

Individual Decision Making and Group Decision Processes

John Payne and Arnold Wood

Arnold Wood: One of the great benefits of this group is that you get introduced to people who are incredibly helpful and incredibly nice. One such person is John Payne who has done yeoman's service at Duke being a dean, teacher, all those sorts of things at one time. Yet he was nice enough to join me in this survey of investment committees and John is going to basically shoulder the entire section and I'll serve as the poster boy for this.

I have the survey here if anybody wants to look at it.

John Payne: Thank you, Arnie.

Yesterday and today we've talked about issues dealing with individuals with a focus on where they're not good at probability judgments, etc. We've also talked about aggregates of individuals, markets, and market behavior, either in the form of empirical data like we've just seen here on historical markets situations. What I would like to do now is focus in on another level of analysis dealing with committee or group decisions.

In thinking about this talk, Arnie Wood and I were faced with a challenge. There's a lot of literature on group decision-making, but little or none on investment committees. Arnie then gave me a number that as a psychologist is hard to conceptualize. He said that as a rough estimation, investment committees are responsible or oversee something more than \$6 trillion in investments worldwide.

We have a situation where there's this very important activity performed by investment committees and there seems to be almost no data on investment committee behavior. We do have a lot of data on group behavior, just nothing or little on investment committees. Arnie and I then came up with a plan that would have three parts to it. Part I is to briefly review the group literature with a specific focus on both classic and new results that we thought were of greatest interest to investment

committee decision-making. Second, Arnie and I wanted to collect some data on investment committees to share with you today. We've done a little survey of people who are involved in investment committees. And last, we decided to do this talk together, combining someone who does this for a living (Arnie) and someone who is most concerned with understanding the psychology involved.

Now, to begin with Arnie's view on an investment committee. Is there anyone else that serves on an investment committee of any kind? Can I see a show of hands here? Okay. One, two, three, four, five, six, seven. Great. So we've got a lot of expertise here.

If you look at the writing on committees and group decision-making, it's really striking. There are two different viewpoints that you can see out in the literature. Now, the first view is that committee decisions are an improvement on us poor individuals and the idea is that none of us is as smart as all of us. For example, we may individually have some biases and not be able to figure out how to estimate the probability that you're going to have AIDS if you get positive tests and so on, but if we put us all together we'll figure it out because we'll be smart enough as a group to do that.

And in the finance area, Merrill Lynch thought that committees will make financial decisions and these will be better managed. Now, I have never been able to find the exact source of this saying, but the old joke that a camel is a horse designed by a committee represents the alternative view of committee decisions. That's unfair to the camel because the camel has a lot of positives to it. However, consider this quote from *Business Week*: "Some fund groups are successfully run by committee. However, it's generally thought that they diminish returns." Also, Terrance Odean has a wonderful paper dealing with investment clubs that has the idea that too many cooks spoil the profits. I should say to Terry that this particular paper has caused me great grief in my family relationships. My wife is a member of an investment club and when I shared those results with her, she didn't speak to me for about a week.

All right. So first question to ask Arnie Wood is, why do funds, whether it be a museum or it be some other organization, form an investment committee to manage their money? What's the idea behind it?

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Arnold Wood: The concept is quite simple. It's really a forum for people to share information. I mean you can congregate a variety of skills in one place and presumably come to better decisions, but that's kind of the textbook side of it. There's some other issues here that we've uncovered, some having to do with status and so on that being on an investment committee gives you a certain amount of status. That, in fact, in one particular instance I'm aware of, if you have important people on your investment committee it helps your fund raise better because these are good people and they'll take care of your money and they may make lousy investment decisions for the organization they're supposed to be working for. But they do raise more money than they lose and there are the opportunity costs on the other side of it. And I think the primary reason that we seem to think exists out there is an issue of blame. I mean these people are agents and no one person wants to get blamed for the responsibility of running a large endowment or foundation. They want to share that blame and there are a variety of reasons, some good and some, oh, I won't say bad, but some are very questionable.

John Payne: When you think about it in terms of the advantages of committees or groups, the idea seems reasonable that none of us knows as much as all of us. So you have different people, different backgrounds, different experience, different knowledge bases and if we bring them together, we're going to get that information shared. That is, by the way, an interesting applied question. Who should you bring together in a committee? One of the results we found when we asked the question to people that were on investment committees in terms of membership, what was the result, Arnie?

Arnold Wood: It's an incredible number. When they brought these people together we asked questions like, how many minorities are on your committee. I think in all the answers we got there were two people who would be considered minority, either a woman or otherwise a minority. There was no one under 30 years of age, 90 percent of the people were essentially white men over the age of 40, of which most of those were 60 and beyond. So this is a homogeneous group of people who are there probably for other reasons, such as to talk about things other than what they're on the committee for, and I'm sure you're going to talk about a common knowledge effect.

John Payne: A piece of advice for people who are responsible for investment committees is that if you have a committee of, say, 16 people, large committee, but they are related in the sense that their judgments tend to be correlated because they have the same backgrounds, same information and

so on. For example, if they're correlated at about 0.3, you can do as well as that 16-person committee with a committee of four people, if those four people are selected so that the correlation among their judgments is much lower. Therefore, one piece of advice, if you're involved in putting together an investment committee, you're much better off putting your resources in trying to find a small number of relatively independent judges than you are in spending a lot of money getting a lot of judges on a committee.

Arnold Wood: One of the less obvious reasons why people are members of a committee is because you put them on the investment committee, they generally are large donors to the college or wherever it is, so they're on there to basically—I don't want to say a pay-back—but to show gratitude for their support for the organization.

John Payne: Besides information, the other good argument for committees is basically what's called error checking. One of us may make a flawed cognitive process, but hopefully there will be someone else in the committee who will pick that up. For example, you forgot to consider base rates or you are worrying too much about sunk cost, and we all know that sunk cost shouldn't influence decision. So the idea is you will get some error checking.

You also may involve people into committees simply on the value idea of incorporating different values. So one argument would be that you might have people on a committee who represent knowledge about finance, but you also might have people on that committee who represent knowledge about the organization that's being supported by those investments and the values that they have.

An interesting question is that with all these potential advantages, why do you get that negative view of committee decisions? Why is it that too many cooks may spoil the broth or the profits? The argument is that there are sources of what are called process losses. The basic idea is that when you think about effective groups, you've got three things going on. One item is what you start with in the quality of people who are part of the committee, how good a job you've done at bringing in people, how correlated they are, for example, in their information bases, etc. That really tells you something about the potential of the group.

Now, over and above that you would like to have some things happen when people get together, such as face-to-face conversations and we actually hope things are going to happen positively by having us together in this room. For instance, you learn from each other. And then there are, unfortunately, things that can perhaps work not so well, that lead to process loss. Process

losses can be either cognitive losses or motivational losses. For instance, information sharing should be one of the strengths of groups, however there's data that suggests it's a place where groups are not as good as they might be. One of Arnie's favorite examples of motivation loss is social loafing. That is the idea that you can hide in a committee, and maybe not work quite as hard if you're up there by yourself.

Finally, there are what I call social interaction effects. These are not studied that much in the group decision literature. One of them might be called an illusion of effectiveness that is one thing a lot of people seem to believe, that as a group they are, in fact, smarter or better. And so there's this strong belief out there that groups are, in fact, very effective. As part of our survey we asked people, how correct or accurate do you think your group is? The answer was something like 75, 80 percent of their decisions they thought were right. We asked them a second question that is; do you think that groups are more or less accurate in quality decisions than individuals? The majority of the respondents said that the group or committee was better. So you may get illusions of effectiveness.

We'll also talk about some data that's come out recently, which is that in the discourse that happens in face-to-face meetings, there's some evidence that suggests that certain kinds of arguments, perhaps representing shared values, norms or mental models, tend to take on a special status. And what can happen is the force of group discussion reinforces that kind of shared belief.

So one thought I'll have, and we'll be speculating about later on, is something that came up yesterday, was the idea of new economy. The notion is that to the extent that people started to believe there was a new paradigm and arguments were being made in investment committees related to the notion of the new paradigm, the view would be magnified by discussion. In the individual decision literature there's a view that a lot of decision-making is reason based. You come up with reasons why you prefer A over B. Well, there's an argument that the same thing goes on in committees. But there are certain classes of arguments that people seem to find more compelling than others that build over and above what you as an individual bring to this sort of social interaction. I'll give you an example of that in a few minutes.

Voice: I was just going to say, Brad Barber and I and Chip Heath are basically looking at that, a test of more or less that theory with the investing clubs and we find some evidence that the clubs seem to buy stocks that you might have said had more acceptable attributes.

John Payne: There are certain classic arguments that really come in here.

Voice: Yes.

Voice: I suspect, because I don't know, I'm not on an investment committee, that they must be organized differently, in the sense that the size of the committee, the committee gets rewarded or not based on the performance of the committee, whether there's a strong chairman, the chairman rotates. I mean these committees get organized in a lot of different ways.

Arnold Wood: One section of the survey is on leadership issues.

John Payne: Leadership and size. It's interesting and this is perhaps not all that surprising, the median size was 7. It was interesting and we'll talk a little bit about this when we talk about leadership, the overwhelming response about what the role of the leader was, was to seek consensus, to try to bring people together. And a lot of strength about majority sorts of things, which sounds really great, but as we'll show in some data if you've got a group of people together who have biased judgments, that effort to seek consensus, majority, is just going to make that bias stronger.

Arnold Wood: 60 percent of the people who were on committees of six or more felt they would rather have it smaller, three to four. People liked the concept of smaller committees.

John Payne: Now, before I get into the literature, there is an important point that needs to be made which is that you need to look at the tasks that you're asking groups (people) to do. There's an important distinction in the group literature between what are called intellectual tasks or problem-solving tasks and these are tasks where going in we may not know what the right answer is, but if someone comes up with the answer we all agree, yeah, that's right. These are sometimes called Eureka problems in the literature. So you can have a variety of people starting off with a task, you don't know exactly how to do it, but when someone comes up with the answer most people are nodding their heads saying yeah, that's the right answer.

Now the interesting thing about that is that it is really based on a shared conceptual system. So in arithmetic we know 2 plus 2 equals 4, it's a little more complicated in domains like finance. But I want to stress something here because I want to come back to it; a shared conceptual system may or may not be right normatively. So if you have a shared conceptual system but it's wrong, people may think, yes, someone's come up with the answer, ah-ha, it's Eureka, but it's Eureka to the wrong thing. Generally in this case, committees are governed by what is called truth or truth supported wins decision schemes. So once one person

comes up an answer or one person plus another one validates that that's the right answer, the committee goes with it.

The other committee tasks are more judgmental or decision types of tasks, where preferences are involved. That is, there's no really right answer, e.g., how much risk are you prepared to take in your investment? Those tasks are generally resolved with some form of majority rule or strength in proportion in support kind of process, whether it be consensus or some variation on that. That's going to be important because as we talk about how well groups do, it turns out that there's an interesting distinction between those two types of tasks.

By the way, in looking at our investment survey, we gave people the definitions of intellectual versus judgmental task and asked them to give us a sense of the type of tasks they dealt with. The tasks were investment policy, asset allocation decisions, markets environment, manager selection review and special issue pertaining to those specific investment decisions. Basically, they viewed these as dealing with judgmental type of decisions where there was no necessarily correct answer, but there were some intellectual sorts of things and most of the committees reported that they used some version of majority rules.

Now, some research data. One of the arguments is that groups will tend to do better because they'll check errors, etc. To illustrate, one of the classic investment errors that people make is the sunk cost or escalation of commitment error. To give you a flavor of what is a typical set of results; this study by Whyte (1993) involved giving a group of people an investment to evaluate. The question was, should you go ahead and invest in it or not? The way the study had been set up was that if you just described the forward-looking prospects of this investment, only about one-third—less than one-third of the people thought it was worth doing, not what you'd call an overwhelming vote for the investment option.

When they put the individuals in groups, there was a slight tendency for the groups to go even less with the project. However, if you then included a of sunk cost story so you had an investment that hadn't worked out, but now you've got a chance improve an outcome, you got a very strong individual effect of sunk costs of the willingness to invest. This is the classic escalation of commitment effect.

What's really interesting is look at the even higher percentage of groups that showed the sunk cost effect.

So here's an example of an individual bias, escalation of commitment. When you have groups

make the decision, the bias doesn't decrease, it gets stronger. So people were much more likely to want to go ahead with this investment with the sunk costs story behind it than they were without it. And the issue then became that when they did this as a group, that effect got magnified.

Arnold Wood: This response is very intuitive to venture capitalists. Venture capitalists come back and said if we only had another million bucks and we can do this, and the committee says give them the million bucks. Let's go.

John Payne: Groups show it even more. Now I'm going to come back to this in a little bit, but there is an interesting asymmetry with the group results that I want to come back to, which is that if you had a majority of people who were in the direction of going with responding to the sunk costs escalating commitment, then the group just magnified that effect. If you had a group of people who were doing what economists teach, which is ignoring the sunk costs, the majority tended not to do it.

But there was a little bit of an asymmetry here, which is the likelihood that a minority would have an impact and would actually change the opinion of a majority was much stronger in the direction of people who wanted to escalate commitment than those who wanted it. And it's to get at this point that I'm going to stress that there may be qualities of arguments that have an asymmetry, so an argument for why you escalate commitment was viewed in some sense a stronger argument than actually the opposite of ignoring sunk costs.

Now, we talked an awful lot about overconfidence in this meeting and I was reading a Wall Street Journal article talking about behavioral finance and suggesting that overconfidence is perhaps the most pervasive bias for behavioral finance and there have been some studies done looking at groups in terms of overconfidence. One was a study by Plous (1995) where people were asked to estimate uncertain quantities and they were giving confidence intervals, high-low numbers, and there were supposed to be 90 percent confidence intervals on 10 items. If you look at the number that 107 individuals got correct in this particular study, it was 3.1 out of 10; a classic overconfidence phenomenon.

Interestingly, groups actually did better. So they get 4.2 out of 10. Still what you might argue is substantial overconfidence, but they're getting more of them right. Now, in talking about group behavior, one common comparison is groups versus how individuals do on average. There is another statistic that people who do this research such as Gigone and Hastie (1997) suggest we should be looking at which is what are called statistical groups. So the idea here is you take your

individual judgments, you form a response just by taking, for example, the average of a number that's equal to the size of the group. So the group is size four, you take four opinions and just take the average, and that gives you in some sense a baseline of what it means just to aggregate individual opinions without any face-to-face discussion at all.

An example of this that was mentioned yesterday is consensus forecasting. A lot of consensus forecasts, as I understand, are basically earnings forecasts taken together and then averaged. And it was interesting in this study that if you had just taken these individual opinions and statistically aggregated them, you would have gotten 7.4 out of 10 correct. That's not an uncommon finding, that face-to-face meetings may improve things, but they're still often worse than you would have been doing without the meeting at all. Just taking the individual opinion.

Now there's one other thing I want to stress here. They asked these people, well, how well do you think you're going to do? How many do you think you're going to get right? What the individuals said was that they were going to get as individuals about 5.6 out of 10 correct. Now they got 3.1, so you can take the difference and not doing as well as they thought they were going to be doing. Then they asked them how do you think the group is going to be doing. The answer, on average, was 7.5 out of 10 correct. Again, I ask you to compare that number to the actual number of 4.2 correct that was achieved. It's really this idea that groups may do better, but people often think they're going to do a lot better than they, in fact, do.

Now I'm going to throw out a speculation here. If groups and our investment survey suggest this effect, namely that it increases your confidence and may or may not increase your accuracy equally well, then an interesting question is to take the work that Terry's done and others about the relationship between confidence and trading volume and examine if there might be some relationship in terms of the amount of trading you see by investment committees.

Voice: Just a quick question. So the response is either 5.6 or 7.5. I mean theoretically wouldn't we expect the answer to be 90 percent?

John Payne: People when asked a more statistical question tend to pool across 10 as opposed to 90 percent for individual items and you get this kind of pattern. What's interesting was the very strong sense that by being part of a group, they're going to do that much better. I think one of the reasons why we see so many investment committees being formed is that we have a belief that groups are going to be just that much more better. In our investment survey, when we asked people what do you

think the probability of making a correct decision was, and it ranged from 55 to 90 percent. Basically, 75 percent of the respondents thought that their committee would have more confidence in their decisions than an individual, which is consistent with the prior research. As I mentioned, I think one interesting question would be to actually look at investment committee confidence and relate that to things like trading volume and so on.

Arnold Wood: And manager turnover.

John Payne: Next, when we ask people to report how they behaved in the investment committees and how much information sharing there was and how much sort of persuasion, most of them responded said, we do information sharing. I happen to believe that part of that is a socially correct response. Sharing sounds better than persuading, but they mentioned a lot of information sharing. So an interesting question is how well are we sharing? What are we sharing?

I've got two studies I want to mention in terms of that. One is one that just recently came out by Schulz-Hardt et al. (2000). An old and very strong effect in the individual decision literature deals with a confirmation bias. So you have an initial opinion, you can acquire new information. What kind of information do you acquire, information that supports that initial opinion or information that might conceivably be arguing the other side?

Well, looking at an individual, you see a lot of evidence of what is called a confirmation bias. That is, when people have an option to choose either one and there's equal numbers of confirming or conflicting, they tend to choose more supporting information than conflicting information. Again, let's look at what happens with groups. This bias doesn't go away and it doesn't get weaker. In fact, it gets stronger. So you get as much information being acquired, but a proportionately larger percentage of that information tends to be of a confirmation effect. And this effect gets even stronger the larger the initial proportion of people in favor of a position. There's some that suggest that if you have a strong leader of a group who expresses an initial opinion, then you get a lot of sort of confirming kinds of activities.

Arnold Wood: I was once an analyst who covered the auto companies. I went through a presentation and a chairman looked at me and he said, "Mr. Wood this is a great report." He then said, "My wife drives a Ford and it's in the shop all the time. I don't think we should put this on the list." And guess what the next person said? Gee, you know, Ford's having trouble with the European division and it just got on a roll. I went out of there with my tail between my legs and I learned about commit-

tees and leadership at that point and the role of chairmen at that point.

David Dreman: And if there's a tilt like we have more recently, a very strong tilt, a lot of the committees will go the same way. They see that Goldman is doing this and, therefore, Shearson's people will probably be doing the same and First Boston and so forth. So I think there's an enormous amount of re-enforcement of decision-making because of the interaction among people.

Arnold Wood: Sponsorship.

John Payne: One of my favorite findings in the group literature is called the common versus unique knowledge issue in sharing by Stasser and his colleagues. Basically, to just give you a sense of this, imagine that you are trying to select a fund manager as part of the investment committee and you have information on different candidates for this job. Some of that information is positive and some of that information is negative. It is positive in the sense of a suggestion this would be the right candidate and negative suggesting that it wouldn't be. Some is just neutral and doesn't have a strong impact one way or the other.

In one study, they had three candidates here and they set it up so candidate A had eight positive, four neutral and four negative [see Table 1]. And these were the numbers for the other two candidates. So when you add up all the information, it's pretty clear which candidate you ought to select as A. In fact, groups did decide on A. Then the researchers set it up so they took the groups and gave one member patterns that looked like this, whether it be two positive to candidate David, four neutral and four negative. For candidate Terry, a different pattern of information would be given to a subject but it would be a two positive for A, but it would be a different two than were used to describe candidates David and Terry. The point being that all the

information was in the heads of four people, it's just that some people had some parts of it and others had other part of the information. Now if you took all that information and you put it out on the table, you'd be back here selecting candidate A. What happened though was in this unshared situation, because they'd set it up so that in this case B had four positives for most people and one negative, now that looks better, four to one for candidate B. So, in fact, the majority of the committee responses were to go with candidate B.

Now, this is really interesting because the potential of having all the information was there. Everybody had it and if they had fully shared it, both the common information and the unique information, they would have chosen A, but they didn't. There's an interesting argument here in terms of investment committees where people tend to start off in a lot of situations sharing information that other people have.

Now part of that is a confirmatory bias, so people were walking in thinking B was the right answer, so they were confirming that by giving the information about B. But there's some recent literature to suggest that it's also a sort of the enhancing effect with people who are part of a committee. You go on a committee and one of the things you're trying to do is to make yourself look good. You've got two choices of information to share with the committee. One piece of information is information that others like and have and believe or you can share information that's sort of out from left field that no one else has. Which do you do?

Well, there's evidence that suggests that what you do is you tend to start off, at least initially, with information that other people already have and it's a form of getting status in the group. So if everybody believes or if some people already believe Ford is not a good investment, yeah, I got some other information about Ford that would suggest it's not a particularly good investment. It makes me look better.

Let me summarize here with an old idea in psychometrics. That is the idea that if you think about a judgment like an earnings per share or the prospects for Ford, you can break down the judgment into three components. One component is the truth (validity) part of your judgment regarding earnings per share. Another component is the one you see in almost all statistical models, random error, and noise. And then third component is another type of error; let's call it bias, systematic error in one direction, overconfidence, etc. What's interesting is that if this bias component is relatively small so your main source of error is just noise or if there is bias and it's actually only held by a minority of members, then it turns out groups

Table 1. Task—Select the Most Preferred of 3 Job Candidates; Information—Positive, Neutral and Negative; Groups—4 Persons With Shared or Unshared Information

	Candidate		
	A	B	C
Shared information			
Positive	8	4	4
Neutral	4	8	8
Negative	4	4	4
Choice %	.83	.11	.06
Unshared information			
Positive	2*	4	1
Neutral	4	5	8
Negative	4	1	1
Choice %	.18	.62	.20

Note: Across the group all 8 pieces of information were held by the group. Adapted from Stasser & Titus, 1985.

are going to help you and they're going to help you for no other reason than statistical law of large numbers. They're going to be canceling out this random error.

But if you're talking about judgment tasks where you have reason to believe that bias is substantial and particularly if that bias is likely to be shared by a majority or more of a committee, then groups do not necessarily improve matters (judgments). And so, Aaron, when I was talking with you, the idea that once you get a concept like the new economy or a new paradigm shared by a majority of the group, whether it's right or wrong, then what happens is the group effect amplifies that bias.

So in thinking about when groups are going to do well and when they're not, the key is to decide how much of what you're going to see in judgment is driven by this random error component versus this bias component. If a lot of it is bias and not random error, in the sense of noise, don't count on groups to fix it.

Now, I will go through this last study a little fast, however, I think it is an important group process result. David Schkade and others (2000) have been involved in studies dealing with judgments about punitive damages. In a recent study they had over 500 juries formed of size six. A huge sample. What the researchers did is they looked at the decision whether to award punitive damages how much they would be. And they found a very common kind of majority rule in terms of whether to award it.

They also found that when they asked people to rate how much punishment the defendants should suffer, you got what's called a polarization effect, so group decisions tended to either increase high numbers or lower low numbers. But what I really want to stress is this last result. They found what they call a severity shift. So if they compared what the sort of statistical results would have been knowing what people started off thinking about what should be the right amount to what happened at the end of group deliberation, they found that actually the punitive amounts people generated after the group deliberation were more severe. If the group started off with a high number, it got a lot higher after group deliberation.

What the authors of this study suggest is that in this kind of domain, arguments for punishment tended to have a rhetorical advantage. People who were making that argument were viewed as making stronger arguments, better arguments than people who were arguing in the other direction. In fact, in the study they measured how easy it would be to make a higher or lower kind of thing and found data supporting this sort of notion. The idea is that while a lot of group behavior can be viewed

as just sort of a mapping of individuals into a collection, majority ruled and so on. There are things that happened in face-to-face meetings that will have to do with arguments being shared.

Further, not all arguments are created equal. Certain arguments tend to have an advantage. In punitive damage award cases, arguments for punishment may have the advantage. It's interesting in criminal cases, there's a leniency norm in this country. So an argument of not punishing, not convicting, tends to have a special status. A question to consider for those of you who have served on investment committees and have been part of these meetings is whether or not there are certain classes of arguments that may have been made, say, in the last couple of years in the bubble and so on, that tend to have this kind of rhetorical advantage?

So the argument is that we're in a new paradigm, new economy, one that sounds like it might have a big advantage over value investing in these kinds of settings, particularly where you've got more than half the group buying into it.

Voice: Does that suggest that larger groups would be more prone to fire under performing managers, for example?

John Payne: Yes—let me rephrase that. I think that groups that tend to be more likely to strive for consensus are more likely to do that because that consensus is going to be more based on the quality of argument.

Arnold Wood: They're certainly more prone to. On the other side of this, if your allocation is 60 percent to stocks and you get to 80, but you had this 10 percent bumper, people don't go back. They get to the 80 and they'll stay there. It's an amazing thing to watch. They just won't open the book on what the guidelines were.

John Payne: Let me summarize because I know we're getting close to the ending time. Groups can do well, particularly well, when we're talking about intellectual tasks where once you find the right answer, everybody can agree that that's true. An interesting question is whether or not you can occasionally get errors in intellectual tasks where what you have is a mistake in shared mental model of a situation. People may think that they're doing an intellectual task. They think they've found an answer consistent with their mental model of the situation and they go with it. They are also very confident with the answer, but they are really making a reasoning error.

In judgment tasks, groups show all the biases that we have talked about. Part of the reason for less than optimal group performance seems to be poor sharing and confirmation bias in information acquisition. Social loafing might also contribute to poor information use. Again, groups don't neces-

sarily mitigate attitudes. They can reinforce them. You can get group polarization effect. Groups tend to reinforce shared beliefs. So if there's shared beliefs about leniency in criminal cases, groups will likely exhibit that even stronger than an individual. If there's shared beliefs about punitive damages, that becomes even stronger with groups. Groups also feel very confident in their decisions.

Now, when I was asked to do this talk, I was given a title, which dealt with optimizing investment decisions. So lastly, I would like to offer some optimizing suggestions for investment committees.

First, in selecting members of an investment committee, diversity of information and attitudes is much more important than numbers. A four-person committee properly selected to have low correlation is a much better thing than a much bigger one. Second, information sharing doesn't happen automatically. You need to manage that as an active process. One of the most important things a leader can do in an investment committee is to manage the information-sharing process. For example, one of the things that can help overcome the failure to share unique information is to start off by making sure you identify the fact that people are in the room because they're expected to have differential expertise and bring that to bear on solving investment problems.

Arnold Wood: A leader has to deputize, virtually deputize people, say, go out of the room and come back and tell us why this is a lousy idea. That was done in the Bay of Pigs, by the way.

John Payne: Third, do not count on groups to correct for systematic bias. If you want to correct for systematic bias, my suggestion is to concentrate on training individuals using some of the techniques that Baruch (Fischhoff) and others have done to avoid some of these biases. If you try to wait for the group to correct judgment bias, that's not going to happen.

Fourth, one of the things that groups can do is they can error check, not on results, but on the decision process. So if you can get the groups agreeing on what defines a good decision-making process, like ignoring sunk costs or incorporating base rate information, one thing the group members can do with each other is to hold each other accountable for the process by which the decision is made.

The last point, most, I want to make is that the process loss effects with groups are very strong psychological effects. So you can talk about them in a committee, you can get everybody nodding, but then if you don't keep working at it, the tendency is to revert back to those biased ways of processing information by groups. The processes of group decision-making require continuous effort and attention for there to be improvement.

Arnold Wood: John, thank you very much. We just started the survey at the end of April. We sent it out to about 130 people. It's a rather extensive survey, we got 13 back and I understand there are 23 sitting on e-mail right now, new ones, fresh data.

