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HEURISTICS IN THE STRATEGY CONTEXT – COMMENTARY ON BINGHAM AND EISENHARDT (2011)

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Abstract

Bingham and Eisenhardt (2011) highlight the positive role of heuristics in the strategy context. They discuss four mechanisms through which heuristics have positive effects for strategy. The first mechanism – using a heuristic cue as a proxy for complex, correlated information – builds directly on Gigerenzer's research on positive heuristics. The second and third mechanisms – capturing a window of opportunity and providing some direction while allowing freedom to improvise, combines Gigerenzer's ideas with Eisenhardt's earlier work. The fourth one relates to coordination. In this commentary, we critically evaluate the applicability of these four mechanisms in the strategy context, which differs fundamentally from Gigerenzer's context. Our primary contribution is the explication of central limitations in the ways heuristics can function in the strategy context.

Key words: heuristics, decision-making, bias, cognition, coordination

INTRODUCTION

In their article ‘Rational heuristics: the ‘simple rules’ that strategists learn from process experience’, Bingham and Eisenhardt (2011; hereafter B&E) show empirically that managers develop and use heuristics in the strategy context. They also suggest four mechanisms through which these heuristics improve decision-making and implementation. B&E emphasize the unique nature of the strategy context and use it to explain why Kahneman’s (2011; 1974) critical points about heuristics are not a major concern for strategy scholars (p. 1439, 1458). However, despite acknowledging the difference between psychological studies and the strategy context, they still rely heavily on Gigerenzer’s (e.g., 2008) psychological research on positive heuristics to justify the mechanisms they suggest. This results in inconsistencies in B&E’s theorizing, as they repeatedly argue for a mechanism that works in Gigerenzer’s context while admitting that they are working in a context that is fundamentally different (p. 1439, 1458).

The ultimate goal of this commentary is to answer the question, ‘How do heuristics work in the strategy context?’ The importance of this question goes far beyond criticizing the inconsistencies in B&E’s argument. Firstly, as B&E show, managers often rely on heuristics for critical strategic decisions. Secondly, there is a broader discussion within the strategy field over whether heuristics’ effects on strategy formation are negative (Hodgkinson *et al.*, 2002; Schwenk, 1984; Teece, 2007) or positive (Denrell and March, 2001; Hodgkinson and Healey, 2011; Knudsen and Levinthal, 2007).

To answer the core question guiding our commentary, we first explicate the contextual differences between the studies of Gigerenzer, Kahneman, and B&E. After that, we explore how the mechanisms discussed by B&E work differently in each context. We consequently show how

Gigerenzer's positive heuristics reasoning has less validity in the strategy context than B&E assume. Rather than improving strategic decision-making in the way Gigerenzer's heuristics improve, for example, medical decision-making, our analysis shows that the main benefits of heuristics in the strategy context relate to coordination during strategy implementation. In other words, heuristics have more value to managers when they are following through on decisions than when they are actually making them.

The rest of the commentary proceeds as follows. In the second section, we briefly review previous research on heuristics. In the third section, we explicate the contextual differences between the studies of Gigerenzer, Kahneman, and B&E. In the fourth section, we show how three of the four mechanisms proposed by B&E are unlikely to be effective in the strategy context, whereas the fourth one, coordination, is likely to be effective. Finally, we conclude the paper.

THEORETICAL BACKGROUND

The concept of heuristics originally emerged from Simon's (Newell and Simon, 1972; Simon, 1947) work on bounded rationality. Faced with a complex decision, humans cannot search all alternatives effectively but must rely on heuristics. This will work provided that the search space is characterized by 'redundancy that can be used to predict the properties of parts of the space not yet visited from the properties of those already searched' (Simon and Newell, 1971: 151). A contextual factor – redundancy – was thus recognized early on as a crucial factor in the effectiveness of heuristics.

Tversky and Kahneman (1974) continued Simon's work empirically by identifying the actual heuristics that people use. They developed experiments that pitted heuristics against

logical-analytical thinking (Kahneman, 2011: 158) and found that heuristics are often useful, but sometimes lead to biases (Tversky and Kahneman, 1974). Kahneman and Frederick (2002: 53) formalized that ‘judgment is mediated by a heuristic when an individual assesses a specified target attribute of a judgment object by substituting another property of that object – the heuristic attribute – which comes more readily to mind.’ Scholars have also argued that Kahneman’s heuristics can lead to bias in strategic decision-making (e.g., Schwenk, 1984).

Other scholars have criticized the negative view of heuristics that resulted from Kahneman and Tversky’s experiments. Cohen (1979) questioned the use of Bayesian probability theory as the benchmark for decisions. Einhorn and Hogarth (1981: 6) suggested that evolution may have produced heuristics that are functional in their focal environment, but they also noted that certain cognitive limitations can ‘persist and be dysfunctional.’ Hogarth (1981) argued that while heuristics may fail in laboratory conditions, where a single discrete decision is made, they may be more useful for continual decision-making in the real world, because the continuity allows the decision-maker to discover which heuristics work (see also, Donovan and Epstein, 1997). Kahneman and Klein (2009) later specified that heuristic thinking is most likely to work if the environment has high predictability and the user of the heuristic has had the opportunity to learn the regularities of that environment.

Continuing the critique against Kahneman, Gigerenzer has built on Simon’s work (including the notion about redundancy) and developed the most positive view of heuristics. He defines a heuristic as ‘a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods’ (Gigerenzer and Gaissmaier, 2011: 454). This definition differs from Kahneman’s in that it includes positive goals and emphasizes information reduction over attribute substitution. Gigerenzer builds on the

premise that while rational approaches may work in ‘small worlds’, where all information is available and all alternatives may be identified, the situation is different in ‘large worlds’, where these conditions are not met (Gigerenzer and Gaissmaier, 2011: 452–453).

Bingham and Eisenhardt (2011) emphasize that they are studying heuristics in the strategy context. Specifically, they note that Kahneman’s critical view on heuristics is not applicable in the strategy context (p. 1439, 1458). B&E (p. 1439) define heuristics following Simon: ‘Heuristics are cognitive shortcuts that emerge when information, time, and processing capacity are limited.’ (Newell and Simon, 1972). While B&E’s primary contribution is in describing what kinds of heuristics organizations learn, and in which order, they also discuss four mechanisms through which heuristics improve strategic decision-making and implementation. They cite Gigerenzer repeatedly to support these arguments, without discussing whether and how Gigerenzer’s context is similar to theirs. B&E argue that heuristics work because they (1) proxy for more complex, correlated information, (2) allow for faster capturing of opportunities, (3) provide some direction and freedom to improvise, and (4) help in coordination. Of these four mechanisms, it seems that #1 is directly borrowed from Gigerenzer, #2 and #3 relate to both Eisenhardt’s earlier ideas (Brown and Eisenhardt, 1997; Eisenhardt and Sull, 2001) and Gigerenzer’s work, and #4 builds on Eisenhardt’s earlier work without explicit links to Gigerenzer.

DIFFERENT CONTEXTS

As shown above, B&E, Kahneman, and Gigerenzer all agree that heuristics only work if they fit their context. So comparing the contexts of their respective heuristics is crucial for understanding how the mechanisms proposed by B&E might work in the strategy context. We have identified

four dimensions along which the contexts differ: redundancy, stability, timeframe for decision-making, and the user of the heuristics. We outline these dimensions of difference below, before discussing how the mechanisms mentioned by B&E work in different contexts.

Redundancy refers to the correlation between elements in a system. When redundancy is high, several elements correlate with one another and the state of several elements can therefore be concluded from the state of one element (e.g., Simon and Newell, 1971). Redundancy is typically moderate or high in Gigerenzer's contexts (Gigerenzer and Gaissmaier, 2011: 457) and variable in Kahneman's contexts (Kahneman and Klein, 2009). The strategy context tends to be high in complexity and low in redundancy, as there are various factors such as legislation, market characteristics, market position, the firm's financial situation, and other resources and capabilities that are all weakly correlated yet relevant for decision-making and its outcomes.

Stability refers to permanence or persistence in the structure of the environment. Gigerenzer's context is typically stable. He emphasizes that his heuristics work in specific contexts, and that if there is a change in the context, the usefulness of the heuristics also changes (Gigerenzer and Gaissmaier, 2011: 457). Kahneman has studied heuristics in both stable and unstable contexts. The strategy context (information technology industry) studied by B&E is considered to be unstable, since it has generally been characterized as a 'high-velocity environment' (Brown and Eisenhardt, 1997: 2) and B&E (p. 1459) emphasize the 'high unpredictability' of the context of their heuristics. More specifically, we consider that instability in the strategy context means that the central factors influencing firm success can change within years rather than decades (e.g., consider how the bases of competitive advantage have changed in the computer and mobile phone industries several times during the past 20 years).

Timeframe for decision-making refers to the amount of time a decision-maker(s) has to make their decision. In Gigerenzer's and Kahneman's studies, the subjects are usually required to make their decisions within seconds, minutes, or hours. Conversely, in the strategy context, even though the environment can change radically over a few years, decision-makers typically have several days or even weeks for making their decisions. Even in high-velocity environments, managers are more likely to measure decision-making timescales with the calendar than with the stopwatch. For example, Brown and Eisenhardt (1997) describe how a company called Midas did not miss a single window of opportunity when they had 'new product released like clockwork every two years' (p. 8).

User of heuristics refers to the entities (individuals, groups, etc.) who make and/or implement decisions with the heuristics. In Gigerenzer's and Kahneman's studies, the user is typically an individual. Conversely, in the strategy context, the user is typically a group of individuals who may operate in a hierarchy. It should also be noted that B&E, Kahneman, and Gigerenzer share the assumption that the user(s) of the heuristics is/are boundedly rational (Simon, 1947).

PROPOSED MECHANISMS

B&E discuss four mechanisms that they suggest make their heuristics work in the strategy context. We will now outline how these fit the strategy context (Table 1), explicating substantial limitations and boundary conditions for their effectiveness.

*** *Insert Table 1 about here* ***

Proxy for complex, correlated information

B&E (p. 1458) write that ‘Building on psychological research (Gigerenzer, 2008; Gigerenzer and Brighton, 2009)’ heuristics help in decision-making because they ‘effectively proxy for complex, correlated information.’ We argue that this argument has limited validity in the strategy context because this context displays less redundancy and stability than Gigerenzer’s contexts.

The influence of redundancy

The importance of redundancy for the ‘proxy mechanism’ can be illustrated with Gigerenzer’s recognition heuristic (see Gigerenzer and Gaissmaier, 2011: 460). For example, when people are asked which German city is larger, Cologne or Kella, they are likely to answer correctly if they choose a city they recognize, because the population of a city correlates with how often it is mentioned. Conversely, the same heuristic fails when people are asked which city is closer to the center of Germany, because location does not correlate with recognition. Kahneman’s reasoning is consistent with the idea that the lower the correlation between the heuristic attribute (recognition, in this case) and the target attribute (city size or location), the higher the bias. However, he also emphasizes that there are typically other factors beyond the target attribute that influence the heuristic cue (e.g., a peculiar name might influence how well a city is recognized), which is why the reliance on a heuristic cue alone often leads to bias (see Kahneman and Frederick, 2002: 53).

We note that, since the strategy context has less redundancy than the contexts where Gigerenzer’s heuristics operate, a strategic decision-maker needs to consider more information than a heuristic can proxy. For example, B&E’s selection heuristic ‘restrict internationalization to English-speaking markets’ uses the English language as a proxy for British Commonwealth

culture (p. 1449), but does not correlate with other factors like market size, availability of resources, and political stability, which are just as influential on performance as cultural fit. Hence, basing decisions on this single heuristic proxy is unlikely to lead to positive outcomes.

Moreover, while B&E argue that the English-language heuristic was enough for their case company, U-Analytics, to decide to enter Australia (p. 1449), one might suggest that the managers actually took more information into account. When interviewed, one of the managers said that ‘it (Australia) was just too good an opportunity to miss.’ It is likely that when the manager evaluated the opportunity, they used also other information about the country, acquired through casual reading of news, traveling, conversations, TV, etc. If asked, the manager would probably have been able to explicate, for example, that Sydney has a population of millions and the country has a high GDP per capita and it is technologically developed and relatively safe.

The influence of stability

The second contextual factor influencing whether the ‘proxy for complex, correlated information’ mechanism can work in the strategy context is the stability of the assumed correlation. If the correlation does not persist over time, there is no reason to develop a heuristic around it for future use. As an example of a situation where the correlation persists, consider the three-step decision rule (Gigerenzer’s heuristic) that medical doctors use for detecting ischemic heart disease.¹ The basic physiology of humans and the disease do not change over time, so a

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¹ Gigerenzer’s heart-disease heuristic comprises three specific questions: “Does the patient’s electrocardiogram show a certain anomaly? Is chest pain the patient’s primary complaint? Are there any other factors (nitroglycerin, myocardial infarction, segment changes, waves with peaking or inversion)?” If the answer to any of these three questions is “yes”, the physician must send the patient to a coronary care unit. Otherwise, the patient goes to a regular nursing bed. No other information is used for making the decision. Empirical data on 292 patients with symptoms of heart disease was quantitatively analyzed to develop this heuristic. (Gigerenzer and Gaissmaier, 2011: 467; Green and Mehr, 1997)

heuristic that has been created by analyzing past patients can safely be applied to future patients (Gigerenzer and Gaissmaier, 2011; Green and Mehr, 1997).

Conversely, in the strategy context, there is much less stability. There are numerous contextual variables that influence the outcomes of actions (Sapienza *et al.*, 2006; Zahra, Ireland, and Hitt, 2000); long-term consequences and feedback loops that lead to unexpected dynamics (Zollo and Winter, 2002); and various actors that each shape the system from the inside and outside (e.g., Porter, 1980). All these factors make the context unstable and may influence the correlations between the heuristic attribute and the phenomena it is assumed to proxy for. For example, a Japanese firm can change their negative attitude towards Asian technologies or positive attitude toward American technologies within years, as new generations of products are introduced (e.g., consider how Korean Samsung is gaining momentum and Chinese contract manufacturers are becoming more and more skilled, whereas Motorola and IBM have become associated with old technologies). If such a change occurs, employing B&E's (p. 1451) heuristic '(1) first enter the U.S., (2) use U.S. customers as references to enter Japan, and then (3) use Japanese customers as references for entry into the rest of Asia' might cause the organization using the heuristic to take an unnecessary detour to the U.S.

B&E also recognize the importance of updating heuristics and so write that 'some heuristics become obsolete' (p. 1456) and provide evidence of how heuristics that worked fine for one decision did not work for the next. For example, they recount how U-Analytics ended up dropping the 'restrict internationalization to English-speaking markets' heuristic because 'it prevented them from addressing attractive opportunities in non-English-speaking markets like France, Germany, and Korea' at a later time.' (p. 1456). Likewise, F-Supplysoft dropped the heuristic 'use acquisition as entry mode' because they found it too slow for subsequent

opportunities and started to use ‘a greenfield entry mode to establish a presence quickly’ (page 1456; see also, page 1449, on how S-Security failed in Hong Kong; and page 1451, on how U-Semi unsuccessfully approached Dell).

Capturing a window of opportunity

The second mechanism B&E argue to explain the success of the heuristics they studied is that they help companies to ‘respond swiftly’ (p. 1449) and capture ‘opportunities sooner, faster, and more effectively than rivals’ (p. 1459). This mechanism is connected to Gigerenzer’s reasoning, as he emphasizes that his heuristics are ‘fast and frugal’ and speed up decision-making.

Likewise, Kahneman (2011) has described the use of heuristics as ‘fast’ thinking.

However, the difference in the timeframe for decision-making in the strategy context versus Gigerenzer’s and Kahneman’s contexts is a crucial distinction that has not been explicated. Applying a heuristic in Gigerenzer’s and Kahneman’s contexts typically takes only a few seconds or minutes. Conversely, strategic leaders are not working with such a clock speed; any opportunity that emerges will be available for at least a few days, if not weeks. Hence, they always have the possibility to check facts using online sources, collect information through phone calls, and delegate analyses to their team. Therefore, strategic leaders need not rush to judgment within seconds of recognizing an opportunity, depending on a single heuristic for their decision. For example, the managers of U-Analytics (the company which, according to B&E, relied on the ‘English-language’ heuristic in their decision to enter Australia) could have carried out a few hours of desk research to find detailed information about the country and its economic and technological situation, as well as calculating the investment needed for entry and its

feasibility given the firm's financial situation, and still have been able to respond swiftly to the emerging opportunity.

Some direction and freedom to improvise (mindfully)

The third way that B&E argue that heuristics improve strategic decision-making is that they provide some direction while allowing the managers to improvise the specifics (in a mindful way). They claim (p. 1449) that heuristics need to provide direction because 'while firms could flexibly improvise all facets of every entry, this would be slow and prone to mistakes.' Yet, B&E (p. 1458) also note that heuristics should not provide too much direction, in order to maintain the 'flexibility to improvise in actual conditions [...] to accommodate the specifics of every opportunity.'

The idea of 'some direction and freedom to improvise' has parallels in Eisenhardt's (e.g., Brown and Eisenhardt, 1997; Eisenhardt and Martin, 2000) earlier work, which is theoretically unrelated to Gigerenzer's heuristics. However, when this idea is discussed simultaneously with Gigerenzer's work and bounded rationality, there is a need to be more explicit about how the heuristic improves cognitive processes associated with decision making. This mechanism assumes that managers need rules to know the right direction because they are boundedly rational and, yet, that they are able to mindfully understand what is relevant in the direction given by the heuristic. The initial selection simplifies the decision problem by reducing the number of options to be considered; consequently, more of the limited cognitive resources are left for dealing with the specifics and managers should be able make better choices.²

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² There is no guarantee that the initial direction provided by a heuristic is a relevant one, as we showed when discussing the first mechanism (proxy for complex, correlated information). If the initial direction is an irrelevant

However, the second task may also be cognitive demanding. For example, the heuristic ‘Synchronize sales approach to local culture’ still leaves open what are the relevant aspects of a culture. In such a situation, mindful improvisation can be challenging since ‘culture’ can denote one or more of Hofstede’s (1980) four dimensions – or any number of other factors, such as the custom of gift-giving in Japanese business meetings, or businesspeople visiting saunas together in Finland. In addition, there are several national stereotypes and related biases that often influence people subconsciously (Kahneman, 2011). Consequently, even though the heuristic helps in focusing attention on relevant initial direction, managers may still make substantial errors while carrying out free thinking in the area constrained by the initial direction. B&E assume that improvisation is an effective way to deal with this challenge but do not contrast it to alternative processes, such as those described by, for example, Hodgkinson *et al.*, (2002) or Kahneman (2011).

There is also evidence that the lack of specificity and structure can lead to mindlessness rather than mindfulness. Gigerenzer (2008) notes that specific heuristics take attention away from cues that are less relevant, and therefore improve decision-making; and that it’s difficult to ignore the less relevant information without a specific heuristic. Kahneman (2011: Chapter 21) emphasizes that to avoid bias stemming from the non-conscious, automatic use of heuristics, decision-makers should rely on explicit formulas that focus attention on the relevant factors and downplay the influence of salient but irrelevant cues. B&E acknowledge this logic when they note that decision-makers who do not use heuristics may fail if they ‘focus too much attention on less relevant details’ (p. 1459), even though they assume elsewhere that managers who improvise typically focus on relevant cues.

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one, the subsequent improvisation is a wasted effort and may cause the company miss more relevant information. However, in this section, we assume that the initial direction is a relevant one.

Of course, the problem is that reliance on any single cue is inadequate in the strategy context, which is also why specific heuristics are unlikely to work well for strategic decision-making. However, the fact that specific heuristics are unlikely to work in the strategy context does not mean that unspecific heuristics lead to mindfulness. Unspecific heuristics may help managers take a first step in the right direction and, thus, improve the quality of strategic decisions. However, they do not ensure that the subsequent steps consider relevant information.

Since in the strategy context heuristics are used by several people, one might suggest that improvising groups transcend the limitations imposed by bounded rationality at the individual level. However, there is also evidence that biases are amplified in groups (e.g., Janis, 1972) and that groups tend to focus on information shared by all members and ignore the rest (Lu, Yuan, and McLeod, 2012; Stasser and Titus, 1985), so the assumption that groups make more mindful decisions than individuals cannot be taken as given. On the other hand, however, heuristics such as ‘Restrict internationalization to Scandinavia’ (p. 1444) can help groups of individuals coordinate their efforts: when such a heuristic is applied, no one will engage in activities focusing on non-Scandinavian markets, but everyone works consistently to help the company succeed in Scandinavia. There is no guarantee that they will make mindful decisions (i.e. choose a good approach for succeeding in Scandinavia), but at least they will all move in the same direction. In sum, while it is possible that heuristics that provide some direction and freedom to improvise have positive effects for organizations (Eisenhardt and Sull, 2001), the mechanism still leaves room for cognitive errors during the improvisation phase. In light of current evidence, it remains unclear whether managers use this room for free thinking in a mindful or mindless way.

Coordination

The final mechanism that B&E mention to explain why their heuristics improve performance is coordination (p. 1452): ‘Since opportunity capture often requires internal coordination of limited resources, heuristics that set a rhythm or pace can be especially advantageous (Brown and Eisenhardt, 1997; Vermeulen and Barkema, 2002).’ They also write (p. 1457) that ‘a simple structure of rules [...] keeps behavior at least partially coherent (Eisenhardt, Furr, and Bingham, 2010; Miner, Bassoff, and Moorman, 2001).’ As the references indicate, this mechanism builds on Eisenhardt’s earlier work rather than Gigerenzer’s research on heuristics.

Although Gigerenzer’s work does not explicitly address coordination, it is worth noting that some of the heuristics he discusses may improve coordination. For example, the three-step decision rule for heart disease could be widely shared in the focal hospital, making it likely that nurses and doctors share an understanding of how a patient will be treated at different stages, which increases coordination (see also, Rico *et al.*, 2008). In addition, the wider literature on shared cognition is consistent with the idea that shared mental structures (including heuristics) improve coordination (DeChurch and Mesmer-Magnus, 2010; Mathieu *et al.*, 2000; Mohammed, Ferzandi, and Hamilton, 2010).

The way B&E’s heuristics are developed is also consistent with the argument that they have positive effects for coordination. Organizations develop B&E’s heuristics when managers reflect and discuss their experience and infer lessons for future use. The managers are likely to have strong faith in these lessons for two reasons. First, the lessons are inferred from personal experience, so managers are likely to consider them to have high validity and to be emotionally committed to them (cf. Kahneman, 2011). Second, when they hold group discussions about

shared experiences, each manager is likely to further reinforce others' observations and ideas (cf. Myers and Lamm, 1976). The consequence is a strongly held shared understanding, which likely results in high-effort, consistent actions, as the literatures on group cognition (e.g., Mohammed *et al.*, 2010) and strategic consensus show (Kellermanns *et al.*, 2011).

In sum, given both Eisenhardt's earlier work and the shared cognition literature, it seems that the heuristics empirically studied by B&E have positive effects on coordination. Of the four mechanisms outlined by B&E, coordination seems to be the one that is most likely to work in the strategy context.

CONCLUSION

B&E's empirical material has convincingly shown that managers learn and use heuristics in the strategy context. Their primary contribution was to describe the heuristics managers actually develop, while their theoretical suggestions on the effects of heuristics were more speculative. We explicated contextual factors relevant to the mechanisms suggested by B&E. We identified boundary conditions for the applicability of those mechanisms that result from the unique characteristics of the strategy context. In this way, we have contributed to the understanding of positive heuristics in strategic management. Future research on other psychological phenomena in the strategy context, in addition to heuristics, can also benefit from our analyses, as several mechanisms are likely to be influenced by contextual factors.

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Table 1: Fit between heuristic mechanisms and contexts

Mechanism proposed by B&E	Contextual factors required	Fit with Gigerenzer context?	Fit with Kahneman context?	Fit with B&E context?
<i>Proxy for complex correlated information</i>	Redundancy	Yes	Varies	No
	Stability	Yes	Varies	No
<i>Capturing a window of opportunity</i>	Decisions made within hours	Yes	Yes	No
<i>Provide some direction... and ...freedom to improvise (mindfully)</i>	Bounded rationality	Yes	Yes	Yes
	Mindfulness during free thinking in the area constrained by the “some direction”	No	No	Unclear
<i>Coordination</i>	Used by a group	No (only implicitly)	No (only implicitly)	Yes