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COGNITIVE DIVERSITY IN ASSET MANAGEMENT

The power of diverse thinking: How the best teams make decisions.

By Professor Alex Edmans FBA FAcSS

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"The Diversity Project commissioned this work to reassess the 'business case' for diversity. We made it clear at the outset that we wanted to see what the evidence showed, not work backwards from any conclusion we hoped to see. The conclusions are both intuitive and compelling: diversity must be developed thoughtfully and managed well to harness its powerful benefits. As the report highlights, great investment involves pursuing outlier ideas, so firms must create the right teams working in the right conditions for those ideas to surface. I hope this research will unify those on opposite sides of the DEI debate so we can all focus on delivering the best client outcomes."

Baroness Helena Morrissey, Chair of the Diversity Project

"Before conducting this research, I thought that cognitive diversity was unambiguously beneficial – surely, diverse viewpoints lead to better decisions. But the scientific evidence and practitioner insights highlighted that it's more complex. While cognitive diversity can indeed generate substantial benefits, it is also difficult to manage and must be supported by psychological safety and a culture of inclusion. These challenges only heighten its importance: since it is tricky to get right, any organisation that succeeds will enjoy a significant competitive advantage. I hope this report helps firms do exactly that – in asset management and beyond."

Professor Alex Edmans

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CONTENTS

1. EXECUTIVE SUMMARY

Cognitive Diversity is the range of expertise, experiences, information, perspectives, preferences, and ways of thinking within a team. It can arise from differences in educational background, professional background, life background, cognitive style, personality, and demographics.

- **Academic research highlights two main channels through which cognitive diversity can improve team performance.**

- *Generation of ideas.* A cognitively diverse team has a broader range of knowledge and viewpoints. Novel perspectives both are individually valuable and enhance the value of other perspectives through synergies. Generation involves not only new ideas but also challenges to ideas, and a more cognitively diverse team is better equipped to notice blind spots and combat the biases of individual members.

- *Sharing of ideas.* It is insufficient for ideas to be generated; they must be shared. Groupthink arises if there is pressure to reinforce the group's view to signal that you fit in. In a cognitively diverse team, members are already aware of their differences so there is less pressure to conform: a colleague with a non-traditional background is already expected to have a different perspective. Moreover, groupthink can arise even if there is no stigma to sharing a different view. A member may suppress a concern thinking that, if it were important, someone else would have raised it: thus, nobody leaves the room even though everyone smells smoke. In a cognitively diverse team, a colleague is aware that only she may have the expertise to notice an issue, and thus raises it.

- **Academic research also highlights two main channels through which cognitive diversity can worsen team performance.**

- *Coordination.* While cognitive diversity may lead to more information being produced and shared, it may also hinder a team's ability to use this information because members "speak different languages". An analyst with a quantitative background may not fully appreciate the value of a qualitative analysis; colleagues may use different valuation techniques. Differences in personality or cognitive style may also hinder coordination; for example, if some members express critiques bluntly and others in a more nuanced manner.

- *Affinity.* Individuals enjoy interacting with others with similar backgrounds, or "like-minded" people with similar values – known as homophily. In addition to directly affecting satisfaction and thus performance at work, this may also affect generation and sharing. Colleagues may be more open to ideas generated by their own "ingroup" than an "outgroup", and may be willing to debate freely with people they have strong ties with because they know that the ties are strong enough to withstand any disagreement.

- **While demographic and cognitive diversity are often seen as different, there are important overlaps:**

- **Demographic diversity may be a source of cognitive diversity.** Different nationalities may have different backgrounds, men and women may have different cognitive styles, and different age cohorts may have experienced different economic conditions and thus have varying risk appetites.

- **Demographic diversity can lead to increased sharing of ideas even if it is not associated with cognitive diversity.** A demographic minority may have fewer social ties with the rest of the group, and thus be more willing to express a different view.

- **Demographic diversity can lead to reduced affinity even if it is not associated with cognitive diversity.** Colleagues may be more comfortable interacting with others with similar demographic characteristics, and place greater weight on their contributions.

- **The scientific evidence on the effects of cognitive diversity is very mixed.** A few papers find a positive correlation with performance, but just as many find a negative correlation. Most papers find no correlation at all, or contrasting results depending on the measure of performance used.

- **These mixed results do not mean that cognitive diversity is irrelevant.** Rather, it needs to be managed in a way that harnesses the benefits and mitigates the costs, in contrast to an "add diversity and stir" approach. By analogy, the average active asset manager does not beat the market, but this does not mean that approaches to active asset management are irrelevant.

- **Stronger evidence arises when decomposing cognitive diversity into different dimensions.** Skill-based diversity, arising from educational and professional backgrounds, has the most positive correlation with performance although the results still remain mixed. There is no consistent correlation (positive or negative) with demographic or cognitive style diversity, although the cognitive styles studied by academic research may be more relevant to other fields (such as engineering and design) than asset management.

- **The strongest evidence arises when studying the link between cognitive diversity and performance not in general, but in particular settings.** Cognitive diversity is particularly positively correlated with performance where psychological safety is high: in inclusive environments where team members feel comfortable sharing their perspectives. The link is also stronger in tasks that involve idea generation rather than coordination or execution; that feature more interactions between colleagues; and that are more complex, varied, or novel.

- **Interviews with practitioners confirmed that the findings of academic research, conducted in broader settings, generally apply to the asset management industry.** Cognitive diversity has costs as well as benefits; if anything, the benefits and costs may be even stronger in asset management than in other industries.

- **According to practitioners, the benefits of diversity include a broader range of information and a greater set of perspectives on a given piece of information.** This is particularly relevant in investing, where the range of information that may be relevant is almost limitless, and uncertainty is high so there are many ways to interpret information. In addition, active managers can only create value if they have views that depart from the market's, which requires them to have different information or to interpret it differently.

- Respondents viewed cognitive diversity as even more important in equities than fixed income, as uncertainty is usually greater and there are fewer valuation anchors.

- **Practitioners also remarked that diversity (either cognitive or demographic) is a by-product of meritocracy.** It results from hiring people with the greatest potential to contribute to the team, irrespective of their cognitive style and demographic characteristics, and then ensuring they are fully included in the organisation. Thus, diversity can be a signal of meritocracy. However, they warned against pursuing demographic diversity or certain types of cognitive diversity (for which there is no link to performance) as an end in itself.

- **Interviewees viewed skills diversity as important, which may stem from industry expertise, country expertise, or professional experience.** In addition to allowing for a greater range of perspectives on an investment, colleagues with less expertise on a topic have licence to ask simple questions – which often end up uncovering complexities. Respondents had a more positive view of cognitive style diversity than the mixed results found by academic research, perhaps because the dimensions studied by research (e.g. whether you are a verbaliser or visualiser) are less relevant to asset management. Relevant cognitive styles include being optimistic vs. pessimistic, risk averse vs. risk tolerant, quantitative vs. qualitative, extrovert vs. introvert, detail-level vs. high-level, contrarian vs. consensus-oriented, long-term vs. short-term, and conservative vs. liberal.

- **One additional benefit of cognitive diversity, expressed by practitioners but not found by the academic research, is alignment with external stakeholders, in particular investee companies and clients.** Cognitive diversity gives an asset manager more "cards in the hand", so that it has the right card to play at a particular time. It may have a tech-oriented colleague who will bond with a tech entrepreneur, or a team member from a particular country who is best able to serve a client in that country.

- **Practitioners viewed the costs of cognitive diversity, documented by academic research, to be important in asset management.** Skills diversity can lead to coordination problems as colleagues misunderstand each other, or fail to fully appreciate the value of each other's analysis. In addition, cognitive diversity can often be incorrectly implemented: it should not mean that "anything goes", or that people cannot criticise their colleagues' ideas – merely that being criticised does not lead to a negative stigma. If all views are taken seriously regardless of expertise, and every member is encouraged to contribute equally, this results in both slow and poor decisions: the analogue of "diworsification" in a portfolio. Excessively large meetings can lead to regression to the mean, while great investment is about pursuing outlier ideas.

- **Diversity in non-skills dimensions can lead to management challenges.** Colleagues may have different communication styles, with some preferring to express themselves in writing rather than thinking on their feet in meetings, or some voicing their views more bluntly than others. Outspoken personalities may not fit conservative firms, while quieter colleagues may be overlooked in a culture where it is routine to talk about one's successes. Colleagues may have different values on what constitutes a reasonable amount of work, or whether they should be expected to work during evenings and weekends. Different socioeconomic backgrounds may dissuade "privileged" individuals from criticising the ideas of colleagues for fear of being viewed as non-inclusive in the current HR environment.

- **Interviewees also agreed that shared backgrounds lead to greater affinity, and that similarities in communication styles and cultures reduce friction.** However, some argued that affinity can be achieved by the organisation having a clear purpose, and frictions reduced through clear expectations of behaviours.

- **One additional cost of cognitive diversity not found by the academic research is that it can weaken an asset manager's identity.** Some firms are known for a particular investment style due to their homogeneity. Clients have more diverse investment opportunities if each asset manager has a distinct identity: diversity in the asset management industry does not require each asset management firm to be diverse. In addition, if cognitive diversity means that all employees can "be themselves", such as focusing on financial modelling and not developing oral communication skills, this can be at the expense of excellence.

- **Practitioners believed that inclusion is even more important than diversity.** Without inclusion, cognitive diversity may have a negative effect as colleagues with different viewpoints have to bury them. While the common acronym is DEI, and some are using EDI, both put inclusion last when it should be first.

- **In addition to the similarity between practitioner views and academic research, there was also similarity between different practitioners on "what good looks like".** However, there was considerable heterogeneity in how effective companies are in achieving cognitive diversity and inclusion. This was particularly expressed by junior professionals. Thus, asset managers who can manage these issues effectively may obtain a significant competitive advantage.

- **Participants identified several barriers to cognitive diversity.** The risk-reward trade-off is asymmetric: the benefit of sharing a contrarian view and having it taken seriously is viewed as less than the cost of being told that you are wrong. Lateral hires in particular reported pressures to conform for fear of being viewed as "not the right fit" and an unwise hire. Portfolio managers' reputations are built by being right, and so some are unwilling to be challenged: winning the argument is sometimes more important than reaching the right decision. This is especially the case in large meetings where seniors may be reluctant to admit that they had missed a particular perspective, and in "star PM" cultures where particular seniors are viewed as omniscient.

- **Given the abundance of both benefits and costs of cognitive diversity, and the mixed evidence on the link between cognitive diversity and performance, leadership is particularly important to ensure the benefits of cognitive diversity outweigh the costs.**

- **Practitioners argued that leaders need to set clear expectations about how much they value different opinions, and match these statements with actions – both encouraging and rewarding dissent.** They should lead by example and role model the behaviours they ask from their direct reports, such as being willing to challenge constructively their own superiors. By tailoring the way they communicate with individual team members, leaders demonstrate that they recognise differences in cognitive style. They can share their own failures to highlight the importance of challenging them, and view failures by their team as learning opportunities. One-on-one meetings encourage juniors to contradict them as they are less worried about being wrong in front of a large audience; seniors are more willing to admit they missed the junior's consideration if there is no large audience. Social interactions help juniors to view seniors as colleagues rather than bosses and thus be more willing to question them, although care should be taken to ensure that such interactions are inclusive to all staff.

- **Turning from behaviours to processes, managers should tailor the amount of cognitive diversity assigned to a task or present in a meeting.** Some tasks concern execution rather than innovation; as one interviewee stressed, "not every meeting is a strategy meeting". Assigning analysts with different backgrounds to the same stock can foster a diversity of perspectives, while establishing common frameworks through which to express their perspectives facilitates coordination. If leaders state the underlying assumptions behind an opinion (rather than appealing to their "experience"), and require colleagues to do so as well, this makes it easier for juniors to express different viewpoints as they can grapple with the assumptions.

- **Several interviewees stressed that the way meetings are run has a significant effect on the cognitive diversity that surfaces.** A surprising number of meetings have no chair or agenda, but are "get-togethers" to discuss a topic which end up being dominated by a few individuals. Similar to stating assumptions, structures help colleagues know when they can contribute. If the chair speaks first, this often leads to anchoring; alternatives are to begin with juniors, more reticent colleagues, or subject matter experts. Holding votes is useful to aggregate views and avoid the "false consensus effect" where chairs believe consensus is reached because dissenters have not expressed their concerns. Non-verbal cues and body language are particularly important when someone is sharing a contrarian view. Scaffolding by asking simple questions can ensure that a presenter who knows a stock in depth does not skip basic steps that others are unaware of.

- **However, inclusive chairing does not mean that everybody should have equal airtime, or that every concern needs to have equal weight.** The chair should discern which points to discuss in most detail, which voices to particularly hear from, and when to move on. Similarly, there were different views as to the optimal attendee list for a meeting. Some believe that a broad list gives more people the opportunity to contribute and increases the likelihood of different perspectives. Others remarked that large meetings lead to regression to the mean, and only invite those who they expect to make significant contributions (unless included for the explicit purpose of learning); those who regularly do not speak are not included in future meetings.

- **Nearly all practitioners said it is very difficult to identify cognitive diversity at the recruitment stage (outside of an applicant's background).** Instead, they stressed the importance of hiring the best people, which requires being unbiased (such as not undervaluing demographic minorities) and ignoring less relevant information (such as being swayed by the charm of a candidate for a non-sales role). Several respondents argued that, rather than recruiting for cognitive diversity (which is hard to assess), they evaluate intellectual curiosity, the willingness to learn from failures, and the ability to form an opinion and express it.

- This view is consistent with a review of popular personality tests (such as Myers-Briggs), which found that they are either not backed up by scientific evidence or not applicable to asset management.

- **Interviewees also identified practices that may reduce cognitive diversity.** One is forced approaches to demographic diversity, which increases ingroup/outgroup distinctions and reduces people to their demographic characteristics, underweighting their cognitive attributes. Another is taking public stances on issues, sometimes due to engaging in "people pleasing" behaviour to vocal clients, which deters employees from expressing different views on these issues. Holding side-meetings before the main meeting can lead to the subgroup already making up its mind and viewing other members as an "outgroup". Default positions, such as starting a stock note with the analyst's recommendation, can lead to readers anchoring on that view.

2. WHAT IS COGNITIVE DIVERSITY?

Cognitive Diversity is the range of expertise, experiences, information, perspectives, preferences, and ways of thinking within a team. It can arise from a number of sources[1]:

- **Educational background**
  This can stem from subject concentration (arts, humanities, or sciences), educational type (academic, vocational, or on-the-job), and educational style (traditional or Montessori; country of schooling).[2]

- **Professional background**
  The most relevant component is "functional background": the specific roles that an employee has played in his/her career. One source of differences is asset management versus other finance careers (e.g. asset owner, investment consultant, banker) and non-finance careers (e.g. corporate, media, NGO). Within asset management, experience can be in public equities, private equities, fixed income, real estate, or other asset classes; as a fund manager, analyst, stewardship professional, or sales executive; or for a fund that is predominantly passive or active, fundamental or quantitative, or traditional or sustainable.

  Other differences include the geographies, industries, economic conditions, or corporate cultures that an employee has worked in.

- **Cognitive style / personality type**
  There are a range of different ways to categorise cognitive style and personality type. Examples include (see Appendix A for a fuller list):

  - The Myers-Briggs Type Indicator. This contains four dimensions: extroversion-introversion, sensing-intuition, thinking-feeling, judging-perceiving.
  - The Insights Discovery Wheel. This uses four colours to categorise different personalities.
  - The Verbaliser-Visualiser spectrum: whether you prefer to explain something verbally or visually.
  - The Adaptive-Innovative spectrum: whether you prefer incremental, structured approaches or broad, unstructured approaches to solving problems.

  However, the validity of some of these measures has been significantly questioned; others may not be as relevant to asset management (for example, visualisation may be more applicable to engineers).

  For asset management, more relevant dimensions include optimism vs. pessimism, preferences for analysing quantitative vs. qualitative information, preferences for discussing investment ideas synchronously in meetings or asynchronously by email, and risk appetite.

- **Values**
  Typically, "values" are interpreted as moral values that are unrelated to work – for example, differences in political or religious beliefs. Such diversity can create conflict, or on occasion broaden perspectives.

  However, values can be work-related and affect how employees view a company's goals: for example, whether a product's design should focus on aesthetics, functionality, or durability. It may seem that this does not apply to asset management, as there is a clear goal of investment returns. However, employees may interpret this goal differently: the horizon of the return (long-term vs. short-term); whether the return should be absolute or relative (and, if the latter, to the benchmark or to your main competitors); and whether the goal should be to maximise expected return or minimise downside risk. Moreover, some may believe that the asset manager should have goals other than returns, such as assets

1. Many studies use "cognitive diversity" to refer exclusively to diversity in cognitive style, and "work group diversity" to include diversity from other sources, such as educational and professional background. We adopt a broader definition of diversity as our goal is to understand whether asset managers benefit from a wider range of perspectives, regardless of where they come from.
2. Throughout this report, we will give examples of different types of cognitive diversity. They are intended only to be examples rather than exclusive. For example, there are educational styles other than traditional and Montessori, and other aspects of a person's educational background than subject concentration, educational type, and educational style.

under management, fees, profits (fees net of costs), third-party ratings, awards, or societal impact. Even if an asset manager has a clear statement of its purpose, asset managers do not make decisions; people do – and people will be at least partially affected by their values. A risk-averse colleague will be concerned about downside protection, whatever the company's purpose statement is.

Another reason why values matter in asset management is that they affect the companies you wish to invest in. Someone may view it as unethical to invest in a weapons manufacturer, irrespective of its return potential. Even if the asset manager's exclusion policy allows investment in such a firm, a fund manager may still not invest.

- **Demographics**
  Demographic diversity is often considered to be separate from cognitive diversity, yet it can be a source of the latter. Age can affect people's views of the world: younger people might uncritically accept new technology while older people might be overly sceptical; people who grew up in economic downturns may be more risk averse.[3] Men and women may have different personality traits; people may have different lived experiences depending on their race, socioeconomic status, or the country of origin.

- **Life Background**
  People's perspectives, preferences, and ways of thinking may arise from their life experiences beyond their demographic characteristics, such as having experienced setbacks (and, in some cases, overcome them). Similarly, their educational background may comprise not only formal education, but also informal education from their parents, family members and friends.

A common view is that cognitive diversity is unambiguously beneficial because it leads to a greater set of ideas and viewpoints. This has been popularised in books such as *Rebel Ideas*[4] and *The Wisdom of Crowds*[5], and the main business case for demographic diversity is that it increases cognitive diversity.[6] Indeed, a frequent criticism of demographic diversity initiatives is that demographic diversity is a poor proxy for cognitive diversity, and that it is cognitive diversity that matters. While there are many opponents of demographic diversity (particularly in the US), very few people openly object to cognitive diversity; to do so would be seen as favouring narrow-mindedness.

However, simply by defining cognitive diversity – even before we explore the scientific evidence and practitioner insights – we can see that this view is too simplistic. First, cognitive diversity may encapsulate many different dimensions (e.g. educational background vs. values). These dimensions may have quite different effects on business performance, in contrast to the common approach of lumping all aspects of cognitive diversity together. Second, cognitive diversity may have costs as well as benefits: it can lead to conflict, the pursuit of different goals, or difficulties in communicating with colleagues due to "speaking different languages". Antonyms for diversity include "congruence" and "alignment", which are often seen as beneficial.

This report argues that cognitive diversity, properly implemented, can have a significantly positive effect on investment performance. The key words are "properly implemented". Its goal is not to claim that cognitive diversity is unambiguously beneficial, cherry-pick academic papers and case studies which suggest this, and conclude that asset managers should simply "increase cognitive diversity". Instead, its objectives are twofold.

The first is to identify the specific *benefits and costs* of cognitive diversity, the *types* of cognitive diversity for which the benefits might outweigh the costs, and the *settings* in which cognitive diversity is overall beneficial or detrimental, rather than to make broad statements about cognitive diversity in general. The second is to discuss what asset management firms can do to fully harness the advantages of cognitive diversity while mitigating its risks.

These two goals are intertwined. The granularity provided by the first objective is practically useful to asset managers who wish to achieve the performance gains from cognitive diversity. Identifying the specific *benefits* of cognitive diversity is useful so that asset management firms ensure that they fully capitalise on them, rather than taking an "add diversity and stir" approach that assumes that the benefits will automatically arise. In addition, since companies can rarely change their cognitive diversity immediately (by firing

3. Malmendier, Ulrike and Stefan Nagel (2011): "Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?" *Quarterly Journal of Economics* 126, 373–416.
4. Syed, Matthew (2019): *Rebel Ideas: The Power of Diverse Thinking*. John Murray.
5 Surowiecki, James (2004): *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*. Doubleday.
6.There are many non-business reasons for increasing demographic diversity, such as improving social equality.

non-diverse workers and hiring diverse replacements), highlighting the benefits of cognitive diversity may allow asset managers to find other ways to achieve these benefits. Being aware of the *costs* allows firms to take actions to mitigate them. Similarly, given that cognitive diversity comes in many forms, knowing the *types* that are particularly valuable is useful to know what to look out for when building teams. Understanding the *settings* in which diversity helps or hurts allows leaders to discern whether to encourage a broad set of contributions, or entrust the decision to those with the most subject matter expertise.

3. THE SCIENTIFIC RESEARCH

A substantial amount of research has been conducted on cognitive diversity. However, it has different definitions of cognitive diversity, different measures of performance, different settings and – most importantly – different results. There are several high-quality systematic reviews that summarise the scientific consensus from this research.[7] However, we cannot simply take one off the shelf for two reasons. First, the reviews focus on whether the evidence supports particular academic hypotheses, rather than what they mean for practitioners. Second, the reviews are general rather than tailored to asset management. They typically treat all papers equally even though some may study dimensions of cognitive diversity that have little relevance for asset management (such as visualisation). Additionally, they refer to aspects of cognitive diversity (such as "mental representations") in general terms and it is not immediately obvious what a "mental representation" means in asset management.

Rather than learning from the entire body of scientific research on cognitive diversity, the opposite approach would be to focus only on studies of asset management. However, I was only able to find one analysis of this sector published in a top journal. Instead, one common setting is manufacturing, because it is easy to measure performance and thus link it to diversity. This is much harder in asset management where there is a weaker link between the decision and the outcome. An investment that underperformed is not necessarily an error: at the time, it may have been the correct decision but there were unexpected changes in economic conditions. Another common setting is creative tasks, such as design. However, beyond launching a fund with a particular style or mandate, it is hard to measure innovation in asset management. Even if innovation leads to a different investment process (such as the type of information considered), the outcome (buying a stock) may be standard. This contrasts with engineering settings where the novelty of a product design can be evaluated. Moreover, focusing only on the single study on asset management would be too narrow. Research on other settings may be relevant because these settings may have analogies in asset management, such as studies on how teams use information to select from different alternatives.

This section conducts a bespoke review of the academic research on cognitive diversity specifically as it applies to practitioners in the asset management industry. There are two main strands of research. One is conceptual[8] and proposes various channels through which cognitive diversity can increase or decrease performance based on logic. The second is empirical and tests whether cognitive diversity increases or performance using data.[9] We consider them in turn.

7. Williams, Katherine Y. and Charles A. O'Reilly, III (1998): "Demography and Diversity in Organizations: A Review of 40 Years of Research" *Research in Organizational Behavior* 20, 77–140; Milliken, Frances J. and Luis L. Martins (1996): "Searching for Common Threads: Understanding the Multiple Effects of Diversity in Organizational Groups" *Academy of Management Review* 21, 402–433; Van Knippenberg, Daan and Michaéla Schippers (2007): "Work Group Diversity" *Annual Review of Psychology* 58, 515–541.
8. Academics refer to this as "theoretical" research; however, it is relevant for real-world practice so we refer to it as "conceptual".
9. There is overlap between the strands because data may alert researchers to a logical channel through which cognitive diversity can affect performance. However, the strands are sufficiently separate that we can tackle them in turn.

3.1 Conceptual Research

Conceptual research has identified four main channels through which cognitive diversity can increase or decrease performance. These are: generation of ideas, willingness to share ideas, ability to coordinate different inputs, and affinity to the organisation. They are described in more detail below.

3.1.1 Generation

Cognitive diversity can allow a team to generate more ideas because it has a greater breadth of knowledge and viewpoints. This greater breadth may include:

- Expertise in assessing information
  A medical doctor on an investment team can better evaluate a pharmaceutical company's R&D pipeline. An analyst who grew up in an emerging country can assess the potential market demand for a new product. A team member with a quantitative background can analyse ESG data, while one with a qualitative background can evaluate descriptive ESG information.

- Ability to obtain information
  A former investigative journalist can obtain investment insights by interviewing customers and employees. An analyst from a particular country may know the most relevant news and data sources for a company headquartered in that country. A more diverse team can access a broader set of networks and thus information sources.

- Combining information
  An analyst with engineering expertise can appreciate the design of a company's products; a colleague with a background in marketing can see the power of its brand. A concentrated fund will only invest in a company that is excellent along multiple dimensions, and so these combined insights are necessary for the investment to be approved.

- Overcoming blind spots
  Generation involves coming up with not only new ideas, but also challenges to ideas. A more cognitively diverse team may be better able to notice flaws in a proposed investment. This may be due to either better information or different biases. Even if a fund manager has full information, confirmation or familiarity bias might lead her to prefer a sector she has worked in or invested in. If a cognitively diverse team has a range of different biases, they may cancel each other out and lead to an objective decision.

Overall, there is general consensus in the academic literature that cognitive diversity should increase the amount of information that a team collectively has. This is also the view among many practitioners, and is supported by evidence and examples from a variety of fields:

- Evolution arises because a species generates a diversity of mutations, and the most successful ones become the new standard. Farmers cross-pollinate to maximise diversity.

- The *Wisdom of Crowds* starts with the story of a 1906 country fair where 800 people took part in a competition to guess the weight of an ox. Some had expertise, such as butchers and farmers, but others had none. Yet the median guess of 1,197 pounds was almost identical to the actual weight of 1,198 pounds. Even though individual non-experts made errors – some overestimated the weight and others underestimated it – these errors cancelled out when averaged across a diverse group.

- Prediction markets, such as for sports and election results, typically outperform the forecasts of expert pundits. Even though an individual bettor may be less informed than a pundit, prediction markets accumulate the views of thousands of bettors, who are collectively more informed due to the "wisdom of crowds". Their individual biases cancel out.

It seems that the same logic applies to an investment setting. A diverse team will be able to analyse a greater subset of the investment universe and unearth investment opportunities that a more homogeneous team might miss. If a diverse team generates more investment ideas, it is more likely to uncover the next Nvidia. However, it may not end up actually selecting Nvidia out of the range of investment ideas, for reasons we will soon discuss.

9. There is overlap between the strands because data may alert researchers to a logical channel through which cognitive diversity can affect performance. However, the strands are sufficiently separate that we can tackle them in turn.

3.1.2 Sharing

Team performance depends not only on members' ability to generate ideas, but also their willingness to share them with colleagues. It is well-known that people are sometimes reluctant to do so; the reasons why are often swept under the umbrella term "groupthink". However, disentangling the different reasons why groupthink may arise is important to understand whether diversity is likely to attenuate it, and if so, which forms of diversity may do so:

- Hostility
  One reason for groupthink is hostility towards anyone who expresses a different view. For example, an autocratic leader dislikes being challenged, or colleagues view dissenters as not being "team players". A milder reason for hostility is not personal affront, but viewing a different opinion as slowing the group down and requiring additional analysis when the team is already overworked. The best remedy is psychological safety rather than diversity, as the problem is not generating different perspectives but sharing them.

- Social Ties
  A second reason is social groups. People think that others in the same social group as them will have similar views. Thus, if you share a different opinion from others in the same group, you feel less of a member. The root cause is not hostility, but the desire to fit in and be seen as like-minded. If so, diversity can help. A white man may be reluctant to share a different view in a team comprised of only white men, as he will weaken his social ties to that group. But a non-white female, who has weaker social ties to begin with, may be more willing to do so.

  Note that any form of diversity that leads to social ties can have this effect: demographic diversity as in the above example, or cognitive diversity if based on a visible category (for example, stock analysts may be one group and ESG specialists another group). Importantly, this highlights how diversity can be beneficial *even if* it does not provide new perspectives – even if it does not increase cognitive diversity.

- Delegating to Others
  A third reason is more subtle still, and arises even in firms with full psychological safety and no social ties. Indeed, this reason stems from respect for your colleagues rather than being dismissive of them. You may have an idea but think that, because no-one else has raised it, your colleagues must have entertained the idea and considered it unworkable. Relatedly, you have a concern but believe that, because no-one else has raised the concern, it must be irrelevant. As a result, no-one talks about the "elephant in the room"; no-one exits the building even though everyone smells smoke.

  This behaviour arises because you assume that your colleagues have similar information to you, so they will have also noticed the same idea, thought about it and dismissed it. More technically, you assume that the team only has "common information" (shared by all team members) and not "unique information" (specific to one member). Thus, any idea that you have must stem from "common information" and have been noticed by everyone else. Cognitive diversity can solve this problem: if you know that your colleagues think differently from you, then your idea may have stemmed from your unique information. It may be that no-one else has thought of your idea, and so you have a responsibility to raise it.[10]

  Note that this benefit might apply to demographic diversity as well, if team members use demographic diversity as a proxy for cognitive diversity. In a team with different ethnicities, people may expect members to have different perspectives even if, in reality, everyone all grew up in the UK and had similar upbringings. Indeed, research suggests that people make mental shortcuts and use "surface-level" similarity as a proxy for cognitive similarity. For example, one study divided students into two groups, allegedly based on their preferences for oil paintings.[11] Students thought that members of the same group would share their views on not only art but also politics, an unrelated subject. *Even if* demographic diversity is unrelated to cognitive diversity and so does not lead to any unique information, if team members *think* that it does, they will be more willing to share ideas and concerns.

  However, cognitive or demographic diversity may also reduce sharing of ideas due to lowering team affinity, as we will discuss later.

3.1.3 Coordination

The performance of a team depends on not only how much information it generates and shares, but its ability to pool this information to reach a decision. While cognitive diversity might increase total information, it may also hinder a team's ability to use information. Even if a diverse team generates more

10. Interestingly, cognitive diversity helps even if your idea arose from common information. Of course, when an idea enters your head, you do not know whether others have thought of it (it arose from common information) or not (it arose from unique information). The mere presence of cognitive diversity means you think that there is some chance it came from unique information and so it is your duty to share it. If it turns out that your idea stemmed from common information, it is even more powerful because others then reinforce it. But cognitive diversity was the spark to encourage you to share it first.
11. Allen, Vernon L. and David A. Wilder (1979): "Group Categorization and Attribution of Belief Similarity" *Small Group Behavior* 10, 73–80.

investment ideas, and one of them is the next Nvidia, it may fail to coordinate on this particular idea out of the many that it has generated. As one article highlights, "Diverse groups excel at creativity and innovation, but struggle to take coordinated action."[12] Coordination problems can lead to either lower-quality decisions, slower decisions, or both. The reasons are as follows:

- Values
  As one study points out[13], "teams made up of individuals from different 'thought-worlds' may find it difficult to develop a shared purpose and an effective group process"[14]. Another highlights how "cognitively diverse teams have a harder time reaching a shared understanding of the team and task at hand."[15]

  As mentioned previously, colleagues in an asset management firm may target different objectives, even if the firm has a clear purpose statement. One may select stocks that maximise expected risk-adjusted return; another may be concerned about how choosing a particular stock will be perceived by clients and affect fund flows. Thus, they talk at cross-purposes.

- Perspectives
  Different perspectives may generate more ideas, but also hinder coordination because team members "speak different languages". One paper stresses how "some similarity in perspective among group members is necessary to ensure enough common ground to facilitate successful group interaction"[16]; another that "teams can perform at a high level when each contributor understands and approaches tasks in a consistent manner, thereby enabling better communication and smoother coordination".[17]

  Other research highlights how diverse teams have different mental models and mental representations. The following are examples of what "mental models" and "mental representations" mean in asset management:

  - Analysts may have mental models of what they believe drives company value: one may focus on culture and another on industry outlook. They may fail to understand the content of each other's analysis or appreciate why it is relevant.
  - Analysts might use different valuation techniques, such as DCF, multiples, or anticipating what future investors will be prepared to pay.
  - One analyst may justify an investment using a quantitative analysis, but another has difficulty assessing it as he is more comfortable with qualitative information.
  - One analyst believes that the market tends to underprice value stocks in old-economy sectors. Another thinks that the market underprices high-tech stocks as it does not fully understand the potential of their technology.
  - A mental model may also refer to a hunch or intuition about a stock that comes from experience, but is difficult to codify and explain to someone else.

- Preferences
  While perspective considers the information that you think is useful, preferences concern how you like to process information. Andy prefers to discuss potential investments in a meeting, with real-time discussions and back-and-forth interactions. Beatriz finds it more difficult to think on her feet and respond to information on the fly, but is adept at analysing information given time and space. In the meeting, she raises an objection and receives a response that sounds convincing at the time. After the meeting, she thinks about it further and realises that the response is unsatisfactory, but the decision has already been made. Alternatively, one prefers graphs and patterns, a second spreadsheets, and a third verbal arguments.

3.1.4 Affinity

A large strand of diversity research examines how it leads to the formation of categories. People in an "ingroup" may share information more with that ingroup than an outgroup, or may trust the views of that ingroup more. Members of outgroups may feel less attachment to the organisation and may quit it entirely. As reviews of the evidence point out:

- "Members... perceive out-group members as less trustworthy, honest, and cooperative than members of their own... 'otherness' is typically seen as a deficiency.[18] This process results in increased stereotyping, polarization, and anxiety. In heterogeneous groups these effects have been shown to lead to decreased satisfaction with the group, increased turnover, lower levels of cohesiveness, reduced within-group communication, decreased cooperation, and higher levels of conflict."[19]

12. Lix, Katharina, Amir Goldberg, Sameer B. Srivastava, and Melissa A. Valentine (2022): "Aligning Differences: Discursive Diversity and Team Performance" *Management Science* 68, 8430–8448.
13. This report often quotes extracts from research that include in-line citations. We have moved the citations to footnotes to make the extracts more concise and readable.
14. Ancona, Deborah Gladstein and David F. Caldwell (1992): "Demography and Design: Predictors of New Product Team Performance" *Organization Science* 3, 321–341.
15. Aggarwal, Ishani and Anita Williams Woolley (2019): "Team Creativity, Cognition, and Cognitive Style Diversity" *Management Science* 65, 1586–1599.
16. Jehn, Karen A., Gregory B. Northcraft, and Margaret A. Neale (1999): "Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups" *Administrative Science Quarterly* 44, 741–763.
17. Lix, Goldberg, Srivastava, and Valentine (2022), fn. 12.
18. Loden, Marilyn and Judy B. Rosener (1991): *Workforce America! Managing Employee Diversity as a Vital Resource*. Business One Irwin.
19. Williams and O'Reilly (1998), fn. 7.

- "The more homogeneous the work group, the higher member commitment[20] and group cohesion[21] will be, the fewer relational conflicts will occur,[22] and the less likely membership will be to turn over."[23,24]

- "Individuals who are similar in background may share common life experiences and values, and may find the experience of interaction with each other easier, positively reinforcing, and more desirable."[25]

Indeed, music is a setting where creativity is key and so the benefits of cognitive diversity are high. Yet some of the most successful bands have little diversity – indeed, the members often grew up together – perhaps because of the affinity benefits. Strong ties may give band members the freedom to disagree with each other, safe in the knowledge that they will remain friends.

Ingroups and outgroups are sometimes formed on demographic characteristics: for example, white males may share information with each other rather than minority females. However, categories can be formed on any visible characteristic – including those that are closely linked to cognitive diversity. As one systematic review points out: "the effects of diversity can result from any attribute people use to tell themselves that another person is different... If salient, these distinctions, regardless of how task-relevant they are, may lead to in-group/out-group distinctions".[26]

Potential groups in asset management are as follows:

- The "ingroup" may consist of fund managers who were initially analysts at the same firm and thus "grew up" together, and the "outgroup" were externally hired. The latter may have unique perspectives from their outside experiences, but they may not be given weight.
- Stock analysts may be the "ingroup" and ESG specialists the "outgroup", even though ESG information is often highly material to a stock's value.
- Equity analysts may be the "ingroup" and fixed income analysts the "outgroup", even though the same factors often affect the value of both equity and debt.
- UK-born colleagues who went to the same university, have similar friends in common, and socialise outside work may be the "ingroup", and non-UK-born colleagues are the "outgroup".
- The "ingroup" may be those with strong technical skills and the "outgroup" are those without, or with less traditional backgrounds for an investing career.

It is important to stress that such group dynamics need not arise from sexism, racism, or discrimination. Certainly, good leadership and diversity and inclusion training can attenuate the formation of cliques and the treatment of colleagues as outsiders – but it is unlikely to eliminate it completely. There is substantial research on "homophily", that people like being around people similar to themselves. It is not sexist, racist, or discriminatory to enjoy spending time with people with common interests, and no amount of training or leadership can eliminate this. Companies claim to have a strong corporate culture and only hire people who share their values; many social groups highlight how they allow you to meet "like-minded people". Thus, it is important to take seriously the affinity costs of diversity rather than assume that they can always be managed away. Moreover, as the research will show, the formation of "ingroups" and "outgroups" can sometimes have *positive* effects, so it is not automatic that a company should try to eliminate them.

3.1.5 Summarising the Conceptual Research

Conceptual research highlights that cognitive diversity may have costs as well as benefits, in contrast to the popular view that it is always beneficial. Moreover, the four channels of generation, sharing, coordination, and affinity interact. A colleague may be less willing to generate or share new ideas if she has little affinity for the organisation, or thinks that her colleagues will underweight them due to being in a different social category or having different mental models.

Instead, frequently-quoted evidence on the benefits of diversity typically studies settings of pure generation only. Thus, the complexities of sharing, co-ordination, and affinity do not arise, and so this evidence may not be applicable to an asset management setting.

20. Riordan, Christine and Lynn Shore (1997): "Demographic Diversity and Employee Attitudes: An Empirical Examination of Relational Demography Within Work Units" *Journal of Applied Psychology* 82, 342–358; Tsui, Anne S., Terri D. Egan, and Charles A. O'Reilly, III (1992): "Being Different: Relational Demography and Organizational Attachment" *Administrative Science Quarterly* 37, 549–579.
21. O'Reilly, Charles A., III, David F. Caldwell, and William P. Barnett (1989): "Work Group Demography, Social Integration, and Turnover" *Administrative Science Quarterly* 34, 21–37.
22. Jehn, Northcraft, and Neale (1999), fn. 16; Pelled, Lisa Hope, Kathleen M. Eisenhardt, and Katherine R. Xin (1999): "Exploring the Black Box: An Analysis of Work Group Diversity, Conflict and Performance" *Administrative Science Quarterly* 44, 1–28.
23. Wagner, W. Gary, Jeffrey Pfeffer, and Charles A. O'Reilly, III (1984): "Organizational Demography and Turnover in Top Management Groups" *Administrative Science Quarterly* 29, 74–92.
24. Van Knippenberg, Daan, Carsten K. W. De Dreu, and Astrid C. Homan (2004): "Work Group Diversity and Group Performance: An Integrative Model and Research Agenda" *Journal of Applied Psychology* 89, 1008–1022.
25. Williams and O'Reilly (1998), fn. 7.
26. Williams and O'Reilly (1998), fn. 7.

- In evolution, a mutation just arises; there is no concept of not wanting to "share" a mutation due to lack of affinity, being in a different social group, or having a different mental model. If the mutation is beneficial, it will succeed, whereas a good investment idea will only succeed if you can convince others to pursue it.
- Guessing the weight of an ox, the outcome of an election, or the result of a sports match involves communicating a single prediction, so there are few coordination issues. In addition, you simply place your bet and do not need to justify to others; you bet anonymously so your social category is irrelevant.

As a result, companies should not simply "increase cognitive diversity" but recognise that it has both benefits and costs. They should take intentional actions to ensure that they fully leverage its benefits, rather than an "add diversity and stir" approach which assumes that they will automatically arise; they also need to attenuate the costs from reduced coordination and lower affinity. As one paper highlights: "These research findings suggest that simply changing the structure of teams (i.e. combining representatives of diverse function and tenure) will not improve performance. The team must find a way to garner the positive process effects of diversity and to reduce the negative direct effects."[27]

The research also highlights that the common approach of treating demographic diversity and cognitive diversity as separate, or views such as "demographic diversity irrelevant, cognitive diversity important" and "demographic diversity is only useful if it leads to cognitive diversity" may be an oversimplification. Certain benefits (e.g. sharing) and costs (e.g. affinity) of cognitive diversity may also apply to demographic diversity. Some demographic characteristics can affect how a person thinks; some aspects of cognitive diversity are visible and can lead to similar categorisation effects as demographic diversity. As a result, the review of the evidence will also consider demographic diversity, to the extent that it may affect cognitive diversity.

It is important to note that the conceptual research studies the effects of cognitive diversity, *holding all else equal*. In reality, all else may not be equal. On the one hand, increasing cognitive diversity may reduce subject matter expertise. A former investigative journalist may have unique interrogation skills, but fewer skills in stock valuation. Increasing cognitive diversity may be at the expense of ability: the best candidate for a job (in terms of standalone ability) may have grown up in the same country as most current team members, but the second-best candidate grew up in a different country. On the other hand, cognitive diversity might be positively correlated with ability in the real world. Employees in firm A may have a preference for hiring candidates who think like them, and thus turn down more able candidates. Firm B hires the best candidates, which leads to it having a cognitively diverse workforce.

27. Ancona and Caldwell (1992), fn. 14.

3.2 Empirical Research

Conceptual research suggests that cognitive diversity can either help or harm performance, depending on whether the benefits outweigh the costs. Empirical research uses data to study the net effect of cognitive diversity and thus ascertain whether the benefits or costs are greater. There are two main types of empirical research:

- Laboratory experiments recruit volunteers, put them into diverse and non-diverse teams (e.g. teams of all MBA students, or a mix of MBA and medical students) and have them collectively work on a case or solve a problem.

- Field studies involve the performance of people on the job. These studies are closer to the real world, and involve people undertaking real-world tasks rather than solving cases. However, they are not unambiguously better for the following reasons:

  - Harder to isolate diversity. With lab experiments, researchers can change diversity and hold everything else constant. In the real world, diverse teams may differ along many dimensions, making it difficult to isolate the effect of diversity – to disentangle correlation from causation. For example, a meritocratic company that hires the best people will often end up being diverse. In this setting, it is merit that drives performance, and diversity is a proxy for meritocracy. As a result, all field studies should be interpreted as correlations, rather than causations.

  - Harder to measure performance. With lab experiments, it is often easy to assess performance. Researchers design a problem to have a single correct solution and can assess whether the team reached that solution. In the real world, it's not clear what the "right answer" is: an investment decision might be correct at the time, but ends up performing poorly due to unexpected changes in the economy. In addition, many performance measures (such as profitability) are only available at the company rather than team level, so many field studies measure perceived performance (where a team rates their own performance, or a supervisor does so) rather than actual performance.

Different studies will measure both cognitive diversity and performance in different ways, and study different settings (lab vs. field; for field studies, the type of company). Thus, it is important not to cherry pick one particular study but to draw from "scientific consensus" – the overall findings of academic research. Scientific consensus can be found from two sources. The first is a systematic review, as discussed at the start of this section. The second is an individual paper conducting new research (e.g. a new lab experiment or field study). Such a paper will start by discussing the "state of the art", i.e. existing research findings, before explaining how it aims to push the research frontier.

Every paper that I came across claimed that the scientific consensus is very mixed. Some studies find positive effects of cognitive diversity; a few find negative effects; but most find no effect at all.

Some quotes are below and overleaf:

- "The literature has "frustratingly equivocal results."[28]
- "Evidence for the positive effects as well as for the negative effects of diversity is highly inconsistent."[29]
- "Empirically, research has not produced consistent support for either of these positions" (i.e. either the benefits or costs of diversity).[30]
- "The prevailing view, backed by a substantial body of empirical evidence, posits that cognitive diversity embodies a performance tradeoff: Diverse groups draw on a broader set of ideas and are therefore better at discovering novel and effective solutions,[31] but this collective problem-solving ability comes at the expense of coordinated action, which is easier to achieve when group members' interpretations are aligned.[32" 33]
- "Diversity has been shown to both facilitate and inhibit creativity in teams[34], and there is an overwhelming lack of consistent evidence for a direct effect of team diversity on team creativity.[35" 36]

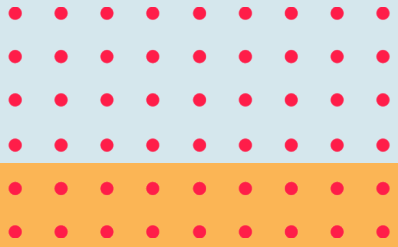
28. Polzer, Jeffrey T., Laurie P. Milton, and William B. Swann, Jr. (2002): "Capitalizing on Diversity: Interpersonal Congruence in Small Work Groups" *Administrative Science Quarterly* 47, 296–324.
29. Van Knippenberg and Schippers (2007), fn. 7.
30. Miller, C. Chet, Linda M. Burke, and William H. Glick (1998): "Cognitive Diversity Among Upper-Echelon Executives: Implications for Strategic Decision Processes" *Strategic Management Journal* 19, 39–58.
31. Gibson, Cristina and Freek Vermeulen (2003): "A Healthy Divide: Subgroups as a Stimulus for Team Learning Behavior" *Administrative Science Quarterly* 48, 202–239; Page, Scott (2008): *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies.* Princeton University Press.
32. March, James G. (1991): "Exploration and Exploitation in Organizational Learning" *Organization Science* 2, 71–87; Knight, Don, Craig L. Pearce, Ken G. Smith, Judy D. Olian, Henry P. Sims, Ken A. Smith, and Patrick Flood (1999): "Top Management Team Diversity, Group Process, and Strategic Consensus" *Strategic Management Journal* 20, 445–465; Sørensen, Jesper B. (2002): "The Strength of Corporate Culture and the Reliability of Firm Performance" *Administrative Science Quarterly* 47, 70–91.
33. Lix, Goldberg, Srivastava, and Valentine (2022), fn. 12.
34. Levine, John M. and Richard L. Moreland (2004): "Collaboration: The Social Context of Theory Development" *Personality and Social Psychology Review* 8, 164–172; Nijstad, Bernard A., Michael Diehl, and Wolfgang Stroebe (2003): "Cognitive Stimulation and Interference in Idea-Generating Groups" in Paul B. Paulus and Bernard A. Nijstad (eds.): *Group Creativity: Innovation Through Collaboration*, 137–159. Oxford University Press; O'Reilly, Charles A., III, Katherine Y. Williams, and Sigal Barsade (1998): "Group Demography and Innovation: Does Diversity Help?" in Deborah H. Gruenfeld (ed.): *Research on Managing Groups and Teams* Vol. 1, 183–207. JAI Press.
35. Hülsheger, Ute R., Neil Anderson, and Jesús F. Salgado (2009): "Team-Level Predictors of Innovation at Work: A Comprehensive Meta-Analysis Spanning Three Decades of Research" *Journal of Applied Psychology* 94, 1128–1145; Jackson, Susan E., Aparna Joshi, and Niclas L. Erhardt (2003): "Recent Research on Team and Organizational Diversity: SWOT Analysis and Implications" *Journal of Management* 29, 801–830; Joshi, Aparna and Hyuntak Roh (2009): "The Role of Context in Work Team Diversity Research: A Meta-Analytic Review" *Academy of Management Journal* 52, 599–627.
36. Aggarwal and Woolley (2019), fn. 15.

- "Williams and O'Reilly's (1998)[37] review of forty years of diversity research concluded that there are no consistent main effects of diversity on organizational performance."[38]

- "The picture emerging from these studies is quite inconsistent for the relationship between personality diversity and group process and performance... Others have also pointed to diversity in attitudes and values as an influence on group functioning.[39] Here, too, findings are highly inconsistent. Some studies suggest that diversity in attitudes and values may be associated with negative outcomes.[40] Some of these studies also show, however, that diversity in attitudes and values may be associated with positive outcomes (e.g., social integration) or may be unrelated to these outcomes. [41]" [42]

- "Research in the area of work team diversity has grown exponentially in the last four decades. However, several comprehensive reviews have noted that the findings in this area do not provide a clear consensus regarding the performance effects of work team diversity.[43] In some studies, researchers have reported that team diversity is positively associated with performance.[44] In another set of studies, team diversity has been found to negatively predict performance.[45] A majority of these studies, however, have reported a nonsignificant, direct relationship between team diversity and performance." [46]

- "Our review indicated that approximately 60 percent of the direct effects reported in past research were nonsignificant for various diversity attributes. Among the remainder, 20 percent of the effects reported were significantly positive, and 20 percent were significantly negative."[47]



37. Williams and O'Reilly (1998), fn. 7.
38. Jehn, Northcraft, and Neale (1999), fn. 16.
39. Hoffman, L. Richard, and Norman R. F. Maier (1961): "Quality and Acceptance of Problem Solutions by Members of Homogeneous and Heterogeneous Groups" *Journal of Abnormal and Social Psychology* 62, 401–407.
40. Harrison, David A., Kenneth H. Price, and Myrtle P. Bell (1998): "Beyond Relational Demography: Time and the Effects of Surface- and Deep-Level Diversity on Work Group Cohesion" *Academy of Management Journal* 41, 96–107; Harrison, David A., Kenneth H. Price, Joanne H. Gavin, and Anna T. Florey (2002): "Time, Teams, and Task Performance: Changing Effects of Surface- and Deep-Level Diversity on Group Functioning" *Academy of Management Journal* 45, 1029–1045; Jehn, Karen A. and Elizabeth A. Mannix (2001): "The Dynamic Nature of Conflict: A Longitudinal Study of Intragroup Conflict and Group Performance" Academy of Management Journal 44, 238–251; Jehn, Karen A., Clint Chadwick, and Sherry Thatcher (1997): "To Agree or Not to Agree: The Effects of Value Congruence, Individual Demographic Dissimilarity, and Conflict on Workgroup Outcomes" *International Journal of Conflict Management* 8, 287–305; Jehn, Northcraft, and Neale (1999), fn. 16.
41. Harrison, Price, and Bell (1998), fn. 40; Harrison, Price, Gavin, and Florey (2002), fn. 40.
42. Van Knippenberg and Schippers (2007), fn. 7.
43. Harrison, David A. and Katherine J. Klein (2007): "What's the Difference? Diversity Constructs as Separation, Variety, or Disparity in Organizations" *Academy of Management Review* 32, 1199–1228; Jackson, Joshi, and Erhardt (2003), fn. 35; Milliken and Martins (1996), fn. 7; Van Knippenberg and Schippers (2007), fn. 7; Williams and O'Reilly (1998), fn. 7.
44. Ely, Robin J. (2004): "A Field Study of Group Diversity, Participation in Diversity Education Programs, and Performance" *Journal of Organizational Behavior* 25, 755–780; Van der Vegt, Gerard S., Evert van de Vliert, and Xu Huang (2005): "Location-Level Links Between Diversity and Innovative Climate Depend on National Power Distance" *Academy of Management Journal* 48, 1171–1182.
45. Jehn, Northcraft, and Neale (1999), fn. 16; Leonard, Jonathan S., David I. Levine, and Aparna Joshi (2004): "Do Birds of a Feather Shop Together? The Effects on Performance of Employees' Similarity with One Another and with Customers" *Journal of Organizational Behavior* 25, 731–754.
46. Joshi and Roh (2009), fn. 35.
47. Joshi and Roh (2009), fn. 35.

These mixed results are also highlighted in a book that emphasises the conceptual benefits of diversity, entitled *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies* by Scott Page.[48] (While not a peer-reviewed academic paper, it is a book published by a university press heavily grounded in academic research, hence including it in this section). It summarises the scientific consensus as follows: "If we look at the evidence on whether identity diverse collections of people perform better than more homogeneous collections, we see mixed results at every level... If we look at groups, the results become even messier and more confusing. Recent, careful, award-winning studies show little effect. Even claims that diverse groups are needed to market to diverse customers do not hold up to close scrutiny. One reason for the mangle of outcomes is that group dynamics can create no end of problems. People prefer to hang with people like themselves." Thus, even though the book strongly argues that diversity is desirable in theory, it acknowledges that in practice the evidence is ambiguous.

3.2.1 Skills Diversity

While the findings on cognitive diversity in general are very mixed, there are stronger results when isolating particular aspects of cognitive diversity. One systematic review studied six elements of diversity: gender, race, age, education, profession, and tenure within the firm.[49] It found that professional diversity is positively related to performance but all five other types of diversity are unrelated.

A second systematic review divided studies into those on demographic diversity (age, gender, and ethnicity) and task-related diversity (functional expertise, education, and tenure within the firm) and found that the latter was positively related to both the quality and quantity of team performance, but the former was related to neither.[50]

Other reviews also find modest evidence for the benefits of professional diversity, and some also for educational diversity:

- "Diversity on skill-based dimensions such as education, occupation, functional background, and industry experience also has generally been found to be associated with some cognitive benefits at the board, top management group, and organisational task group levels." [51]
- "Diversity along skill- or knowledge-based dimensions seems to have some positive cognitive outcomes for top management groups and project teams. One reason may be that diversity along these skill-based dimensions translates into a greater variety of perspectives being brought to bear on decisions and, thereby, increases the likelihood of creative and innovative solutions to problems. Also, problems such as those that a top management group deals with often require information input from a variety of functional areas within the organisation. Communication between the top management group and nonmembers may be more frequent and of higher quality when the team has representatives from many different areas of the organisation." [52]
- "The research suggests that the diversity of information functionally dissimilar individuals bring to the group improves performance in terms of creativity, but not necessarily implementation".[53]
- "Diverse groups are more likely to be less integrated, have less communication, and more conflict. Interestingly, the one exception to this pattern is with regard to functional diversity or educational background. For this variable, increased diversity has shown under some circumstances to increase communication."[54]

In contrast, the findings for demographic diversity are weaker: the systematic review that found a positive effect of professional diversity also found no effects of gender, race, and age. One study focused on the hedge fund industry, and thus particularly relevant for asset management, concluded that "functional diversity (based on educational institution, college major, and work experience) more positively relates to investment performance than does nonfunctional diversity (based on gender and race)."[55] While demographic diversity was sometimes positively correlated with performance, its effects were smaller and less consistent than skills diversity.

This contrast is consistent with conceptual research. Professional and educational diversity are likely a better indicator of diversity of skills, knowledge, and background than demographic diversity, and thus more likely to increase generation and sharing. In addition, professional and educational diversity categories may be less visible than demographic diversity categories, and thus less likely to lead to reductions in affinity. We will use the phrase "skills diversity" to capture diversity from either professional or educational background.

48. Page (2008), fn. 31.
49. Joshi and Roh (2009), fn. 35.
50. Horwitz, Sujin K. and Irwin B. Horwitz (2007): "The Effects of Team Diversity on Team Outcomes: A Meta-Analytic Review of Team Demography" *Journal of Management* 33, 987–1015.
51. Milliken and Martins (1996), fn. 7.
52. Milliken and Martins (1996), fn. 7.
53. Williams and O'Reilly (1998), fn. 7.
54. Williams and O'Reilly (1998), fn. 7.
55. Lu, Yan, Narayan Y. Naik, and Melvyn Teo (2024): "Diverse Hedge Funds." *Review of Financial Studies* 37, 639–683.

However, it is certainly not the case of "skills diversity good, demographic diversity bad": as I will explain later, skills diversity may involve more coordination costs than demographic diversity; as the conceptual research has highlighted, demographic diversity may have benefits even if it does not increase skills diversity. Moreover, the evidence for the benefits of skills diversity is far from unambiguous, because it typically uncovers costs as well as benefits:

- **Improved communication, reduced performance.** One study examined 409 members of 45 new product teams within five hi-tech firms.[56] It found that functional diversity (whether team members came from marketing, manufacturing, or engineering) was positively related to how often a team communicated with outsiders, perhaps due to a broader set of external networks. However, the link to performance was negative: thus, any positive impact on generation may be offset by negative effects on coordination. As the authors conclude: "While it does produce internal processes and external communications that facilitate performance, [diversity] also directly impedes performance. That is, overall the effect of diversity on performance is negative, even though some aspects of group work are enhanced. It may be that for these teams diversity brings more creativity to problem solving and product development, but it impedes implementation because there is less capability for teamwork than there is for homogeneous teams."

- **Increased use of information, reduced integration of information.** A study of 135 MBA students examined educational diversity, measured by their undergraduate majors.[57] The researchers found that more diverse study groups showed a greater breadth and depth of information usage[58] when solving a Harvard Business School case. However, this only held up to a point: after that point, further increases in educational diversity reduced information breadth and depth, perhaps because too diverse groups had coordination issues. This is the analogy of "diworsification": a portfolio being excessively diversified. In addition, diverse groups were less adept at integrating the information. As the authors write: "Educationally diverse teams were less able to connect topics within issues. Drawing connections requires knowledge of each relevant content area. In that educationally diverse teams have distributed knowledge of content, they have more difficulty making links because they have to bridge from one team member to another."

- **Increased administrative innovations, unchanged technical innovations.** Another study examined 199 banks, a setting that may be particularly relevant for asset management.[59] It explored senior managers' age, tenure, educational level, educational background, and professional background, and related them to the number of innovations that the bank made: technical innovations (products/services, customer applications and administrative innovations (staffing, attitude assessment). Most characteristics were insignificant, but professional diversity was associated with more innovations. However, this result was driven by administrative innovations; there was no effect on technical innovations. The latter may be more relevant for asset management.

These equivocal results arise because skills diversity has costs as well as benefits. As the literature has highlighted:

- "Performance benefits should be expected only to the extent that workgroup members successfully manage the difficulties of interacting effectively with dissimilar others."[60]

- "Given that functional background may be salient in groups and organizations and form the basis for social categorization, there is a need to carefully consider the conditions under which functional diversity can lead to improved performance or be responsible for diminished group functioning. Without this attention, the benefits of increased background diversity may be undermined."[61]

- There is "clear evidence that groups with skill-based diversity seem to have greater coordination costs than groups composed of people with more homogeneous skills or backgrounds."[62]

- "There is also some evidence that groups that are diverse with respect to background and skills may have integration problems similar to those of other diverse groups in that people who are different from their peers tend to be more likely to turn over."[63]

This tension has useful practical implications for asset management

56. Ancona and Caldwell (1992), fn. 14.
57. Dahlin, Kristina B., Laurie R. Weingart, and Pamela J. Hinds (2005): "Team Diversity and Information Use" *Academy of Management Journal* 48, 1107–1123.
58. Breadth was measured by the number of topics covered and depth by the number of arguments per topic.
59. Bantel, Karen A. and Susan E. Jackson (1989): "Top Management and Innovations in Banking: Does the Composition of the Top Team Make a Difference?" *Strategic Management Journal* 10, 107–124.
60. Jehn, Northcraft, and Neale (1999), fn. 16.
61. Williams and O'Reilly (1998), fn. 7.
62. Milliken and Martins (1996), fn. 7.
63. Milliken and Martins (1996), fn. 7.

firms. Rather than simply "increasing cognitive diversity", i.e. trying to get cognitive diversity to the highest possible level, they may be better off increasing cognitive diversity to a reasonably high level, and then managing in a way that attenuates its costs. Similarly, clients should not simply assess asset managers on their level of cognitive diversity under the assumption that more is always better – more important may be an asset manager's ability to fully exploit the cognitive diversity that it already has.

3.2.2 Cognitive Style Diversity

We now turn from skills diversity to cognitive style diversity, for which the results are more ambiguous.

- **Improved specialisation, reduced consensus.** One study explored 463 MBA students randomly assigned to 112 project teams.[64] The researchers measured cognitive style using the Verbaliser-Visualiser spectrum.[65] The researchers found that greater cognitive style diversity was associated with a better "team knowledge system"[66] (awareness of the mix of skills within a team),[67] but lower "team strategic consensus" (a common understanding of the team's goals and how to allocate time). Overall, the positives outweighed the negatives: more diverse teams produced more creative reports for a case assignment. However, the Verbaliser-Visualiser spectrum may be more applicable to other fields such as design or engineering.
- **Reduced strategic consensus.** Another study confirmed that cognitive style diversity, using the Verbaliser-Visualiser spectrum, reduces strategic consensus.[68] It took 231 participants and divided them into 64 teams, and had them build a housing complex.[69] Teams with greater cognitive style diversity performed worse, and this was due to lower "strategic consensus": they disagreed on how to divide their time across the various parts of the task and what each person should work on.
- **Increased collective intelligence – up to a point.** Another paper using the same spectrum divided 377 students into 98 teams.[70] The researchers found that more diverse teams displayed higher "collective intelligence" – the ability to work together across a wide variety of tasks[71] – but only up to a point.
- **Increased ideas, reduced cohesion.** A separate paper measured cognitive style on the Adaptive-Innovative spectrum (whether you prefer incremental, structured approaches or broad, unstructured approaches).[72] It found that more diverse business school study groups generated significantly more ideas in a management-labour negotiation simulation. However, the same paper also conducted a separate study of teams in companies, which found that more diverse groups were less cohesive. As the author concluded: "Although there may be benefits to heterogeneity for certain task-outcomes, the emotional well-being of the team members may suffer in the process. Being on a heterogeneous team seems to be hard work—and seems to take its toll on the emotions and the satisfaction of the team members."

3.2.3 Other Forms of Diversity

We now turn to other forms of diversity beyond skills and cognitive style.

- **Positive effects of informational diversity, negative effects of values diversity.** A field study of 545 employees in 92 workgroups in a leading household goods moving firm explored social category diversity (gender and age), values diversity (such as whether team members had similar values and viewed the team's goals similarly), and informational diversity (education, functional area, and seniority).[73] The authors found that informational diversity increased group performance, whereas values diversity reduced satisfaction, intent to remain, and commitment to the group, consistent with diversity reducing affinity. Moreover, these effects interacted: information diversity was particularly beneficial when values diversity was low, perhaps because it was easier to share information.

64. Aggarwal and Woolley (2019), fn. 15.
65. In turn, visualisers are either object visualisers (who view objects as isolated entities) or spatial visualisers (who focus on relationships between objects).
66. The authors use the term "transactive memory system."
67. This was assessed with questions such as "different team members were responsible for expertise in different areas" and "I trusted that other members' knowledge about the task was credible".
68. Aggarwal, Ishani and Anita Williams Woolley (2013): "Do You See What I See? The Effect of Members' Cognitive Styles on Team Processes and Errors in Task Execution" *Organizational Behavior and Human Decision Processes* 122, 92–99.
69. This task was modelled to simulate a complex R&D problem which involves trade-offs between multiple criteria. While the visual element of a building task may have little applicability to asset management, managing trade-offs is more relevant.
70. Aggarwal, Ishani, Anita Williams Woolley, Christopher F. Chabris, and Thomas W. Malone (2019): "The Impact of Cognitive Style Diversity on Implicit Learning in Teams" *Frontiers in Psychology* 10, 112.
71. Sample tasks include: brainstorming new ideas (on the possible uses of a brick), making moral judgements (deciding disciplinary action in a fictitious case where a college athlete bribes an instructor to change his grade), allocating limited resources (planning a group shopping trip where each member wants different groceries) and coordination (typing a text into a shared document, where members work independently and simultaneously and so have to avoid duplicating colleagues or missing words).
72. Kurtzberg, Terri R. (2005): "Feeling Creative, Being Creative: An Empirical Study of Diversity and Creativity in Teams" *Creativity Research Journal* 17, 51–65.
73. Jehn, Northcraft, and Neale (1999), fn. 16.

- **Values diversity reduces strategic planning.** One study surveyed CEOs on the values diversity[74] within senior management: differences of opinion on what the company's goals should be.[75] Diversity was associated with less extensive strategic planning for long-term strategies and less comprehensive responses to short-term opportunities and threats, suggesting that misalignment makes it harder for a team to collaborate towards a common goal.[76]

- **Political diversity.** A recent study examines the political affiliation of top US executives based on donations and voter records.[77] A departure of a politically misaligned executive, such as a Democrat quitting a mainly Republican-led company, costs the average firm $200 million. This may be because political diversity is relevant for many issues. For example, right (left)-wing executives may place insufficient (excessive) emphasis on DEI, or fail to appreciate the values of left (right)-wing customers. In addition to generating different ideas, diverse members may be more willing to share them. For example, a Republican may not be afraid to argue that the company is overinvesting in DEI, because he is already known for being a Republican.

Summing Up

The empirical research on cognitive diversity finds much more ambiguous results than commonly portrayed. The most positive results are for skill-based diversity, stemming from professional background and, to a lesser extent, education. There is generally no link between either demographic diversity or cognitive style diversity and performance. The effect of values diversity is slightly negative, with the exception of political diversity. This is particularly relevant for asset managers because professional and educational backgrounds are easier to assess than cognitive style or values.

74. The authors refer to this as "preference diversity".
75. Miller, Burke and Glick (1998), fn. 30
76. They found no effect of belief diversity (differences in opinion on how to achieve the company's goals).
77. Fos, Vyacheslav, Elisabeth Kempf, and Margarita Tsoutsoura (2025): "The Political Polarization of Corporate America" NBER Working Paper 30183.

3.2.4 When Does Cognitive Diversity Matter?

The popular view on cognitive diversity is that it is unambiguously beneficial in all situations. As we have shown, the evidence on the *general* effects of cognitive diversity ("main effects") is much more mixed than commonly portrayed. Thus, a more promising direction is to study the *specific* settings in which cognitive diversity has positive effects ("moderated effects"). Indeed, a systematic review concludes: "Evidence for the positive effects as well as for the negative effects of diversity is highly inconsistent... It seems time to declare the bankruptcy of the main effects approach and... consider moderating variables in explaining the effects of diversity."[78]

Studying the setting is practically useful, regardless of whether it is within an asset manager's control:

- **Settings outside an asset manager's control.** Making an investment involves coming up with investment ideas (generation) and then choosing between them (coordination). Both are necessary; an asset manager cannot change this. However, if the evidence suggests that cognitive diversity helps with generation but not with coordination, it might use cognitively diverse teams for the former but not the latter.
- **Settings within an asset manager's control.** For example, the evidence might suggest that cognitive diversity particularly improves performance when combined with psychological safety. That provides the practical implication that asset managers should increase psychological safety, rather than focusing on raising cognitive diversity to the maximum.

We now discuss which features of the setting affect the link between cognitive diversity and performance.

3.2.4.1 Task Type

Generation vs. Coordination

Conceptual research suggests that cognitive diversity improves generation but hinders coordination. One study examined Gigster, an online platform where freelance software developers produce on-demand software for clients.[79] A project consists of three phases:

- **Planning:** deciding on goals, the steps needed to achieve them, and the duties of each team member.
- **Brainstorming:** generating ideas to achieve the above goals and providing feedback on others' ideas.
- **Integration:** combining the individual outputs, reviewing what has been accomplished, and discussing how to complete outstanding tasks.

The first and third phase mainly involve "coordination", the second "generation". Given the same team worked on all three phases, the *inputs* to cognitive diversity (team members' backgrounds) were the same throughout. However, successful teams were able to alter the *outputs* of this diversity by changing their discourse – whether they spoke using common language and terminology. Teams were more successful when the diversity of their discourse was high in the generation phase (phase 2) and low in the coordination phases (phase 1 and 3). Simply put, they harnessed their individuality[80] when generating ideas, and "spoke the same language" when coordinating.

Execution

Another contrast is "generation" tasks vs. "execution" tasks (or "experimentation" vs. "exploitation"). The former involves finding new approaches, the latter carrying out currently favoured approaches. Since execution tasks require coordination, and thus convergent rather than divergent thinking, cognitive diversity may be less valuable. One study found that a high level of strategic consensus – team members agreeing on the group's priorities – was associated with fewer errors in an execution task. In addition, differences in cognitive styles (measured on the Verbaliser-Visualiser spectrum) led to lower strategic consensus.[81]

Task Novelty

The generation benefits of cognitive diversity should be higher in more novel tasks. We previously mentioned a study of the household goods moving industry which found positive effects of informational diversity.[81] The authors found that informational diversity was particularly valuable for groups that do less routine tasks.[83]

78. Van Knippenberg and Schippers (2007), fn. 7.
79. Lix, Goldberg, Srivastava, and Valentine (2022), fn. 12.
80. An example of high discursive diversity is the following exchange: A: "what's the plan for finalizing the design mockups?" B: "we need to decide on a backend technology stack first". C: "How should we communicate that to the client?"
81. Aggarwal and Woolley (2013), fn. 67.
82. Jehn, Northcraft, and Neale (1999), fn. 16.
83. This was measured by questions such as "I encounter a lot of variety in my normal working day" and "I feel I am doing the same thing over and over again".

A systematic review found that diversity (on gender, ability level, and personality: it combined all these dimensions together) was positively related to performance for more complex tasks but negatively related for simpler tasks.[84] Given that asset management is a complex activity, it might be tempting to think that cognitive diversity is more beneficial in asset management than the average results found by researchers. However, asset management arguably involves less creativity than other sectors such as engineering – for example, stocks in different industries may still be valued using the same general framework. Indeed, another review found that cognitive diversity has more positive effects on performance in high-tech industries than manufacturing and services, including financial services.[85] As Section 4 will show, practitioners had a quite different view, arguing that creativity matters in asset management much more than commonly thought.

84. Bowers, Clint A., James A. Pharmer, and Eduardo Salas (2000): "When Member Homogeneity is Needed in Work Teams: A Meta-Analysis" *Small Group Research* 31, 305–327. It considered the complexity of tasks assigned in lab experiments: for example, business cases were deemed more complex than puzzles.
85. Joshi and Roh (2009), fn. 35.

3.2.4.2 Interdependence

If diversity leads to more ideas being generated, this is particularly valuable if these ideas are shared – if work is interdependent. In some settings, tasks are naturally interdependent (discussing an investment is more interdependent than building a financial model); in other settings, a team can choose how interdependent it wants to be.

One systematic review found modest evidence that task-oriented diversity (based on education, profession, and tenure) has more positive effects on performance in interdependent teams.[86, 87] However, interdependence is not unambiguously desirable: some decisions should be left to subject matter experts. Tord Stallvik, CEO of Redwheel and a member of the Diversity Project Advisory Council, described at a Diversity Project event how a CEO leadership course involved a case where you are stranded in a storm and need to choose particular items. The teams of five ranked the items individually and then discussed them collectively. In 7 out of the 8 teams, no group member individually scored better than the group. But in the 8th group, one team member outperformed not only his group but all other groups – an ex-Special Forces general who had been in similar situations in real life. In that setting, expertise trumped diversity.

This anecdote is consistent with empirical research:

- The downsides of collaboration. One lab experiment involved two tasks, A and B. Participants filled in a questionnaire which assessed which task their cognitive style was suited to.[88] The experiments divided them into teams of two and told each member what to work on. Not surprisingly, teams where an A-person was assigned to A and a B-person to B performed the best. More interestingly, collaboration had no effect on their success. Since tasks were assigned based on subject matter expertise, there was no benefit to collaboration. When an A-person was assigned to B and a B-person to A, collaboration significantly increased performance. Most intriguingly, for homogenous teams consisting of two A-people or two B-people, collaboration *reduced* performance. Since neither team member was skilled, collaborating was simply a distractor.
- Collaboration reduces creativity. A review of the evidence concluded that "compared to individuals working alone, groups generate substantially fewer solutions[89] and the reasons include ways in which interaction hinders creativity.[90] They include evaluation apprehension, social loafing[91] and conformity.[92"93]
- Emergent interdependence. A systematic review concluded that, rather than trying to force interaction among colleagues, most effective is "emergent interdependence" – creating conditions under which team members can work together if beneficial, but are not compelled to do so.[94]

While intuitive, these results are inconsistent with evaluation systems that assess how interactive, cooperative, or how much of a "team player" someone is, as if more is always better. Books on the wisdom of crowds suggest that decision making should always be democratic, but sometimes a single person may have the greatest wisdom. This is consistent with how the best operas, plays, and novels are written by a single person.

86. Such teams include cross-functional R&D teams where members frequently exchange ideas, compared to manufacturing or sales teams who interact with each other sequentially rather than simultaneously (manufacturing tries to make the best product, and the sales team then sells it).
87. Joshi and Roh (2009), fn. 35.
88. Caruso, Heather and Anita Williams Woolley (2008): "Harnessing the Power of Emergent Interdependence to Promote Diverse Team Collaboration" in Katherine W. Phillips (ed.): *Diversity and Groups: Research on Managing Groups and Teams* Vol. 11, 245–266. Emerald Group Publishing.
89. McGrath, Joseph E. (1984): *Groups: Interaction and Performance*. Prentice Hall.
90. Paulus, Paul B., Travis S. Larey, and Michael T. Dzindolet (2000): "Creativity in Groups and Teams" in Marlene E. Turner (ed.): *Groups at Work: Advances in Theory and Performance*, 319–338. Erlbaum.
91. Karau, Steven J. and Kipling D. Williams (1993): "Social Loafing: A Meta-Analytic Review and Theoretical Integration" *Journal of Personality and Social Psychology* 65, 681–706.
92. Larey, Travis S. and Paul B. Paulus (1999): "Group Preference and Convergent Tendencies in Small Groups: A Content Analysis of Brainstorming Performance" *Creativity Research Journal* 12, 175–184.
93. Nemeth, Charlan J., Bernard Personnaz, Marie Personnaz, and Jack A. Goncalo (2004): "The Liberating Role of Conflict in Group Creativity: A Study in Two Countries" *European Journal of Social Psychology* 34, 365–374.
94. Caruso and Woolley (2008), fn. 87.

3.2.4.3 Psychological Safety

The concept of psychological safety was pioneered by Amy Edmondson, who defines it as "a shared belief held by members of a team that the team is safe for interpersonal risk taking" – they can speak up without encountering hostility, being seen as not a team player, or losing their social ties. It is a key component of the "inclusion" in "diversity and inclusion". Edmondson's seminal paper on psychological safety measured it using responses to the following questions[95]:

- If you make a mistake on this team, it is often held against you.
- Members of this team are able to bring up problems and tough issues.
- People on this team sometimes reject others for being different.
- It is safe to take a risk on this team.
- It is difficult to ask other members of this team for help.
- No one on this team would deliberately act in a way that undermines my efforts.
- Working with members of this team, my unique skills and talents are valued and utilized.

She surveyed a manufacturer of office furniture with 5,000 employees and found that teams with higher psychological safety performed better, both as self-reported by team members and as assessed by their managers. Her book *The Fearless Organization* lists many other papers that also find positive effects of psychological safety in a range of settings.[96]

Our interest here is not so much on the benefits of psychological safety *per se* (which are well established) as on how it increases the benefits of cognitive diversity. For example, if cognitive diversity leads to more idea generation, these additional ideas are particularly useful if people are willing to share them. Instead, if psychological safety is low, then cognitive diversity might actually be harmful: people have different opinions and yet have to bury them, or the team suffers lower coordination and affinity without the benefits of higher idea sharing.

- **Cognitive diversity increases performance only when psychological safety is high.** One study took 736 masters students in IT, divided into 196 teams.[97] It measured educational diversity using their undergraduate major and team performance using the grade on a semester-long IT project. It found no link between diversity and performance, but a positive link when psychological safety (measured using Edmondson's 7 questions) was high.[98]

- **Cognitive diversity increases performance by leading to task conflict.** Some research finds that an important channel through which cognitive diversity improves performance is through increasing "task conflict": disagreement about what to do, measured by questions such as "how frequently are there conflicts about ideas in your work unit?" or "how many disagreements over different ideas about this decision were there?"[99] Psychological safety is likely valuable in promoting task conflict.

- **Dissent increases innovation only when participation in decision making is high.** Another study found that minority dissent (measured by questions such as "within my team everyone tends to immediately agree with one another" and "in this team, members go along with the majority opinion") increases team innovation, but only when teams have high levels of participation in decision making (measured by questions such as "I have a real say in how the team carries out its work" and "my team is designed to let everyone participate in decision making.")[100] The latter ensured not only that new ideas were generated, but also implemented.

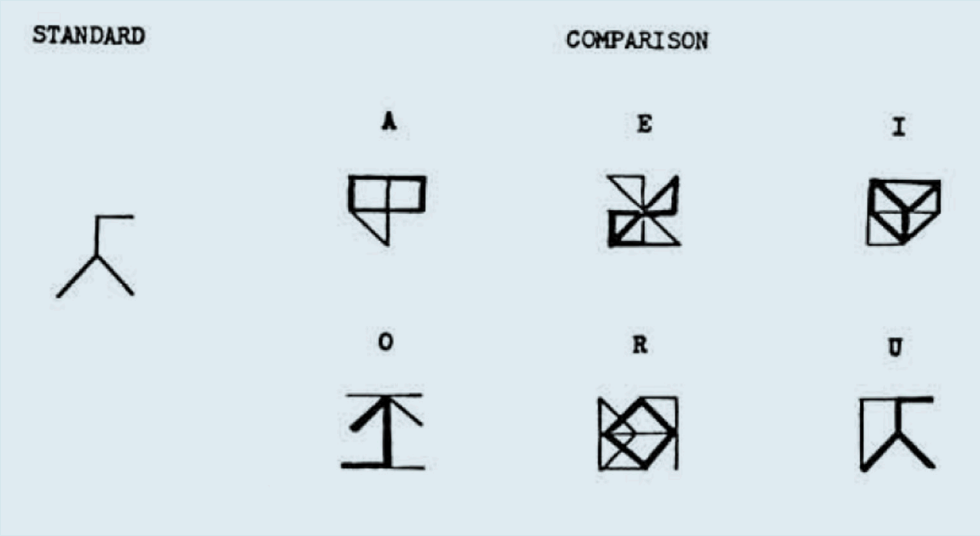
- **Authentic dissenters are more effective than assigned devil's advocates.** A common solution to groupthink is to assign a "devil's advocate" or "red team" (a group of devil's advocates) to take the opposite position to the majority view. However, even more powerful is allowing a devil's advocate to emerge, and psychological safety likely facilitates this. An assigned devil's advocate can lack authenticity: colleagues may think that he is simply playing a role and thus do not take his concerns seriously. Indeed, a lab experiment found that a team generated more solutions to a problem, and more high quality solutions, when there was an authentic dissenter than an assigned devil's advocate.[101]

Interestingly, psychological safety can be beneficial even if it leads to people speaking up and sharing *incorrect* views. What matters is not so much that a view is right but that it is different; sharing a

95. Edmondson, Amy (1999): "Psychological Safety and Learning Behavior in Work Teams" *Administrative Science Quarterly* 44, 350–383.
96. Edmondson, Amy (2018): *The Fearless Organization: Creating Psychological Safety in the Workplace for Learning, Innovation, and Growth*. Wiley.
97. Martins, Luis L., Marieke C. Schilpzand, Bradley L. Kirkman, Silvester Ivanaj, and Vera Ivanaj (2012): "A Contingency View of the Effects of Cognitive Diversity on Team Performance: The Moderating Roles of Team Psychological Safety and Relationship Conflict" *Small Group Research* 44, 96–126.
98. More precisely, it found that the link between diversity and performance was more positive when psychological safety was higher.
99. Jehn, Northcraft, and Neale (1999), fn. 16; Olson, Bradley J., Satyanarayana Parayitam, and Yongjian Bao (2007): "Strategic Decision Making: The Effects of Cognitive Diversity, Conflict, and Trust on Decision Outcomes" *Journal of Management* 33, 196–222.
100. De Dreu, Carsten K. W. and Michael A. West (2001): "Minority Dissent and Team Innovation: The Importance of Participation in Decision Making" *Journal of Applied Psychology* 86, 1191–1201.
101. Nemeth, Charlan, Keith Brown, and John Rogers (2001): "Devil's Advocate Versus Authentic Dissent: Stimulating Quantity and Quality" *European Journal of Social Psychology* 31, 707–720.

different view shakes others out of the status quo and prompts them to think creatively.

One lab experiment gave subjects a "standard" figure and six comparison figures, and asked them to name all the comparison figures that contained the standard.[102] One of them (U in the below example) was easy; the other five were difficult. The subject was placed in a group of six. Depending on the setup, either two ("minority condition") or four ("majority condition") of the other six were paid participants who said both U and E. Again depending on the setup, E was either correct or incorrect.



As expected, the subject was more likely to say U and E in the majority than minority condition. More surprisingly, subjects in the minority condition were more likely to find novel correct solutions, i.e. I and R. This was not due to random guessing, as there was no effect on novel incorrect solutions (i.e. A and O). Importantly, whether the minority was correct or not (i.e. whether E was right or wrong) made no difference: those exposed to minority dissent always found more correct solutions. As one of the authors concludes in a review article[103]:

- "Minority viewpoints are important ... because they stimulate divergent attention and thought. As a result, even when they are wrong they contribute to the detection of novel solutions and decisions that, on balance, are qualitatively better."
- "Individuals are finding solutions not proposed by the minority and solutions that they would not find by themselves, and their solutions are correct."
- "Individuals exposed to persistent minority views are actually better decision makers in that they attend to more aspects of the situation and they examine and reexamine premises. They manifest divergent rather than convergent thinking. By contrast, those exposed to persistent majority views tend toward convergence of thinking and to an unreflective acceptance of the majority position."

This highlights how minority viewpoints exert influence differently from majority viewpoints. The latter do so either through information (the majority view is more likely to be correct) or norms (people want to be accepted and avoid being in a minority). In contrast, minorities do not influence people to adopt *their* position but simply to challenge the status quo and not go with the obvious answer. Thus, it matters less whether the minority viewpoint is actually correct.

102. Nemeth, Charlan Jeanne and Joel Wachtler (1983): "Creative Problem Solving as a Result of Majority vs Minority Influence" *European Journal of Social Psychology* 13, 45–55.
103. Nemeth, Charlan Jeanne (1986): "Differential Contributions of Majority and Minority Influence" *Psychological Review* 93, 23–32.

In addition to implications for the sharing of minority viewpoints, this study also has implications for coordination: what to do with a minority viewpoint. A common view is that requiring unanimity (e.g. within an investment committee) is overly stringent and will mean that many good investments are turned down. However, one advantage is that unanimity leads to minority viewpoints being taken seriously. While fictional, the movie *Twelve Angry Men* is a useful analogy. If unanimity were not required, the dissenting juror could be ignored, often known as the "tyranny of the majority". Instead, the need for unanimity forced others to take his views seriously. Of course, there are important drawbacks to requiring unanimity, such as leading to a bias towards the status quo. The point here is not to argue for unanimity in every case, but to suggest that unanimity may have benefits as well as costs, and to prompt asset managers to think of other ways than unanimity to ensure that minority viewpoints are taken seriously.

How much do these lab findings apply to asset management? Comparing figures clearly has no direct application. However, the insights about stimulating re-examination of the status quo are not confined to visual tasks, and researchers have demonstrated similar results in verbal settings.[104] That being said, it is important not to overapply this finding – it does not mean that asset managers should give everyone airtime to share an idea, regardless of expertise, and devote the same time to discuss an idea, regardless of who it came from. In a lab setting, subjects did not know who the other group members were and so everyone was equal; thus, a minority view was taken seriously. This is not the case in the real world. If an idea stems from someone who is perceived to lack expertise, it may immediately be dismissed rather than prompting a re-examination of the status quo.

What Psychological Safety is Not

It is important to stress that psychological safety does not mean "being nice", lowering performance standards, giving all team members equal airtime, or discussing all contributions equally regardless of quality. We earlier used the evolution analogy to highlight the benefits of diversity. However, evolution works because good mutations survive and bad mutations are killed off. Keeping bad ideas alive in the name of psychological safety and inclusion are misapplications of the concept. Recall the study of masters students in IT, which found that expertise diversity was positively linked to performance when psychological safety was high. It also found that expertness diversity (measured by the variation in students' grades) was *negatively* linked to performance when psychological safety was high, potentially because low-quality ideas were not killed off.

In addition, psychological safety does not mean that people should never be told that they are wrong – merely that being wrong does not lead to a negative stigma. Indeed, a study divided students into teams and asked them to give solutions to a problem.[105] Some teams ("Debate") were given the instructions "Most research and advice suggest that the best way to come up with good solutions is to come up with many solutions. Freewheeling is welcome; don't be afraid to say anything that comes to mind. However, in addition, most studies suggest that you should rule out criticism. You should NOT criticize anyone else's ideas." Other teams ("Brainstorm"), the underlined sentences were replaced with "However, in addition, most studies suggest that you *should* debate and even criticize each other's ideas." A third set of teams ("Control") group were given no instructions at all: thus, they were not actively encouraged to brainstorm.

When considering only the ideas generated during the group discussion, the Debate groups generated more ideas than the Control groups, while the Brainstorm groups did no better than the Control groups. However, the difference between the Debate and Brainstorm groups was not statistically significant. However, when also including the ideas generated after the group discussion, the Debate group generated significantly more ideas than both the Control and Brainstorm groups. Interestingly, this result held in both the US and France, despite different cultural norms.

These results underscore the importance of psychological safety in fostering effective brainstorming. It encourages people to share ideas without fear that they are seen as criticising others' ideas, or that their own ideas will be criticised: any criticism will be of the idea, not the person. The findings also highlight the benefit of allowing for additional idea generation after a meeting. One side-effect of encouraging open dialogue is that not everyone can speak at once; someone may have a valuable idea but not get the opportunity to voice it. In addition, some people's cognitive styles mean that they are more creative when given time and space rather than thinking on the spot.

104. Nemeth, Charlan Jeanne and Julianne L. Kwan (1985): "Originality of Word Associations as a Function of Majority vs. Minority Influence" *Social Psychology Quarterly* 48, 277–282; Nemeth, Charlan Jeanne and Julianne L. Kwan (1987): "Minority Influence, Divergent Thinking and Detection of Correct Solutions" *Journal of Applied Social Psychology* 17, 788–799.
105. Nemeth, Personnaz, Personnaz, and Goncalo (2004), fn. 92.

3.2.4.4 Visible Diversity

Visible diversity can arise either from demographic diversity (such as gender and ethnicity), or cognitive diversity that stems from a visible attribute (such as whether someone is a stock analyst or ESG specialist). Field studies generally find that cognitive diversity is particularly valuable where visible diversity is low: if the team has a high affinity for each other, they are more likely to share their own ideas and respect their colleagues'.

- We earlier discussed a systematic review which found that professional diversity is positively related to performance, but diversity on gender, race, age, education, and tenure is unrelated. This review also found that task-oriented diversity (related to education, profession, and tenure) has a more positive effect in majority white and majority male settings.
- We earlier discussed a study of a household goods moving firm which found a positive effect of informational diversity. These benefits were even stronger when values diversity was low, perhaps because it led to fewer frictions.

However, the lab experiments of Katherine Phillips and coauthors have found positive benefits of visible diversity. The following are some examples.

Who Dissents?

One study conjectures that dissent is taken more seriously when it comes from an outgroup, as people think it is reasonable for outgroups to have different viewpoints.[106] It took MBA students and asked them to analyse individually which market to target for a new MRI system. Then the students were put into teams containing other MBA and medical students. They were more surprised and irritated when a fellow MBA student agreed with them than disagreed; there was no difference for medical students. This may be because they expected fellow MBA students to be "like-minded" and were disappointed when they were not.

Interestingly, these results continue to hold even if visible diversity is on an irrelevant dimension, so there is no logical reason to think that an ingroup member should be like-minded. Another experiment took students from two dormitories and had them individually read a murder mystery to identify the culprit, before discussing the mystery in groups. Dissenting views were shared more strongly by outgroup than ingroup members, and the team did better at identifying the suspect when dissent came from the outgroup. This might be because ingroup members find it harder to disagree, as suggested by the conceptual research.

These two experiments show that dissent may be particularly effective when it comes from an outgroup: "having someone in the group who is a ''double-minority'' (both a social and a knowledge outsider) may actually improve group process and performance"[107]; "in contrast to the recommendations that call for the diminution of categorical distinctions, the current research suggests that there may be some benefits associated with maintaining categorical differences in diverse decision-making groups." This suggests that cognitive diversity might be especially beneficial when it is salient – for example, when a view on ESG comes from an ESG analyst. If cognitive diversity is less salient, it may be particularly beneficial when coupled with demographic diversity. Simply having a demographic minority who thinks the same as her colleagues may not improve performance, but a minority who thinks differently may be especially able to share new perspectives.

How Diversity Affects How Dissent Is Perceived

While dissent may be particularly powerful when it comes from outgroups, companies cannot choose who will think what on a particular issue. If an ingroup member happens to think differently, how can we encourage him to speak up? Another study found that ingroup dissent is more powerful in teams with visible diversity.[108] This study also conducted two experiments. The first was the MRI experiment, where the subject always dissented from her colleagues (unknown to her, this is because the researchers gave her different information). The team always contained a majority of MBA students, so she was always in the ingroup, but what changed was whether the team was all-MBA or contained a minority medical student. Dissenting MBA students reported a more positive and accepting group experience in diverse than non-diverse groups.

The second experiment again divided students up into irrelevant categories: whether they came from North and South Campus. Particularly relevant for asset management, the subjects were given a set of investment opportunities and asked to choose one. Again, they were given information that always led to them recommending a different investment. Like the first experiment, they had a more positive and accepting group experience in diverse groups; they also shared their views more strongly.

This research suggests that any type of visible diversity – even demographic diversity that is unrelated to cognitive diversity – can create a climate of diversity and encourage people to share different viewpoints.

106. Phillips, Katherine W. (2003): "The Effects of Categorically Based Expectations on Minority Influence: The Importance of Congruence." *Personality and Social Psychology Bulletin* 29, 3–13.
107. Phillips, Katherine W., Elizabeth A. Mannix, Margaret A. Neale, and Deborah H. Gruenfeld (2004): "Diverse Groups and Information Sharing: The Effects of Congruent Ties" *Journal of Experimental Social Psychology* 40, 497–510.
108. Phillips, Katherine W. and Denise Lewin Loyd (2006): "When Surface and Deep-Level Diversity Collide: The Effects on Dissenting Group Members" *Organizational Behavior and Human Decision Processes* 99, 143–160.

How Diversity Affects Group Dynamics

While the prior paper studies how diversity affects the experiences of dissenters, another paper explores how it affects group dynamics and outcomes.[109] It took a group of fraternity brothers[110] and asked them to solve a murder mystery. Five minutes in, they added a newcomer to the group. When he was from outside the house, the group was more likely to correctly identify the perpetrator than when he was a fellow resident. This superior performance was not because the newcomer provided fresh ideas of his own, but because his entry changed the dynamics between the existing members. During the initial five-minute discussion, the brothers typically had different views on who the culprit was. When a newcomer from a different fraternity arrived and shared his opinion, members who agreed with him found themselves in an awkward situation – they concurred more with an outsider than their own brothers. This tension made them more willing to try to understand their brothers' opposing views. In contrast, when the newcomer was from the same fraternity, they saw no conflict and kept arguing against their brothers.

How Diversity Affects Preparation

Another study asked 186 people whether they identified as a Democrat or a Republican and then assigned them the murder mystery.[111] They were asked to identify the culprit and prepare for a meeting with another participant. They were told their partner disagreed and they needed to come to a consensus. The first step was to write a statement explaining their view, which the counterparty would read before the discussion. Half of the subjects were told their partner belonged to the same political party, the other half to the opposition.

Democrats prepared better for the meeting, as measured by a more comprehensive essay, when they were contradicted by a Republican rather than a fellow Democrat; the same was true for Republicans. These results suggest that social diversity prompts us to work harder to address disagreement. In contrast, if the person is in the same social circle as us, we think we can convince them using charisma.

How Highlighting Similarities May Backfire

The conceptual research highlighted how diversity can increase the sharing of different views, and what matters is not actual but perceived cognitive diversity. Another study found that racially diverse groups were more likely to believe they had different information and spent more time discussing the murder mystery than non-diverse groups, consistent with members using demographic diversity as a proxy for cognitive diversity.[112] More interestingly, the researchers asked some groups – before discussing the murder mystery – to spend five minutes finding out how many common interests (such as friends, hobbies, and favourite movies) they had.[113] Being aware of these deep-level similarities made racially diverse groups perform worse at identifying the culprit.

This suggests that trying to highlight common interests and a "one firm" mentality may backfire. Allowing people to embrace their individuality may make them more willing to share their unique information. "Quants" should be allowed to behave like "quants", even if it might lead to pigeon-holing because – in the right environment – it leads to their differences being highlighted and respected.

Why might the findings of lab experiments contrast field studies, which generally find no link between demographic diversity and performance, and a negative link to affinity? One reason could be that the lab experiments are a one-off setting. Students participating in the experiment might never interact with other group members in the future. Thus, outgroup members are less concerned about sharing a different viewpoint, whereas in a company they may worry about being even more marginalised by the ingroup. A second issue is that some of the divisions used in the lab are non-hierarchical: for example, neither North nor South Campus is objectively better. In reality, some aspects of visible diversity are hierarchical, with particular genders, ethnicities, or educational backgrounds being more associated with success in asset management than others. This will come through in the practitioner perspectives.

3.2.4.5 Stereotyping

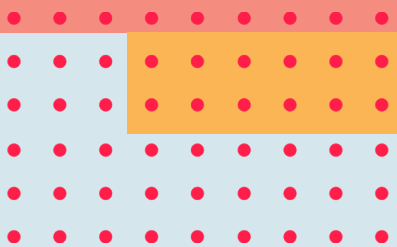
One downside of diversity is that it can lead to people being stereotyped. This may apply to cognitive diversity, not just demographic diversity – for example, an ESG specialist might be seen as less commercial than a stock analyst.

One study explores "interpersonal congruence" – whether a person is viewed by his colleagues in the same way as he views himself.[114] The researchers

109. Phillips, Katherine W., Katie A. Liljenquist, and Margaret A. Neale (2009): "Is the Pain Worth the Gain? The Advantages and Liabilities of Agreeing With Socially Distinct Newcomers" *Personality and Social Psychology Bulletin* 35, 336–350.
110. The same results held when studying sorority sisters.
111. Loyd, Denise Lewin, Cynthia S. Wang, Katherine W. Phillips, and Robert B. Lount, Jr. (2013): "Social Category Diversity Promotes Premeeting Elaboration: The Role of Relationship Focus" *Organisation Science* 24, 757–772.
112. Phillips, Katherine W., Gregory B. Northcraft, and Margaret A. Neale (2006): "Surface-Level Diversity and Decision-Making in Groups: When Does Deep-Level Similarity Help?" *Group Processes & Intergroup Relations 9*, 467–482.
113. Other groups were asked to work alone spending five minutes listing US state capitals.
114. Polzer, Milton, and Swann (2002), fn. 28.

asked MBA students to rate themselves and others in their study group on 11 dimensions such as academic ability, social skills, and cooperativeness. They found that skills diversity (prior degree, prior job function, and MBA concentration) had a positive effect on how strongly a student identified with his study group, but only where interpersonal congruence was high. In such settings, a person was appreciated for his unique perspectives, but not stereotyped.

Interestingly, the study also found that interpersonal congruence also affected the effects of demographic diversity (age, sex, race, and citizenship). Demographic diversity was positively correlated with the social interaction of a study group,[115] as well as group performance on creative tasks, but only when interpersonal congruence was high. (However, demographic diversity was negatively correlated with group performance on computational tasks when interpersonal congruence was high). Thus, while evidence on the overall benefits of demographic diversity is mixed, like cognitive diversity it may be beneficial in particular settings.



115. This was measured by statements such as "Everyone's input is incorporated into most important study group discussions."

3.3 Summarising the Scientific Research

The conceptual and empirical scientific research suggests that, rather than being universally positive or negative, the benefits of cognitive diversity are stronger in particular settings. These include generation rather than coordination and execution tasks, and novel rather than routine tasks. Similarly, cognitive diversity can be particularly beneficial for interdependent teams. However, collaboration should not be forced upon team members; instead, it should be allowed to emerge if and when it is beneficial.

Cognitive diversity is especially beneficial when combined with psychological safety, as the latter ensures that different viewpoints are shared and affect decisions. Otherwise, team members feel forced to bury them, and thus have a worse group experience than if everyone shared the same view. Interestingly, psychological safety can be beneficial even if it leads to incorrect views being shared: such views shake other team members out of the status quo and lead them to revisit their assumptions.

Visible diversity also encourages people to share different viewpoints, as it creates expectations that team members will have unique perspectives, and reduces any groupthink caused by social ties. Visible diversity can be particularly beneficial if it is coupled with cognitive diversity: a "double minority" is expected to have different views and so is less reluctant to share them. In contrast to common wisdom that companies should promote a "one firm" approach and remove categorical distinctions, having them may be beneficial in encouraging diversity of thought. However, care must be taken to ensure that categorisations do not lead to stereotyping, and instead people are seen by their colleagues as they want to be seen.

Overall, the mixed and nuanced findings suggest that companies should not simply "increase diversity", but focus on the forms of diversity that are most likely to improve performance (such as skill-based diversity from educational and professional background, and cognitive style diversity relevant to asset management), and increasing it in the settings in which diversity is most valuable but not viewing it as a panacea. In addition, firms should pay attention to enablers of diversity such as psychological safety and emergent interdependence, and address the costs that come from cognitive diversity such as lower affinity, coordination challenges, and potential stereotyping.

In addition, the mixed evidence does not mean that cognitive diversity has neither benefits nor costs and is thus irrelevant. Instead, the weak correlation arises because it has both benefits and costs. They are difficult to manage, and the average firm is unable to harness benefits that exceed the costs, but a well-managed firm may be. By analogy, the evidence that active asset management does not beat the market does not mean that markets are efficient. If they were, then stock selection would be irrelevant as everything is fairly priced. Instead, markets are inefficient and so stock selection is highly relevant – it is difficult to beat the market, but skilled asset managers can. Similarly, good leadership is necessary to enjoy the net benefits of cognitive diversity. The next section uses practitioner insights to uncover best practices.

4. PRACTITIONER INSIGHTS

I interviewed a wide range of practitioners to learn their perspectives on the costs and benefits of cognitive diversity in asset management, the settings in which cognitive diversity is particularly valuable, the barriers to cognitive diversity, and best practices to harness the value of cognitive diversity.

The vast majority of interviewees were from asset management and covered a range of seniorities, experience levels, and views on diversity. To obtain a diversity of perspectives and to learn from other sectors, I interviewed a small number of practitioners from other financial services industries and one from outside finance with significant experience of managing diverse teams in business. I also interviewed an ex-military fund manager and ex-military business practitioner, given that the military seeks to balance speaking up with hierarchy, and given prior work applying insights from the military into business.[116]

There was a remarkable level of similarity between practitioner views and the findings on scientific research – in particular that cognitive diversity has costs as well as benefits, and that demographic diversity is at best only a weak proxy for cognitive diversity. The main difference was that the advantages and challenges may be more pronounced in asset management than in the typical settings considered by academic research. In addition, while there was similarity among practitioners on "what good looks like", there was considerable heterogeneity in how effective companies are in achieving cognitive diversity and psychological safety. This sentiment was particularly expressed by junior professionals. Thus, asset managers who can manage these issues effectively may obtain a significant competitive advantage.

4.1 Benefits of Cognitive Diversity

Virtually all interviewees believed that cognitive diversity has the potential to create substantial value in asset management. This is for several reasons.

- Range of information. Investing is about noticing opportunities and risks. Cognitive diversity increases the range of opportunities and risks that an asset manager is aware of and can understand. An analyst with a tech background might notice the AI opportunities in even a non-tech industry; one with the ability to analyse corporate culture might notice a significant risk to an otherwise attractive investment; one who lived in a particular country may be best able to evaluate a local investment opportunity.

  This benefit is particularly important in investing where an almost unlimited range of information may be relevant to the value of an asset, in contrast to some manufacturing settings where there is a known "one best way" and the main challenge is to execute it (execution rather than generation).

One respondent argued that the Dunning-Kruger effect is particularly prevalent in asset management: you don't know what you don't know. Investors are simply unaware of either the availability or relevance of certain information. Cognitive diversity is valuable to shed light on these blind spots.

Moreover, there may be synergies between different information sources. One respondent pointed out that cross-sector and thematic research can be more valuable than sector-specific research. For example, it can predict trends such as the importance of AI in non-tech industries. Another said that AI will become increasingly strong at single-issue analysis, and that the ability to synthesize across issues and notice connections that AI might miss is how humans can continue to have an edge.

A range of information is also useful to understand a company's products and services. For example, female analysts will better understand products aimed at female customers. Analysts from a less affluent background will appreciate the value of affordability, and may have a contrarian perspective on luxury goods.[117]

116. See, for example, Willink, Jocko and Leif Babin (2017): *Extreme Ownership: How U.S. Navy Seals Lead and Win*. St Martin's Press.
117. One interviewee gave the example of a meeting where colleagues discussed a company that makes components for kettles. A senior raised the substitution risk for kettles as a product because s/he had a hot water tap and thus no need for kettles, with another senior agreeing. After a discussion amongst the group, highlighting the large gap in their respective pricing points, it became clear that there was limited substitution risk as a significant demographic may not be able to afford a hot water tap.

- **Interpretation of information.** Asset management is a setting with high uncertainty. Even if team members see the same information, they may interpret it differently. One may see a downturn in sales growth as a temporary blip, another as a harbinger of long-term decline. One may view high environmental and social performance as an indicator that a company is building for the future, another that it is taking its eye off shareholder value. One may be excited about the prospects of a growing sector, while another views it as over-hyped. Cognitive diversity increases the variety of perspectives on a given set of information, helping overcome a particular individual's biases or errors: the "wisdom of crowds" argument. This is why investors read a range of equity research reports: while analysts use largely the same information, they may interpret it differently.

  The scientific research typically used engineering and design settings to study how cognitive diversity affects creativity and innovation, and one study classified financial services as having only a moderate level of creativity – perhaps because it viewed the process for analysing an investment and reaching an investment decision as reasonably standard.[118] However, practitioners stressed how creativity and innovation matter more in asset management than commonly believed:

  - Creativity is needed to understand all of the different factors that may be relevant for an investment decision and piece together the different parts of the mosaic.
  - Creativity helps with imagining different futures for a company, and visualising a world that does not yet exist (e.g. a low-carbon future, or one in which AI is widely used). One interviewee argued that a truly good investor is a futurist: one who could predict the success of (say) Nvidia before even seeing the full range of products and use cases.[119]
  - Creativity is valuable for understanding new situations that are not taught in textbooks and where past experience is unlikely to be a guide. Examples include thinking about the effect of the COVID-19 pandemic, the Russia-Ukraine war, or the effect of Donald Trump's second term in office.

  Having a broader range of information and different interpretations of information is particularly valuable in asset management, where an investor can only create value by noticing information that is not in the price or having a different interpretation of information from the rest of the market. One respondent argued that the required technical skills to be an investor are not difficult to learn; it is cognitive diversity that gives the biggest edge.

- **Communication of information.** While the scientific literature highlighted how cognitive diversity can hinder coordination (which was echoed by practitioners, as described in Section 4.4.1), interviewees argued that cognitive diversity can also help coordination. Chiin-Zhe may present his case using graphs and Deya using narratives; even if Chiin-Zhe and Deya have the same underlying information, simply presenting it in different ways may help colleagues absorb it. Similarly, some colleagues being detail-oriented and others being high-level (see Section 4.2) will ensure that materials are thorough while maintaining sight of the bigger picture.

- **By-product of meritocracy.** Even if certain types of cognitive diversity do not directly add value by themselves, they may be a by-product of creating a truly meritocratic organisation that hires the best people by overcoming biases and stereotypes, and ignoring irrelevant information. (Note that the "best" people are those with the greatest forward-looking potential, rather than past achievements, and with the greatest potential to contribute to the team rather than best in isolation). For example, some interviewers may wish to hire people that they get along with at interview. This may be because the candidate went to the same university and can talk about shared experiences, is energetic and charming even though they are being hired for an investing rather than sales role, or is neurotypical and thus viewed as easier to interact with.

  Several practitioners said that some of the best investors that they have worked with are neurodiverse. They may be outspoken and direct in meetings, which can be a particular challenge in a conservative culture or in the current HR environment; they may be less presentable to clients; and they may not be the best company at social events. However, they stressed that this is either irrelevant (you are hiring an investor, not a friend) or can be overcome through leadership and coaching. While the company would not actively hire neurodiversity or diversity in personality, it sought to hire the best people irrespective of diversity, and if such people happened to be diverse, it would work as hard as possible to ensure that they are fully included.

118. Joshi and Roh (2009), fn. 35.
119. The interviewee also noted that being a futurist is important not only for investment decisions, but also investment product design, such as being able to predict future client demand for ESG.

Practitioners emphasised that meritocracy would lead to not only cognitive diversity, but also demographic diversity: the best teams would involve a range of demographics. However, they stressed that demographic diversity should be viewed as a by-product of meritocracy, rather than pursued as an end in itself. Similarly, interviewees did not actively seek to hire educational diversity, since most relevant skills are learned on the job. Instead, educational diversity was an indicator of meritocracy, rather than only recruiting candidates with business and economics backgrounds, or who had studied similar subjects to current employees. Note that educational diversity was with respect to subject, rather than rank of educational institution. One interviewee (from a non-traditional background) stated that hiring from lower-tier universities, on average, leads to lower-quality talent, and that universities are generally good at admitting the right people. Another pointed out that different-tier universities still study the same textbooks and teach the same materials, so diversity of institution quality is less valuable than diversity of subject.

- Alignment with stakeholders. Asset management involves forming relationships with external stakeholders, in particular investee companies and clients. The former is especially relevant for asset managers who intend to engage with investee companies, such as private equity. Cognitive diversity gives an asset manager more "cards in the hand", increasing the likelihood that it will have the right card to play at a particular time. For example, it may have a tech-oriented colleague who will bond particularly strongly with a tech entrepreneur, or a team member from a particular country who is best able to serve a client in that country.

4.2 Beneficial Types of Cognitive Diversity

Practitioners believed that the following types of cognitive diversity are particularly beneficial:

- Skills. This may include subject matter expertise (including industry and country expertise), professional experience, and networks.

  A range of expertise increases the breadth of skills at an asset manager's disposal. Moreover, someone whose expertise lies outside the current setting (e.g. a healthcare expert when evaluating a tech company, or an analyst with little knowledge of the country where a company is located) can still be valuable. First, the non-expert may have an outsider's perspective that others may have missed, such as providing a contrarian view on the tech industry. The industry or country expert might have an affinity towards that industry or country, or think that they have all the answers and do not need additional views. Second, the lack of expertise gives the non-expert license to ask "dumb questions" that experts would be reticent to ask. In reality, the question is far from "dumb", but a blind spot that everyone else has missed, or a question that some experts also have but are unwilling to ask because they feel that they should know the answer.

  In addition to different subject matter expertise, age and tenure can also increase someone's willingness to ask questions. Young employees may suffer little stigma from asking a question (in the right environment) as they are not expected to know the answer, and a newcomer to the firm may not yet know its processes. Newcomers may also be more able to question a company's processes rather than thinking "we've always done it that way", and can bring in approaches learned from other firms. This needs to be balanced against the benefits of having a long tenure with the company, hence the importance of tenure diversity.

- Life Background. A couple of interviewees highlighted the value of life experiences. One argued that investing is pattern recognition; it is useful to have seen different scenarios play out so that you can recognise patterns. The range of outcomes that you are able to foresee for a stock may be influenced by the range of outcomes that you have experienced: an analyst who has experienced few setbacks may only consider the bull case. Another argued that life experiences shape your mental models, and defined a mental model as recognising particular "types" of stocks. This allows an investor to reach a conclusion, such as "I've seen a stock like this before and this is how it performed" without having to go through numerous steps to get there. (Of course, there are costs as well as benefits of such shortcuts).

- **Demographics.** Relatively few participants brought up demographic diversity as a source of cognitive diversity: they thought that cognitive diversity is difficult to identify "at entry" based on observable characteristics and is only identified later on the job (see Section 4.6.5). The following demographic characteristics were discussed:
  - **Country of origin.** This was the most common demographic characteristic discussed. In addition to providing expertise on that particular country, it also leads to different perspectives on macroeconomic issues in general. However, respondents said that it was country of origin rather than race that leads to these different perspectives. Race did not directly matter, although greater racial diversity may be a by-product of either meritocracy or of forced diversity at the expense of meritocracy (see Section 4.6.6).
  - **Age.** Only a few participants discussed age, although they generally viewed age diversity as a positive. Different age cohorts may have contrasting views on a company's products and services, varying perspectives on economic, social, and political trends, and experienced different economic conditions leading to variation in risk appetite and optimism/pessimism.
  - **Gender.** Only a few participants discussed gender. One participant highlighted how men and women react differently to particular situations, particularly stressful situations, and that the "stereotype" of women having higher emotional intelligence is generally accurate. In contrast, another said that women have a wide range of personalities and cognitive styles, as do men, and so it is difficult to use gender as a proxy for cognitive diversity.
  - **Optimistic vs. pessimistic.** Information has multiple interpretations. Optimists and pessimists will interpret information in different ways, providing a broader range of interpretations and countering each other's biases. By analogy, cars have both accelerators and brakes. Knowing that a colleague is a pessimist may encourage an optimist to propose bold ideas, confident that if there are indeed serious drawbacks, the pessimist will point them out. Knowing that you have good brakes allows you to push on the accelerator even harder.
  - **Risk-averse vs. risk-tolerant.** Even if two colleagues are equally optimistic/pessimistic, i.e. see the probability distribution of future outcomes, one might focus more on the upside potential and another on the downside risk.
  - **Quantitative vs. qualitative.** An investment decision involves a range of different factors. Some investors focus on quantitative value drivers, others qualitative, and others still on "unknown unknowns". A team whose members are adept at assessing a range of information will be collectively more informed than one with a narrower range of expertise.
  - **Extrovert vs. introvert.** Extroverts are more willing to express an idea even if not fully formed, while introverts may be unwilling to share a view even if well-grounded. I asked practitioners whether diversity on this dimension was more valuable than homogeneity, because introverts may report being talked over and extroverts may complain about introverts slowing them down. They replied that diversity does lead to clashes, but these clashes are necessary to prompt the sharing of diverse viewpoints. For example, an introvert may have a legitimate concern but be unwilling to share it unless prompted by an extrovert pushing an idea too hastily. In addition, an introvert might prefer to listen to other views first before forming his own, but this requires the group to contain extroverts who readily share their opinion.
  - **Detail-level vs. high-level.** A high-level person may miss important details; a detail-level person may miss the big picture. A detail-level person may aim for a perfect answer even though there may be a limited window to invest; a high-level person understands the importance of making timely decisions even when information is incomplete. In contrast, a high-level person may overestimate urgency and make hasty decisions, and be reined-in by a detail-level colleague.
  - **Contrarian vs. consensus-oriented.** A contrarian person is willing to challenge and go against the grain: both the views of the market and of his colleagues. However, too many contrarian people may lead to decisions never being taken because they are always debating with each other. A team also needs people focused on building consensus and moving forward.
  - **Long-term vs. short-term.** One colleague may be focused on short-term earnings and recent stock momentum at the expense of long-term trends; another may be overly swayed by a company's potential even though it has repeatedly failed to hit short-term milestones.

- Conservative vs. liberal. A number of interviewees remarked that political diversity is particularly valuable in the current environment. For example, right-leaning analysts might have predicted the backlash against Target and Wal-Mart; colleagues with different political affiliations may have different views on the outlook for renewable energy, the effectiveness of Donald Trump's policies, and the value of ESG and DEI initiatives. One participant caveated that political views should be expressed in the context of discussing investments, but not outside of work-related issues.

Note that all of these types of cognitive diversity have costs as well as benefits. For example, a high-level person may not appreciate the insights provided by a detail-level person; worse, she may be frustrated by constantly interacting with him. These coordination and affinity challenges are discussed in Section 4.4.

4.3 Beneficial Settings for Cognitive Diversity

Although practitioners believed that cognitive diversity can be valuable in all areas of asset management, they viewed it as being particularly beneficial in equities as there is greatest uncertainty in valuation and the greatest range of potential outcomes: the upside is unlimited, while liquidation value is zero. With fixed income, the upside is limited to the principal plus coupons, and the downside is limited by the value of collateral; both of these provide valuation anchors. Cognitive diversity is also useful for multi-asset funds, because they need knowledge of different asset classes, and the ability to compare different securities on the same issuer.

One consideration that can be more relevant in fixed income is liquidity. Most stocks are liquid, particularly in developed markets, and so investment teams can focus on analysing the quality of an investment opportunity without needing to consider whether it can be executed. In contrast, in fixed income, an investment idea may be fundamentally attractive but not executable. Thus, fixed income may require a greater understanding of supply/demand dynamics in the market; for over-the-counter products, investors need to know who the potential counterparties are and who has inventory. However, this may not be so much "cognitive diversity" as the importance of considering an additional factor.

Practitioners also viewed cognitive diversity as highly beneficial in asset allocation and security selection, which involves gathering a range of information, encouraging a variety of perspectives on that information, and imagining a breadth of different futures. However, it is less valuable in execution-oriented tasks, such as operations, compliance, and trading.

4.4 Challenges of Cognitive Diversity

While there was broad consensus about the potential benefits of cognitive diversity, there was also broad consensus about the challenges that cognitive diversity can bring, which mirrored the scientific research.

4.4.1 Coordination

All interviewees agreed that cognitive diversity can lead to coordination challenges, with unequivocal answers such as "absolutely", "100%", and "without question", although there were different views on the extent to which these challenges can be managed (see Section 4.6). They expressed the following difficulties:

- Misunderstandings. People with different skills, perspectives, and views of the world may not fully understand or appreciate each other. A quant might dismiss a colleague's assessment of corporate culture as "fluffy", or understand that it is valuable but not precisely why and thus underweight it. A big-picture thinker may be frustrated with a colleague who she views as getting lost in the detail; in contrast, he may view her as being too cavalier. In addition, people may be unaware of the full range of cognitive resources within a team: a fundamental analyst may view three colleagues as all being "quants", when there are different types of quant. In all of the above cases, the team has cognitive diversity, but coordination issues prevent it from fully leveraging it.

- Slow Decisions. Cognitive diversity may lead to inertia. Even if colleagues fully understand each other, the process of consulting everyone can lead to "analysis paralysis" and "too many cooks". One interviewee pointed out that, in equity markets, it is rare to be more than 60% correct given the level of uncertainty. A leader of a cognitively diverse team may think that her breadth of resources will allow her to get to 80%, and miss the window of opportunity to invest. Others highlighted that the process of seeking multiple perspectives and reaching consensus among people with different views simply takes time, whereas a more cognitively homogeneous team will converge quickly.

  A related challenge is that cognitive diversity can be used as an excuse for inaction. Seniors may be reluctant to make a decision and appeal to the need to seek different viewpoints, when the culprit is poor leadership rather than cognitive diversity.

- Poor Decisions. Relatedly, the desire to be inclusive can lead to a company valuing all perspectives equally, or taking all concerns seriously – any opinion goes, even if it is based on ideology or gut feel rather than analysis. Many respondents stressed how inclusion should not mean that everybody's view is equal and incorporated. One said that if a leader gives more airtime to experienced colleagues, a colleague may complain to HR that she is insufficiently inclusive of junior members, even if the decision is based on meritocracy rather than discrimination. A leader who listens to a concern open-mindedly but uses professional judgment to move ahead with the decision, may similarly be the subject of a complaint.

- Challenging the Wrong Topics. Slow decisions and poor decisions arise from excessive challenge on a given topic, such as an investment decision. Another cost of cognitive diversity is challenging the wrong topics. One interviewee said that their firm was effective at encouraging juniors to challenge investment decisions, but that this sometimes led to juniors challenging how they should be managed, such as why a stock note has to comply with a particular format.

  An ex-military interviewee explained that a key aspect of military training is being constantly encouraged to speak up, but also to know when to stop and to respect a senior's decision. As former US Secretary of State Colin Powell said, "When we are debating an issue, loyalty means giving me your honest opinion, whether you think I'll like it or not. Disagreement, at this stage, stimulates me. But once a decision is made, the debate ends. From that point on, loyalty means executing the decision as if it were your own."

- Conservatism. In contrast to the common view that cognitive diversity sparks innovation, several respondents argued that it can lead to conservatism (consistent with the "Collaboration reduces creativity" evidence in Section 3.3.2). Obtaining many different viewpoints may lead to regression to the mean or to the lowest common denominator – the action that everyone can agree on. Great investors are contrarian, and if a single PM has authority to make an investment, she can be contrarian. However, if a team of five decides on the investment, then she would have to convince two other colleagues to obtain a majority, and it hard to encourage others to be contrarian also. Thus, teams are more likely to go with the consensus.

The above issues arise from dimensions of cognitive diversity that a company actively selects because it views them as beneficial (see Section 3.2). In addition, there may be challenges from aspects of cognitive diversity that an asset manager does not actively seek, but arise as a by-product of hiring the best people.

- Communication Style. Communication involves both expressing and receiving viewpoints. Some people prefer voicing their thoughts in a meeting; others like to communicate them in writing beforehand, or afterwards having listened to and then digested the discussion. Some like to evaluate an investment thesis in written form, others prefer to see it presented. Some are energised by meetings; others like solitary deep work. Some cultures may be used to expressing themselves directly and openly; others may view this as blunt and abrasive – yet be seen by the former as opaque and difficult to read.

- Personality. Hiring the best people may lead to colleagues who are not a natural cultural fit (for example, an outspoken or impulsive fund manager in a conservative firm) or whose way of working may not suit the organisation's processes (for example, someone who prefers working alone in a company that values teamwork). Some may have personality traits that directly hinder cognitive diversity, such as being very quiet, being unwilling to ask questions, or being from a culture in which juniors simply follow the instructions of seniors.

- Status. A meritocratic company will hire people from a range of backgrounds, such as both state and private schools (a deliberately simplistic example for clarity). "State school" employees may feel less comfortable challenging "private school" colleagues and thus do not speak up. "Private school" employees may be reticent about disagreeing with "state school" colleagues for fear of being seen as condescending or non-inclusive. This concern is absent from laboratory experiments where (for example) North Campus and South Campus are different groups but not viewed hierarchically.

- Values. Hiring the best people may lead to team members with different work-related values. Some expect every meeting to start on time and are frustrated by latecomers. Some value precision in any marketing claim made; others may prioritise pragmatism and commerciality. Some may proactively talk about their successes and contributions; others will be more modest and thus risk getting overlooked. Some may believe that team members should work together in an office; others value the flexibility to work from home. Some may view their leisure time as sacrosanct and be unwilling to work past a certain hour, placing added pressure on colleagues that are willing; the latter may pressure the former to work more than they are comfortable with, or create unnecessary work. Respondents highlighted cultural differences on the amount of work that is viewed as reasonable.

  Differences in ethical values may lead to friction when discussing whether a stock should be excluded for ethical reasons. Differences in political or religious viewpoints can also cause tension even if unrelated to an investment decision. An ex-military interviewee said that values are non-negotiable in the military and so homogeneity, not diversity, is required. S/he remarked that soldiers are required to disobey an order they believe is immoral, unethical, or illegal. Asset management firms may similarly have red lines on certain actions even if they would increase returns or client inflows.

4.4.2 Affinity

There was widespread agreement that a level of commonality helps ensure team cohesion. The following is a subsample of the views expressed:

- People have to enjoy work to be at their best, and people enjoy working with colleagues that share common backgrounds, interests, and sense of humour.
- Constantly having to translate your views into another "language", or seeing your contributions go underutilised because colleagues do not have the expertise to appreciate it, may lead an employee to being unhappy and eventually quitting.
- Affinity should not be seen as "fluffy". Culture clashes frequently lead to the failure of M&A deals.
- That expats form expat communities highlights that, when given a free choice, people like to interact with others with similar backgrounds.
- People from the same country (sometimes the same university if there is a flagship university in that country) frequently dine together, socialise together, and seek to work on the same projects. This leads to camaraderie where they support each other through challenges, share work-related information, and bring fun to a stressful environment. One respondent reported that colleagues who share such bonds are typically the highest performers and stay longest at the firm.
- Happiness need not lead to comfort but challenge: colleagues who feel comfortable interacting with each other are more willing to be candid and express different views, rather than feeling the need to conform to earn their place in the group. Bringing in an outsider may upset that dynamic.

However, there was some diversity of views on how much commonality is required. Several interviewees said that professional respect and trust are sufficient to lead to openness; you do not need to want to have a drink outside the office to work well with a colleague within the office. Another remarked that going to the same university might help you form a relationship faster, but after the initial conversations about mutual friends and shared experiences, it makes little difference. A number of respondents argued that a commonality of purpose – for example, wanting to be clients' first choice, to deliver top-quartile returns, or to have a deep understanding of the markets – was enough to ensure that colleagues worked well together.

4.4.3 Identity

An added disadvantage of cognitive diversity highlighted by practitioners, that was not in the academic literature review, is that it weakens a firm's identity along the following dimensions:

- Excellence. A common view is that companies should hire a diversity of people and let them "be themselves". However, several interviewees highlighted that there are minimum standards of excellence that an investment professional should achieve; the company's response to lacking particular skills should be training rather than "inclusion":
  - One respondent argued all investors should possess the fundamental skills of written communication, oral communication, and financial modelling – irrespective of their preferred communication style and professional/educational background. For example, if a colleague is reluctant to give presentations, they should not be left to "be themselves" but coached. If training is ineffective, the person should be let go even if they bring cognitive diversity.
  - Another argued that all fund managers should have emotional control, so that they do not have knee-jerk reactions to sudden market movements, and that both fund managers and analysts need a willingness to challenge company management. Thus, personality diversity is not always beneficial.
- Investment Approach. Cognitive diversity can lead to an asset manager being "jack of all trades": it may be so excited by its range of cognitive resources that it dilutes its product offering. For example, a boutique fund may have been founded on a particular investment philosophy. It recruits colleagues from different backgrounds initially to challenge that investment philosophy, but mission creep leads to it departing from that investment philosophy and adopting others that it has less expertise in.

  Not only can cognitive diversity affect the actual investment approach; it can also affect the perceived investment approach. With cognitive homogeneity, clients know what an asset manager stands for. Some firms are known for being quant funds, a few of which are famous for academic expertise; similarly, some fundamental firms are associated with a particular style. As an interviewee commented (referring to a private equity firm X), "you know what a typical X deal looks like and what a typical X partner thinks like". Clients often want diversity, to diversify their portfolio, and this is easier if each asset manager has a distinct identity so they know what investment approach they are getting: diversity in the asset management industry does not mean that each asset management firm needs to be diverse.
- Values. Some firms might expect all employees to share a common set of values, even if doing so reduces cognitive diversity. Some may be committed to rigour and precision over commercial pragmatism; others may attract employees who are primarily financially motivated and use pecuniary reward structures.

4.5 Barriers to Cognitive Diversity

Participants highlighted a number of challenges to cognitive diversity in the asset management industry. These predominantly concerned less obtaining the "raw materials" for cognitive diversity (i.e. recruiting colleagues with a diverse mix of viewpoints) and more encouraging colleagues, in particular junior ones, to share their different viewpoints. Interestingly, these concerns were voiced by senior as well as junior interviewees.

- Career Risk. Just as investing is about risk and return, colleagues trade off (career) risk and return when deciding whether to express a different viewpoint. Some juniors believe that the risk-return trade-off is asymmetric: the benefit of sharing a contrarian view and the senior following it is much less than the cost of being told that you are wrong. "Errors of commission" (sharing an opinion viewed as incorrect) are more likely to lead to negative evaluations than "errors of omission" (failing to share an opinion). Moreover, even if the senior follows the junior's view, this is not necessarily beneficial to the latter's career due to a subsequent asymmetry: the "fundamental attribution error". If the investment recommendation ends up paying off, the senior takes the credit; if it does not, the senior blames the junior rather than owning the decision.
  - This concern was not universal among interviewees. Some juniors reported that their firm constantly encouraged them to challenge, and indeed had this as an expectation. This heterogeneity means that asset managers that are able to encourage diverse perspectives may enjoy a significant competitive advantage.

Where these concerns were present, they sometimes manifested in general fear, not just fear of sharing different viewpoints. For example, some juniors feared being asked a specific question about a company they are covering and being unable to answer. "I don't know and will get back to you" was not seen as an acceptable response. They thought that they are constantly being judged, and this created stress.

- **Pressure to Conform.** Lateral hires in particular reported a reluctance to challenge their colleagues. This was due to a desire to fit in; too much challenge might lead you to be viewed as "not the right fit" and cause others to question whether hiring you was the right decision. This may be especially the case for funds that have held positions for a long time: new hires are viewed as not knowing the holdings as well, even though they may be less wedded to the holdings and may offer an independent perspective.

- **Seniors' Desire To Be Right.** Portfolio managers' reputation is built by being right: by making the correct judgement calls on an investment. This sometimes translates into wanting to be right all the time – including when discussing investments. Being challenged can hurt a senior's ego and lead to defensiveness. When a junior presents a different viewpoint, a senior may immediately try to explain why he is wrong rather than entertaining the possibility that he may be right – intellectually winning the argument is more important than reaching the right decision or considering the consequences on the junior. If a junior is told that he is wrong in public, this deters him from speaking up in the future.

- **Confirmation Bias.** In addition to the desire to be right leading to defensiveness in meetings, it may lead to confirmation bias outside of meetings. For example, a senior asks juniors to prove her viewpoint rather than objectively assessing the data.

- **Large Meetings.** The above dynamics are particularly acute in large meetings. Some portfolio managers do not wish to be told that they are wrong in front of colleagues. This may lead to them snapping at a junior who expresses a different view, or being unwilling to admit that the contrarian view may have merit. Relatedly, a senior may not wish to ask juniors questions if she thinks that others expect her to know the answer, and so will claim the juniors are wrong rather than finding out the source of their different opinions.

  Separately, large meetings give little opportunity for juniors to contribute in detail, since they can only speak for a short time. A third disadvantage, as discussed earlier, is that large meetings lead to regression to the mean: contrarian and outlier ideas are stifled.

- **Additional Work.** Disagreeing can make your life harder at an individual level, as you need to do additional work to ensure that your different view is watertight, particularly when challenging seniors.[120] It can also make life harder for your team. For example, if the sustainable research team is unanimously recommending a stock, it is more likely to be given weight by fund managers.

  An ex-military interviewee noted that it is common for officers and their senior advisors to have an agreement where they disagree freely behind closed doors, but present a united front when in front of subordinates. Alignment between seniors builds confidence in the leadership and creates buy-in for the proposed course of action.

- **Star PM Mentality.** Some asset managers have "star PMs" who are sufficiently revered that people are unwilling to challenge them, which may lead to a culture of not challenging PMs more generally. In reality, those PMs' outperformance may have been partially due to luck rather than skill. As one respondent argued, the worst thing you can do as an investor is to be overconfident.

120. In addition, the organisation's processes may lead to extra work for a dissenter. Outside of asset management, an institution I am involved in requires negative votes to be accompanied by a written memorandum signed by the dissenter, which is shared among all committee members. Positive votes need not be accompanied by a memorandum, and are anonymous (except to the committee chair).

4.5.1 Equity and Inclusion

One barrier to cognitive diversity that was shared by many respondents, and sufficiently important to warrant its own subsection, was lack of equity and inclusion. Psychological safety is one aspect of inclusion and specifically concerns the courage to speak up. However, respondents highlighted how equity and inclusion matter beyond psychological safety. Sharing different viewpoints requires courage and the view that the company "has your back". Thus, even if perceptions of inequity and non-inclusion are unrelated to the sharing of different viewpoints, they can lead to the general perception that the organisation is not supportive and dissuade speaking up.

Equity and inclusion are major topics in their own right and I would not be able to do them justice in a single sub-section. Since gender diversity is a high priority of the Diversity Project, I will focus exclusively on equity and inclusion issues discussed by the interviewees that relate to gender. The goal of this section is to raise awareness of issues, rather than suggest silver bullets. As will soon become clear, well-intentioned actions that seek to be equitable and inclusive may have the opposite effect; raising awareness aims to draw attention to these unintended consequences.

- Work Relationships with Men, Personal Relationships with Women. If a male PM shares a cab with a female analyst, he might ask about her toddler's nursery. This might seem to be inclusive: to view her as a person, not just an employee. However, if the same PM shares a cab with a male analyst, he might ask whether he is being staffed on the right stocks and getting enough exposure in meetings. If both analysts have one shared cab ride a month, the male analyst obtains twelve opportunities a year to be mentored that the female analyst does not.

  This example is symptomatic of a broader concern: the conversations men conduct to build relationships with other men tend to be work-related, while the conversations they have with women are personal.

- Lower Standards. Junior women reported not being pushed by seniors to as high standards as junior men. The quality of work that seniors deem acceptable from a woman may be lower; they may be happy with the level that she is currently at rather than stretching her further. Again, this might be seen as inclusive, by being more aggressive towards junior men, but has the unintended consequences of both making junior women feel they have less potential, and preventing them from reaching their potential.

- Less Investment. Given the empirical fact that men typically stay longer within the industry, seniors may view it as individually rational to spend more time investing in and mentoring junior men. This is self-fulfilling, since the lack of investment in women leads to them dropping out at a higher rate.

- Non-Inclusive Language. Some non-inclusive language has become so commonplace that it is rarely called out, but the commonality does not attenuate the non-inclusiveness. For example, the common use of the word "guys" gives the impression that the investors are male, or that the only investors that matter are male (such as "are you guys coming to the meeting?"). The "solution" of referring to "guys and girls" remains non-inclusive, since female professionals are women and "girls" is diminutive.

- Non-Inclusive Activities. Interviewees commented that golf events are common in asset management, but few or no women are invited. Even if they are invited, those who are not interested in golf will either decline, or accept but not thrive at such an event. Similarly, a junior may obtain significant visibility with a senior through conversations in the men's locker room in the company gym; male colleagues will play five-a-side football with each other, form a bond and share work-related information. The interviewees stressed that these activities should not be dissuaded. Rather, asset management firms should be aware of them and how they lead to micro-biases, bonds, and learnings, and ensure that similar opportunities are provided for women.

  Sometimes, non-inclusion arises not from the nature of the activity but last-minute planning. Since women typically bear the majority of childcare responsibilities, they may be unable to "go for a couple of pints" on a weekday evening at short notice. Even if spontaneous social events are organised to be inclusive, with the intention of connecting with colleagues outside work, they can be unintentionally exclusionary. A lunch within working hours might be a more inclusive alternative.

- Women's Networks. Women's networks may seem to be unambiguously positive for women, but are sometimes perceived as principally providing positive PR for the firm, as it can claim that it has women's networks on its website and at diversity recruitment events. If networks fail to achieve real change by helping women thrive at the firm, they may have negative impact as they are seen as perfunctory.

  In addition, it takes significant time for women to organise networking events, and for senior women to attend such events. Acknowledging this, for example with a day's annual leave, would show that the firm recognises this at work. Viewing the time taken for organisation and attendance as a free good can lead to perceptions of inequity.

- Career Interruptions From Pregnancy. A significant hurdle to women becoming PMs is that the promotion decision (from analyst to PM) is typically taken around the time many women have children, i.e. early 30s or after approximately 10 years as an analyst. This promotion is a career-defining juncture that is critical for ensuring the longevity of a career in asset management. While most women take extended parental leave, men rarely do; in addition, women typically bear the majority of childcare responsibilities after birth. Moreover, there is an age range where, if a woman has not made PM, she likely never will and is viewed as a career analyst.

  Moreover, relative earnings dynamics within a family amplifies workplace dynamics. If a woman is overlooked for promotion in her early 30s while having children, her earnings may have fallen significantly behind her partner's by her late 30s. The family dynamic may either dissuade her from returning to work or require her to bear more childcare responsibilities after returning, further increasing inequality.

  The career interruption from pregnancy applies outside of promotion concerns. A woman in the early stages of pregnancy or intending to become pregnant may be reluctant to take risk (e.g. by speaking up, making a contrarian investment, or switching firm) because, if she is made redundant, it will be difficult for her to find a new job as she will be at a late stage of pregnancy. One interviewee knows of women who have had abortions because they were too new in the job and being pregnant would expose them to too much career risk.

- Perceptions of Pregnant Women. Just as interviewees remarked that women are held to lower standards than men, they reported that pregnant women are held to lower standards too. As one commented, "I'm pregnant but my brain still works." They may be given fewer client meetings, assigned fewer stocks, and ascribed fewer responsibilities – either because seniors think they have diminished capacities, or they are planning for them going on maternity leave. Again, the reduction in responsibilities may be intended to be inclusive, but often has the opposite effect.

  In contrast, genuine impediments may be overlooked. An interviewee reported being asked to take a flight when 8.5 months pregnant, on the grounds that "being pregnant is just like wearing a fat suit".

- Return After Pregnancy. While interviewees reported that pregnant women may not need special treatment, women who have returned to work after maternity leave do need help to ease back in, and additional support due to their childcare responsibilities. However, because pregnancy is physically visible and being a new mother is not, pregnant women are given additional support (which may not be necessary) and new mothers are not.

- Unequal Pay. While interviewees did not have evidence, given the confidential nature of pay, there was the perception that women are less forceful than men as demanding bonuses. This may lead to both perceptions of unfair treatment that can stifle speaking up, and women eventually leaving the industry. In addition, many companies do not pay bonuses to women who are on maternity leave. Given that bonuses comprise a significant proportion of total compensation, leaves that employers claim to be on "full pay" are actually not.

4.6 Leading Cognitively Diverse Teams

Interviewees were unanimous that managing cognitively diverse teams is complex: good leadership is needed to fully leverage the benefits of cognitive diversity while mitigating its costs, rather than simply recruiting a diverse team and assuming that diversity will do its magic. However, there were differences of opinion about the extent to which leadership can overcome these challenges. Some interviewees believed that all these challenges can be addressed, and that if cognitive diversity still ends up having costs, this is a leadership failure. The majority believed that good leadership can attenuate, rather than eliminate these challenges.

Regardless, there was full agreement that good leadership can make a big difference, and the participants identified several ways in which it can do so. Most of them focused on increasing inclusion of different viewpoints to ensure that they are generated, shared, and taken seriously, rather than increasing cognitive diversity. One interviewee pointed out that a culture of challenge and debate leads not only to diverse viewpoints being shared within the organisation, but also information generated outside the organisation being questioned. This is particularly important to ensure that investors do not simply accept the narrative spun by CEOs and investor relations departments, or the view of the rest of the market which will already be priced in.

I summarise the various suggestions below. Not every suggestion will be appropriate for every firm, or for a particular firm at every time. The purpose of this section is to increase the tools at a company's disposal, rather than providing a recipe of "To Dos" that it should always follow. Since some of the suggestions covered similar themes to Chapter 10: Thinking Smarter in Organisations of my book *May Contain Lies* (on overcoming biases and developing critical thinking), I occasionally weave in ideas from that chapter which are on the same topic as those raised by interviewees.[121]

I divide the suggestions into the following categories: leadership, management, running meetings, surfacing different viewpoints, recruiting, and practices to beware. One consistent theme across many interviewees was that, even though some of these suggestions may seem obvious, they are far from universally practised. As one member of the Cognitive Diversity taskforce noted, leading cognitively diverse teams is "simple, but not easy" – "what good looks like" is clear, and the path to getting there is often clear, but actually following the path is difficult.

4.6.1 Leadership

- Make Expectations Clear. Arguably the most important step is for leaders to be explicit that they value contributions from all team members, and in all directions (both supportive and contrarian). Both junior and senior interviewees highlighted the power of a fund manager stressing how they do not know everything about a stock, have blind spots, and appreciate different perspectives.

  While setting expectations may seem obvious, some leaders may think that it is so obvious that they fail to do it. In other companies, these expectations are so counterintuitive (given pressures to conform, or views that portfolio managers are "stars" who either should not be challenged or dislike being challenged) that they cannot be emphasised enough.

  Leaders could also set clear expectations about boundaries. This ensures that any cognitive diversity that arises as a result of hiring the best people does not lead to inappropriate behaviour.

- Seek Viewpoints. Words must be matched by actions. A leader may claim to value colleagues' contributions but never solicit them; alternatively, they ask for their view but to tick a box rather than taking it seriously.[122] Treating juniors as equals, and as if their opinion matters, may seem obvious, but several respondents highlighted that it is far from ubiquitous.

  Simply asking a junior "what do you think?" has the direct benefit of obtaining an additional opinion, and an indirect benefit of making the junior feel included and motivating him to generate ideas as he knows that he will be able to share them. One participant recommended that questions be as open-ended as possible, to allow maximum contribution and not restrict the answer. A second suggested the mindset "pretend that you have no clue about the answer so that you give others room to share their views." A third remarked that, at their firm, portfolio managers are also analysts themselves, and thus have to present to other analysts and be challenged. This gets other analysts in the habit of challenging them.

  Outside of asset management, when he ran General Motors, Alfred Sloan closed a meeting by asking "I take it we are all in complete agreement on the decision here?" Everyone nodded. Sloan continued, "Then, I propose we postpone further discussion of this matter until our next meeting to give ourselves time to develop

121. Edmans, Alex (2024): *May Contain Lies: How Stories, Statistics, and Studies Exploit Our Biases – And What We Can Do About It.* Penguin Random House.
122. Note that taking an opinion seriously does not mean going along with it, but considering it carefully when making a decision even if the final decision involves not following that opinion.

disagreement and perhaps gain some understanding of what this decision is about." He believed that no decision he proposed would be perfect, and if no one raised any concerns, this was because he had not given his colleagues sufficient time to think of them.

- Reward Dissent. Showing that you value dissent goes a long way towards encouraging it. This may be as simple as saying "I hadn't considered that" after hearing a different viewpoint.

  Acknowledgements are particularly important if the contrarian perspective does not end up changing the decision. For example, if an investment committee goes ahead with an investment despite a challenge, the chair could thank the dissenter and stress that, even though they are still making the investment, they will actively monitor the concern to see if it surfaces and warrants an exit. Otherwise, the dissenter may think that speaking up was futile as it did not change the decision; worse, that it upset the proposers of the investment and prolonged the meeting. Then, the next time, she may self-censor.

  Beyond informal acknowledgement, formal evaluations of junior colleagues can highlight their willingness to ask questions, share different viewpoints, and voice concerns. Failure to challenge may be raised as a development area. One interviewee said that their boss's KPIs included ensuring that juniors are asking questions in meetings.

- Awareness. A precursor to making expectations clear and backing them up with actions is for leaders to recognise the benefits of cognitive diversity in the first place.[123] This involves leaders being aware of their own blind spots and that junior colleagues may have perspectives that they lack. One senior interviewee constantly asks themselves "what if I'm wrong?" and looks for colleague to tell them why they are wrong.

  An ex-military interviewee pointed out how this awareness is engrained in the military. There are two pools of employee, officers and tradesmen, and young officers often manage tradesmen with decades of experience. Officers would always recognise the expertise of tradesmen; one who failed to do so would "lose the dressing room". In the military, this awareness is automatic because tradesmen have specialist skills and often greater experience, but it is not so automatic in asset management and needs to be intentional.

- Decisiveness. Both junior and senior interviewees highlighted the importance of leaders taking and owning decisions. A leader should invite different perspectives but also discern when she has heard enough and reach a decision. An ex-military interviewee quoted General George Patton: "A good plan... executed now is better than a perfect plan executed next week"; this is often also true in asset management when market conditions may have shifted by the time a leader has full information. Decisiveness also involves knowing which views to overweight and which to underweight, rather than making a decision by consensus.

  Similarly, many participants said that decisiveness is easiest when the decision is entrusted to one person (e.g. a single fund manager), even if that person can consult a team of analysts. However, single fund managers may lead to the star PM mentality discussed in Section 4.5. An alternative is co-PM structures; this may reduce decisiveness but increase cognitive diversity.

- Lead By Example. Leaders can model the behaviours they wish to encourage, in turn showing that you can succeed in the organisation by voicing different opinions. In particular, leaders of a team are rarely leaders of the entire company. Thus, if the leader's reports see her constructively challenging senior management, they are more likely to challenge her themselves.

- Tailoring. Leaders should be mindful of cognitive diversity in their own team. The way they communicate feedback, ask questions, and invite contributions should differ according to the colleague's preferences and personality. Some team members appreciate blunt feedback while others may be upset by it; some prefer to express their views in writing rather than in a meeting. Not only will this directly increase the effectiveness of such actions, but it will also indirectly highlight the leader's awareness of cognitive diversity.

  Leaders can also tailor expectations to a colleague's cognitive style; for example, a colleague with ADHD might not be expected to follow a lengthy conversation or take notes of an extended meeting. Leaders can also be transparent about their preferred ways of working and communicating, to encourage colleagues to be transparent about theirs.

123. Indeed, a scientific study found that the effects of diversity depend on whether colleagues believe that diversity is beneficial. While the research was on demographic diversity, the conclusions likely extend to cognitive diversity. Ely, Robin J. and David A. Thomas (2001): "Cultural Diversity at Work: The Effects of Diversity Perspectives on Work Group Processes and Outcomes" *Administrative Science Quarterly* 46, 229–273.

- Share Own Mistakes. Leaders can be up-front about mistakes that they (or the organisation) have made. This creates a learning culture that views a mistake as a learning opportunity. It also signals how they value outside opinions to prevent future mistakes. Some seniors reported that being self-deprecating helps juniors feel comfortable challenging them rather than viewing them as infallible.

  The following examples were not mentioned by interviewees but illustrate the principle that they discussed, in an admittedly stark way:

  - CEO of software company Index Group, Tom Gerrity (later the Dean of Wharton) hired a consultant to tell him everything he was doing wrong in front of his entire staff. Doing so highlighted his own receptivity to feedback, and encouraged a culture where employees challenged each other.
  - Ray Dalio, co-CEO of Bridgewater, received an email from a colleague which read: "Ray – you deserve a "D-" for your performance today... you rambled for 50 minutes... It was obvious to all of us that you did not prepare at all because there is no way you could have been that disorganised at the outset if you had prepared. We told you this prospect had been identified as a "must-win"... today was really bad... we can't let this happen again." He shared it with the whole company, highlighting his openness to feedback.

- Tolerate Others' Mistakes. Again, this has two advantages: it signals a learning organisation, and it encourages colleagues to innovate without fearing failure. Tolerating errors of commission (mistakes) reduces errors of omission (not trying something new).

  Some companies go further than tolerating mistakes – they actively reward them through accolades for ideas that ultimately failed but provided valuable learnings, and "failure parties" to celebrate the takeaways. Outside of asset management, Pixar has a failure gallery displaying characters, scenes and gags that never made it to the final movie, demonstrating their belief that failures can be a work of art, like a blooper reel on a film. The non-profit Engineers Without Borders used to release a Failure Report detailing that year's flops – the initial intentions, what happened and the lessons learned.

  In addition to tolerating mistakes, leaders can also be up-front that they tolerate not knowing an answer: that is fine to admit that you do not know and will find out the answer later, but it is not fine to make up an answer.

- 1-on-1 Meetings. Section 4.5 highlighted how large group meetings are a barrier to cognitive diversity. In contrast, 1-on-1 meetings give juniors time and space to share their views. They are more willing to share contrarian views without fear of public dismissal; conversely, seniors are more willing to ask questions and acknowledge blind spots if there is no large audience. In addition, 1-on-1 meetings are useful precursors to a large meeting. If a junior has had the opportunity to share his idea with a senior 1-on-1 and had positive feedback, he is more willing to do so in a subsequent large meeting. Sometimes a senior might give a junior a nudge that she will back him in the large meeting.

- Social Interactions. Some senior respondents highlighted the importance of spending social time with juniors, for example through team social events, or 1-on-1 coffees unrelated to work. This leads to juniors viewing seniors as colleagues rather than bosses, and thus being more willing to challenge them.

  In contrast, an ex-military interviewee warned of the dangers of fraternisation. Too much personal interaction may lead to leaders making decisions based on their affinity to certain colleagues rather than the team as a whole. In addition to being directly detrimental to the team, such behaviour may create ingroups and outgroups based on the leader's favourites. In addition, if juniors view seniors as colleagues rather than bosses, it may undermine leaders' authority and lead to juniors valuing their suggestions less, even if they are more informed or based on greater experience. Separately, as mentioned in Section 4.5.1, many social events involve activities that appeal more to men, or are at times that men are more likely to make.

  Thus, leaders should be careful to ensure that personal interactions with juniors are balanced rather than favouring particular colleagues, and that also some distance is maintained. While popular business writings typically criticise hierarchy and praise flat organisations, reality is less black-and-white. Hierarchy can be valuable given leaders' greater experience and ability to see the big picture given their position in the organisation.

4.6.2 Management

While the prior section focused on behaviours, this section mainly concerns processes. However, the distinction between leadership and management is blurred, and so the allocation of suggestions across sections is less important than the suggestions themselves.

- Understand Where Cognitive Diversity Matters. As highlighted in Section 3.2.4, cognitive diversity is not unambiguously beneficial in all situations. Managers should choose the level of cognitive diversity to match the task and meeting.

  - Tasks. Execution tasks should generally be given to cognitively similar teams and generation tasks to cognitively diverse ones. One participant pointed out the importance of aligning the heterogeneity of the team with the heterogeneity of the investment opportunity set. A pan-European fund may benefit from team members from different European countries, while a UK-only fund might need less geographic diversity.

    An ex-military interviewee described how reconnaissance teams seek to contain soldiers who are more willing to take direction than give unsolicited advice. While they still have discretion on how to execute a plan, they would not question whether to execute. Extraversion was not valuable given it was common to be sitting in a hole in the ground for up to 12 hours at a time. In contrast, sniper teams required a greater willingness to push back, since they ultimately may pull the trigger. They would question whether to execute a command, not only how to do so.

  - Meetings. Meetings that concern the overall business should have representatives from different areas, but more focused meetings should have less functional diversity: as one respondent pointed out, "not every meeting is a strategy meeting". A quant meeting should often contain only quants: they think in similar ways and use the same technical language. Meetings for decisions that need to be taken swiftly might also feature less diversity.

- Assignment. Several respondents highlighted how they assign team members to investments to reduce individual biases. One said that they allocate optimistic people to defensive sectors and cautious people to growth sectors. Another always assigns two people to evaluate a stock, and ensures that they have different backgrounds. A third interviewee said that, at their firm, analysts only cover a stock for a maximum of three years before being rotated out, to reduce the risk that they become biased towards that stock.

  Assignment involves not only who you ask to do something, but also what you ask them to do. One interviewee asks analysts to share both positives and negatives about a stock, rather than to give a view: to inform, not to persuade. They may be invited to share their opinion at the end, but are careful to distinguish between the facts and their opinion. Another approach is to ask analysts to give a view, but highlight how it should be balanced: anyone proposing a stock has to highlight downsides as well as upsides. Similarly, devil's advocates or red teams (discussed later) should stress the upsides as well as downsides.

- Common Frameworks. One disadvantage of cognitive diversity is that team members have different mental models and "speak different languages". Common frameworks can help bring together different perspectives under a unified template. Examples are as follows:

  - Some companies have a list of factors that analysts should evaluate for any investment. Different analysts may use different information sources to guide their assessment, but will fill in the same template and assess the same factors.

  - Another approach is highlight the various channels through which a factor may affect valuations: for example, through top-line growth, margins, and multiples. Then, even if different analysts assess different factors, they integrate them into valuations in the same way.

  - One firm requires all analysts to give an assessment of an asset's "relative value", but how they reach this assessment is up to them.

- **Stating Assumptions.** Stating the assumptions underpinning an opinion makes it easier to challenge that opinion. This allows others to assess what they agree and disagree with, and to challenge the assumptions, not the person.

  One participant noted that seniors sometimes justify their stance by appealing to their experience, or claiming or implying that "I know what I'm talking about". Often, experience is indeed valuable and the senior can explain how it has informed her view; other times, experience does not actually lead to the senior being more informed. Clarifying the basis for a viewpoint means that a senior cannot simply appeal to experience, and allows others to challenge it. Indeed, scientific research finds that requiring people with a strong opinion to explain its basis in detail makes them realise that it is not as grounded as they thought, rendering them more receptive to different viewpoints.[124]

  On the other hand, highlighting the assumptions sometimes makes colleagues realise that they agree more than they disagree. One interviewee argued that coordination challenges arise when colleagues think there is more dissent that there actually is. When the view is stripped down to its inputs, people realise they actually do not disagree much – analogous to a dog barking or a child crying when there is nothing to bark or cry about.

- **Delegation.** In the military, "mission command" involves delegating authority to the lowest levels in the hierarchy, recognising that juniors may have greatest information and expertise. In asset management, this may involve juniors presenting their analysis in meetings, rather than juniors conducting the analysis and then a senior presenting it. It may also involve a junior directly communicating information to senior colleagues in other departments, rather than conveying it to their direct boss to be subsequently passed on.

- **360 Feedback.** While sometimes seen as a cliché, 360 feedback can be valuable because seniors are often unaware of how their actions and words may affect psychological safety. Interviewees across all seniorities highlighted how small actions can make a big difference (both positive and negative), and that many effects on psychological safety may be unintentional and never noticed by the senior in the absence of feedback.

- **Ensure that HR Supports Management.** Some interviewees raised the concern that HR may encourage "excessive" inclusion, for example that all team members be included in all meetings, be given the chance to speak, and have their concerns given weight. Such practices may lead to the analogy of "diworsification". Others suggested that meritocracy may lead to the hiring of cognitively diverse people who may cause HR issues due to unconventional behaviours. While HR should certainly take action in unacceptable cases, there was a concern that it can go too far to the other extreme.[125]

4.6.3 Running Meetings

- **Chairing.** Interviewees reported that a surprising number of meetings have no chair. A chair is important to add structure to a meeting and to conduct the processes described in this section. One senior interviewee rotates the chair between meetings, to allow juniors to chair which then gives them practice in speaking up.

- **Agendas.** Interviewees similarly reported that a surprising number of meetings have no agenda, but are "get-togethers" where an hour is blocked out to discuss a topic, and the discussion is almost always dominated by a few individuals. A clear agenda for a meeting allows colleagues to prepare beforehand and know where they might be able to contribute. It also makes it easier for a chair to seek the input of colleagues by asking for their views on an agenda item.

  Beyond meeting agendas, interviewees believed that structures are helpful for ensuring equal opportunity to contribute, and fair treatment (such as structured mentoring programmes rather than mentoring only developing informally through social ties).

124. A study by Rozenblit and Keil took topics such as how a toilet flush operates, how piano keys make sounds, and how a helicopter flies, and asked students to rate their knowledge. Most awarded themselves a high score. Then they had to write a step-by-step explanation of how these actually work and, afterwards, re-rate their knowledge. Humbled by their inadequate explanations, they lowered their marks. While that study was on an objective description of a current reality, another study by Fernbach and coauthors concerned a subjective opinion on a future action, which may be more relevant to investment. They replaced household items with public policy questions, such as whether there should be a national flat tax or performance-based pay for teachers. Being forced to explain their position reduced not only subjects' estimation of their own understanding, as in the first study, but also the strength of their stance – making them more willing to listen to alternative opinions. Rozenbilt, Leonid and Frank Keil (2002): "The Misunderstood Limits of Folk Science: An Illusion of Explanatory Depth" *Cognitive Science* 26, 521–562; Fernbach, Philip M., Todd Rogers, Craig R. Fox and Steven A. Sloman (2013): "Political Extremism Is Supported by an Illusion of Understanding" *Psychological Science* 24, 939–946.
125. Two recent articles have raised similar concerns about the HR profession, in a broader context than asset management. This report takes no stance on the validity of such concerns, but merely notes that they have been raised: Dow, Pamela (2024): "HR Britain: How Human Resources Captured the Nation" *New Statesman*, 27 November 2024; Martin, Iain (2024): "Bloated HR is More About Woke Than Wealth" *The Times*, 4 December 2024.

- **Sequencing.** Many respondents highlighted the danger of a chair speaking first, as the rest of the team anchors on her view, and the importance of carefully selecting who starts. Alternative approaches are to begin with juniors, more reticent members, assigned note-takers, or subject matter experts. This fourth approach may help ensure that the ensuing discussion is focused and informed, but a disadvantage is that experts may have a partisan view or others do not feel confident in challenging them.

  Interviewees highlighted that sequencing matters even outside of discussions on an agenda item. When giving introductions at the start of a meeting, beginning with juniors signals that the chair wants them to be active participants. If the chair starts the meeting by saying "I am concerned about X, Y, and Z" before getting to the agenda items, other attendees may try to reinforce her concerns, or get the impression that the chair is more important than the agenda.

- **Silent Starts.** Even if juniors are asked to speak first, this may not be enough to prevent them from anchoring on leaders' views. For many meetings, the agenda is released beforehand, and the juniors may have learned of seniors' opinions. Then, even if they are asked to speak first, they say what they think the leaders want to hear. One solution is the "silent start", practiced by Amazon (among other companies). The agenda and papers are not released beforehand but at the start of the meeting; all members have half an hour to read them. Then, when juniors are called on to speak, what they share is genuinely their own view.

  A variant of a silent start is used for a different purpose. Here, the pre-reading is released beforehand, but some attendees may have been too busy to read it, or read it a while ago and have not had the chance to refresh their memory. Allocating the first 5-10 minutes to allow attendees to (re)read the key materials can make the remainder of the meeting much more productive by being inclusive of those who were recently swamped. In an ideal world, everyone would have read and re-read the papers thoroughly, but this is not always possible.

- **Attendance.** There were differing views on the optimal attendee list for a meeting. Some respondents recommended inviting juniors to meetings (both internal and external), to give them the opportunity to contribute.

  Others argued that only those who are able to actively contribute to a meeting should be invited, unless they are included for the explicit purpose of being able to learn about a topic. One senior interviewee reported that they uninvite attendees who regularly do not speak; meetings should only have those who can help make a decision rather than passengers. Note that this does not mean that juniors should not be invited: instead, the attendee list depends on ability to contribute, rather than seniority.

  We earlier used the analogy that cognitive diversity gives an asset manager more "cards in the hand". This does not mean that the firm needs to use all the cards at the same time, i.e. bring all its cognitive resources into every meeting. Instead, the benefit of more cards in the hand is that you can pick out the right cards to play at the right time: to assign small, nimble teams to a meeting, where all members are able to contribute outlier ideas and avoid regression to the mean.

- **Weighting Contributions.** Inclusion does not mean weighting all opinions equally and giving them the same airtime. This delays the process and dilutes the views of the most informed team members. A good leader ensures that everyone has the chance to contribute, and that dissent is taken seriously. However, "taking seriously" does not mean that it needs to be debated at length; it should be heard and considered, but it may be overridden by other factors. In addition, she should allow enough time for issues to be surfaced, but also know when to stop inviting new viewpoints and move ahead with a decision.

  Relatedly, a leader should ensure that any views expressed are grounded in facts or expertise as much as possible, or at least question the basis for a particular opinion. This allows other members to decide how much weight to put on it, and to challenge assumptions they disagree with (see "Stating Assumptions" in Section 4.6.2).

- **Aggregating Views.** Interviewees highlighted the importance of holding votes, to avoid the "false consensus effect" where the leader incorrectly thinks there is consensus because some dissenters have not had the chance to speak. Anonymous votes allow members to express their opinions freely without anchoring on seniors' views. Some also suggested extensions to simple Yes/No voting:
  - **Voting With Conviction.** Members not only voting Yes/No but also give their degree of conviction. A junior might report a high level of conviction if he has analysed the investment in detail. The leader does not simply calculate a conviction-weighted average of the votes, since some people may always report high conviction, but takes into account each vote, the level of conviction expressed, and the person who expressed it (including the frequency with which they claim to have high conviction, and their track record in past high-conviction calls).
  - **Continuous Voting.** When predicting events, this involves not voting Yes/No on whether an event will occur (such as an interest rate rise) but assigning a probability to the different outcomes. When voting on decisions, each member selects from a range: for example, allocating a number from 1-5 to different asset classes based on their expected outperformance.
  - **Delayed Voting.** This involves voting after a meeting so that attendees have had a chance to reflect on the discussion, and also make further contributions. Colleagues sometimes come out of a meeting and think "I wish I'd said X"; delayed voting ensures that the vote is informed by more than just the views that happened to be expressed in the meeting.
  - **Pre- and Post-Voting.** This involves voting or scoring an investment both before and after the meeting. The pre-score is unaffected by the group discussion and less susceptible to groupthink. Members who significantly changed their score are asked why, so that they can ensure it was genuinely due to new information rather than being swayed by senior colleagues without a sound justification.

  Of course, these variants have costs as well as benefits: voting with conviction and continuous voting lead to greater complexity and opacity, and delayed voting may give rise to a never-ending discussion. Again, these are additional tools for leaders to have at their disposal rather than proposed replacements.
- **Scaffolding.** When presenting in meetings, juniors (who have studied a stock in depth) may overestimate others' knowledge. They may jump to the more complex issues, assuming that the basics are well understood. A leader can help by providing scaffolding: asking simple questions to ensure that the basics are covered, and all the logical steps in the investment thesis are clear. These are not "softball" questions to make the junior feel good, but legitimate questions that anyone unfamiliar to the stock may have.
- **Non-Verbal Communication.** Respondents highlighted the importance of seemingly small non-verbal cues in a meeting. If a junior is presenting a contentious view, a senior simply nodding or devoting her full attention can provide significant encouragement. In contrast, being on one's phone or negative body language can lead to the junior diluting his view.
- **Interventions.** Letting unprofessional behaviour go unpunished, such as disagreeing with a colleague aggressively or constantly interrupting, can similarly discourage juniors from speaking out in the future. In contrast, redirecting the conversation to someone who attempted to contribute, but got interrupted, highlights that you value his opinion.

4.6.4 Surfacing Different Viewpoints

- Showcase Cognitive Diversity. Section 4.6.3 discussed the sequencing of who speaks first in meetings. Another practice is to ensure that different viewpoints are surfaced, irrespective of when this occurs. One approach is for a leader to call on more reticent colleagues to speak, particularly if they have expertise or are likely to have a different viewpoint. Another is to invite members to email their views to the chair beforehand, since some prefer to express themselves in writing. If a colleague had provided valuable written input before the meeting, the leader can ask him to share it.

  In addition to ensuring that colleagues can contribute to an agenda item, leaders can give them the opportunity to showcase their expertise outside of a formal agenda. One interviewee held monthly meetings where any colleague could speak about any topic, such as offshore wind or a new client, so that the team is fully aware of the diversity of cognitive resources at its disposal.

  Showcasing differences in cognitive style, rather than skills, can be achieved through a personality audit of a team, analogous to a skills audit of a board. This involves team members either assessing themselves, or being assessed by their colleagues, on their preferred ways of working, communicating, and thinking. All team members see the outcome of the assessments so that they understand their colleagues' preferences; this can lead to the "interpersonal congruence" described in Section 3.3.5 and avoid stereotyping. One book recommends that colleagues create a "working with me" document about how they like to work.[126] An admittedly extreme example is the "baseball cards" at Ray Dalio's firm, Bridgewater, which publicly rate each employee on a variety of both skills and personalities.

- Devil's Advocates. Multiple interviewees highlighted the value of devil's advocates and red teams. Some respondents prefer devil's advocates to emerge rather than be assigned, consistent with the academic research. Indeed, the interviewee who allocates two analysts to each stock stressed that the second person is not asked to be a devil's advocate: if asked to poke holes in an investment case, you will always be able to. As a result, if the second person ends up contradicting the first one, then his concerns are taken more seriously.

  However, some respondents at least sometimes assigns devil's advocates. One said that it is difficult playing this role, because you are criticising your colleagues' ideas; s/he prefers to create a red team and change its composition each time. Another said that, in an ideal world, red teams would emerge but this does not always happen naturally, so s/he sometimes creates one.

- External Views. External speakers are a direct source of cognitive diversity: since they are brought in to provide an outside perspective, they can say what they believe even if it goes against the "house" view. This plays a similar role to members of an outgroup in Katherine Phillips's research (see Section 3.3.4), who are able to speak freely. Moreover, also as suggested by that research, external speakers can indirectly trigger cognitive diversity internally, by raising a concern that some employees held but had been reluctant to be the first person to voice.

126. Hughes Johnson, Claire (2023): *Scaling People: Tactics for Management and Company Building.* Stripe Press.

4.6.5 Recruiting

Almost all respondents argued that it is difficult to assess cognitive diversity (outside of background) in the hiring process. Very few said that they use popular personality tests, such as Myers-Briggs. Appendix A contains a review of such tests, and finds that they are either not backed up by scientific evidence or not applicable to asset management. Instead, traits such as optimism and risk aversion are observed on the job, and leaders use these learnings to guide team formation and assignment. One respondent said that internships are particularly useful for assessing cognitive diversity given how difficult it is to evaluate at the interview stage.

Rather than recruiting for cognitive diversity, interviewees argued that recruitment should seek to hire the best people, and cognitive (and demographic) diversity will be a by-product of doing so. Respondents shared the following ideas to improve recruiting:

- Balanced Recruiting Committees. Having a balanced recruiting committee can avoid biases caused by wanting to hire "people like themselves". This may involve balance in demographics, educational and professional backgrounds, personality types, and skillsets (e.g. quantitative vs. qualitative).
- Combat Excessive Influence. Balance involves not only the number of different opinions, but also the weight placed on them. Sometimes, a senior person may have outsized influence, meaning that it is almost impossible to hire a candidate without his approval. The suggestions in the "Aggregating Views" part of Section 4.6.3 may be relevant, such as holding anonymous votes.
- Ignore Irrelevant Information. This involves ignoring personality traits which may make give a positive impression at interview but are less relevant for the job itself, such as energy and charm for an investing rather than sales role.
- Ignore Unfamiliar Information. This involves ignoring information that recruiters are unable to assess rather than viewing it negatively, such as a candidate attending a university they have not heard of.
- Other Traits. Several respondents argued that other traits are easier to assess than cognitive diversity. These include:
  - The ability to form an opinion and express it.
  - Intellectual curiosity rather than accepting something at face value, such as a bullish statement by a CEO or a datapoint in an annual report.
  - The honesty to own your mistakes and the willingness to learn from them.
  - Cognitive ability (e.g. logical thinking) rather than cognitive diversity, which is assessed by asking questions that reveal how candidates think.
  - The willingness to ask questions.

One interviewee stated they do not assess technical skills as they can be learned. However, his/her colleagues do assess technical skills because they are easiest to measure (e.g. with questions with an objectively right answer), even though they may not be as important.

4.6.6 Practices To Beware

While this section has so far considered the "Dos" of managing cognitively diverse teams, this section considers some "Don'ts." As with the "Dos", this section should not be viewed prescriptively: these are practices to beware, not necessarily to avoid.

- Forced Demographic Diversity. A number of interviewees, across a range of demographic characteristics, warned that "forced" approaches to increasing demographic diversity (such as quotas or targets) could reduce cognitive diversity or inclusion for the following reasons:
  - Division. Such approaches pit some groups against others, whereas approaches focused on inclusion and psychological safety are viewed as benefiting the whole firm. The former also increase ingroup/outgroup distinctions and thus may lead the ingroup to underweight the views of an outgroup. Interestingly, no-one suggested the benefit of such distinctions suggested by the lab experiments in Section 3.2.4.4 – that outgroup members may be more willing to dissent than ingroup members, or that their presence encourages ingroup dissent.[127]

127. This does not mean that such research is invalid; instead, it may be that the finding of the lab experiments (that outgroups dissent) only arises under psychological safety. However, if an organisation is psychologically safe, then ingroups may be willing to dissent also.

- **Reductionism.** Forced approaches draw attention to people's demographic characteristics and may lead to employees being defined by them, increasing stereotyping and underweighting their other attributes.

- **Meritocracy.** Forced diversity may come at the expense of merit. One interviewee described a non-white male colleague who was told that his profile was perfect for a job but he was not offered it due to being the wrong gender. He himself was asked by a headhunter: "do you know anyone whose CV looks like yours but is female?"

  Relatedly, if an organisation hires someone in part due to his/her demographic characteristics, it may end up devoting significant resources to ensure s/he succeeds, to justify the initial hire and to rebut concerns of having made a "diversity hire". These resources can be at the expense of the rest of the organisation, and involve "throwing good money after bad" as the organisation is unwilling to admit its mistake. Another participant described a candidate hired in part due to diversity who struggled with the core skills required for the job. Despite devoting significant hours of training, s/he continued to underperform, the rest of the team had to pick up the slack, and the organisation ended up having to let him/her go anyway. The termination decision was made much later than optimal, due to the desire to make the hire succeed.

- **"Diversity Hires".** Even if hiring and promotion decisions are made based on merit, diversity targets and quotas may lead to a minority being incorrectly perceived as a "diversity hire". Then, if an investment ends up performing poorly, this is viewed as a bad decision even if the cause is bad luck (e.g. unexpected market conditions).

- **Berkson's Paradox.** A common example of Berkson's Paradox is basketball, where taller players are less athletic even if height and athleticism are uncorrelated in the general population. To be a professional basketball player, you have to be either tall or athletic (or both). Thus, short, non-athletic players do not become professionals, and so height and athleticism are negatively correlated among professionals. Similarly, asset managers hire demographic minorities, and cognitively diverse people, but it has been historically rare to hire people who are "double minorities". Demographic minorities tend to have traditional backgrounds, leading to a negative correlation between demographic and cognitive diversity.

- **Politicisation.** A company that sets targets or quotas for demographic diversity may attract employees with a particular political stance, reducing political diversity.

While interviewees stressed the problems with demographic diversity targets for the actual hiring decision, one highlighted the value of ensuring that longlists and shortlists are demographically balanced, to ensure that they are casting their net widely and seeing the full range of talent available.

- Public Stances. Asset managers taking public stances on particular issues can reduce cognitive diversity by deterring employees from expressing different views, and in the extreme from joining the firm. Sometimes, these stances arise if asset managers engage in "people pleasing" behaviour to vocal asset owners with a specific set of values. One interviewee argued that a diversity of values across clients (e.g. pension funds from both Republican and Democratic states) helps reduce the pressure on asset managers to take a particular stance.[128] Another solution is to resist the temptation to be "people-pleasing" and to be clear about the asset manager will not take a public stance on issues unrelated to maximising long-term returns.
- Side-Meetings. These occur when a subgroup holds a pre-meeting to align themselves. They often lead to the subgroup having already made up their mind, and not being open to other viewpoints. They become an ingroup, and are resistant to outgroup members' opinions.
- Dismissing Contributions. Loss aversion means that negative comments weigh more heavily than positive ones. As one respondent pointed out, one piece of negative feedback can negate ten pieces of positive feedback. Another remarked that the fastest way to discourage different viewpoints is for a leader to claim that she values them but then shut them down, even on a single occasion.
- Defaults. Defaults can lead to anchoring. Internal stock notes sometimes start with the analyst's view (e.g. Include or Exclude) before commencing the analysis. This is consistent with the recommended writing practice of starting with the punchline, rather than leaving it to the end like a mystery novel. However, it means that readers of the note anchor on the analyst's opinion – it is the default. If the reader knows that the analyst had recommended Exclude, she might read the report unintentionally overweighting the negatives and downplaying the positives. The alternative is for the stock note to lay out the arguments and leave the recommendation to the end. By that time, the reader has already formed her own opinion and can independently decide whether she agrees.

128. This interviewee recognised the need to follow any mandate given or wishes expressed by a client, but argues that the asset manager should not internalise the client's values.

5. CONCLUSION

Cognitive diversity – the range of expertise, experiences, information, perspectives, preferences, and ways of thinking within a team – has the potential to unleash significant value in any organisation. This potential is particularly high in asset management given the range of information that may be relevant to value an asset, the myriad of different ways to assess and interpret information, and the importance of being contrarian and taking a different view to the market.

However, cognitive diversity alone is not enough. Without psychological safety, cognitive diversity can lead to employees generating different opinions but being too afraid to share them, particularly if doing so goes against a senior colleague. Without inclusion, colleagues believe that the organisation does not treat them fairly, discouraging interpersonal risk-taking. Moreover, cognitive diversity has challenges as well as benefits. It can lead to coordination difficulties as employees "speak different languages" or do not fully understand or appreciate the perspectives of different colleagues, and the loss of affinity and camaraderie that arises when colleagues share common backgrounds.

The scientific evidence of the link between cognitive diversity and performance is decidedly mixed. There is modest evidence that skills diversity has a generally positive relationship, but even this evidence is not unambiguous and the benefits vary according to the setting. However, the mixed evidence does not mean that cognitive diversity is irrelevant; rather, that cognitive diversity is difficult to manage and thus highly relevant because those that can do so effectively will have a significant competitive edge.

I hope that this report is a useful guide to help asset managers understand the benefits of cognitive diversity so that they can intentionally harness them, the costs of cognitive diversity so that they can manage them, and best practices that their peers are already using effectively. While this review is focused on asset management, it should also be valuable to other knowledge-based industries which benefit from creativity, innovation, and contrarian viewpoints.

6. ACKNOWLEDGEMENTS

This project benefited from a cognitively diverse set of perspectives

I am very grateful to Will Ryan, Alon Susz, Andrew Tickell, and Jackie Yordan for research assistance, to Christian Abuide, Ayesha Akbar, Kris Atkinson, Grégoire Cailleux, Amy Chen, Miren-Edurne De Frutos, Othman El Iraki, Pablo Fernandez, Georgie Flowers, James Gifford, Nageen Javaid, Sandy Jayaraj, Dan Mannix, Shaunak Mazumder, Emma Moreby, Brishni Mukhopadhyay, Stephanie Niven, Ben O'Connor, Rebecca Phillips, Aaron Punwani, Tristan Purcell, Sacha Sadan, Arita Sehgal, Arnoud Terwindt, Mark Tsang, Ben Yeoh, and Irene Zhang for generously participating in interviews, and to the Diversity Project Taskforce for comments.

APPENDIX A: MEASURING COGNITIVE STYLE

There are several existing measures of cognitive style that could be used to gauge a team's cognitive style diversity. However, many of them are ad hoc rather than based on scientific evidence. In addition, their applicability to asset management is unclear.

Note that the existence of an off-the-shelf measure applicable to asset management should *increase* the importance of cognitive diversity, rather than reduce it. If it were simple to measure cognitive style and create cognitively diverse teams, then all asset management firms would do it and it would be difficult to create a competitive edge. Instead, the lack of a simple measure means that firms that successfully harness the power of cognitive diversity will be differentiated from their peers.

I review the main existing measures of cognitive style diversity below.

Method	Description	Relevance to Asset Management	Scientific Evidence
Big Five Personality Traits	Assesses individuals along five dimensions: • **Openness to Experience** • **Conscientiousness** • **Extraversion** • **Agreeableness** • **Neuroticism**	**Moderate/high.** Understanding how people may react to different situations is important for most firms. The traits have been shown to correlate with investor beliefs, and Openness and Neuroticism correlate with investment behaviour.[129]	**Moderate/high.** Developed using factor analysis (examination of correlated traits), empirically validated and used by many academic studies, but criticised for lacking a theoretical backing.
Verbaliser-Visualiser Spectrum	Assesses how a person processes and communicates information: • **Verbalisers prefer to explain concepts verbally** • **Visualisers prefer to explain concepts visually** A more advanced model divides visualisers into object visualisers (who view objects as isolated entities) and spatial visualisers (who focus on relationships between objects).	**Low.** While visual information has some relevance in asset management, such as graphs, charts, and diagrams, questions such as "I can easily imagine what a place I've never seen looks like" (for visualisation) or "I prefer to follow verbal instructions rather than diagrams" (for verbalisation) are more relevant for other fields such as engineering.	**Moderate/high.** Developed by academic papers[130] and widely used in subsequent academic studies, but criticised for being overly simplistic.
Kirton Adaption-Innovation Inventory (KAI)	Assesses a person's preference for structure when solving problems: • **Adaptive individuals aim to "do things better" and seek structured solutions** • **Innovative individuals aim to "do things differently" and seek unconventional solutions**	**Low/moderate.** It is more relevant for R&D, strategy, and creative industries. Its relevance to asset management is in specific contexts such as new product development and organisational change, rather than portfolio selection. None of the interviewees mentioned this spectrum.	**Moderate/high.** Developed by Dr. M.J. Kirton, founder of the Occupational Research Centre and a Reader in Management at Hertfordshire University. The measure has been used by many academic studies, both by Kirton and others[131], although it has been criticised for being overly simplistic.
Cognitive Style Index (CSI)	Assesses a person's information processing style from Analytical to Intuitive.	**Moderate/high.** Asset management involves combining both quantitative and qualitative insights. However, limited evidence of use by asset managers.	**Moderate.** Developed by Christopher Allinson and John Hayes, two professors at Leeds University, in an article in the respected *Journal of Management Studies*.[132] However, most papers using it are by Allison and Hayes, and in minor journals.

129. Jiang, Zhengyang, Cameron Peng, and Hongjun Yan (2024): "Personality Differences and Investment Decision-Making." *Journal of Financial Economics* 153, 103776.
130. See Paivio (1971) and Richardson (1977) for the verbaliser-visualiser spectrum and Kozhevnikov, Kosslyn, and Shephard (2005) for the difference between object and spatial visualisers. Paivio, Allan (1971): *Imagery and Verbal Processes.* Holt, Rinehart and Winston; Richardson, Alan (1977): "Verbalizer-Visualizer: A Cognitive Style Dimension" *Journal of Mental Imagery* 1, 109–126; Kozhevnikov, Maria, Stephen M. Kosslyn, and Jennifer Shephard (2005): "Spatial Versus Object Visualizers: A New Characterization of Visual Cognitive Style" *Memory & Cognition* 33, 710–726.
131. See https://kai.foundation/wp-content/uploads/2024/01/KAI-Publication-List-2023-with-links.pdf
132. Allinson, Christopher W. and John Hayes (1996): "The Cognitive Style Index: A Measure of Intuition-Analysis For Organizational Research" *Journal of Management Studies* 33, 119–135.

Method	Description	Relevance to Asset Management	Scientific Evidence
Basadur Profile	Measures a person's preferred role in improving an organisation's creative performance: • **Generator** • **Conceptualiser** • **Optimiser** • **Implementer**	**Low/moderate.** Relevant in specific contexts such as new product development and organisational change, rather than portfolio selection.	**Low/moderate.** Developed by Min Basadur, a professor of organisational behaviour at McMaster University, and backed up by peer-reviewed papers, but typically in minor journals and by Basadur himself.[133] Limited independent verification.
Herrmann Brain Dominance Instrument (HBDI)	Assesses thinking preferences across two dimensions: • **Left- vs. right-brained (logical vs. intuitive)** • **Cerebral vs. limbic (rational vs. emotional)** This leads to four quadrants: • **Analytical (left-brained, cerebral: logical and fact-oriented)** • **Practical (left-brained, limbic: organised and process-oriented)** • **Conceptual (right-brained, cerebral: big-picture and creative)** • **Relational (right-brained, limbic: interpersonal and empathetic)**	**Moderate/high.** Understanding how people process information and may react to different situations is potentially important, although the left-right brain distinction is too simplistic a measure of the former.	**Low.** The left-right brain distinction is now viewed as outdated and overly simplistic.
Myers-Briggs Type Indicator (MBTI)	Analyses personality style along four dimensions: • **Extrovert vs. Introvert** • **Sensing vs. Intuition** • **Thinking vs. Feeling** • **Judging vs. Perceiving.**	**Moderate.** Understanding personality styles is useful to most firms, although only extroversion vs. introversion was mentioned by interviewees.	**Low.** Aims to be based on Jung's (1923)[134] theory of psychological types, but developed in an ad hoc way by two non-psychologists (a mother-daughter duo). Popular with practitioners but heavily criticised by the scientific community and rarely used in academic research. Poor test-retest reliability: types change on repeat tests.

133. See https://www.basadur.com/research/.
134. Jung, Carl G. (1923): *Psychological Types*. Kegan Paul, Trench, Trubner & Co.

Method	Description	Relevance to Asset Management	Scientific Evidence
Insights Discovery Wheel	Categorises individuals into four colour energies: • **Cool Blue: cautious, precise, deliberate, questioning, formal** • **Fiery Red: competitive, demanding, determined, strong-willed, purposeful** • **Earth Green: caring, encouraging, sharing, patient, relaxed** • **Sunshine Yellow: sociable, dynamic, demonstrative, enthusiastic, persuasive**	**Moderate.** Understanding personality styles is useful to most firms, although these specific dimensions were rarely mentioned by interviewees.	**Low.** Aims to be based on Jung's (1923) theory of psychological types, but developed in an ad hoc way by two non-academics (a father-son duo). Limited empirical support and rarely used in academic research. No robust, peer-reviewed evidence of test-retest reliability.
AEM-Cube	Analyses an individual's cognitive approach (particularly when managing change) along three dimensions: • **Attachment (preference for stability)** • **Exploration** • **Management of Complexity**	**Low.** Mainly relevant for organisational change.	**Low.** Developed in an ad hoc way with limited empirical support.[135]
DiSC Assessment	Analyses an individual's behavioural tendencies along four dimensions: • **Dominance** • **Influence** • **Steadiness** • **Conscientiousness**	**Low.** Understanding personality styles is useful to most firms, although none of these specific dimensions were mentioned by interviewees (except for one mention of emotional control, which is related to steadiness).	**Low.** Developed in an ad hoc way with limited empirical support.

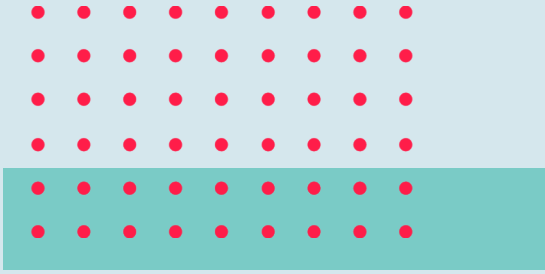
135. Reynolds and Lewis (2017) might seem to be empirical support. However, it studies only six teams and measures decision speed rather than quality. Indeed, scientific papers often use a longer discussion time as evidence of the benefits of cognitive diversity as it suggests that more information is being discussed. Reynolds, Alison and David Lewis: "Teams Solve Problems Faster When They're More Cognitively Diverse" *Harvard Business Review*, 30 March 2017.

The summary, on the previous pages, highlights significant problems in applying the existing measures of cognitive style to asset management:

- Many of them are ad hoc and have little scientific backing. Scientific backing is not simply an "academic" concept, but a highly practical one: it affects the reliability of the measure (whether it measures what it claims) and the relevance of the measure (whether it is material for performance).
  - Some measures developed by companies list several academic references which they claim informed the construction of the measures. However, all these references suggest is that the companies read these papers; it does not prove that the measures of cognitive style are based on these papers (let alone whether the measures capture what they seek to measure or are correlated with performance). It is analogous to claiming that you are a good cook because your dish uses carrots and there is scientific evidence that carrots are good for eyesight: instead, what matters is the quality of your cooking.
- Those that are scientifically backed are less relevant for asset management. Successful measures aim to be as general as possible so that they can be widely used, but this generality is at the expense of specificity to a particular setting. In addition, while some have been widely used in academic research, there is very little academic research on diversity in asset management given the difficulties in defining performance (an investment decision may be correct at the time but end up performing poorly).
- Many of them are overly simplistic and can reduce the complexity of a person to a narrow set of traits (in the same way that demographic diversity can be a poor proxy for cognitive diversity).
  - For example, the Insights Discovery Wheel sometimes leads to people using heuristics, such as "red = good investor, yellow = bad investor". It may also perpetuate gender differences, for example if men are more likely to be seen as red, and women are told that they need to be more red to succeed. One respondent reported how "be less blue, more red" is common advice given after a Wheel assessment.
  - In addition to personalities having many dimensions, people may display different personalities in different situations. For example, an introvert may dislike large meetings and social situations, but nonetheless may be good at public speaking. Yet a colleague may be stereotyped and pigeon-holed as an introvert and not asked to do client presentations.
- Many of them are focused on particular contexts, such as how to handle new and complex situations, or how to manage change.

Instead, asset managers can do the following:

- Assess educational and professional diversity. These are the dimensions of cognitive diversity that are most positively correlated with performance. Moreover, educational and professional backgrounds can be easily measured, without the need for a third-party questionnaire.
- Assess country of origin. While there is little scientific research on this dimension, as most research focuses on ethnicity, it may be relevant for asset management by providing expertise on a country, shaping an employee's experiences (e.g. of specific economic conditions), and affecting cultural norms.
- Assess the specific dimensions of cognitive style that are most relevant for asset management, listed in Section 4.2. Often managers are able to assess these dimensions within their colleagues, without needing a questionnaire.



APPENDIX B: THE RESEARCH IN DETAIL

Below is a summary of individual papers. It does not summarise every finding of each paper, but focuses on those most relevant for asset management. To avoid a cumbersome prose, I will sometimes use language such as "cognitive diversity improves performance" rather than "cognitive diversity is positively correlated with performance". However, it is important to remember that these relationships are correlations rather than causations.

Aggarwal, Ishani and Anita Williams Woolley (2013): "Do You See What I See? The Effect of Members' Cognitive Styles on Team Processes and Errors in Task Execution." *Organizational Behavior and Human Decision Processes* 122, 92–99

- Punchline: Cognitive style diversity reduces a team's strategic consensus, in turn worsening its performance on execution tasks.
- Hypothesis: Diversity is valuable for generation tasks that require divergent thinking, but detrimental for execution tasks that require convergent thinking.

Study 1

- Setting: 140 participants (half strong spatial visualizers and half strong object visualizers) divided into 2-person teams.
- Task: Computer-based maze populated by "greebles" that need to be found and tagged. Spatial visualisers are good at navigation but not greeble recognition; the opposite is true for object visualisers.
- Measure of diversity: Cognitive style using the Verbaliser-Visualiser spectrum to determine whether you are a verbaliser or visualiser, and the Object–Spatial Imagery and Verbal Questionnaire to determine whether you are a spatial or object visualiser.
- Measures of performance: Process focus: two raters coding the team's 2-minute planning period about what each person should do, the order things should be done, and whether to collaborate or work independently.

  Errors: the proportion of greebles incorrectly tagged.
- Results: Diversity in spatial visualisation was associated with lower process focus, which in turn was associated with more errors.

Study 2

- Setting: 231 participants in 64 teams.
- Task: Asked to use a set of building blocks to build a housing complex including a house, garage, and swimming pool. This task is modelled after complex R&D-type problems, where trade-offs among multiple criteria need to be managed.
- Measure of diversity: As above
- Measures of performance:
  Process focus: each team member rated how much certainty they had on various planning issues, such as how the team should divide its time and what each person should work on.

  Strategic consensus: within-group variance of process focus.

  Errors: deviations from the building codes for each structure, as specified in the instructions.
- Results: Diversity in object visualisation was associated with lower strategic consensus, which in turn was associated with more errors.

Relevance to asset management: Limited to execution tasks such as trading and compliance. The bulk of asset management involves "generation" tasks (coming up with investment ideas) and "choose" tasks (selecting between these ideas).

Aggarwal, Ishani and Anita Williams Woolley (2019): "Team Creativity, Cognition, and Cognitive Style Diversity." *Management Science* 65, 1586–1599

- Punchline: Cognitive style diversity is associated with improved use of team members' unique skills but reduced consensus. Team creativity rose.
- Hypothesis: Diversity leads to team members being more aware of their colleagues' unique skills, thus allowing for greater specialisation. However, it also makes it harder for team members to reach a shared understanding of the task at hand.
- Setting: 463 MBA students assigned to 112 project teams.
- Task: Develop a case study on a senior manager, involving subject selection, interviews, and report generation.
- Measure of diversity: Cognitive style using the Verbaliser-Visualiser spectrum.
- Measures of performance:
  Team knowledge system[135], the awareness of the mix of skills within a team: questions on team member specialisation (e.g. " different team members were responsible for expertise in different areas"), credibility (e.g. "I trusted that other members' knowledge about the task was credible"), and coordination (e.g. "Our team worked together in a well-coordinated fashion").

  Team strategic consensus: questions on process focus (e.g. "how the team should divide its time among the various parts of the task") and outcome focus (e.g. "what constitutes successful performance on this task"). Students scored how much certainty they had on this issue; a higher variance of team members' ratings constituted lower team strategic consensus.

  Team creativity: evaluations of the creativity of the final reports by five independent raters.
- Results: Higher cognitive style diversity was associated with a superior team knowledge system but lower team strategic consensus.

  Higher cognitive style diversity improved team creativity by improving the team knowledge system.

Relevance to asset management:
Cognitive diversity leads to broader mix of skills, but makes it harder to reach a shared understanding of the team's goals.

135. The authors use the term "transactive memory system."

Ancona, Deborah Gladstein and David F. Caldwell (1992): "Demography and Design: Predictors of New Product Team Performance." *Organization Science* 3, 321–341

- Punchline: Functional diversity increases a team's communication with outsiders but reduces its performance.
- Hypothesis: Functional diversity increases a team's networks, thus increasing its external communication. However, it also leads to members having different "thought-worlds", which hinder performance.
- Setting: 409 members of 45 new product teams within five high-tech firms.
- Measure of diversity: Functional diversity. A team member's background is either marketing, manufacturing, or engineering.
- Measures of performance: Frequency of external communication, management ratings of performance, team members' ratings of own performance.
- Results: Functional diversity is positively associated with frequency of external communication but negatively related with management ratings of innovation and teams' ratings of own performance.

Relevance to asset management: Diversity is not an unmitigated blessing. Internal processes need to be in place to manage coordination costs.

Bantel, Karen A. and Susan E. Jackson (1989): "Top Management and Innovations in Banking: Does the Composition of the Top Team Make a Difference?" *Strategic Management Journal* 10, 107–124

- Punchline: Top management functional diversity is associated with higher administrative innovation; diversity in educational level is associated with higher technical innovation.
- Hypothesis: Top management diversity improves innovation through leading to a greater mix of viewpoints.
- Setting: 199 banks. CEO filled in technical innovations; HR executive filled in administrative innovations.
- Measure of diversity: Age, tenure, educational background, functional background.
- Measures of performance: Number of technical innovations (e.g. new products/services, marketing, computerised retail customer applications).

  Number of administrative innovations (e.g. staffing, attitude assessment, planning).
- Results: Diversity in average education level is positively related to number of technical innovations; functional diversity is positively related to number of administrative innovations. All other relationships are insignificant.

Relevance to asset management: Only some aspects of diversity matter for some outcomes, in contrast to common wisdom that all aspects of diversity are better for all outcomes.

Dahlin, Kristina B., Laurie R. Weingart, and Pamela J. Hinds (2005): "Team Diversity and Information Use." *Academy of Management Journal* 48, 1107–1123

- Punchline: Educational diversity increases a team's range and depth of information use, but only to a point. Too much diversity reduces information use.
- Hypothesis: Educational diversity increases a team's breadth of perspectives, but also creates coordination challenges.
- Setting: 135 MBA students taking an introductory course in organisational behaviour.
- Measure of diversity: Undergraduate major.
- Task: Write up a Harvard Business School case.
- Measures of performance: Each write-up was divided into individual "units", where the company or person in the case took a meaningful action; the number of units in a write-up ranged from 60-229. Each unit was then classified by topic, such as "corporate-region goal alignment" and "incentive structure for sales personnel."

  Information range: the number of topic categories in the report.

  Information depth: the average number of units per topic.

  Information integration: a qualitative assessment of how the team considered relationships among diverse issues.
- Results: Educational diversity was associated with a greater range and depth of information use, but only up to a point.

  Regarding range, "at high levels of educational diversity, further increases resulted in a decrease in range back to the mean of the sample."

  Regarding depth, "at the highest levels of diversity, teams returned to relatively shallow analyses, equivalent in depth to those of the teams with the lowest diversity in our sample." Educational diversity was also associated with lower information integration.

Relevance to asset management: Educational diversity is valuable but only up to a point. Excessive diversity leads to coordination challenges.

De Dreu, Carsten K. W. and Michael A. West (2001): "Minority Dissent and Team Innovation: The Importance of Participation in Decision Making." *Journal of Applied Psychology* 86, 1191–1201

- Punchline: Minority dissent increases team innovation, but only when teams have high levels of participation in decision making.
- Hypothesis: Minority dissent stimulates creativity and divergent thought among team members. However, only when team members are active participants in decision making will this ultimately manifest in superior innovation.

Study 1

- Setting: Homogeneous sample of self-managed teams at an international postal service in the Netherlands.
- Measure of diversity: Minority dissent, using questions such as "individuals disagree with the rest of the team" and "within my team everyone tends to immediately agree with one another."
- Measure of context: Participation in decision making, using questions such as "as a member in this team, I have a real say in how the team carries out its work" and "most members in this team get a chance to participate in decision making."
- Measure of performance: Innovation. Team supervisor listed all the innovations generated by the team (rather than an individual team member or the supervisor).
- Results: Minority dissent did not increase the number of innovations overall, but did increase it when there was high participation in decision making.

Study 2

- Setting: Heterogeneous sample of cross-functional teams in a variety of organisations.
- Measure of diversity: Minority dissent, as above.
- Measure of context: Participation in decision making, as above.
- Measure of performance: Innovation, using questions such as "team members often implement new ideas to improve the quality of our products and services" and "this is an innovative team."
- Results: Minority dissent did not increase the number of innovations overall, but did increase it when there was high participation in decision making.

Relevance to asset management:
To fully benefit from cognitive diversity, companies need to ensure high levels of participation in decision making. Only then will the creativity triggered by cognitive diversity lead to innovation.

Edmondson, Amy (1999): "Psychological Safety and Learning Behavior in Work Teams." *Administrative Science Quarterly* 44, 350–383

- Punchline: Teams with higher psychological safety performed better, both as self-reported by team members and as assessed by their managers.
- Hypothesis: Psychological safety will enhance the learning behaviour of a team, such as experimenting and seeking feedback. This ultimately manifests in superior team performance.
- Setting: Field study of 427 members from 51 teams in a manufacturer of office furniture.
- Measures of performance:
  Psychological safety: questions such as "if you make a mistake on this team, it is often held against you"

  Team learning behaviour: questions such as "we regularly take time to figure out ways to improve our team's work process."

  Team performance: questions such as "the quality of work provided by this team is improving over time". Also surveyed external observers of these teams (typically managers) using questions such as "this team meets or exceeds its customers' expectations."
- Results: Psychological safety is associated with higher team performance, and this link arises because psychological safety improves team learning behaviour.

Relevance to asset management:
Psychological safety – creating an environment where team members are willing to take interpersonal risks – improves team performance.

Jehn, Karen A., Gregory B. Northcraft, and Margaret A. Neale (1999): "Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups." *Administrative Science Quarterly* 44, 741–763

- Punchline: Informational diversity increases performance because it increases task conflict, but values diversity reduces affinity.
- Hypothesis: Prior studies on diversity find mixed results, because they lump all types of diversity together. Different types of diversity may have different outcomes, and so this paper separates them out.
- Setting: Field study of 545 employees in 92 groups in a leading firm in the household goods moving industry.
- Measures of diversity:
  Social category diversity: sex and age (no data on race).

  Values diversity: surveyed team members on issues such as whether the values of all group members were similar, the work unit had similar work values, and the work unit had similar goals.

  Informational diversity: education (e.g. undergraduate major), functional area (e.g. marketing, operations), position in firm (hourly employee or management).
- Measures of performance:
  Task conflict: questions such as "how frequently are there conflicts about ideas in your work unit?"

  Relationship conflict: questions such as "how much friction is there among members in your work unit?"

  Perceived group performance: questions such as "how well do you think your work unit performs?"

  Actual group performance: departmental production records and error reports.

  Efficiency: supervisors' ratings of "how effective is this group at getting things done quickly?" and "how effective is this work unit?"
- Results:
  Informational diversity increased actual group performance by increasing task conflict. The effect is stronger where values diversity is low.

  Informational diversity increased efficiency where social category diversity and values diversity were low.

  Informational diversity increased actual performance, perceived performance, and efficiency when tasks are complex (measured with questions such as "I encounter a lot of variety in my normal working day" and "I feel I am doing the same thing over and over again.")

  Social category diversity increased group member morale (measured using questions on satisfaction, intent to remain, and commitment to the group.)

  Values diversity reduced group member morale by increasing relationship conflict.

Relevance to asset management: Informational diversity improves team performance, but values diversity reduces team morale. In the authors' words: "For a team to be effective, members should have high information diversity and low value diversity. For a team to be efficient, members should have low value diversity. For a team to have high morale (higher satisfaction, intent to remain, and commitment) or to perceive itself as effective, it should be composed of participants with low value diversity."

Kurtzberg, Terri R. (2005): "Feeling Creative, Being Creative: An Empirical Study of Diversity and Creativity in Teams." *Creativity Research Journal* 17, 51–65

- **Punchline:** Cognitively diverse teams generate more ideas than non-diverse teams but had lower affinity and perceived creativity.
- **Hypothesis:** Cognitive diversity leads to more idea generation but may hinder coordination and affinity, thus reducing team satisfaction and emotional well-being.

Study 1

- **Setting:** Lab experiment of 357 MBA students, divided into three-person teams.
- **Task:** Each team was given a management-labour negotiation simulation and asked to delineate all the issues they considered relevant to the upcoming negotiations.
- **Measure of diversity:** Cognitive style, measured using the Adaptive-Innovative spectrum.
- **Measures of performance:**
  Number of distinct issues identified by the team ideas generated by the team.

  Own assessment of the team's creativity, using questions such as "I felt like we were innovative in our thinking."

  Own assessment of affinity with the team.
- **Results:**
  Teams with greater cognitive style diversity generated significantly more ideas.

  Higher affinity led to higher perceived creativity.

Study 2

- **Setting:** Field study of 237 employees in 26 teams across 7 industries.
- **Measure of diversity:** Cognitive style, measured using the Adaptive-Innovative spectrum.
- **Measures of performance:** Self-reported perceived creativity and affinity.
- **Results:**
  More cognitively diverse teams reported lower affinity.

  Affinity was positively related to perceived creativity. Combined with the first result, this meant that more cognitively diverse teams were viewed as less creative.

Relevance to asset management:
Cognitive diversity can lead to more ideas being generated but reduces team affinity and thus the creativity of these ideas. In the author's words, "Although there may be benefits to heterogeneity for certain task-outcomes, the emotional well-being of the team members may suffer in the process. Being on a heterogeneous team seems to be hard work—and seems to take its toll on the emotions and the satisfaction of the team members."

Lu, Yan, Narayan Y. Naik, and Melvyn Teo (2024): "Diverse Hedge Funds." *Review of Financial Studies* 37, 639–683.

- Punchline: Skills diversity (from educational and professional background) are more positively correlated with investment performance than gender and ethnic diversity.
- Hypothesis: Diversity (along a variety of dimensions) improves investment performance.
- Setting: Field study of 16,307 hedge funds managed by a team.
- Measures of diversity: Degree of overlap across the team members in educational institution, undergraduate major, prior employers, gender, and race.
- Measures of performance: Fund alpha (monthly abnormal returns)
- Results: In univariate correlations, team diversity based on educational institution, undergraduate major, and professional background are positively correlated with fund performance but diversity based on gender and race are not. With controls, all forms of diversity are positively correlated with fund performance, particularly educational and professional diversity.

Relevance to asset management: "These results suggest that functional diversity (based on educational institution, college major, and work experience) more positively relates to investment performance than does nonfunctional diversity (based on gender and race)."

Nemeth, Charlan, Keith Brown, and John Rogers (2001): "Devil's Advocate Versus Authentic Dissent: Stimulating Quantity and Quality." *European Journal of Social Psychology* 31, 707–720

- Punchline: Authentic dissenters are more effective than assigned devil's advocates.
- Setting: 32 groups of 4 students from the Berkeley undergrad psychology department.
- Task: Vacation-scheduling problem where Marge made a last-minute "emergency" request for a week off when Annie, George, and Sam had already booked vacation time. Annie and George had the strongest reasons for being allowed to take vacation, then Sam, then Marge. The participants had to decide who should stay.
- Manipulation: One participant is asked to play the devil's advocate (DA). The researchers manipulate what other participants known about the DA's true position on the issue.

  Consistent DA condition: DA was known to believe in the position adopted.

  Inconsistent DA condition: DA was known not to believe in the position adopted.

  Ambiguous DA condition: DA's true position was unknown.

  Authentic Minority condition: there was no announcement that the dissenter was playing a role, and so she was presumed to be arguing her own viewpoint

  Control condition: no dissent.
- Hypothesis: Authentic Minority condition will generate the highest quantity and quality of solutions.

  The Consistent DA will have less effect than the Authentic Minority. Even though the role is consistent with her own views, and thus her overall stance is seen as genuine, playing a role removes interpersonal risk and is not viewed as courageous. Others are unable to distinguish which of her specific arguments are genuine and which are role-played.

  The Inconsistent DA and the Ambiguous DA will have even less effect: they lack credibility as others do not believe that the dissent is authentic.
- Measure of performance: After the discussion, the participants gave as many solutions to the problem as possible. Research assistants rated the quality of solutions. Since the quantity of solutions ended up being highly correlated with the quality of solutions, the two measures were combined into the number of quality solutions.
- Results:
  The Authentic Minority generated more quality solutions than the Consistent DA.

  The Consistent DA performed no better than the control and also was indistinguishable from the Ambiguous DA and Inconsistent DA.

Relevance to asset management:
A devil's advocate that emerges is more effective than one who is assigned. The latter lacks authenticity: colleagues think that she is playing a role and thus does not take her concerns seriously. This is the case even when the assigned devil's advocate is known to believe in the position she has been asked to take: she lacks courage, and it is difficult to separate genuine arguments from role-played ones. Psychological safety is likely useful to encourage devil's advocates to emerge.

Nemeth, Charlan J., Bernard Personnaz, Marie Personnaz, and Jack A. Goncalo (2004): "The Liberating Role of Conflict in Group Creativity: A Study in Two Countries." *European Journal of Social Psychology* 34, 365–374

- **Punchline:** Brainstorming is more effective when members are explicitly encouraged to criticise each other's ideas.
- **Hypothesis:** Criticism is important for effective brainstorming, because it gives freedom to express new ideas without worry about whether they constitute criticism of someone else's idea. Highlighting that criticism is encouraged also means that any criticism will be of the idea rather than person, thus encouraging people to share ideas without fear of criticism.
- **Setting:** 260 female students at the University of California, Berkeley, divided into 52 groups of 5 people; 195 male and female students at the University of Paris, divided into 39 groups of 5 people.
- **Task:** Come up with as many good solutions as they could to traffic in San Francisco or Paris, respectively.
- **Manipulation:** Groups were given one of the following instructions:

  "Most research and advice suggest that the best way to come up with good solutions is to come up with many solutions. Freewheeling is welcome; don't be afraid to say anything that comes to mind. However, in addition, most studies suggest that you should rule out criticism. You should NOT criticize anyone else's ideas" (Debate groups).

  "Most research and advice suggest that the best way to come up with good solutions is to come up with many solutions. Freewheeling is welcome; don't be afraid to say anything that comes to mind. However, in addition, most studies suggest that you should debate and even criticize each other's ideas" (Brainstorming groups)

  No instructions (Control groups).
- **Measures of performance:** number of ideas generated.
- **Results:** When considering only the ideas generated during the group discussion, the Debate groups generated more ideas than the Control groups, while the Brainstorm groups did no better than the Control groups. However, the difference between the Debate and Brainstorm groups was not statistically significant.

  However, when also including the ideas generated after the group discussion, the Debate group generated significantly more ideas than both the Control and Brainstorm groups. This could be because one side effect of encouraging debate is that people cannot speak at the same time, so some good ideas may not be expressed in the session itself.

  The results hold in both the US and France studies, despite different cultural norms.

Relevance to asset management:
Psychological safety is key to effective brainstorming, as it encourages people to express ideas without fear that they will be seen as criticising other ideas, and without fear of their ideas being criticised themselves. In addition, brainstorming should allow for ideas to be generated after the discussion is over.

Nemeth, Charlan Jeanne (1986): "Differential Contributions of Majority and Minority Influence." *Psychological Review* 93, 23–32

- **Punchline:** Minority dissent is valuable, even if the ideas shared are wrong, as it sparks others to challenge their own thinking and come up with more novel solutions.
- **Hypothesis:** Majorities and minorities influence people's views through different challenge. Majorities influence either through information (the majority view is more likely to be correct) or norms (people want to be accepted and avoid being in a minority). In contrast, minorities get people to think differently: not necessarily to converge on the minority view but simply to move from the status quo.

Study 1

- **Setting:** 96 undergraduates, divided into 16 groups of 6.
- **Task:** Subjects were given a "standard" figure and six comparison figures, and asked to name all the comparison figures that contained the standard. One of them (U) was easy, the other five were difficult.
- **Manipulation:** Either 2 of 6 (minority condition) or 4 of 6 (majority condition) were paid participants who said both U and E. E was either correct or incorrect.
- **Results:** Subjects were more likely to say U and E in the majority than minority condition.

  However, subjects in the minority condition were more likely to find novel correct solutions than subjects in the majority condition. This was not due to guessing, as there was no difference for incorrect solutions.

  Whether the minority was correct or not made no difference. Those exposed to the minority condition found more correct solutions regardless of whether E was correct or incorrect.

Study 2

- **Setting:** Participants, divided into groups of 4.
- **Task:** Subjects were shown a series of slides, each consisting of five letters with the middle three in capitals (e.g. tDOGe). Were asked to name the first three-letter word they saw; all said "dog."
- **Manipulation:** Subjects were then given feedback on the overall group. Those in the majority condition were told that 3 out of 4 saw "god" and one saw "dog." Those in the minority condition were told that 3 saw "dog" and one saw "god."

  They were then shown a series of 10 letter strings and asked to form all words they could from the five letters.
- **Results:** Subjects in the minority condition found more correct words. They did so using all possible strategies: forward sequencing, backward sequencing, and mixed sequencing.

  Those in the majority condition used backward sequencing but at the expense of forward sequencing. Their overall performance was similar to the control (who were not told the group's response).

  Overall, those in the majority condition followed the majority strategy but to the detriment of other possible strategies. Those in the minority adopted all possible strategies and thus found more solutions.

Study 3

- **Setting:** Participants, divided into groups of 2.
- **Task:** Subjects were asked to judge 20 slides for colour. All were blue but were told that 80% of people in general judge them to blue and 20% to be green, or the reverse.
- **Manipulation:** The other participant (a paid participant) said "green" for all 20 slides. Thus, the other participant was either the majority (if 80% of people judge the slides to be green) or minority (if 80% judge them to be blue).

  Subjects were then asked for word associations to the words "green" and "blue."
- **Results:**
  Subjects in the minority condition gave more original associations (i.e. statistically less frequent) to both green and blue. For example, they associated "blue" with "jazz" or "jeans" rather than "sky" or "green."

  Those in the majority condition gave more conventional responses, even more so than the control (who were not told whether 80% of people judge the slides to be blue or green).

Relevance to asset management:
Encouragement of dissenting viewpoints is valuable to stimulate innovation. Note that the dissenting viewpoints do not exert influence by leading others to adopt the same viewpoint, so it does not matter if they are wrong. Instead, they stimulate divergent thinking and encourage others not to simply go with the obvious answer.

Olson, Bradley J., Satyanarayana Parayitam, and Yongjian Bao (2007): "Strategic Decision Making: The Effects of Cognitive Diversity, Conflict, and Trust on Decision Outcomes." *Journal of Management* 33, 196–222

- Punchline: Cognitive diversity increases performance by increasing task conflict.
- Hypothesis: Cognitive diversity increases task conflict (disagreements about what to do), particularly if competence-based trust is high. This task conflict ultimately improves team performance.
- Setting: Field study of top management teams from 85 hospitals.
- Measure of diversity: Two questions on commonality within the top management team on beliefs (the best way to maximise the hospital's long-term performance, what the hospital's goals should be) and two questions on preferences (the best way to ensure the hospital's long-term survival, and which goals should be considered most important).
- Measure of context: Competence-based trust, using questions such as "I can rely on this group not to make my job more difficult by careless work."
- Measures of performance:
  Task conflict: questions such as "how many disagreements over different ideas about this decision were there?"

  Perceived decision quality: questions such as whether the decision led to better or worse results than expected.
- Results: Cognitive diversity increases task conflict, particularly if competence-based trust is high. This increase in task conflict ultimately improves decision quality.

  Task conflict is one channel through which cognitive diversity improves decision quality. However, task conflict does not fully explain the link between cognitive diversity and decision quality, so other factors (not explored by this paper) are also at play.

Relevance to asset management:
Task conflict is an important mechanism through which cognitive diversity improves performance. Psychological safety is likely valuable in promoting task conflict as it will encourage cognitively diverse team members to disagree with each other.

Phillips, Katherine W. (2003): "The Effects of Categorically Based Expectations on Minority Influence: The Importance of Congruence." *Personality and Social Psychology Bulletin* 29, 3–13

- Punchline: Dissent is taken more seriously when it comes from an outgroup rather than an ingroup, as people think it is reasonable for outgroups to have different viewpoints.
- Hypothesis: It is commonly believed that a dissenting opinion is less influential when it comes from an outgroup. Ingroup members think that the outgroup has a different goal or world view from them, so its opinion is irrelevant. In contrast, the author argues that people will be more resistant to ingroup dissent, because they think that ingroup members should agree with them. They are more accepting of outgroup dissent; as a result, outgroups are more willing to dissent.

Study 1

- Setting: 158 MBA students in a classroom setting.
- Task: Discuss the best market to target for a new MRI system. Subjects first decided individually and then discussed in groups.
- Measure of diversity: Educational diversity. Groups comprised of MBA and medical students.
- Manipulation: An MBA student is told whether other group members agreed or disagreed with him/her. The experimenter chooses whether the agreement comes from a fellow MBA student or a medical student.
- Results: Students more surprised and irritated when an ingroup member (fellow MBA student) agreed rather than disagreed. No difference when an outgroup member agreed rather than disagreed.

Study 2

- Setting: 165 undergraduate students in a lab setting.
- Task: Consider a murder mystery and decide who the culprit is. Subjects first decided individually and then discussed in groups.
- Measure of diversity: Social group. Students either from dormitory A or dormitory B. Unlike Study 1, this dimension of diversity shouldn't affect your view – even if you think two MBA students should think similarly, there's no reason to think that two dorm A members should think similarly. However, it may do due to social ties.
- Results: Dissenting views were shared more strongly by outgroup members rather than ingroup members.

  The group did better at identifying the suspect when dissent came from outgroup than an ingroup.
- Relevance to asset management: Rather than trying to eliminate "cliques" and other divisions, there may be benefits in keeping them: dissent can be more effective when it comes from a different group. In the author's words: "In contrast to the recommendations that call for the diminution of categorical distinctions, the current research suggests that there may be some benefits associated with maintaining categorical differences in diverse decision-making groups."

Relevance to asset management:
Rather than trying to eliminate "cliques" and other divisions, there may be benefits in keeping them: dissent can be more effective when it comes from a different group. In the author's words: "In contrast to the recommendations that call for the diminution of categorical distinctions, the current research suggests that there may be some benefits associated with maintaining categorical differences in diverse decision-making groups."

Phillips, Katherine W. and Denise Lewin Loyd (2006): "When Surface and Deep-Level Diversity Collide: The Effects on Dissenting Group Members." *Organizational Behavior and Human Decision Processes* 99, 143–160

- Punchline: Dissent from an ingroup is taken more seriously in a diverse organisation, including in an investment setting.
- Hypothesis: Phillips (2003) showed that dissent from an ingroup member leads to more surprise and irritation than dissent from an outgroup member. This paper: dissent from an ingroup member will lead to even more surprise and irritation in non-diverse organisations, because people expect everyone to be in line.

Study 1

- Setting: 112 MBA students divided into three-person groups.
- Task: Discuss the best market to target for a new MRI system.
- Measure of diversity: Educational diversity. Groups comprised of MBA and medical students.
- Manipulation: An MBA student was given different information from the two other group members. They were either both fellow MBA students (non-diverse group) or one MBA and one medical student (diverse group). The dissenter was always in the ingroup (the MBA students were always in the majority), but what changed was the diversity of the organisation.
- Results: Dissenting ingroup members had a more positive and accepting group experience in diverse than non-diverse groups.

Study 2

- Setting: 87 undergraduate students divided into three-person groups.
- Task: Decide which company to invest in.
- Measure of diversity: Social group. Students either from North or South Campus. Unlike Study 1, this dimension of diversity should not affect your view – even if you think two MBA students should think similarly, there is no reason to think that two North Campus members should think similarly. However, it may do due to social ties.
- Manipulation: A member of North Campus was given an information packet designed to lead to the selection of Company A; the other two were given info designed to lead to the selection of Company B. They were either both also from North Campus (non-diverse group) or one was from North and one was from South (diverse group).
- Results: Dissenting ingroup members had a more positive and accepting group experience in diverse than non-diverse groups; they also shared their views more strongly. However, diverse groups were no better at making the correct investment decision: it was difficult for dissenting ingroup members to change others' minds.

Relevance to asset management:
Rather than trying to eliminate "cliques" and other divisions, there may be benefits in keeping them: ingroup members are more willing to share dissenting views when the organisation has multiple groups.

Phillips, Katherine W., Gregory B. Northcraft, and Margaret A. Neale (2006): "Surface-Level Diversity and Decision-Making in Groups: When Does Deep-Level Similarity Help?" *Group Processes & Intergroup Relations* 9, 467–482

- Punchline: Highlighting similarities between colleagues may make them less willing to share different perspectives.
- Hypothesis: People are unwilling to voice different viewpoints if they share similarities with other group members. If everyone else is the same, you think everyone else has the same information as you. Thus, if no-one else has brought up the point, you assume they are all aware of it and deemed it irrelevant.
- Setting: 216 undergraduate business students divided into three-person groups.
- Task: Consider a murder mystery and decide who the culprit is. Students were given different information, but they did not know that.
- Measure of diversity: Racial diversity (surface-level) and existence of common interests such as friends, hobbies, experiences, books, and movies (deep-level) between students.
- Manipulation: Some groups were made aware of their similarities by being asked to spend 5 minutes finding out as many common interests as they had. The control groups were asked to spend 5 minutes listing as many US state capitals as they could, working alone.
- Results: Surface-level diverse groups believed they had different information and spent more time discussing the task. But, being aware of deep-level similarities made them perform worse in identifying the culprit.

Relevance to asset management:
Trying to highlight common interests and a "one firm" mentality may backfire. Allowing people to embrace their individuality may make them more willing to share their unique information. "Quants" should be allowed to behave like "quants", even if it might lead to pigeon-holing.

Polzer, Jeffrey T., Laurie P. Milton, and William B. Swann, Jr. (2002): "Capitalizing on Diversity: Interpersonal Congruence in Small Work Groups." *Administrative Science Quarterly* 47, 296–324

- Punchline: Diversity increase group effectiveness when interpersonal congruence is high: when other group members see you as you see yourself.
- Hypothesis: Diversity has costs as well as benefits: it may lead to people being stereotyped. This is why there is very mixed evidence of a general link between diversity and performance. However, when focusing on cases in which interpersonal congruence is high and thus stereotyping is low, diversity may be beneficial.
- Setting: 423 MBA students at the University of Texas at Austin, divided into 83 study groups of 4-6 members each.
- Measure of diversity:
  Demographic diversity: age, US citizenship, race, and sex.

  Functional diversity: prior degree, MBA concentration, and prior job function.
- Measures of interpersonal congruence: Subjects rated themselves and each member of study group on 11 dimensions, e.g. academic ability, artistic ability, social skills, sporting skills, trustworthiness, leadership ability, cooperativeness. Interpersonal congruence is the discrepancy between own rating of themselves and other group members' rating of themselves.
- Measures of performance:
  Social integration: questions such as "everyone's input is incorporated into most important study group discussions."

  Group identification: questions such as "the study group's successes are my successes."

  Group performance: grade for group projects. The researchers categorised each project as creative or computational.
- Results: Demographic diversity had a positive effect on social integration when interpersonal congruence was high.

  Functional diversity had a positive effect on group identification when interpersonal congruence was high.

  When interpersonal congruence was high, demographic diversity had a positive effect on creative task performance and a negative effect on computational task performance.

  There was no effect of functional diversity on group performance, even when interpersonal congruence was high.

Relevance to asset management:
To fully leverage the benefits of diversity, leaders should ensure that diversity does not lead to stereotyping, but instead that group members are seen as they want to be seen.

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