**OBJECTIVES:** Grice’s Maxim of Quantity (1975) says cooperative speakers should give no more and no less information than needed. In practice, people only partly align with this principle. When they do not, two opposite tendencies emerge: over-informativeness (adding unnecessary information) and under-informativeness (choosing a relevant but less precise word). Those tendencies have been extensively studied, yet mostly in separate literatures (Engelhardt et al., 2006; Koranda & Zettersten, 2022). Across studies, we observe that how much speakers choose to say depends not only on what is necessary but also on what it costs to say. Over-informativeness usually involves adding unnecessary information that is typically easy to retrieve and harmless for comprehension (e.g., saying “the red apple” instead of “apple” when only one is present or repeating a referent’s name when a pronoun would suffice). Under-informativeness, by contrast, reflects a “good enough” strategy. Speakers default to an easier option when the cost of finding a more precise word is high, especially when there is no immediate pressure from a listener (e.g., saying “bat” when referring to an animal bat in the presence of a baseball bat). We propose a unifying account in which these opposing tendencies are two directions of the same cost-sensitive process balancing the ease of production with the cognitive cost of precision. This account is grounded in the resource-rational framework, which models human decisions as rational use of limited cognitive resources (Lieder & Griffiths, 2020). On this view, people use language efficiently, not perfectly. Notably, those tendencies appear to be amplified in bilingual adults, who face increased cognitive demands from managing multiple language systems. Our prior work shows that speakers immersed in a foreign language environment tend to use more redundant or under-informative expressions depending on contexts, compared to monolinguals. This further supports our account and offers a nature test case for how people continue to adapt to new language environment. We aim to take this further by asking how real-time interaction with a partner (i.e. pragmatic pressure) reweights the balance between effort and precision in language use, relative to individual production. In joint work as communication, each partner adjusts their effort given what they expect the other to do, leading to a natural division of labour between speaker and listener: sometimes the speaker spends extra effort, and sometimes the listener carries more of the inferential load (Hawkins et al.,2022). Thus, we specifically ask: Do speakers reduce redundancy (i.e. potentially tolerate more ambiguity) when they know a partner can help resolve it together? (2) Do speakers increase informativeness when the task is difficult and the pressure to support listener comprehension is high? These questions focus on the flexible adaption of effort and clarity in real-time communication. But a deeper issue concerns cognitive foundations of this flexibility. Our third question asks: Do speakers’ strategies draw on a domain-general capability to manage limited cognitive resources, extending beyond language use? For each of these questions, we also ask how bilingual experience modulates speakers’ sensitivity to communicative needs and production effort under sustained resource pressure.

**CHALLENGES:** The main challenges of this project are measurement quality and control. Webcam eye-tracking are noisier and more sensitive to head movement and devices. We will set clear calibration standards and exclusion rules and re-calibrate frequently during the task to ensure accuracy. Second, we need to ensure our manipulations truly change cue informativeness and costs. We will do norming studies for tasks in human language.

**METHODOLOGIES:** Our method has three modules. The first two are behavioural. In Module 1 (RQ1-2), we run two language-production tasks, targeting the two tendencies, respectively. Module 2 (RQ3) adds an artificial language task that gives clean control of informativeness and retrieval cost, and a matched non-linguistic analogue to test whether the strategies generalize beyond language. We recruit monolinguals and bilinguals to explore the role of bilingual experience in resource-rational adaptation. All behavioural tasks use a director-matcher setup in the visual world paradigm (i.e. images) in three blocks: individual (baseline)-interaction with a partner-individual (post-interaction). On each trial, the speaker guides the listener through two choices about the same objects. Stage 1 (pair selection): pick a target pair from three; Stage 2 (target selection): within the chosen pair, pick one. This design allows us, within a single trial, to flip cue informativeness (helpful vs redundant) and vary retrieval cost to investigate over- and under-informativeness across individual and interactive settings. The visual world paradigm allows to incorporate online eye-tracking (e.g., WebGazer) to track real-time gaze from both speakers and listeners. Module 3 develops computational models based on current modelling framework (e.g. the Rational Speech Act and resource-rational modelling) to formalize the cost-benefit trade-off to account for over- and under-informativeness in language use and measure how interaction and bilingual experience reweights this trade-off.

**OUTPUTS:** We will present our findings at major conferences and publish papers in high-impact journals. We will share all experimental code (web-based tasks and dual-webcam eye-tracking setup), modelling code, analysis code, and data collected during the project on open repositories (e.g., GitHub) to maximise reproducibility and support reuse.

**IMPACT&BENEFICIARIES:** By studying two linguistic phenomena (i.e. over- and under-informativeness), this project sheds new and important light on how we explain everyday language use and communication. We frame the work within resource-rational analysis, testing its explanatory power and extending it to interaction setting. Bilinguals offer a unique window onto flexible adaptation in resource allocation. We formalize these mechanisms and introduce one the first formal computational models for bilingual communication, an area still under-explored. In doing so, we both advance linguistic theory and use language as a probe of human rationality. This project directly benefits research in psycholinguistics, cognitive science, and bilingualism. Practically, it may also inform the design and evaluation of AI language tools to be more efficient and human-like, not just accurate.