knox, a colleague at Macquarie University (Caple & Knox, 2012, 2015, 2017; Knox, 2007; Knox, 2009a, 2009b, 2010).

How do you see the increasing possibilities that the online medium affords in terms of the several multimodal combinations and the way people understand them (and could learn from), especially image/text interaction in Instagram?

I have not been involved with social media research per se, but the online environment certainly affords extended forms of multimodal integration of sound, music and haptics so that communication, interpretation and learning are responsive to innovative forms of multimodal meaning making. One example of bodily engagement in meaning-making along with the experience of language, moving image, sound and music is digital literature for children, where, for example, manipulating the actual i-pad (or other tablet device) is how the 'reader' experiences the story by being a participant and taking action in the storyworld (Zhao & Unsworth, 2017). Recent developments in augmented reality and virtual reality have created other ways in which readers/viewers can enter into the actual story space in online narrative fiction (Mills et al., 2023 see Chapter 10) [This book is open access and can be downloaded free of charge from *https://www.taylorfrancis.com/books/oa-mono/10.4324/9781003137368/literacy-digital-futures-kathy-mills-len-unsworth-laura-scholes?_gl=1*rloxje*_gcl_au*MTA0OTI3Mjg4NS4xNzI0OTI0ODE4*_ga*MTI5NjM4MTc4LjE3MjQ5MjQ4MTk.*_ga_0HYE8YG0M6*MTcyOTcyNDk1Ny40LjAuMTcyOTcyNDk1Ny42MC4wLjA*.].

The recent advances on online tools for the creation of multimodal texts enables the creation of texts that integrate moving images, sound and music. I have just completed a large project in which teachers of students in Years 6 and 7 of their schooling incorporated coding of animated narratives as part of the English curriculum (Unsworth, 2024). In this project the students used the online block coding platform Scratch (https://scratch.mit.edu/) to create animated stories in which they were able to import music and create sound effects as well as record the dialogue using their own voices for the characters.

These are just some of the ways in which the digital literacies of the 21st century are developing multimodally, and while words remain integral to our communication, they are no longer sufficient and the literacies of today and the future are now inherently multimodal.

Emojis, stickers, gifs and images may be used to express meanings, and oftentimes are used alone in online interactions. How, in your point of view, should school teachers approach their teaching/learning? How should a teacher proceed in order to explore the meanings that come from such features of online discourse?

As a teacher and researcher of literacies and learning, since I was introduced to the systemic functional linguistic and social semiotic theories of Michael Halliday (Halliday, 1978; Halliday et al., 1988; Halliday & Hasan, 1985; Halliday & Matthiessen, 2004), Jim Martin (Martin, 1992) and the work of those who followed this trajectory into multimodality (Kress, 1997, 2003, 2010; Kress & van Leeuwen, 2021; van Leeuwen, 2005; Van Leeuwen, 2022), I have found that this work provides the most appropriate robust semiotic perspective on which to ground the development of pedagogies of multimodal literacy. I have not personally undertaken research into the meaning-making options of emojis and gifs etc, but I highly recommend that teachers draw on the systemic functional semiotic research of Associate Professor Michelle Zappavigna in this area (Zappavigna & Logi, 2024a, 2024b).

Memes have become ubiquitous in online social networks. Do you believe science-related memes may be used for teaching and/or learning purposes?

I don't believe it is possible to provide a yes/no answer here. It depends on the nature of the memes. Some may provide readers with opportunities to interrogate the meanings communicated by the meme and through such an inquiry build their own scientific understanding. For example I saw a meme that was visual comparison of the Fahrenheit, Celcius and Kelvin temperature scales in which each showed the values of 0 and 100. For Fahrenheit the annotation for 0 was 'really cold outside' and for 100 'really hot outside'; for Celcius the annotation for 0 was 'pretty cold outside' and for 100 'dead'; for Kelvin the annotation for 0 was 'dead' and for 100 was 'dead'. On the other hand, I saw a meme that said that something like 'Chemists: I research atoms, molecules and their interactions' and 'Physicists: I research matter and its properties and interactions and how the universe works'; and then the third quote was 'Geologists: I like that bouder. That is a nice boulder'. Memes of that kind are simply detrimental. So, I think the judicious discussion of some memes may be useful if they provoke scientific questioning, and especially if they are visually astutely amusing.

REFERENCES

ABBAS, Z.; WHITE, P. R. Attitudinal positioning and journalistic commentary in politically fraught circumstances: Editorializing about the killing of Osama bin Laden. *Journal of Research in Applied Linguistics*, v. 12, n. 2, p. 89-102, 2021.

BARTON, G.; UNSWORTH, L. Music, multiliteracies and multimodality: Exploring the book and movie versions of Shaun Tan's The Lost Thing. *Australian Journal of Language and Literacy*, v. 37, n. 1, p. 3-20, 2014.

BEDNAREK, M.; CAPLE, H. 'Value added': Language, image and news values. *Discourse, context & media*, v. 1, n. 2, p. 103-113, 2012.

CAPLE, H. Intermodal Relations in Image Nuclear News Stories. *In*: UNSWORTH, L. (ed.). *Multimodal Semiotics: Functional Analyses in Contexts of Education*. Continuum, 2008a. p. 123-138.

CAPLE, H. Reconciling the co-articulation of meaning between words and pictures: exploring instantiation and commitment in image-nuclear news stories. *In:* MAHBOOB, A.; KNIGHT, N. (ed.). *Questioning Linguistics*. Cambridge Scholars Press, 2008b. p. 77-94.

CAPLE, H. Doubling-up: allusion and bonding in multi-semiotic news stories. In BEDNAREK, M.; MARTIN, J. R. (ed.). *New discourse on language: Functional perspectives on multimodality, identity, and affiliation*. Continuum, 2010. p. 111-133.

CAPLE, H. *Photojournalism: A social semiotic approach*. Springer, 2013.

CAPLE, H.; KNOX, J. S. Online news galleries, photojournalism and the photo essay. *Visual Communication*, v. 11, n. 2, p. 207-236, 2012.

CAPLE, H.; KNOX, J. S. A framework for the multimodal analysis of online news galleries: What makes a "good" picture gallery? *Social Semiotics*, v. *25*, n. 3, p. 292-321, 2015.

CAPLE, H.; KNOX, J. S. Genre (less) and purpose (less): Online news galleries. *Discourse, context & media*, v. *20*, p. 204-217, 2017.

CHANDLER, P.; O'BRIEN, A.; UNSWORTH, L. Towards a 3D digital multimodal curriculum for the upper primary school. *Australian Educational Computing*, v. 25, n. 1, p. 34-40, 2010.

CHANDLER, P.; UNSWORTH, L.; O'BRIEN, A. Evaluation of students' digital animated multimodal narratives and the identification of high-performing classrooms. *Journal of Literacy and Technology*, v. 13, n. 3, p. 80-128, 2012.

COFFIN, C.; DEREWIANKA, B. Multimodal layout in school history books: The texturing of historical interpretation. *In: Text type and texture*. University of Toronto Press, 2009. p. 191-215.

DEREWIANKA, B.; COFFIN, C. Time visuals in history textbooks:Some pedagogic issues. *In*: UNSWORTH, L. (ed.). *Multimodal Semiotics: Functional Analysis in Contexts of Education*. Continuum, 2008. p. 187-200.

ECONOMOU, D. Pulling Readers *In*: WHITE, P. R. R.; THOMSON, E. A. (ed.). *Communicating Conflict: Multilingual Case Studies of the News Media*. London, 2008. p. 253–280.

ECONOMOU, D. Standing out on Critical Issues: Evaluation in Large Verbal-visual Displays in Australian Broadsheets. *In*: BOWCHER, W. (ed.). *Multimodal Texts from Around the World: Cultural and Linguistic Insights*. Palgrave Macmillan, 2012. p. 246 - 272.

GE, Y.; UNSWORTH, L.; WANG, K. The effects of explicit visual cues in reading biological diagrams. *International Journal of Science Education*, v. 39, n. 5, p. 605-626, 2017.

GE, Y.-P.; CHUNG, C.-H.; WANG, K.-H.; CHANG, H.-P.; UNSWORTH, L. Comparing the images in Taiwanese and Australian science textbooks by grammar of visual design: An Example of biological classification. *Chinese Journal of Science Education*, v. 22, n. 2, p. 109-134, 2014.

GE, Y.-P.; UNSWORTH, L.; WANG, K.-H. The effects of explicit visual cues in reading biological diagrams. *International Journal of Science Education*, v. 39, n. 5, 605-626, 2017.

GE, Y.-P.; UNSWORTH, L.; WANG, K.-H.; CHANG, H.-P. Image design for enhancing science learning: helping students build taxonomic meanings with salient tree structure images. *In*: TANG, K.-S.; DANIELSSON, K. (ed.), *Global developments in literacy research for science education*. Springer, 2018a. p. 237-258.

GE, Y.-P.; UNSWORTH, L.; WANG, K.-H.; CHANG, H.-P. What Images Reveal: a Comparative Study of Science Images between Australian and Taiwanese Junior High School Textbooks

[journal article]. *Research in Science Education*, v. 48, n. 6, p. 1409-1431, 2018b. DOI: https://doi.org/10.1007/s11165-016-9608-9

HALLIDAY, M. A. K. *Language as a social semiotic: The social interpretation of language and meaning.* Edward Arnold, 1978.

HALLIDAY, M. A. K.; FAWCETT, R. P.; YOUNG, D. J. *New Developments in Systemic Linguistics: Theory and application.* Pinter, 1988.

HALLIDAY, M. A. K.; HASAN, R. *Language, context and text: Aspects of language in a social-semiotic perspective.* Deakin University Press, 1985.

HALLIDAY, M. A. K.; MATTHIESSEN, C. *An introduction to functional grammar.* 4th ed. Arnold, 2004.

KNOX, J. Visual-verbal communication on online newspaper home pages. *Visual Communication*, v. 6, n. 1, p. 19-53, 2007. DOI: https://doi.org/10.1177/1470357207071464

KNOX, J. S. Punctuating the home page: image as language in an online newspaper. *Discourse & communication*, v. 3, n. 2, p. 145-172, 2009a.

KNOX, J. S. Visual minimalism in hard news: Thumbnail faces on the smh online home page. *Social Semiotics*, v. 19, n. 2, p. 165-189, 2009b.

KNOX, J. S. Online newspapers: evolving genres and evolving theory. In *Applied linguistics methods: a reader: systemic functional linguistics, critical discourse analysis and ethnography* (pp. 33-51). Routledge, Taylor and Francis Group, 2010.

KRESS, G. Visual and verbal modes of representation in electronically mediated communication: the potentials of new forms of of text. In I. Snyder (Ed.), *Page to screen: Taking literacy into the electronic era.* Allen and Unwin, 1997. p. 53-79.

KRESS, G. *Literacy in the New Media Age.* Routledge, 2003.

KRESS, G. *Multimodality: A social semiotic approach to contemporary communication.* Routledge, 2010. DOI: https://doi.org/10.4324/9780203970034

KRESS, G.; VAN LEEUWEN, T. *Reading Images: The grammar of visual design.* 3rd ed. Routledge, 2021. DOI: https://doi.org/10.4324/9781003099857

MACKEN-HORARIK, M. Working the Borders in Racist Discourse: The Challenge of the 'Children Overboard Affair' in News Media Texts. *Social Semiotics*, v. 13, n. 3, p. 283-303, 2003.

MARTIN, J. R. *English text: System and structure.* Benjamins, 1992.

MARTIN, J. R. Revisiting field: Specialized knowledge in secondary school science and humanities discourse. *In*: MARTIN, J. R.; MATON, K.; DORAN, Y. J. (ed.). *Accessing Academic Discourse: Systemic Functional Linguistics and Legitimation Code Theory.* Routledge, 2020. p. 114-148.

MARTIN, J. R.; MATRUGLIO, E. Revisiting mode: Context in/dependency in Ancient History classroom discourse. *In*: MARTIN, J. R.; MATON, K.; DORAN, Y. J. (ed.). *Accessing Academic Discourse: Systemic Functional Linguistics and Legitimation Code Theory.* Routledge, 2020. p. 89-113.

MARTIN, J. R.; UNSWORTH, L. *Reading Images for Knowledge Building: Analyzing Infographics in School Science.* Routledge, 2024. DOI: https://doi.org/10.4324/9781003164586

MILLS, K.; UNSWORTH, L. iPad Animations: Powerful Multimodal Practices for Adolescent Literacy and Emotional Language. *Journal of Adolescent & Adult Literacy*, v. 61, n. 6, p. 609-620, 2018. DOI: https://doi.org/10.1002/jaal.717

MILLS, K.; UNSWORTH, L.; SCHOLES, L. *Literacy for Digital Futures: Mind, Body, Text.* Routledge, 2023. DOI: https://doi.org/10.4324/9781003137368

NGO, T.; UNSWORTH, L.; FEEZ, S. Enhancing expressions of attitudes: Achieving equity for international students in everyday communication. *TESOL in Context: TESOL as a Global Trade: Ethics, Equity and Ecology, Special Edition,* 2012.

NGO, T.; UNSWORTH, L.; HERRINGTON, M. Teacher Orchestration of Language and Gesture in Explaining Science Concepts in Images. *Research in Science Education,* n. 52, p. 1013–1030, 2022. DOI: https://doi.org/https://doi.org/10.1007/s11165-021-10011-z

O'BRIEN, A.; CHANDLER, P.; UNSWORTH, L. 3D multimodal authoring in the middle years: a research project. *Synergy*, v. 8, n. 1, p. 1-5, 2010. DOI: http://www.slav.vic.edu.au/synergy/volume-8-number-2-2010/research/79-3d-multi...

RUTHERFORD, L.; BITTMAN, M.; BROWN, J.; UNSWORTH, L. Digital Natives: New and old media and children's outcomes. *AUstralian Journal of Education*, v. 55, n. 2, p. 73-87, 2011.

SHANAHAN, C.; SHANAHAN, T. Disciplinary literacy. In *Handbook of research on teaching the English language arts*. Routledge, 2017. p. 281-308.

TAVASSOLI, F.; JALILIFAR, A.; WHITE, P. R. British newspapers' stance towards the Syrian refugee crisis: An appraisal model study. *Discourse & Society*, v. 30, n. 1, p. 64-84, 2019.

UNSWORTH, L. Choosing and using information books in junior primary science. *In:* UNSWORTH, L. (ed.). *Literacy learning and teaching: Language as social practice in the primary school*. Macmillan, 1993.

UNSWORTH, L. Scaffolding reading of science explanations: Accessing the grammatical and visual forms of specialised knowledge. *Reading*, v. 31, n. 3, p. 30-42, 1997.

UNSWORTH, L. Explaining school science in book and CD ROM formats: Using semiotic analyses to compare the textual construction of knowledge. *International Journal of Instructional Media*, v. 26, n. 2, p. 159-179, 1999.

UNSWORTH, L. Comparing school science explanations in books and computer-based formats: The role of images, image/text relations and hyperlinks. *International Journal of Instructional Media*, v. 31, n. 3, p. 283-301, 2004.

UNSWORTH, L. *e-literature for children: enhancing digital literacy learning*. Routledge/Falmer, 2006a.

UNSWORTH, L. *Multiliteracies and a metalanguage of image/text relations: Implications for teaching English as a first or additional language in the 21st century. Tales out of school: Identity and English language teaching. Special edition of TESOL in Context.*, Series S, n. 1, p. 147-162, 2006b.

UNSWORTH, L. Multiliteracies, e-Literature and English Teaching. *Language and Education*, v. 22, n. 1, p. 62-75, 2008.

UNSWORTH, L. Re--configuring image--language relations and interpretive possibilities in picture books as animated movies: A site for developing multimodal literacy pedagogy. *Ilha do Desterro: A Journal of English Language, Literatures in English and Cultural Studies (Special Issue on Multimodality)*, v. 64, p. 15-47, 2013.

UNSWORTH, L. Multimodal Reading Comprehension: Curriculum Expectations and Large-scale Literacy Testing Practices. *Pedagogies: An International Journal*, v. 9, p. 26-44, 2014.

UNSWORTH, L. (ed.). *Learning from Animations in Science Education: Innovating in Semiotic and Educational Research*. Springer, 2020. DOI: https://doi.org/10.1007/978-3-030-56047-8.

UNSWORTH, L. (ed.). *Coding Animated Narratives: Classroom Practices for Developing Digital Multimodal Authoring*. Primary English Teaching Association Australia, 2024.

UNSWORTH, L.; BUSH, R. Introducing multimodal literacy to young children learning English as a Second Language. *In*: COLE, D.; PULLEN, D. (ed.). *Multiliteracies in Motion: Current Theory and Practice*. Routledge, 2010. p. 59-83.

UNSWORTH, L.; CHAN, E. Assessing integrative reading of images and text in group reading comprehension tests. *Curriculum Perspectives*, v. 28, n. 3, p. 71-76, 2008.

UNSWORTH, L.; CHAN, E. Bridging multimodal literacies and national assessment programs in literacy. *Australian Journal of Language and Literacy*, v. 32, n. 3, p. 245-257, 2009.

UNSWORTH, L.; COPE, J.; NICHOLLS, L. Multimodal literacy and large-scale literacy tests: Curriculum relevance and responsibility. *Australian Journal of Language and Literacy*, v. 42, n. 2, p. 128-139, 2019.

UNSWORTH, L.; HERRINGTON, M. Visualization Type and Frequency in Final Year High School Science Examinations. *Research in Science Education*, v. 53, n. 4, p. 707-725, 2023. https://doi.org/10.1007/s11165-022-10094-2

UNSWORTH, L.; MILLS, K. A. English language teaching of attitude and emotion in digital multimodal composition. *Journal of Second Language Writing*, v. 47, 100712, 2020. https://doi.org/https://doi.org/10.1016/j.jslw.2020.100712

UNSWORTH, L.; THOMAS, A.; BUSH, R. The role of images and image-text relations in group 'Basic Skills Tests' of literacy for children in the primary school years. *Australian Journal of Language and Literacy*, v. 27, n. 1, p. 46-65, 2004.

UNSWORTH, L.; THOMAS, A.; SIMPSON, A.; ASHA, J. *Children's literature and computer based teaching*. McGraw-Hill/Open University Press, 2005.

UNSWORTH, L.; TYTLER, R.; FENWICK, L.; HUMPHREY, S.; CHANDLER, P.; HERRINGTON, M.; PHAM, L. *Multimodal Literacy in School Science: Transdisciplinary Perspectives on Theory, Research and Pedagogy*. Routledge, 2022. DOI: https://doi.org/10.4324/9781003150718

VAN LEEUWEN, T. *Introducing Social Semiotics*. Routledge, 2005.

VAN LEEUWEN, T. *Multimodality and Identity*. Routledge, 2022.

WHITE, P. R. R. The attitudinal work of news journalism images – a search for visual and verbal analogues. *Quaderni del CeSLiC Occasional Papers del CeSLiC*, p. 6-42. 2014. Disponível em: http://amsacta.unibo.it/4110/

ZAPPAVIGNA, M.; LOGI, L. *Emoji and Social Media Paralanguage*. Cambridge University Press, 2024a.

ZAPPAVIGNA, M.; LOGI, L. How emoji make meaning and enact ambient affiliation: a social semiotic account of emoji-text relations in TikTok comments. *Social Semiotics*, p. 1-21, 2024b.

ZHAO, S.; UNSWORTH, L. Touch design and Narrative Interpretation: a social semiotic approach to Picture book Apps. *In*: KUCIRKOVA, N.; FALLOON, G. (ed.). *Apps, Technology and Younger Learners: International evidence for teaching*. Routledge, 2017. p. 89-102.

A AUTORA

Marisa Mendonça Carneiro

Marisa Mendonça Carneiro is an English language professor at the School of Language and Linguistics at the Federal University of Minas Gerais since 2017. She holds a PhD in Linguistics and her research interest include teaching and learning English as an additional language and Internet linguistics and multimodality.