

**GROUP HETEROGENEITY AND STRATEGIC DECISIONS:  
DO INFORMAL “CONSIDER THE OPPOSITE” PROCESSES  
IMPROVE DECISION EFFICACY?**

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*The effect of discussion in heterogeneous groups on the individual group members is measured in a hindsight bias, debiasing experiment. Results indicate that exposure to differing viewpoints did not improve decision making, but lead to polarization of viewpoints instead. Exposure alone may not stimulate the level of information processing necessary to bring about improved decision making. It is suggested that the nature of a decision process may be more critical to improvement in strategic decision making than heterogeneity of the decision team. Implications for strategic management are discussed.*

One fairly robust finding from research on executive team demographics is that performance, particularly in relatively dynamic environments, is enhanced by executive team heterogeneity. Executive team heterogeneity is correlated with organizational adaptiveness, a critical factor in dynamic environments (Bantel & Jackson, 1989; Lant, Milliken & Batra, 1992; Murray, 1989). Heterogeneous teams are thought to gather information from a variety of sources representing diverse interpretations and perspectives leading to greater creativity and innovation, which may enhance a firm's adaptability (Wiersma & Bantel, 1992).

Diversity also presents problems for organizations, such as constraining efforts to take decisive action (Goodstein, Gautam & Boeker, 1994). In contrast, similarity of schemata and cognitive structure in homogenous teams can be expected to enhance

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cohesion (Michel & Hambrick, 1992), facilitating both consensus decision making (Prich, 1990) and effective decentralization (Bourgeois & Brodwin, 1985).

On balance, positive effects of heterogeneity are thought to predominate as these groups quickly develop norms which facilitate interaction (Hambrick, 1994). Over time, culturally diverse groups experience process and performance improvements (Watson, Kumar & Michaelsen, 1993). Researchers attribute benefits from group heterogeneity to naturally occurring 'devil's advocacy' or 'dialectic inquiry' thought to take place when executives with broadly different backgrounds work together through Hegelian processes to solve strategic problems.

The formal process of dialectic inquiry has three steps (Churchman, 1971). First, a plan (thesis) is presented and its underlying assumptions identified. Then a counter-plan (antithesis) is developed which is generally credible, but rests on different assumptions than the initial plan. Finally, a structured debate is conducted and a final plan (synthesis) is developed.

Devil's advocacy is less structured than dialectic inquiry. The devil's advocate, an appointed dissenter, develops a critique of the prevailing plan but offers no counterplan (Herbert & Estes, 1977). The adversary pressures decision makers to be more thorough in evaluation by forcing consideration of potential failure.

Schwenk (1991; Valacich and Schwenk, 1995) found that formal use of either dialectic inquiry or devil's advocacy improves decision making. (In stable, well-understood environments both lead to reduced performance due to added time for decision making and increased uncertainty raised by the processes.) However, evidence on dialectic inquiry and devil's advocacy applies to the formal use of these decision tools. The findings of research utilizing executive team demographics presumes the mere presence of executive team heterogeneity is sufficient to stimulate similar, albeit informal processes which capture the essence of formal decision aids. The finding that executive team heterogeneity leads to enhanced organizational adaptiveness would appear to bear this out. It is useful to know whether the mere presence of heterogeneity is sufficient to improve decision making. This paper tests these limits.

### **Previous Tests of Informal Dialectic-Type Processes**

Using subjects who supported or opposed capital punishment, Lord, Lepper and Ross (1979) reported cause for pessimism as to whether simple exposure to opposite perspectives improves decision making. Subjects were presented with credible studies supporting each position. Reading the two studies further polarized beliefs on the death penalty. In general, polarization is thought to occur when confirming evidence is given greater weight than disconfirming evidence (Einhorn & Hogarth, 1978). Supporting evidence bolsters one's initial position to a greater degree than disconfirming evidence casts doubt upon it.

Schoemaker (1993: 202) compared the forecasts of subjects required to write positive and negative scenarios for "strategically important issues from work or home" with subjects who merely read the same scenarios. He elicited forecasts from both groups two weeks prior to and two weeks after exposure to the scenarios, enabling a within-subject comparison. He reports no within-subject or between-subject differences in point estimates of forecasts.

Wider subjective confidence ranges were evident for both groups. Schoemaker interprets this as evidence of greater uncertainty, supporting the use of multiple scenarios. However, multiple scenarios are meant to improve decision making, not merely increase uncertainty. Improvements in forecasts would appear to be lacking in his study, given that there was no change in the subjects' point estimates. As no benchmarks for appropriate forecasts were available, the lack of change in point estimates cannot be conclusively interpreted.

These studies suggest that advantages attributed to exposure to opposing perspectives may be somewhat elusive. However, the use of simple business scenarios or non-business scenarios may have hindered the generalizability to strategy as they lacked the contextual richness usually accompanying strategic decisions. The studies also used only written scenarios. It is reasonable to assume discussion would be an integral, and perhaps primary part of informal processes stimulated by group heterogeneity.

### **Hindsight Bias**

Studies show we recall outcomes of most situations as more predictable than they seemed in prospect (Fischhoff, 1975, 1977, 1982a; Fischhoff & Beyth, 1975). When given outcome information, our remembered or reconstructed probability estimates are biased. We have a sense of having "known all along" that the outcome would occur. Fischhoff labeled this "hindsight bias."

Hindsight effects are shown to be both wide-ranging and robust. (For reviews, see Christensen-Szalanski and Willham, 1991; and Hawkins and Hastie, 1990.) Attempts at reducing hindsight bias have had little success (Fischhoff, 1982b; Davies, 1987). The most noteworthy method is described by Slovic and Fischhoff (1977) who found that having subjects generate scenarios to explain possible outcomes that did not occur reduced, but did not eliminate, hindsight bias. Generation of alternate scenarios increases the salience of other possible outcomes and thus their subjective probabilities, with a corresponding reduction in the perceived inevitability of the known outcome. We refer to this approach as "considering the opposite."

While considering the opposite reduces hindsight bias, it is counterintuitive to construct scenarios explaining outcomes which did not occur. A less formal way to achieve similar results is needed. One possibility is to combine individuals with differing perspectives on outcomes. In this way, rationales may be made more salient by discussion in a heterogeneous group, and hindsight bias may be reduced. Bukszar and Connolly (1988) suggested this as an area for investigation after demonstrating that discussion in homogeneous groups failed to have an effect on the bias.

The parallel between hindsight debiasing and assumptions underlying the benefits of heterogeneous executive teams is striking. In both cases formal dialectic-type processes were shown to improve decision making. Informal processes, such as those stimulated by discussion in heterogeneous groups, may produce similar results. An investigation into the hindsight debiasing potential of heterogeneous groups would shed light on the ability of heterogeneous groups to improve decision making in general, absent implementation of formal "consider the opposite" processes.

This study tests the following hypothesis:

Discussion groups, consisting of subjects heterogeneous with regards to outcome information, will reduce hindsight bias and improve decision making efficacy.

## **METHODS**

Forty-five MBA students in two sections of a Strategic Management seminar in Vancouver, Canada, participated in the experiment. Nineteen subjects had little managerial experience and non-business undergraduate degrees. Subjects hailed from ten countries other than Canada and seven of the ten Canadian provinces.

The remaining 26 subjects were enrolled in a separate Executive MBA program. Executives were from middle and upper management, and from large and small companies in industries that included forest products, mining, retailing, banking, government, regulated utilities, health care and software development. Educational backgrounds were diverse. Of the 45 subjects, 21 were female.

Subjects were more representative of groups within business organizations than is typically the case in student samples. They were familiar with each other's abilities and interacted comfortably. The MBA programs from which the subjects were drawn operate on a cohort model where all coursework is taken together. The executive cohort met on alternating weekends, taking meals together and staying in the same hotel for the previous 20 months. Subjects from the non-executive cohort studied together over the previous eight months.

Subjects completed an in-class, written case analysis worth 10% of their final marks. The six-page case, an updated and slightly modified version of "Hygeia International," (Newman & Logan, 1980) detailed a pharmaceutical company's opportunity to enter chick-hatching and egg production in Nigeria. Although Hygeia (a pseudonym) had the necessary expertise and technology and sold pharmaceutical products in Nigeria for agricultural purposes, the decision required evaluation of several factors.

The case outlined the decision process, the information available to decision makers, and Hygeia's past experience in chick-hatching (minimal) and in Nigeria (significant). The case provided positive and negative aspects of the project, and previous studies indicate that subjects were evenly split on whether to undertake the project (Bukszar & Connolly, 1988; Connolly & Bukszar, 1990).

Two versions of the case were distributed randomly to the subjects. The versions were identical until the final statement: "Following careful consideration, management at Hygeia decided to enter this market in 1990. Results for the first year of full operations (1992) indicate a \_\_ R.O.I." One version had a 4% R.O.I., the second a 36% R.O.I.

Subjects were asked to "evaluate the Nigerian project in terms of suitability for Hygeia, and provide what you believe to be the most likely explanation for its outcome." Subjects, working alone, had 90 minutes to analyze the case and write a report.

Upon completion, subjects were separated randomly into two groups. The first (the control group) completed a questionnaire prior to discussing the case. The second group (the "discussion" group) immediately engaged in group discussion and then completed the questionnaire (see appendix).<sup>1</sup> Control subjects were moved to another room prior to distribution of the case, with their names displayed on an overhead to eliminate confusion, and given an explanation that separation would provide more work space.

The provision of differing outcomes (4% ROI versus 36% ROI) was intended to create two sets of distinct and variant perspectives on the project. Wide differences in judgment about the project, corresponding with the outcome information, have been produced in previous studies using this manipulation. The combination of these two sets of perspectives in discussion groups provides the manipulation of heterogeneity in this study.

The study is a standard, 2 x 2 design with “Outcome” and “Discussion” the two factors, and “4% ROI / 36% ROI” and “Control / Discussion” the two treatments, as shown in Figure 1.

**Figure 1**  
**Study Design**

		DISCUSSION	
		Control	Discussion
OUTCOME	4%	4% / Ctrl	4% / Dis
	36%	36% / Ctrl	36% / Dis

Comparisons between the discussion and control groups constitute the critical tests of the hypothesis. Convergence of opinion for the high and low-outcome subjects was expected to occur in the discussion group compared with the control group as a result of exposure to opposing perspectives. Thus, in contrast to the Schoemaker (1993) study, this manipulation provides benchmark expectations for estimates made after exposure to opposing perspectives.

The facilitator began the discussion by asking whether this was a good project for Hygeia to have entered. Subjects were told to ignore the outcome and evaluate the project based on merit alone.<sup>ii</sup> Vigorous discussion lasted 45 minutes, with high quality arguments equally for and against the project.

**RESULTS**

Data were analyzed using MANOVA, ANOVA, MANCOVA and ANCOVA.

**Hindsight Effects**

The test for hindsight effects involves a comparison of high-outcome subjects (36%) and low-outcome subjects (4%). MANOVA results reveal a significant main effect for ‘Outcome’ ( $F = 8.745, p < .001$ ). ANOVA tests were conducted to delineate the MANOVA results. Summarized ANOVA results are reported in Table 1.

**TABLE 1**  
Mean Responses and ANOVA Results

Dependent Variables	LO	HO	HO	
	4%/Ctrl	4%/Dis	36%/Ctrl	36%/Dis
a. Probability of success ***	.22	.29	.65	.63
b. Predicted first year ROI ***	6.3	6.8	21.0	22.0
c. Adequacy of information	2.5	2.6	2.6	2.9
d. Prediction confidence *	1.9	2.4	2.9	2.6
e. Perceived riskiness *	3.6	3.5	2.8	2.6
f. Readiness to invest *	3.5	3.5	2.6	2.5
g. Willingness to enter *	0.5	0.55	0.73	1.0
h. Confidence in decision	4.3	4.0	3.8	3.8
i. Second yr. ROI ***	8.3	11.0	29.0	33.0
j. Project continuance <sup>+</sup>	0.64	0.55	0.45	1.0
k. Decision process rating **	2.3	2.5	3.1	3.3
l. Credit/Blame	3.2	3.1	3.2	3.4
m. Cause of error	2.8	3.3	4.1	3.6
n. Timing ***	1.9	2.0	2.6	3.0
o. Personnel evaluation **	3.3	3.6	2.6	2.2
p. Autonomy shift **	3.3	3.6	2.9	2.4
q. Decision review	2.6	3.7	3.6	2.5
r. Information search	2.5	2.1	2.8	3.3

Low-Outcome vs. High-Outcome

Main effects for Outcome (LO 4% / HO 36%):

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Interaction effect for Outcome and Discussion:

+  $p < .05$

Dependent variables are derived from the corresponding questions in the Appendix.

Subjects given, but asked to ignore, a high-outcome found the project lower in risk (question e) than their low-outcome counterparts (mean of 2.7 for high-outcome subjects versus 3.6 for low-outcome subjects on a scale from 1 to 5 with very low risk equal to 1 and very high risk equal to 5;  $F = 6.93$ ,  $p = .01$ ).<sup>iii</sup> They expected both a higher first year ROI (question b) (21.5% versus 6.5%;  $F = 67.4$ ;  $p < .001$ ) and a higher second year ROI (question I) (31% versus 9.6%,  $F = 89.5$ ;  $p < .001$ ). They were more likely to have entered the market (question g) (87% versus 52%,  $F = 6.77$ ,  $p = .01$ ) and were more willing to invest their own money (question f) (2.6 versus 3.5 on a scale from 1 to 5, with 1 indicating that they definitely would invest and 5 indicating they definitely would not invest;  $F = 4.96$ ,  $p < .05$ ).

High-outcome subjects rated the decision process utilized in the case (k) as better (3.2 versus 2.4, on a scale from 1 to 5 with 1 indicating a poor process and 5 an excellent process,  $F = 7.82$ ,  $p < .01$ ). They thought the timing of the entry decision (n) was about right whereas the low-outcome subjects thought entry was too early (2.8 versus 1.95, on a scale of 1 to 5 with 1 indicating too early an entry, 5 too late an entry and 3 indicating that the timing was about right;  $F = 19.5$ ,  $p < .001$ ). Finally, the high-outcome subjects seemed more favorably disposed to allowing managerial autonomy in future decision making (p) (2.65 versus 3.44 on a scale of 1 to 5 with 1 indicating more autonomy and 5 less autonomy;  $F = 11.6$ ,  $p < .01$ ).

In general, questions not showing hindsight effects are questions where the presence of such effects would not be expected. There were no differences between the high-and low-outcome subjects with respect to their perception of the adequacy of the information to make a decision about the project (c), whether additional information should be gathered for similar decisions in the future (r), or with respect to the confidence in their own decision to enter the Nigerian market (h).

These results are highly consistent with past evidence on hindsight bias in general, and with the Bukszar and Connolly study (1988) in particular, which show that decision makers are unable to ignore outcome information when assessing decisions.

### Discussion Effects

Attention can focus on the question that motivated this study: would participation in a heterogeneous group discussion reduce hindsight bias? To further demonstrate the rationale for expected convergence, recall that subjects were asked to evaluate the suitability of the project for Hygeia. This allowed consideration of variables other than to performance to enter the evaluation.



Written case reports indicate that a number of subjects who received information suggesting poor performance (subjects in the 4% ROI treatment) favored project continuance by suggesting: a) its evaluation over a longer period, or b) organizational benefit from goodwill generated by the project and from synergies not likely to show up in the financial results of the chick and egg business, such as improved performance of related veterinary and pharmaceutical activities in Nigeria. A number of subjects with information indicating good performance (36% ROI) suggested the project detracted from the focus of the organization by shifting attention to activities outside of the organization's core competence. They suggested "spinning-off" the activity given that the project was up and running. Under this argument, the project's value was seen as a stimulant to sales of veterinary pharmaceutical products. The group discussion, which further illuminated these points, was expected to result in convergence on project continuance.

The reduction of hindsight effects was thought most likely to occur on the question of whether to continue in the market (question j). The continuation decision was forward looking. As such, subjects were no longer asked to ignore outcomes, but instead to determine, in light of their analysis and discussion, whether project continuance was advisable.

The results were somewhat unexpected. MANOVA results reveal no evidence of a main-effect for "Discussion" ( $F = .417$ ,  $p = ns$ ) but do show a significant interaction effect between "Outcome" and "Discussion" ( $F = 3.926$ ,  $p = .001$ ). Rather than convergence, evidence of polarization was found.

ANOVA shows a significant interaction effect on the bellwether question of project continuance (j). Following group discussion, high-outcome subjects were more willing to continue with the project while low-outcome subjects were less willing compared to their control counterparts ( $F = 4.68$ ,  $p < .05$ ).

Subjects appear to have had their initial positions reinforced by confirming evidence found in the discussion while simultaneously discrediting the contrary evidence, similar to the effect documented by Lord et. al. (1979). These results lead to the rejection of the hypothesis under investigation.

### **Experience and Gender Effects**

Experience and gender covariates were utilized in a MANCOVA analysis. Results indicate no main or interaction effects for gender. For experience, there were no main effects and only a minor interaction effect between experience and discussion ( $F = 2.74$ ,  $p < .05$ ). ANCOVA indicates this interaction effect relates only to question "m." Following discussion, experienced subjects were more willing to attribute the discrepancy between the estimated ROI and the actual ROI to the manager, whereas inexperienced counterparts were more willing to attribute the discrepancy to the decision process ( $F = 4.83$ ,  $p < .05$ ).

The lack of effects for experience and gender is consistent with research results to date, which indicate that experienced and inexperienced decision makers are equally susceptible to hindsight bias, as are both men and women, and that debiasing efforts are unaffected by these variables (Fischhoff, 1982b).

## DISCUSSION

This study suggests that informal attempts to have subjects "consider the opposite" may be insufficient to reduce hindsight bias, and might instead cause the bias to be exacerbated. Results also call into question whether the benefits of heterogeneous groups, as detailed in the strategy literature, are attainable by merely bringing heterogeneous groups together.

The heterogeneous discussion groups stimulated conversation that clearly illuminated opposing perspectives. Indeed, an observer of this process might well have been led to conclude that the vigorous discussion resulted in improved decision making as participants appeared to be considering different perspectives. This appearance could be particularly seductive, absent measurable results, in that it is consistent with conventional wisdom. However, results from this study suggest that exposure to opposing arguments may not sufficiently stimulate the cognitive involvement necessary for increased decision efficacy.

More formal processes of dialectic inquiry or devil's advocacy force greater cognitive involvement and thus greater information processing. Such cognitive involvement with the opposing argument may be essential to improved decision making. With formal dialectic, devil's advocacy and multiple scenario procedures, the purpose of the exercise is known by all and proceeds with the blessing of management, endowing the process with greater legitimacy. As such, decision makers may consciously try to assimilate new possibilities.

How can these results be reconciled with the findings in the strategy literature that heterogeneous groups lead to improvements in organizational performance in dynamic environments? The improvements that organizations witness, and that have been attributed to executive team heterogeneity, may be more the result of the processes these organizations use to take advantage of the heterogeneity than the heterogeneity itself. For example, executives who assemble heterogeneous groups for decision making may favor processes designed to enhance internalization of opposing viewpoints. Selection of heterogeneous teams may be a manifestation of their preferences, based on the belief that heterogeneity creates an ample supply of opposing views.

However, conveyance of a favorable attitude towards dialectic type processes could, in and of itself, legitimize multiple scenario procedures, and lead to enhanced performance for either heterogeneous or homogeneous teams. Heterogeneity of executive teams might be more the effect of predisposition than the cause of improved

performance. The degree of heterogeneity of the management team may be a relatively minor, or even spurious, factor in improvements. This raises an interesting question: Would heterogeneous groups, acting without processes designed to facilitate consideration of the opposite, outperform homogeneous groups acting with the help of said processes? The answer could have dramatic and far-reaching consequences for strategic management.

Homogeneous groups may offer organizations advantages in terms of decision speed and a sense of shared culture, which, when combined with "consider the opposite" processes, may enhance the effectiveness of strategy formulation and implementation. For example, Bourgeois and Brodwin (1985) suggest that shared culture enables strategy implementations to be conducted in a more decentralized and evolutionary manner, while minimizing risks from agency problems. Zajac, Golden and Shortell (1991) suggest that, while diversity amongst individuals may contribute to the generation of new ideas, it may prevent ideas from being successfully implemented. Regardless, results of the current study are an important reminder that executive team demographics are proxies and should not be considered as an end in themselves, since they do not illuminate actual strategic decision processes.

### **Limitations and Suggestions for Future Research**

This study, while raising doubts about the value of informal devil's advocacy processes, is by no means conclusive. Its primary value is to raise questions. Researchers should perhaps re-examine conventional wisdom surrounding studies of decision making that rely on demographic comparisons. This study does not invalidate those results.

The most important practical implication of this study is the suggestion that the benefits of group heterogeneity may be elusive if not augmented by processes designed to force internalization of opposing viewpoints. The nature of those processes is not yet clear. It may involve simple encouragement from a chief executive to take opposing viewpoints seriously, or the existence of an organizational culture which encourages such behavior, or more formal measures, particularly in organizations where opposing viewpoints have not historically been appreciated.

A good follow up to this study would be to compare the performance of heterogeneous groups without formal aids designed to get participants to internalize opposing viewpoints, with homogeneous groups utilizing such aids. By manipulating the degrees of heterogeneity and the formality of the decision aids, researchers could gain an understanding of what is necessary and sufficient to improve decision efficacy.

**NOTES**

1. Subjects were informed that questionnaire responses would not affect their marks.
2. Subjects conducted case analyses previously in their strategy seminar and learned to analyze cases without discussing outcomes. In this experiment, subjects were unaware that two outcomes were given. This was confirmed for each subject in a post-experiment debriefing. This manipulation is conservative in design. Had it broken down and subjects become aware that two outcomes were given, the significance of results would have been severely reduced.
3. The mean of 2.7 for high outcome subjects in question 'e' is the weighted mean for the 6% / control subjects (2.8), and the 36% / discussion subjects (2.6), as depicted at the bottom Table 1. The remaining numbers reported in this section were calculated in like manner.

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**APPENDIX**

**Questionnaire**

Assume that the decision to enter agricultural production in Nigeria was made in 1990. Imagine that you are back at that point in time.

a. Probability of success: With only the information you would have had in 1990, state what you believe to be the probability of success and the probability of failure for the first full year of operations (1992) of the Nigerian chick-farming venture. (A successful operation would meet the 20% ROI goal, an unsuccessful operation would fall short of that goal). Be sure the two probabilities add to 100%.

b. Predicted first-year ROI: What would your best estimate have been of the ROI figure for 1992 (the first full year of operation)?

c. Adequacy of information: Was the available information adequate for making a decision of this significance? (completely inadequate = 1 and completely adequate = 5).

d. Prediction confidence: How confident do you feel making these ROI predictions from the information available in 1990? (not at all confident = 1 and completely confident = 5).

e. Perceived riskiness: How risky would you rate the decision to go ahead? (very low risk = 1 and very high risk = 5).

f. Readiness to invest: Would you have been prepared to invest your own money in this project? (definitely would invest = 1 and definitely would not invest = 5; reverse scored, so that high scores indicate greater readiness).

g. Would have entered: Putting yourself in Mr. Livingstone's position at the time of the original decision to enter the chick business, would you have entered the market? (Yes = 1, No = 0).

h. Decision confidence: How confident would you be in your decision? (not confident = 1, confident = 5).

Using all of the information available to you today:

i. Predicted second-year ROI: What is your best estimate of the ROI figure for 1993 (second full year of operation)?

j. Recommend continuance?: Should Hygeia continue this project? (Yes = 1, No = 0).

k. Rate decision process: Rate the strategic decision process utilized in the case. (poor = 1 and excellent = 5).

l. Credit/blame locus: Does the credit/blame for the decision in this case lie primarily with the process or with the decision makers? (process = 1, 50/50 = 3, and decision makers = 5).

m. Error cause: As it turned out Murtala's original estimate of ROI was substantially in error. Do you attribute this error to the difficulty of making estimates in situations like this or does the fault lie in Murtala's estimating ability? (Murtala is the manager in Nigeria). (Error mainly due to Murtala = 1, 50/50 = 3, and situation = 5).

n. Decision timing: The timing of the Hygeia decision, like many business decisions, represents a balance between moving too early, before enough information is available, and moving too late, after the good opportunities have been taken. Would you say Livingston (Hygeia's U.S. manager) moved: (too early = 1, about right = 3, and too late = 5).

o. Personnel evaluation: Who do you think deserves the most credit/blame for the outcome in this case? (Murtala = 1, 50/50 = 3, and Livingstone = 5).

p. Autonomy shift: Should Murtala have more or less autonomy in future decisions? (more autonomy = 1 and less autonomy = 5).

q. Decision review: In the future, should someone in a position of authority over Livingstone review his decisions prior to implementation? (should not review = 1, should review = 5).

r. Information search: Imagine yourself in Mr. Livingstone's position in the future. A decision of similar complexity arises. You have the option of gathering more information on market conditions prior to deciding but would do so knowing that your competitors may beat you into the market. Would you seek out additional information? (seek more information = 1 and make decision now = 5).