

Nora Wollen

University of Pennsylvania

Talking with AI: Computational & Communication Approaches

O'Donnell

14 May 2024

## Exploring Ingroup and Outgroup Dynamics: Can an LLM be Programmed to Transition from the Outgroup to the Ingroup?

In sixth grade, my friend Maia begged me to join the cross-country team. Maia ran with her mom all summer and was eager to become a competitive runner. I, on the other hand, had no experience or interest in competitive running. I reluctantly agreed to go to practice on the first day of middle school. My first cross-country practice was rough. I switched between running two blocks and walking one. However, as the season progressed and I got more in shape, I began to enjoy it. By the time I entered high school, I had developed a love for the sport. The combination of competitive drive it gave me, along with the people I bonded with made the sport fun. Currently, I am a rising senior in college running competitively and loving every step of the way. I often find myself asking the question of how my identity would differ if I never signed up to join the team in middle school. How would this piece that has been a big part of my life for so long affect the type of people I interact with or influence my quality of life? Being a part of the competitive running community has ingrained characteristics in me that contribute significantly to my sense of self and belonging within the group.

In modern-day society, running has evolved from simply a physical activity into a background of your identity. Beyond the athletic competition that is associated with running, it has developed into a lifestyle choice with various implications. Runners embody a lifestyle of determination and discipline whether towards certain goals or regarding a healthy lifestyle. Running as a behavior indicates a range of activities and characteristics that you are automatically affiliated with. In my high school, there was always a correlation between kids who run and kids who get good grades. This crossover, while athletics and academics are on opposite ends of the spectrum, occurs because of the elements of running that become part of your identity. The same discipline that you carry towards getting out the door every day even when you don't want to is applied to discipline with school. Running can be a multifaceted expression that can communicate characteristics about yourself. Running can articulate what type of person you are, what you stand for, and what group you are a part of.

Ingroup and outgroup communication differ largely in the way that they operate. Ingroup communication functions by maintaining norms and enhancing cohesion, while outgroup communication leads by perpetuating stereotypes. Social identity theory represents the varying ways individuals express and categorize themselves as part of their greater social identity (Hogg, 2006). This theory suggests that when an ingroup behavior is established, individuals work to maintain the characteristics that embody them and those that they hold dearly. Ingroup members communicate in a manner that maintains group norms and practices, whether that pertains to fitness level, adherence to training schedules, or completing a run without the coach watching. Ingroup communication is typically adopted by those of the group and acts as a medium to transmit values and traditions throughout the group. This type of communication helps to

maintain a steady team culture across generations as new classes of runners get recruited annually.

Conversely, outgroup communication functions by recognizing preconceived boundaries, stereotyping, and comparative aspects. Categorization of ingroups and outgroups automatically establishes boundaries and predetermined notions. Such generalizations often stem from the utilization of linguistic symbols, colloquial phrases, and stereotypes to represent distinct groups. Language can act as a device to create a barrier between “us and them,” where people exhibit characteristics to hint at their identity and what group they belong to (Gaudet & Clément, 2009). Consequently, when one does not belong to the group, distinguishing the difference among members of that group becomes increasingly challenging, as it is far more difficult to individualize. For example, as someone who is removed from the group of lacrosse players, it is hard to identify the unique characteristics that make up this group, therefore reinforcing a lack of difference among lacrosse players from my point of view. This disparity in communication between ingroups and outgroups displays the significance of familiarity with common language, which significantly influences group cohesion.

Within ingroup settings, commutative, linguistic symbols such as colloquial phrases are often relied on to offer a feeling of belonging (Giles, 2013). Shared experiences in workouts, easy runs, races, lifts, and practice, facilitates interpersonal connection and strengthens group cohesion. Members of an ingroup use common language, inside jokes, and slang help to strengthen group cohesion and create a feeling of belonging and shared identity. Various colloquial phrases are often inspired by emotions and feelings related to a shared group experience. These words or phrases allow individuals to resonate with others who understand the context and bring the group closer. For instance, when my teammates and I talk about “rigging,”

we all bond over the shared experience of working hard in the last one hundred meters of a race. Other phrases such as “one-stepping,” “sandbagging,” and “buns” are examples of the common language used within the ingroup of running. Group identity is further solidified as members of the ingroup spend increasing amounts of time together. In my experience, the more time I spend with my teammates, the more words, phrases, and traits I pick up from them.

To explore how LLMs can effectively assimilate into the ingroup dynamics of my track team, particularly in interactions with coaches, teammates, and trainers, I began by reflecting on my own journey as if I were an LLM. As I analyzed my experiences and interactions within the team, I realized that, much like an LLM, I required exposure and training to understand how to navigate the nuances of ingroup communication. Just as I needed guidance and immersion in the culture of running to become part of the ingroup, an LLM would require similar training to engage naturally in various situations. This includes familiarizing the LLM with specific terminology, understanding popular slang, acquiring knowledge of the sport, and learning about strategies for injury prevention and performance enhancement. Essentially, I must approach the training of an LLM as if it were my own journey of transitioning from the outgroup to the ingroup within the context of running.

This led me to question the similarities in LLM learning compared to me as a runner. Can we teach an LLM the framing used to converse naturally in different track situations? With teammates, a coach, and trainers? Can LLMs follow this same model of going from an outgroup to an ingroup through time learning behaviors, banter, and conversation, or does the LLM fail to be in the ingroup because it is not human and can’t physically experience training? These are the questions I looked to answer when prompting ChatGPT.

To dive deeper into the complexities of teaching an LLM to communicate within an ingroup, it's crucial to point out the challenges ingrained in this process. Firstly, context is crucial in understanding and interpreting language within a specific group. An LLM must grasp the nuances of situational context to engage in meaningful communication. Secondly, language is dynamic and constantly evolving, with new slang and expressions emerging over time. An LLM must adapt to these changes to remain relevant and effective in its communication. Most importantly, a chatbot is vague when communicating. Oftentimes, even with a specific prompt, the tendency is to broaden the subject. LLMs may never truly understand how to replicate natural behaviors and communicative methods by an ingroup. My goal is to bridge the gap between humans and artificial intelligence by determining how far an LLM can be challenged to navigate the complexities of ingroup communication as well as be able to replicate behaviors and communication patterns.

To understand how LLMs can be trained to replicate the nuanced language and behaviors shown between athletes and athlete to trainer, I wanted to ask ChatGPT what it thinks on transitioning from the outgroup to the ingroup. After much practice communicating with ChatGPT, I know that my prompts must be very clear and context heavy in order to get Chat to generate responses that are most replicable to a natural response from one of my teammates or coaches. I asked ChatGPT, “Can LLMs effectively navigate the complexities of ingroup communication, or are there inherent limitations to their understanding and adaptation?” ChatGPT’s response was interesting, explaining that “ingroup communication often involves implicit understandings, shared experiences, and non-verbal cues that contribute to the cohesion and identity of the group. LLMs may struggle to grasp the subtle nuances and implicit meanings embedded within ingroup communication, leading to misunderstandings or misinterpretations of

dialogue.” Keeping this in mind, I then fed Chat with a list of as many phrases and terms I could think of between athletes and coaches. This list can be seen here:

Coach →

- A & B Skips: Referring to a warm up drill
- Hurdles: Referring to drills over hurdles for athletes to stretch out their hips
- Body weight: Referring to a body weight exercise circuit that athletes repeat twice a week, after running
- Vo2 Max: Used to measure fitness, capacity of oxygen a person can intake in exercise
- T-Pace: Referring to “threshold pace,” where heart rate is at 175-190 BPM
- M-Pace: Referring to “marathon pace,” where heart rate is at 160-175 BPM
- Premeet: Consists of a short easy run, one 400m threshold pace rep, and 3X200m at mile pace. Completed a day before a race
- Athletic monday: Consists of short easy run, sprinting mechanics, hurdles, plyometrics, and bodyweight circuit, completed every Monday
- Big Q little q: Referring to qualifications for the final at a track meet, where “big Q” is automatic qualifier and “little q” is time qualifier
- Medium Long Run: Referring to a medium length mileage run on Wednesday after Tuesday’s workout

I then prompted it to act as my coach when I have a race tomorrow. What should I do today?

Chat responded, “As your coach, I recommend dedicating today to a well-rounded preparation for tomorrow's race. Begin your day with a light cardiovascular session, such as a short, easy run

of about 20-30 minutes. Then, engage in dynamic stretching exercises. Throughout the day, prioritize proper hydration by drinking plenty of water and maintaining a balanced diet rich in carbohydrates for energy, lean proteins for muscle repair, and healthy fats for sustained energy.”

Chat completely disregarded the information I fed it for the “premeet,” which is the term my coach would tell me to do the day before a race. I tried a different scenario, prompting Chat, “Using the list given, craft a training week for me, as your athlete.” ChatGPT responded, “As your coach, I've tailored a training week to optimize your performance, incorporating the key training terms and exercises you provided. On Monday, we'll kick off with an Athletic Monday session, focusing on sprinting mechanics, hurdle drills, plyometrics, and a bodyweight circuit. Tuesday will feature a VO2 Max Workout, consisting of interval training at your VO2 max pace. Wednesday's schedule includes a Medium Long Run to build endurance, followed by a Race Preparation routine on Thursday, incorporating short, easy runs and race-specific drills. Friday will be dedicated to a Pre-Race Tune-Up, with a focus on visualization techniques and a pre-race workout. Saturday is designated for rest and recovery, allowing your body to recuperate before Sunday's race day.” I was pleasantly surprised this time, as ChatGPT was able to provide a training week that is fairly similar to mine. The difference is that I would never have a rest day leading up to a race (Sunday in this example). My plan in this case would consist of having premeet the day before a race, with an easy run two days out, and a workout three days before the race. It is also important to note that even after prompting Chat with multiple terms that my coach uses daily, Chat was still unable to communicate a natural tone as a coach. It sounded quite robotic, and as if Chat as a coach did not fully grasp the intention behind each day of a runner’s training. Reflecting on the limitations encountered in coaching scenarios, it becomes

apparent that while ChatGPT can provide structured training plans, it struggles to replicate the nuanced communication and personalized guidance that a human coach offers.

Despite being fed with specific terms and phrases used by my coach, Chat's responses lacked a natural tone. This prompts me to explore whether ChatGPT can better emulate the conversational style and camaraderie shown between me and my teammates. Transitioning from the coach's perspective to that of a teammate, I aimed to understand how ChatGPT would interpret and respond to the banter, slang, and camaraderie shared within the close-knit dynamics of our track team. I expected this to be more difficult, mostly because a coach can oftentimes be robotic and reflect straight forward conversation, while conversation between athletes is very natural and casual. I first fed ChatGPT with a list of phrases my teammates and I often refer to:

Athlete →

- “Warming up the tibs' ' refers to warming up the lower legs (specifically tibia bones) so they feel good. This helps prevent shin splints
- “Buns” refer to the racing shorts women wear
- “Hollywood” refers to when a teammate is acting “too cool” for the group, used as a joke
- “Sandbagging” refers to making excuses and downplaying, you aren't trying, used as a joke
- “One stepping” refers to when a runner is running at the same pace, just one step ahead, has negative connotations
- “Workout warrier” refers to when one races workouts, but can't perform at that same level



- “Lactic bomb” refers to during a race when a runner goes lactic and struggles to breathe, can’t pick up their legs, and begins to unintentionally decrease speed
- “Rigging” refers to the end of a race when one is struggling to pick up their legs and is stiff

After giving ChatGPT these terms that athletes use while talking amongst themselves, it was time to prompt Chat to act as a fellow teammate. After learning from how specific I need to be when prompting Chat to act as a coach, I focused on being as detailed as possible. I prompted Chat, “Imagine you are my teammate, and you are joking about a different teammate who overruns workouts and recently had a tough race. Using the terms that I utilize amongst my teammates, act as if you are in the group. What would you say?” ChatGPT remarked, "Looks like Hollywood decided to go full 'Lactic Bomb' mode in that race. Maybe we should warm up the 'buns' extra tomorrow to avoid a 'rigging' replay!" Although Chat clearly used multiple terms in this sentence, it made no sense. There were too many reference terms and the sentence essentially became Arthur confusing. I tried again, prompting Chat, “Using some of the terms provided, select a few that would be used in this situation. Act as one of my teammates before a race.” Chat responded, "Looks like someone's gearing up for a lactic bomb today, better warm up those buns and avoid rigging at the finish line!" I was pleasantly surprised. This response had humor and made some sense. To translate, this would mean something like “Looks like someone is getting ready to work really hard today, better get ready and avoid losing all energy before finishing the race!” To make this sentence more natural, I would replace “buns” with “tibs” because buns refer to the uniform, and it makes more sense to warm up the lower legs.

Overall, I am surprised that ChatGPT had more of an ability to replicate the behaviors and exchanges between teammates than the coach. While ChatGPT demonstrated a better grasp of the casual banter and camaraderie among teammates compared to its performance as a coach, there is still room for improvement. Chat's responses did much better between teammates, but still clearly lacked context and understanding. This leads me to believe that even after fine tuning and working to give detailed prompts to an LLM, its behavior will never reach a natural level in the ingroup. However, there is a possibility that with further refinement and training, LLMs could potentially adapt to navigating the complexities of ingroup communication among teammates and coaches, however, I predict that this would take a substantial amount of training, contextual information. I suppose an interesting solution could be to train the LLM daily of what conversations look like day to day.

Similar to when I was just beginning track, I did not know many terms. I started off in the outgroup, and through daily experiences, I slowly became one with the culture and camaraderie behind running track and cross-country. Much like the LLM, I was once new to the words used between teammates. This past year, coming to a new school with new people, behaviors, personalities, and inside jokes, I was once a clueless LLM trying to train into being in the ingroup. Reflecting on this journey underscores the potential for LLMs to evolve and adapt within the context of ingroup communication. While their current limitations are evident, continued efforts to refine their training methods and enhance their contextual understanding hold promise for their integration into complex social dynamics, both in sports teams and broader societal contexts. Through refinement, detailed prompts, and regular training, advancing a LLM's ability to replicate human behaviors and conversations becomes increasingly possible.