



At a Glance: Analyze and synthesize complex information. Critically evaluate ideas and options. Develop and test hypotheses. Analyze and interpret findings.

Understanding Analytical & Critical Reasoning

Analytical and critical reasoning is the rational process through which you “obtain, interpret, and use knowledge, facts, and data”, while exercising logical thinking in analyzing issues and making proper decisions, to ultimately solve problems.¹

Why does it matter?

Analytical and critical reasoning is a highly transferable skill set that is widely sought after in a variety of career paths.² Being an analytical and critical “thinker” is the most common attribute of successful researchers, regardless of their field.³ This ability allows you, whether you are a graduate student or a professional, to effectively navigate the different phases of the research process: From compiling and synthesizing information, to evaluating variable evidence, formulating questions and testing hypotheses, and interpreting and reflecting on your own findings in connection to other studies. Developing analytical and critical reasoning skills is important to reduce biased practices in professions that rely on complex decision making such as healthcare, where errors in judgement have severe consequences.⁴

While being critical is a way of utilizing your [subject knowledge](#) to solve problems and make decisions, this process compels you to seek and validate new information, thus expanding your knowledge in a familiar or new subject areas. Moreover, analytical and critical reasoning allows you to improve on other skills such as writing and presenting. For instance, by critically examining published evidence and pertinent facts, you will enhance your argumentative [writing skills](#) needed for drafting a research manuscript or a thesis.⁵

In everyday life, analytical and critical reasoning is essential for solving problems and making adequate decisions. In contrast to the passive “sponge approach” of merely absorbing information by relying on concentration and memory, analytical and critical reasoning provides you with an interactive approach to reach an independent decision or belief about the worth and validity of what you read, hear, or experience.⁶ Therefore, through this thinking process, our decisions and beliefs are based on reflective judgement rather than associations or assumptions.

Cultivating Analytical & Critical Reasoning

Graduate students are provided with many opportunities to acquire and practice their analytical and critical reasoning skills which, while enhancing the learning process, provide a lifelong tool that goes beyond graduate studies.⁷ While it may come to you as second nature, analytical and critical reasoning can be further honed through practice, during and following graduate studies.⁸ For instance, in a data-driven learning setting, repeated cycles of making, reflecting, and deciding on how to act vis-a-vis quantitative comparisons, have remarkably improved students’ critical thinking, as well as their learning outcomes (e.g., evaluating models, making appropriate changes to methods).⁹

Be a critical reader and writer

Cultivating critical reading will enhance your [critical writing](#). Critical reading implies that readers should focus on the “Ways of Thinking” about a topic, rather than exclusively gathering the information about it in the text.¹⁰ For example, examine how arguments were presented and conclusions were reached.

Here are some examples of guiding questions:¹

- What are the issues and the conclusions?
- What are the reasons?
- Which words or phrases are ambiguous?
- What are the value conflicts and assumptions?
- What are the descriptive assumptions?
- Are there any fallacies in the reasoning?
- How good is the evidence?
- Are there rival causes?
- Are the statistics deceptive?

Adopting a question-asking attitude and reflecting on the answers will guide you through this process.

Depending on the nature of the questions, the answers could either be definite such as the distance between the moon and the earth in physics, or limited to intelligent guesses such as the reason behind a given human behaviour in psychology.

Quick Guide to Becoming an Effective Analytical and Critical thinker

- Consider what a critical thinker would expect, comment, or ask as you write a manuscript or prepare a presentation
- Be a curious learner by continuously seeking information and discussing concepts and novel discoveries with your peers or supervisor¹¹
- Avoid “analysis paralysis” by focusing on both the details and the big picture, ensuring a rational decision-making process¹²
- Analyze your own reasoning process and effectively communicate it as a way to persuade others¹³
- Connect with ideas, people, and organizations beyond your comfort zone to expand your perspectives
- Engage with challenging and dissenting views, and consider unconventional, alternative solutions¹⁴
- Consider how your personal biases, values, views, and location in time and space – collectively known as positionality – influence your reasoning and actions. Positionality is a challenge for objectivity in research, especially in qualitative studies¹⁵
- Play brain training games (validated): [Fit brains](#), [Luminosity](#), [Elevate](#).

Taking Action

Professional Development & Training

- Courses - [McGill Writing Centre - Writing Courses](#): The Writing Centre offers both credit and non-credit courses for both native and non-native English speakers.
- Workshop - [McGill Writing Centre - Graphos](#)
- Courses - [School of Continuing Studies - Professional Writing in Business](#).
- Course - [McGill Executive Institute - Business Writing Course](#): One day course to improve professionalism and quality of your writing.
- Workshops - [Mitacs Training Workshops](#): Training workshops including business writing, effective email writing and strategic business report writing workshops for advanced degree graduates.
- Check [myInvolvement](#) for upcoming workshops and programs under “Communicate: Writing”

Gaining Experience

- Become a blogger for [Campus Life & Future Careers Blog](#) (Contact [CaPS](#) for this opportunity).
- Become a blogger for [GradLife](#).
- Write for the McGill community: [McGill Daily](#) | [McGill Tribune](#).

Resources

Websites

- [Paradigm - Online Writing Assistant](#): provides Writing tips and guidelines
- [Purdue Online Writing Lab](#): houses writing resources and reference materials for different types of writing - general, research and citation, subject-specific, job search, etc.
- [Writing Tools](#) - McGill Library: A comprehensive list of reference materials and tools, from general writing to thesis writing.
- [Writing Advice](#) - University of Toronto: A comprehensive list of downloadable PDF handouts covering topics of prewriting stages, to grammar and types of writing.
- [McGill Graphos](#): Graphos offers different ways for graduate students to become more efficient, precise and effective scholarly communicators.
- [Access Technology Resources](#) - McGill Office of Students with Disabilities.
- [McGill Thesis Preparation Guidelines](#) - McGill Graduate and Postdoctoral Studies.

Video Clips & Podcasts

- [Reading and Writing Skills](#) (McGill OSD): This video clip and the resources listed on this webpage are to help you improve academic reading and writing skills.
- [Grammar Girl \(Mignon Fogarty\)](#): Writing tips from multi-award winning website and podcast.

Groups & Associations

- [Graduate Student Writers' Group](#)
- [Peer Writing Groups](#) (Graphos)
- [Quebec Writers' Federation](#)

Articles of Interest

- Writing Tips: [Strategies for Overcoming Writer's Block](#) (University of Illinois)
- Writing Tips: [Op-ed writing tips](#) (McGill Newsroom)
- Writing Tips: [Inclusive writing](#) (University of Leicester)

Books

- Williams, J. M., & Bizup, J. (2017). *Style: Lessons in clarity and grace*. <http://mcgill.worldcat.org/oclc/919068263>
- Graff, G., & Birkenstein, C. (2017). *"They say / I say": The moves that matter in academic writing*. <http://mcgill.worldcat.org/oclc/957747941>
- Zinsser, W. (2006). *On writing well: The classic guide to writing nonfiction*. New York: HarperCollins. <http://mcgill.worldcat.org/oclc/62421288>
- Elbow, P. (1998). *Writing with power: Techniques for mastering the writing process*. New York: Oxford University Press. <http://mcgill.worldcat.org/oclc/191952969>
- Pinker, S. (2014). *The sense of style: The thinking person's guide to writing in the 21st century!*. <http://mcgill.worldcat.org/oclc/870919633>
- Clark, R. P. (2008). *Writing tools: 50 essential strategies for every writer*. <http://mcgill.worldcat.org/oclc/154694504>
- Maggio, R. (2009). *How to say it: Choice words, phrases, sentences, and paragraphs for every situation*. New York: Prentice Hall Press. <http://mcgill.worldcat.org/oclc/233549465>
- Mack, K., & Skjei, E. W. (1979). *Overcoming writing blocks*. Los Angeles: J.P. Tarcher. <http://mcgill.worldcat.org/oclc/5510812>

References

- ¹ Career Readiness Defined. NACE. (2014).
- ² 2013 Campus Recruitment Educator Summary. Smith, P. (2013).
- ³ Vitae Researcher Development Framework (RDF) 2011.
- ⁴ [Cognitive forcing strategies in clinical decisionmaking. Croskerry, P. \(2003\).](#)
- ⁵ Asking the right questions : a guide to critical thinking. Browne, M.N. (2011).
- ⁶ Asking the right questions : a guide to critical thinking. Browne, M.N. (2011).
- ⁷ Targeted Competencies in Graduate Programs. ADESAQ (2015).
- ⁸ Teaching critical thinking. Holmes, N.G. (2015).
- ⁹ Teaching critical thinking. Holmes, N.G. (2015).
- ¹⁰ Critical Reading Towards Critical Writing. University of Toronto.
- ¹¹ 5 strategies to grow critical thinking skills. Wiley, S. (2015).
- ¹² 5 strategies to grow critical thinking skills. Wiley, S. (2015).
- ¹³ 5 strategies to grow critical thinking skills. Wiley, S. (2015).
- ¹⁴ 5 strategies to grow critical thinking skills. Wiley, S. (2015).
- ¹⁵ Positionality. Sanchez, L. (2010).