

12 ANGRY MEN: A BEHAVIORAL BIAS EXERCISE FOR FINANCE STUDENTS

Lynda S. Livingston, University of Puget Sound

ABSTRACT

*Undergraduate investments and portfolio management courses have traditionally prescribed the optimal choices for rational economic man—a creature who does not exist. Real portfolio choices, especially those by retail investors, are made by “normal” people, and normal people exhibit behavioral biases. In this paper, we use a classic play, *12 Angry Men*, to help students recognize the biases that have been highlighted in the professional Chartered Financial Analyst curriculum. This approach is engaging, “messy,” and fun, and it has helped my portfolio management students better appreciate the trade-offs that are necessary when putting theory into practice in the real world.*

JEL: G40, M2, A2

KEYWORDS: Behavioral Biases, *12 Angry Men*

INTRODUCTION

Investors are not the rational, expected return-maximizing automatons described by traditional mean-variance portfolio theory—as is obvious from the broad-market manifestations of “irrational exuberance” or herd behavior such as the 2021 run-ups of Game Stop stock or Bitcoin. Investors instead are creatures driven by emotional and expressive desires (Statman, 2017), operating in markets created by their own adaptation to their social, political, and economic environments (Lo, 2017). The curriculum for the premier professional finance designation, the Chartered Financial Analyst (CFA), recognizes this, noting “As a result of identified divergence between observed and theoretically optimal decision making, the global investment community has begun to realize that it cannot rely entirely on scientific, mathematical, or economic models to explain individual investor and market behavior” (Pompian, 2014a). Teaching students how to thrive in this less “rational” world requires novel assignments that go beyond simply teaching them to find a portfolio variance.

In this paper, we present a fun, motivating assignment designed to help students identify the types of behavioral biases addressed in curricula such as that of the Chartered Financial Analyst’s Level III (2014). (Earning a CFA charter requires passing three rigorous exams. Behavioral biases and their implications for client service are covered in the third. For an overview of the associated curriculum, see <https://www.cfainstitute.org/en/programs/cfa>.) Students are asked to identify common biases demonstrated by the characters in the play *Twelve Angry Men*. While this play’s film adaptations have been used before for pedagogical purposes—for example, by legal scholars illustrating jury dynamics (e.g., Sunstein, 2007) and by management scholars describing “interpersonal influence” (e.g., Buchanan and Huczynski, 2004)—our approach is novel in two ways. First, we focus specifically on an audience of finance students, rather than on general management students, allowing discipline-specific extensions; and second, we use the freely available (and much shorter) 1954 Studio One live TV version of the play. Using this version facilitates both the time and resource commitments that students and instructors must devote to the exercise.

The paper proceeds as follows. First, we review the pedagogical literature on the uses of *12 Angry Men* in the classroom, as well as the finance-oriented literature on behavioral biases. (For those unfamiliar with the play, we have included Vidmar, *et al.*'s, 2007, synopsis of the story in the Appendix.) We then turn to the individual biases exhibited by the characters, considering cognitive and emotional biases in turn. Next, we briefly consider the play's illustrations of group biases, both those depicted within the jury and those evoked in the audience. Finally, before concluding, we describe several possible teaching approaches that allow significant flexibility for instructors.

LITERATURE REVIEW

The exercise described in this paper relates most directly to three strains of research: investigations into behavioral biases, especially in financial affairs; pedagogical research into the use of film in classrooms, and especially the use of *12 Angry Men*; and, perhaps most interestingly, to studies of jury behavior. We discuss each in this section.

Behavioral Biases

From the enormous body of psychological research into heuristics and biases, the CFA curriculum highlights several relevant sets that include papers and books quite accessible to undergraduate finance students. The first set concerns four paradigms of behavioral finance that present alternatives to the construct of “rational economic man”: bounded rationality, behavioral portfolio theory, adaptive portfolio theory, and prospect theory. The second set, outlined in Table 1, describes specific behavioral biases that could affect financial decision-making. We will describe this set in detail, and identify relevant sources, as we identify examples of these biases in *12 Angry Men*. (An accessible, if somewhat cursory, introduction to these is Nofsinger, 2014.) In this section, we will consider the four paradigms in the first set of studies.

The first of these paradigms is bounded rationality (Simon, 1972), which acknowledges that people cannot actually assimilate all relevant information when making decisions. Our faculties are limited. Since we cannot truly optimize, we do the best we can and leave it at that. Simon calls this “satisficing” (from “satisfy” + “suffice”). As he concludes: “Whatever compromises [the decision maker] must make with reality in order to comprehend and cope with it, [heuristic models] make substantially more tractable the task of matching man's bounded capabilities with the difficulty of his problems.”

In behavioral portfolio theory, the second paradigm, this “matching” becomes explicit. As people attack the task of creating a portfolio, they match assets to goals, creating a layered pyramid. The base layer, for example, could represent the safety goal; bonds and cash are deployed here. Successive layers add risk and become increasingly aspirational. This approach reflects the cognitive biases of framing and mental accounting, as well as the emotional bias of self-control. As Statman (2017) stresses, it also reflects the nonpecuniary goals that drive investors—how investing makes people feel, and how it makes them appear to others.

Behavioral portfolio theory imagines risk as a shortfall. Similarly, adaptive portfolio theory (Lo, 2005) couches success as survival. Lo's paradigm draws on biology, ecology, mathematics, and economics to conclude that today's heuristics (e.g., loss aversion, overconfidence, and mental accounting) were yesterday's environmental adaptations. Just because some behavior seems odd now does not mean it was not beneficial in an earlier environment. Students who are interested in behavioral finance should read Lo's accessible popular treatment, *Adaptive Markets* (2017), in which he fleshes out these interdisciplinary connections in memorable ways.

Of the four behavioral paradigms covered by the CFA curriculum, my students are usually most familiar with prospect theory (Kahneman and Tversky, 1979), which is covered in many of their introductory

economics courses. Prospect theory is also arguably most directly related to the specific covered biases, since Kahneman and Tversky first rigorously identified many of them. Prospect theory asserts that individuals view losses and gains differently: losses are felt more acutely, and investors facing losses may actually prefer risk to certainty (which for gains they do not). Losses are measured relative to some (mobile) reference point (e.g., perhaps a stock's buy-in price, or perhaps its high price for the year). In contrast to rational economic man, real investors do not do a great job assessing probabilities, and may, for example, overreact to some small-probability events. Students interested in this theory, and in the biases investigated by Kahneman and Tversky, should read Kahneman's wonderfully entertaining and educational book *Thinking Fast and Slow* (2011).

Later, we will see the jurors from *12 Angry Men* demonstrating aspects of each of these behavioral paradigms. Before considering those, however, we turn first to the play's relationship to the pedagogical and legal literature.

Teaching with *12 Angry Men*

Video can be an excellent teaching tool. It can offer “new dimensions on old subjects, provid[e] meaningful embellishments to current curricula, or afford... educative experiences that no other medium can give” (McCambridge, 2003). Despite the initial shock of seeing something in black and white, old films can be especially useful, since “[l]ess-than-familiar classic films allow students to focus on communication patterns and concepts without distraction” (Proctor, 1991). For many who appreciate the pedagogical value of video, *12 Angry Men* has been a staple for years. In this section, we briefly review how instructors in several disciplines have used the film versions in the classroom. We then consider how the extras added by those films make the original play a better source for our purposes.

Law students are the most obvious audience for a classroom exercise with *12 Angry Men*, and indeed, many have used it. The story allows law students to see how a jury actually works—unlike most movies that just use jurors to connote legal time and place (there is a jury box, so we must be in a courtroom; nothing is happening, so the jury is still out). Since *12 Angry Men* takes us inside the “black box” (Bharara, 2019), it is “unique in the realm of popular culture” (Papke, 2007; see, also Hans, 2007, and Jimeno-Bulnes, 2007).

It is not just for law students, though. McCambridge (2003) uses the 1997 movie version of the play to teach management students about dialogue. His approach involves showing three to four five-minute clips in class, with subsequent small-group work—guided by prepared questions—asking students to evaluate things like the relative amounts of inquiry and advocacy in the characters' interactions and the jurors' progression toward effective dialogue. This focus is in keeping with Proctor's (1991) observation that the story is “frequently” used as a tool for demonstrating persuasion.

Marder's (2007b) approach is closer to ours, as she explicitly considers the depiction of some psychological biases in the script (e.g., “group bias”). However, she focuses in a very general way on prejudice (especially as it is demonstrated by juror #10); she does not consider the range of the cognitive and emotional biases covered by behavioral finance literature such as Nofsinger (2014), Lo (2017), and Statman (2017). Nonetheless, she does note that the jury's haste to reach a verdict (which she characterizes as “banal evil”) involves their desire to avoid the work of “serious thinking”—or what Kahneman (2011) would call “system 2” thinking.

Fried (1998) has her students consider a broader array of biases, specifically asking them to identify characters' belief perseverance biases (she asserts that juror #3 is “particularly prone to these cognitive shortcomings”). She also notes that the fact that the story was not explicitly designed to demonstrate social psychological principles is a strength: the examples are rooted in the narrative drive, and so are “messy.” Students must therefore engage more deeply with the material.

All of these authors use a film version of the story. However, the movies pad the play's narrative with details that are unnecessary for our examination. For example, we learn that it is the hottest day of the year and that the paper towel dispenser in the bathroom does not work. A guilty verdict means the electric chair. The defendant's father has been in jail for forgery, and the boy himself has lived in an orphanage. Hay (2007) interprets a lot of these new details as support for his thesis that the movie version of *12 Angry Men* is a religious allegory. However, for us, they are mostly immaterial.

(One bonus from the extra material, though, is that at least one author has used the details to demonstrate a bias himself. Garfinkle (2011), who uses the 1957 film version to explore "psychic barriers to truth," provides character sketches that can be used by instructors to illustrate the cognitive bias of representativeness. The best example is that of juror #2: "a mousy character, a bit of a milquetoast with a high voice who we later discover is a bank teller"; compare this to the description of Steve the shy neighbor who characterizes representativeness in Tversky and Kahneman, 1974.)

One important difference between the play and the 1957 movie version comes at the very end, when the protagonist, juror #8, and his first confederate, #9, exchange names on the courthouse steps after the verdict is rendered. In the play, we never learn the jurors' names—perhaps because they are meant to represent "Everyman" (Burns, 2007), people who choose their identities and are what they do (Hay, 2007). Their not having names may also strengthen the audience's own representativeness bias, as we discuss later.

A second important embellishment the films add is the race of the defendant. This detail has real-world implications according to empirical research on jury behavior, so we turn to that next.

Jury Behavior

Race plays a much more explicit role in the films than it does in the play. In the play, all we know is that the (unseen) defendant is one of "them." In the movies, we are told that he is Hispanic, and we see a brief shot of him in the courtroom. Actually seeing him underscores the fact that he is being judged by a jury of twelve white men (at least until the 1997 film version, which we are not considering here), and primes the audience's suspicion that he is not being judged by a jury of his peers.

Modern students will undoubtedly be quick to notice this racial disparity, as earlier commentators have been. Gertner (2007), for example, describes the jury as "wholly unrepresentative of the community," and Abramson (2007) summarizes his criticism by concluding that "the play's quaintness stems from its heroic image of the white man's burden." Nonetheless, Babcock and Sassoubre (2007) and Burns (2007) recognize considerable nonracial diversity within the jury, highlighting the clear differences in class, age, and occupation. Does the empirical record suggest that any of these demographic differences matter for the trial's outcome?

White-majority juries are, in fact, much more likely to convict Hispanic defendants, rather than white ones ("jury-defendant similarity bias"). Similarly, discrepancies between the jurors' socioeconomic status and the defendant's increase the probability of conviction (Devine, *et al.*, 2001). However, demographic differences are not determinative. For example, in civil trials, the gender composition of juries does not affect awards (Devine, *et al.*, 2001). More relevantly for us, Hans (2007) reports that first-ballot votes are not reliably explained by demographic factors; even if there are "gaps" in jurors' initial opinions associated with race, these are often overcome through deliberation (Abramson, 2007). This is obviously what we observe in the play. Perhaps presenting the audience with an apparently monolithic, potentially hostile jury makes this transformation all the more dramatic.

In addition to studying the aggregate composition of the jury, legal scholars have identified two specific participants in the trial who may be significant: the jury foreman and the judge. In both cases, *12 Angry*

Men offers interesting narrative choices—interesting, because both men are so boring. The foreman acts against empirical type: while he does sit at the head of the table, speak early, and call for votes, he does not participate as much as we might expect, and he is not particularly influential (see Devine *et al.*, 2001). He never challenges the protagonist, juror #8, for center stage. As for the judge, he appears only in the first minute of the play, but has nonetheless drawn relatively extensive critical commentary—all centered around characterizations of him as as “bored” or disinterested (see, for example, Hay, 2007). Empirically, judges seen as “less professional, less dominant, less competent, less dogmatic, and less wise” have been linked to guilty verdicts (see Devine, *et al.*, 2001). Thus, our introduction to the case, through the boring judge and the scan of equally bored-looking jurors, primes us for the early moments in the jury room when the jurors declare how obvious the defendant’s guilt is.

Nonetheless, the content of the judge’s boring speech also primes us for some “talk,” since he tells us that the jury’s verdict must be unanimous. This requirement is the reason the play lasts more than three minutes. As Burns (2007) asserts, the unanimity requirement generates social pressure to invoke the “coercive force of reason,” leading the unanimous group to make a better decision than an individual juror might. (Such a rationale for the unanimity requirement is not simply a question of theoretical or historical interest. From 1974 to 2018, Louisiana allowed convictions on 10-2 in non-death penalty cases; the U.S. Supreme Court’s decision that all state criminal trials require unanimous decisions was handed down only in April of 2020. See American Bar Association, 2020.) Students will almost certainly leave the play believing that the group’s work does lead to a just decision. However, that outcome was achieved only after a fairly epic struggle against a myriad of behavioral biases. We turn to those biases next.

COGNITIVE BIASES

The CFA curriculum classifies behavioral biases as either cognitive or emotional. Cognitive biases are errors in information handling: for example, misuse of statistical base rates or overreliance on trends when forecasting. These biases can be related to the assimilation of information (processing errors) and to cognitive dissonance (selective exposure, selective perception, and selective retention—called belief-perseverance errors). We begin with the processing errors: anchoring and adjustment, framing, availability, and mental accounting.

Anchoring and Adjustment

The cognitive bias of anchoring and adjustment describes both people’s preference for anchors and their tendency to insufficiently adjust those anchors. Anchors are reference values that help with estimates; instead of having to generate an estimate out of whole cloth, one can adjust a given anchor value up or down. These anchors can even be meaningless or random. For example, Kahneman (2011) describes study participants who were asked to estimate the percentage of African countries in the United Nations; people who had just seen a large number come up on a wheel of fortune chose a larger percentage than people who had seen a smaller number on the wheel. In civil trials, Devine *et al.* (2001) note that ad damnum clauses (which specify the damages sought by the plaintiff) act as anchors to awards; similarly, Kahneman (2011) asserts that capping awards at a specific maximum increases judgments that would otherwise be much smaller.

In *12 Angry Men*, the jurors make several estimates. They pace off distances and mimic the hobbling of an old man as they recreate the testimony of the downstairs neighbor. More relevant, however, is their consideration of the female eyewitness. First, juror #8 asks, “How long does it take an elevated train going at top speed to pass a given point?” This initially elicits a response of “I wouldn’t have the slightest idea” (from #4, whose “only concern is with facts,” according to his profile), but then “About ten or twelve seconds maybe” from #5. #8 pronounces this a “fair guess,” then asks for others; #11 and #2 then pile on with “about ten seconds,” anchoring on #5’s estimate.

Perhaps a more subtle example of the anchoring and adjustment bias is revealed through the sequence of votes cast throughout the play. Here, it is the audience who anchors. We have not seen the actual trial, so our first impression of the weight of evidence comes from the initial 11-1 guilty vote; this functions as our substitute for the prosecution's case. But since this vote occurs at the very beginning of the play, we are "primed" to expect much more to the story (Heller, 2006). We then assess juror #8's "progress" throughout the play as we watch him gradually convince his fellows to change their votes and join him.

The jurors did not need to start with a vote. As we learn from the foreman: "[y]ou gentlemen can handle this any way you want to... If we want to discuss it first and then vote, that's one way. Or we can vote right now to see how we stand" (Act 1). Marder (2007a) identifies these deliberation approaches as evidence-driven and verdict-driven, respectively. Jurors using an evidence-driven process attempt to construct a common narrative when evaluating evidence, while those using verdict-driven deliberations—like the *12 Angry Men* jurors—may instead use deliberations to search for evidence supporting their votes. Verdict-driven juries also may be more likely to find the defendant liable (see Devine, *et al.*, 2001).

Thus, the jury's "let's vote now" decision at the beginning of the play meant that juror #8—our protagonist—faces a tough room even before that first vote comes back 11-1. But that vote does make things much worse for him. Devine, *et al.* (2001), after reviewing hundreds of academic articles on jury behavior, find that "[t]here are compelling data from numerous studies indicating that the verdict favored by the majority of the jury at the beginning of deliberation will be the jury's final verdict about 90% of the time." In fact, with an initial 11-1 vote, the probability is 92%. Sunstein (2007) summarizes this by putting the odds of one juror's changing the other eleven's minds at "essentially zero." What will probably happen instead is that the prevailing opinion will strengthen as it is echoed around the room, converting early outliers to the majority's opinion and leaving the group's consensus even more extreme than the initial position of the median juror. (This may be what happened after the initial 11-1 guilty vote in the trial of the murderer of George Floyd in 2021; see *The Week*, 2021. Also see Hans, 2007, and Devine, *et al.*, 2001, for a review of the literature on this point; see Babcock and Sassoubre, 2007, for a real-life, #8-like counterexample, and MacCoun, 2012, on a theoretical explanation for it.)

Thus, we the audience anchor on the strong reflection of the persuasiveness of the prosecution's case and the improbability of jury movement, yet we are primed to expect some drama. Encouraged by juror #8's likeability (which we discuss further, below), we therefore are prone to see each new vote—as the jurors cast one, two, six, nine, and finally twelve votes to acquit—as progress toward justice, and we are grateful to #9 (who says, "He gambled for support, and I gave it to him") for allowing the deliberation to continue (see Abramson, 2007, on the importance of support for minority-position jurors). Our anchoring on 11-1 makes us even more satisfied at the end of the play with the jury's long-shot decision.

Framing, Availability, and Mental Accounting

The 11-1 anchor also creates the frame through which we view the jury's deliberations. We are notified at the very beginning that there is a very strong case for the defendant's guilt (or at least that the jurors believe there is); on the play's first page, we hear: "Six days. They should have finished it in two. Talk, talk, talk. Did you ever hear so much talk about nothing?" (#3); and "A kid kills his father. Bing! Just like that" (#10). As the play progresses, the jurors who strongly believe in guilt will frame their interpretations of the evidence through the lens of guilt, especially when the evidence is direct (Heller, 2006).

There are other frames employed by individual jurors. #3 sees the defendant as another disobedient child, like his own son; #7 sees him as a criminal with a long record. Juror #5, the juror who "lived in a slum all [his] life" and "used to play in a back yard that as filled with garbage," and #11, the refugee who has "suffered through so much injustice," are more disposed to be sympathetic to the defendant. #8, of course, provides the most comprehensive compassionate frame: the boy has "been kicked around all his life...his

mother dead since he was nine,” tough and angry as many “slum kids” are because “we knock ‘em on the head once a day, every day.” This frame, while alone insufficient to cause his colleagues to change their votes, is nonetheless the catalyst for the logical examination of the evidence that will.

The framing bias leads people to answer the same question differently, depending on how it is asked. In *12 Angry Men*, that question is usually, “Is this piece of circumstantial evidence consistent with the defendant’s guilt?” given how the narrative has been framed. However, as just noted, there are also more intimate frames that come from the jurors’ individual experiences. These experiences also affect how those jurors assess the probability of certain events, which is an example of the availability bias.

This processing bias leads people to link the probability of an event to how easily they can imagine it. Events that are memorably dramatic, or that occurred recently, are easier to recall, and therefore are assessed as more likely. Thus, for the audience, the fact that the play ends on a high note makes the “not guilty” verdict memorable, facilitating a type of availability bias that strengthens our conviction that justice was served (Kahneman, 2011). We see the availability bias demonstrated by the play’s characters, as well. Once they have a coherent narrative for the crime, the availability of that narrative makes it more apparently probable, despite contrary evidence (Heller, 2006). Events within a juror’s range of experience are also seen as more likely, so juror #3 assigns a high probability to a boy’s violently hating his father, and juror #5 expects that experienced switch knife-fighters will stab from below. One way to combat this bias is to actively search out new information and consult those with different experiences, a strategy that was imposed on our jurors by the very system that brought them together.

That the jurors do draw on very different ranges of experience becomes clear as the play progresses. This can be illuminating for students, who—as noted above—will undoubtedly notice right away that the actors in the play are all white men, and may expect this lack of physical diversity to be reflected in a similarly monochromatic deliberation. This is the one point at which my classes have been able to link the final processing bias, mental accounting. This bias causes investors to break their investments into discrete layers or “buckets,” with each bucket tied to a specific goal. Such a scheme is a feature of behavioral portfolio theory (see Statman, 2017). The problem with this approach is its failure to capitalize on diversification potential among the layers—this can lead to a suboptimal risk-return trade-off. Linking this to our jurors is a stretch, we admit! Nonetheless, we have had students recognize that they come to play with certain expectations about the necessary diversity of the jury—certain buckets to be filled—and that they are subsequently surprised to see that, despite the existence of only one apparent bucket, there is actually significant variance of opinion reflected throughout the deliberations. (We note that the 1997 movie version of the play does reflect a much more physically diverse jury, as well as a female judge.)

Having considered the cognitive processing errors, we now turn to the belief perseverance biases: conservatism, confirmation, representativeness, illusion of control, and hindsight.

Confirmation, Conservatism, and Stories

Conservatism is a belief perseverance bias in which someone tries to avoid the cognitive strain of updating her prior beliefs, especially when responding to new information would require assimilation of complex or statistical information. Confirmation bias takes this perhaps a step further: the individual actively protects her prior beliefs by selectively perceiving and retaining consistent information, while downplaying or ignoring contradictory evidence. We have already seen that our jurors’ decision to use a verdict-driven deliberation style may exacerbate their tendencies to search for confirming evidence. Such tendencies are not uncommon in juries. In fact, Hoffman (2007) calls the whole trial process is “the mother of all confirmation bias problems”: if “the system” has already determined that the defendant is guilty, how is the jury supposed to decide otherwise? If the system also provides direct evidence, like eyewitness testimony,

this question becomes even harder. Heller (2006) identifies four ways that belief perseverance biases can “devastate” a defense in a trial with direct evidence. All four biases are present in *12 Angry Men*.

The first two relate to conservatism. Jurors may focus only on evidence supporting their belief in the defendant’s guilt, or, if they do do confront exculpatory evidence, they may do so only superficially or skeptically, especially when they are very confident in their initial assessment. As Hay (2007) puts it: “Whenever someone comes forward to suggest [people have] been deceived by appearances or that they’ve ignored significant details or that there’s more to this case than anyone understands..., they’re likely to dismiss him as a crank, ignore what he’s saying, and cling to their prior views as long as possible.” Juror #7 certainly does when someone suggests that “maybe you don’t understand the term ‘reasonable doubt’,” and he responds “angrily”: “What do you mean I don’t understand it? Who do you think you are to talk to me like that?”

In addition to confronting inconsistent evidence with skepticism, jurors confident in their positions will often “truncate their search for alternative hypotheses” (Heller, 2006). (“[W]hen rejecting an item as unreliable would require an individual to discard a narrative of an event that she finds causally convincing, *the individual will almost always hold onto the narrative and disregard the evidence instead*”; Heller, 2006; emphasis original.) There are numerous examples in the play. When #8 starts looking at the floorplan of the apartments, #3, #7, and #10 “barely bother to look at it.” Instead, #7 asks #10 to “Wake me up when this is over.” Nor does #3 want to look at the knife again: “We all know what it looks like.” Ultimately, he and #7 are not interested in continuing examination of *any* evidence: both want to “walk into court right now and declare a hung jury.” (This sort of conservatism recalls the real-life jurors described in Abramson, 2007, one of whom “busied herself clipping discount coupons,” while another “put on earphones and listened to music to avoid hearing the others.”) In some cases, it can be efficient to rush to judgment this way, *if* the judgment is likely to be correct. After all, as bounded rationality stresses, “jurors’ overall processing capacity is not unlimited, [so] they normally conserve their cognitive resources” (Heller, 2006). However, ignoring evidence is a risky strategy for novel, consequential circumstances for which it is not possible to gather more information (Kahneman, 2011).

Heller’s (2006) other two trial complications relate to the confirmation bias. In contrast to their skepticism regarding exculpatory evidence, jurors exhibiting the confirmation bias may simply trust the reliability of inculpatory evidence, and they may interpret ambiguous evidence as inculpatory. (For example, “People who stated their beliefs of guilt or innocence early in the review of a mock police file were disposed to seek confirming evidence and interpret ambiguous evidence as further confirming it”; Statman, 2017, citing Ellsworth and O’Brien, 2009.) In the play, when #8 asked how fast the elderly downstairs neighbor got to his door, #4 dismisses his question by saying that his testimony that he got there is “enough, isn’t it?” More dramatically, when #8 suggests that the downstairs neighbor could not hear boy yelling if the el train were passing by, #3 immediately counters: “What d’ya mean? Sure he could have heard it... He said the boy yelled it out. That’s enough for me...Are you calling the old man a liar?” And as for the female neighbor’s wearing glasses: “How do you know what she saw? Maybe she’s far-sighted... I think he’s guilty!” (juror #3, Act 3).

As noted, all four of these biases are exacerbated by jurors’ high confidence in their assessment. Our jurors are quite confident, as is made clear from the beginning of Act 1: “How did you like that business about the knife? Did you ever hear a phonier story?” (#7); “I never saw a guiltier man in all my life” (#3); and my students’ perennial favorite: “I think the guy’s guilty. You couldn’t change my mind if you talked for a hundred years” (#7). Part of the reason the jurors are so confident is the nature of the prosecution’s case, which includes direct evidence—eyewitness testimony—from the female neighbor living across the el tracks. Direct evidence strengthens belief perseverance, because *reliable* direct evidence equates to guilt—its probative value (the conditional probability that the defendant is guilty) is 100%. Of course, direct evidence might not be reliable, but “jurors rarely question the reliability of direct evidence” (Heller, 2006).

That is definitely true for eyewitness testimony. “Jurors dramatically overestimate the accuracy of eyewitness identifications... and convict in eyewitness cases even in the face of exculpatory evidence” (Heller, 2006). Error rates for eyewitness identifications are “extremely high,” and are even less reliable—with 60% to 90% false identifications, by far the greatest cause for false convictions—when the act being observed is violent and when visibility is imperfect (Heller, 2006). Nonetheless, eyewitness testimony is compellingly concrete, and it transports a jury in a way circumstantial evidence cannot.

Circumstantial evidence, such as fingerprints or other forensic evidence, requires a jury to make inferences and weigh probabilities. Heller (2006) identifies four crucial differences between direct and circumstantial evidence. First, direct evidence is representational and structurally coherent, providing a tidy representation of the crime itself, in chronological order (compared to the reversed structure of a trial, which flows backward from the crime to its precursors). In contrast, circumstantial evidence only offers “an abstract statement about the connection between the defendant and an incriminating physical trace of the crime.” Second, direct evidence is narrative—it is a story that allows the jury to “see” the event in their minds—while circumstantial evidence is simply an argument linking the defendant to the crime and making his guilt more likely. (As former U.S. Attorney for the Southern District of New York, Preet Bharara puts it, “You can have facts and figures and statistics, but they are powerless and unpersuasive if not woven into a compelling narrative, an understandable story”; Bharara, 2019.) Third, as just noted, reliable direct evidence is univocal: it allows only one interpretation—guilt. Circumstantial evidence is polyvocal, and can be interpreted as either damning or exculpating: “every fact has two faces” (Burns, 2007). Finally, direct evidence is unconditional, while circumstantial evidence is probabilistic. Jurors in a circumstantial case are likely to acquit “*even when their subjective probabilities of guilt are sufficient to convict*” (Heller, 2006, emphasis original; this is called the “Wells effect”). Jurors in a direct case, in contrast, can easily see how the crime could have happened as the prosecution says it did.

Given how compelling eyewitness testimony can be, it is not surprising that the female neighbor’s statement provides the final argument supporting the three jurors who persist in voting guilty through four rounds of voting. “I still believe the boy is guilty of murder... To me, the most damning evidence was given by the woman across the street who claimed she actually saw the murder committed” (#4). “That’s right. As far as I’m concerned, that’s the most important testimony... the whole case... You can throw out all the other evidence” (#3).

It is not easy for juror #8 to combat such evidence. His approach is therefore very delicate. He is careful to say that “maybe she honestly thought she saw the boy kill his father,” but that actually “she saw only a blur.” His interpretations may not be the most probable, as he recognizes—“It’s possible... I’m just saying it’s possible... Do you think this possible?”—but he just wants to create reasonable doubt. The reason we leave the play thinking he is brilliant is because he succeeds.

(As we see later, perhaps he should not have. Being able to imagine a factually exculpatory scenario is not the same as the legal standard of reasonable doubt, since “poor evidence can make a very good story”; Kahneman, 2011. Heller, 2006, asserts that judges should be sure to inform juries of this. Of course, our bored judge did not.)

Even after juror #8 was able to convince #4, whose “only concern is with the facts of this case” (Rose, 1954), there was still one more guilty vote: #3’s. His more emotional biases are more difficult to counter. Before addressing those sorts of biases, however, we will complete our discussion of the CFA’s roster of cognitive biases.

Representativeness and the Halo Effect

The representativeness bias is the tendency to classify a thing based on its similarity to a stereotype. It is a bias that allows us to avoid cognitive strain. We search for patterns, drawing on past experiences and underutilizing probabilities; we overweight information from small samples. We demonstrate “an excessive willingness to predict the occurrence of unlikely (low base-rate) events” (Kahneman, 2011). Vidmar, *et al.* (2007) show that mock jurors do all of this. Their evidence therefore suggests that jury deliberations—even fictional ones—can provide good examples of the representativeness bias.

Audience members might expect plays to offer other good examples, being populated by stock characters like the hero, the damsel in distress, or the nerd. Prince and Jackson (2005) describe these sorts of characters as “familiar...identified by an oversimplified pattern of behavior that typically labels the character as being part of a group of people.” Rose (1954) embraces this tendency in his audience by providing brief character sketches, employing juror descriptions such as “an angry, bitter man” (#10), “a mild gentle old man” (#9), “a refugee from Europe” (#11), and “a loud, flashy-handed salesman type” (#7). Hay (2007) calls these “the oldest, most vicious [stereotypes] in the book,” and asserts that Rose uses them to demonstrate the insidiousness of labels.

An interesting twist in *12 Angry Men* is that we also see the characters themselves exhibit the representativeness bias as they assess the probable guilt of the defendant. Juror #3 sees the boy through the prism of the troubled relationship with his own son—who he tried to “make a man” out of (“or bust... up into little pieces trying”)—concluding, “It’s the kids. The way they are—you know?” Juror #4 points instead to the defendant’s upbringing: “The children who come out of slum backgrounds are menaces to society.” But of the most interest to us are the perspectives of jurors #9, #10, and #8—the elderly man, the bigot, and the protagonist, respectively.

Juror #9, the elderly man, “mourns the days when it would have been possible to be courageous without shielding himself behind his many years,” and is now “merely waiting to die” (Rose, 1954). His perception is critical to the jury’s evaluation of the downstairs neighbor’s testimony, about whom #9 says, “I think I know him better than anyone here.” He then leads the other through what Vidmar, *et al.* (2007) call “untested speculation about his need to feel important,” after which he concludes that, “He wouldn’t really lie. But perhaps he’d make himself believe that he heard those words [‘I’m going to kill you’] and recognized the boy’s face.” Juror #9 assumes that his personal experience can be extrapolated—that his sample size of one is representative of the entire group of elderly men.

Juror #10 is the play’s most obvious stock character: the bigot. He “places no values on any human life save his own”; he “has been nowhere and is going nowhere and knows it deep within him” (Rose, 1954). More harshly, Papke (2007) describes him as “a bigot whose racism is so deeply ingrained that he cannot imagine it to be anything other than common sense.” We see this first when he becomes perturbed when juror #8 suggests the group spare the boy’s defense “a few words,” saying, “You’re not going to tell us that we’re supposed to believe him, knowing what he is. I’ve lived among ’em all my life. You can’t believe a word they say.” Later, he is more explicit, calling the boy “a common, ignorant slob,” who “don’t even speak good English!” (#10’s own grammatical error here is immediately pointed out by #11, the immigrant.) Finally, in the third act, he reacts to the third vote—9-3 in favor of acquittal—with an extended, violent rant: “You know how these people lie... They don’t need any real big reason to kill someone... They get drunk, and bang, someone’s lying in the gutter... It’s like they have no feelings... These people are drinking and fighting all the time... Human life doesn’t mean as much to them as it does to us.”

This rant is too toxic even for his fellow jurors, who all rise and turn their backs on him. Their reaction is a delayed version of a dislike the audience has probably felt all along (as we were supposed to: Rose also describes this character as someone who “antagonizes almost at sight”). Our reaction highlights the

existence of two levels of representativeness bias in the play: that among the characters, and that between the audience and the characters. They stereotype each other, and we stereotype them.

Our characterizations are not always negative, of course. Rose offers us an antidote to the “humorless, intolerant, dull-witted, opinionated, loud, bitter” jurors with his protagonist, juror #8, who personifies the behavioral bias called the halo effect. This bias reflects our tendency to assume that someone with good traits is a good person. For example, juries are less likely to convict attractive defendants (Devine, *et al.*, 2001). In *12 Angry Men*, juror #8 exhibits so many positive characteristics—such as being “highly likeable, rational, and generally confident” (Sunstein, 2007)—that we are inclined to believe him. (However, some find him “too good to be true...above the law and unconstrained by its limits”—basically, a vigilante; see Landsman, 2007. These critics appear to be in the minority.)

Hay (2007) pushes the halo effect idea to the point of making it literal. For him, *12 Angry Men* is a religious allegory, with juror #8 cast as a miracle worker with “solomonic wisdom”—perhaps a martyr, a prophet, Jesus, or even God. He asserts that it was easy for audiences of the 1957 movie to view #8 as a Christ-like figure, since he was played by beloved actor Henry Fonda (whose character in *The Grapes of Wrath* was “widely understood in those terms”). Even without this context, student viewers of the 1954 play undoubtedly will be persuaded by #8’s humble and thoughtful evaluation of the evidence. However, by accepting #8’s interpretation of events, they themselves may be committing the cognitive error of hindsight bias.

Hindsight, Guilt, and the Illusion of Control

Things that we know actually have happened—like the acquittal of a defendant facing an initial guilty vote of 11-1—seem, after the fact, much more predictable than they really were. This is hindsight bias: the ex post overestimation of the probability of an event. In *12 Angry Men*, it is the audience who probably commits this error, when we leave believing that the defendant was not guilty even though, as juror #7 says in the movie version, “the odds are a million to one.” Astimow (2007), reassessing the evidence, agrees, concluding that the prosecution far exceeded its burden of proof, and putting the probability of the defendant’s guilt at “close to 100%.” Why, then, does it seem so obvious at the end of the play that he was innocent?

The most important reason is that *12 Angry Men* leads us through a compelling exculpatory narrative championed by a strongly sympathetic guide. Such a great narrative reduces our ability to consider critically (Heller, 2006): “Good stories can overwhelm good arguments” (Bharara, 2019). However, some observers who overcome that obstacle see “a veritable buffet of juror misconduct” (Weisselberg, 2007), where jurors replace reasonable doubt with *speculative* doubt (Hoffman, 2007), and “very arguably” acquit a guilty man “because they concocted alternative narratives that were not critically assessed for plausibility” (Vidmar, *et al.*, 2007).

Vidmar, *et al.*’s (2007) preferred narrative focuses on the circumstantial evidence, which, despite being harder to evaluate, is much more reliable than direct evidence. (“Circumstances cannot lie,” according to William Paley, or, perhaps, “Circumstances may sometimes lie, but witnesses lie far more often”; see Heller, 2006.) Vidmar, *et al.* (2007) therefore reconsider the salient circumstantial evidence. First, the knife. While it was not unique, it was unusual. Is it likely that a random killer would have used such a knife? And while supposedly “[a]nyone who’s ever used a switch knife would never have stabbed downward” (according to juror #5), that is exactly what the killer did do. Next, the motive. The boy clearly had one, but there is no evidence that anyone else did. Finally, the eyewitnesses. The woman was able to see well enough to observe the murder and identify the defendant, while the old man’s estimate of 15 seconds was just that—an estimate. The authors conclude that the jury “systematically dismantled inculpatory evidence without considering the plausibility of the deconstruction,” while manufacturing

motives “from whole cloth,” and failing to test the defendant’s story for internal consistency. They conclude that the boy was probably guilty.

Nonetheless, viewers of the play believe him innocent, and see that verdict as obvious in hindsight. Our (vicarious) active involvement in the deliberations reinforces our conclusion. This is an example of the belief perseverance bias called illusion of control. The jurors also exhibit this bias, as they explicitly link their conclusions about guilt to their reenactments. Seeking out information gives them more confidence in their interpretations, even though it is quite possible that the information they are using is misleading and that their conclusions are wrong. Having more information and being more actively involved in a decision foster the illusion of control, but they do not necessarily lead to better outcomes (Nofsinger, 2014; Kahneman, 2011). It is possible that in *12 Angry Men*, the jury, like us, “confuse facts for proof” (Babcock and Sassoubre, 2007).

The biases just discussed were all cognitive biases, which are relatively amenable to guided correction. Nonetheless, in our play, the jurors were “angry,” so we turn now to the more intractable problems: the emotional biases.

EMOTIONAL BIASES

Landsman (2007) describes the interactions among our jurors “more like a struggle for dominance than rational analysis,” but this is one of the selling points of the play. Angry people are interesting; rational people are not. (As Jimeno-Bulines, 2007, notes, *12 Angry Men* is a better title than *12 Impartial Jurors*; Preet Bharara says no one would go see a movie called *12 Angry Mediators*.) Anger actually feeds the narrative, since being angry can affect the way the jurors process information; for example, anger can focus inquiry, making it less likely that the jurors simply accept confirmatory evidence (Statman, 2017). (Even simply frowning reduces overconfidence and makes people think harder; Kahneman, 2011.) In general, however, biases driven by emotion move people farther from the ideal of rational economic man (as Kahneman, 2011, puts it: “The dominance of conclusions over arguments is most pronounced when emotions are involved”). In this section, we consider how our angry jurors exhibit each of the emotional biases described in the CFA curriculum: status quo, endowment, loss aversion, overconfidence, self-control, and regret avoidance.

Status Quo

The status quo bias reflects our tendency to just leave things alone, rather than undertake the taxing effort of considering alternatives. It is essentially inertia. For investors, it can lead to missed opportunities, and the attendant suboptimal risk-return trade-off. For the jurors, it helps explain why the majority of criminal juries convict (Preet Bahrara cites his conviction percentage at trial at “just a few points shy of 100 percent”): as noted earlier, there is “an all-too-human tendency to think the worst of a person, especially one whom the prosecutor has said is guilty” (Marder, 2007b). It can also mean overlooking critical pieces of evidence.

The jurors in *12 Angry Men* almost universally exhibit this bias. For example, by adopting a verdict-driven deliberation style, the majority clearly wishes just to vote and get it over with. Perhaps the best example of the ennui we might expect with this bias is juror #2’s contribution to the first round robin: “Oh. Well...(long pause) I just think he’s guilty. I thought it was obvious.” He is clearly not advocating for a deeper investigation of the issues.

As the play progresses, the status quo bias buttresses the more emotionally driven advocates for guilt, as conservatism supports the more intellectual. The former hold out longer. Emotional biases must be countered with more than basic logic, often making them much more difficult to overcome than are

cognitive biases. We should therefore not be surprised to find juror #3—a man who is “extremely opinionated...humorless...intolerant,” with “a streak of sadism”—remaining impervious to rational argument until he cracks at the very last line of the play.

Endowment and Loss Aversion

The endowment bias makes us value something more highly if we already have it, and loss aversion makes us especially sensitive to losing it. Both of these biases are exhibited by juror #7.

This juror is a “loud, flashy-handed salesman type who has more important things to do than to sit on a jury.” Hay (2007) identifies him the archetypal fool. In addition to being generally obnoxious, he is preoccupied with his theater tickets. These tickets are introduced at the very beginning of Act 1, even before everyone sits down: “This better be fast. I’ve got tickets...tonight.” Their pull appears again in Act 3, right before he changes his vote: “I’m a little sick of this whole thing already...Let’s break it up and go home. I’m changing my vote to not guilty.” Even though juror #11 pressures him into admitting that it was the evidence that caused him to reconsider, #7’s continued association with these tickets illustrates clearly the emotional salience of sunk costs.

Juror #7 considers his tickets to be part of his “endowment.” The endowment bias causes him to value his tickets more highly since he already owns them (and even more so if he bought them recently): he would charge someone more to buy them from him than he would be willing to pay for them himself today. For investors, the endowment bias can make someone unwilling to sell assets she inherited, even if those assets do not make sense within her portfolio; for juror #7, the bias makes him fixate on getting to the theater. This emotional attachment is linked to another bias, as well: loss aversion.

As noted earlier, Kahneman and Tversky’s (1979) prospect theory suggests that people view losses and gains asymmetrically, with losses of a certain size decreasing utility much more than corresponding gains increase it. Thus, #7 fears facing a loss if he is unable to use his tickets, and he wishes to avoid the corresponding decrease in utility. Juror #11 recognizes this motivation, saying to #7: “You have sat here and voted guilty with everyone else because there are some theater tickets burning a hole in your pocket. Now you have changed your vote for the same reason.” #11 finds this disgusting, angrily asking #7, “What kind of man are you?” This confrontation is emblematic of the tension between rationality and emotion, and helps explain why the CFA curriculum more often advocates for adaptation over moderation when advisors are working with clients governed by emotional biases. Unlike cognitive biases, emotional issues are not as amenable to improvement through education, and may need to be accommodated rather than corrected. However, this can be especially challenging when the emotional bias at issue is overconfidence.

Overconfidence

People who are overconfident “overestimate their knowledge, underestimate risks, and exaggerate their ability to control events” (Nofsinger, 2014). Men tend to be more overconfident than women, at least on tasks deemed “masculine” (Barber and Odean, 2001), and both men and women are more likely to be overconfident when they face a difficult task with low predictability and slow, vague feedback. For investors, this means that men’s portfolios are often more risky and less diversified than women’s (this is especially true for single men, who lack the moderating influence of a spouse). For the *12 Angry Men* jurors, it means initial verdicts defended with assertions rather than through examination of evidence; as Hay (2007) puts it, the jurors “overestimate themselves,” and “[c]ertitude and comprehension are inverse quantities for the characters.” (This conviction is not uncommon in capital trials: jurors who support the death penalty tend to have more confidence in their judgment than those who do not; see Devine, *et al.*, 2001.)

Not surprisingly, the characters prone to other emotional biases also show flashes of overconfidence, especially juror #3 (described by Rose as “extremely opinionated”), #7 (a “bully”), and #10 (who is “angry” and “bitter”). When #8 asks in Act 1 if the defendant may have lied, #10 “angrily” responds that “of course he lied!” In Act 2, when the jury is wondering which one of them could have changed his vote, #3—again “angrily”—asserts “I know who it was.” And of course #7, as we noted earlier, defends his immediate vote for guilty: first by denying that it was easy for him to do so—since he understands the (capital) consequences, but ultimately because “I think the guy’s guilty. You couldn’t change my mind if you talked for a hundred years.”

Also not surprisingly, the two angry and overconfident men in this group, #3 and #10, are some of the longest holdouts of the jury. They are also two of the jurors who most obviously exhibit the next emotional bias: lack of self-control.

Self-Control

“The exertion of self-control is depleting and unpleasant” (Kahneman, 2011). Delaying or forgoing what we want to do in order to accomplish necessary but more unpleasant things requires a successful struggle within a person’s “multi-self” nature: the triumph of the person’s “planner” over her selfish, myopic “doers” (Shefrin and Thaler, 1981). (Kahneman, 2011 describes this as a conflict between rational, calculating “system 2” and intuitive, subjective “system 1,” where system 1 “has a sweet tooth.”) In financial planning, self-control problems inhibit saving. We rationalize this aversion to saving by appealing to hyperbolic discounting—the idea that people discount cash flows much more heavily over the short term than they do over the long term (being willing to pay a high price for immediacy). In *12 Angry Men*, the self-control problem is more about time and effort than money: the sooner the jurors can reach a verdict, the sooner they can get back to doing what they would rather be doing. Those jurors with more self-control problems are more reluctant to devote the cognitive resources necessary to give the defendant’s case a thorough review.

The protagonist, juror #8, employs two mechanisms to combat his colleagues’ self-control issues, both of which are recommended by Shefrin and Thaler (1981). The first is moral suasion, which he effects through the adoption of a new norm. At the beginning of Act 1, after the initial 11-1 guilty vote, juror #3 “sarcastically” says, “Somebody’s in left field.” This prompts #8 to justify his vote, even while admitting that he does not know if the defendant is innocent. He just wants “to talk for a while” because it is “not so easy for me to raise my hand and send a boy off to die without talking about it first...maybe we owe him a few words.” This show of compassion is sufficient to begin a meaningful discussion of the facts, despite #10’s objection that “We don’t owe [the defendant] a thing.”

Juror #8’s second tactic is rules-based. Specifically, he employs an approach that Shefrin and Thaler (1981) call “externally enforced precommitment.” At the end of Act 1, he makes this proposal: “I want to call for a vote. I want eleven men to vote by secret ballot. I’ll abstain. If there are still eleven votes for guilty, I won’t stand alone. We’ll take in a guilty verdict right now.” This was an effective strategy, as juror #9 changed his vote to not guilty, ensuring that the deliberations would continue. The denouement to the self-control aspect of the play then follows in Act 3, when juror #7—the impatient “salesman type” who wants to go to the theater—changes his vote to not guilty. Despite his obvious endowment bias and his prefacing of his change of heart by saying “I’m a little sick of this whole thing already...,” this scene makes it clear that he now really believes the defendant is innocent. It plays more like an apology than an expedient. Juror #8’s strategies have successfully mitigated the self-control problems of his most recalcitrant colleague. They may also have saved him from regretting a hasty decision.

Regret Avoidance

Of all of the biases displayed in *12 Angry Men*, perhaps the one most important to the narrative is regret avoidance. Juror #8 repeatedly raises the specter of regret throughout the play, stressing that his colleagues' decision means a "man may die." The outcome of the trial affects not only the defendant, but the jurors as well; only their thoughtful discharge of their duties can mitigate the potentially negative effects of their decision on their futures.

Regret can arise from something we do (an error of commission) or from something we do not do (an error of omission). Errors of commission usually make us feel worse (see Kahneman, 2011). However, whether a choice counts as action or inaction depends on our perception of the default option. Juror #8 seems to demonstrate his appreciation of this distinction through his framing of the jury's responsibilities.

Juror #8 is process oriented. He sees the jury as a deliberative body; for him, the default option is to talk about the case. Other jurors are decidedly more task oriented: they see their job as delivering a verdict (as #10 says, "He got a fair trial, didn't he?"). #8 is able to shift their default toward deliberation, and he does so by explicitly exploiting regret aversion in multiple ways.

First, juror #8 reframes the decision from something that needs to be done "fast" so that "we can all go home" (#7) to something that needs to be taken seriously: a decision that could "send a boy off to die." By focusing on the severe and irreversible consequences of the decision—the "terrifying duty of rendering a verdict" (Bharara, 2019)—he stressed the "negative affect" of the decision and emphasized the potential for regret. He then subtly reminds his colleagues that this decision is theirs—an important reminder for those jurors (like #3 and #4) who might otherwise avoid regret by blindly trusting the neighbor's testimony (if she was wrong, that was her fault, not theirs; see Statman, 2017). He also invokes guilt, as is obvious by #7's reaction: "Who says it's easy for me?" Finally, he persuades the last holdout juror by employing a technique that Kahneman (2011) says is the most useful protection from regret: explicitly anticipating it. ("If you can remember when things go badly that you considered the possibility of regret carefully before deciding, you are likely to experience less of it.") At the end of Act 3, juror #3 shouts, "I'm entitled to my opinion! It's gonna be a hung jury!" To which #8 replies, "There's nothing we can do about that, except hope that some night, maybe in a few months, you'll get some sleep." #3 relents, and the play ends.

Having reviewed the individual cognitive and emotional biases, we now turn briefly to the biases related to group dynamics.

GROUP DYNAMICS IN *12 ANGRY MEN*

According to the CFA curriculum, group decision-making can mitigate or exacerbate the biases of members. It can also generate new biases (Pompian, *et al.*, 2014). In this section, we consider how these dynamics are reflected in *12 Angry Men*.

Opinions vary about the realism of depictions of group interactions in *12 Angry Men*. For supporters, "*12 Angry Men* remains one of the very few films to fashion a compelling account of how and why juries work" (Babcock and Sassoubre, 2007); "As a psychological study of what it takes to be persuasive in a small group setting, the film is a gritty portrait in psychological realism" (Abramson, 2007); and its deliberations depict the "convergence of reason, eloquence, and openmindedness" (Devine, *et al.*, 2001). However, detractors fault the film's "dramatic cleanliness" (Burnett, 2007) and its "striking dramatization" of an event that almost never occurs—one juror's turning around eleven others—for "encourag[ing] a naïve notion about what group decision making is like" (Landsman, 2007). In addition, the jurors' "decision metrics" (counting the seconds for the el train to pass, or for the elderly neighbor to reach his door) "buttresses a kind of collective fantasy about participatory judicial rationality" (Burnett, 2007).

Nonetheless, the movie does a good job highlighting the points made in the CFA's treatment of group behavioral issues. This is a minor part of its coverage of investment biases, since the primary purpose of the curriculum is to guide interactions with clients. There are essentially two main points that the curriculum seeks to deliver.

The first of these is that the process of reaching group consensus can smother contrary opinions, as "the nail that sticks up gets hammered down." This is the external influence of the group upon the individual. It is easy to see such dynamics in the play. For example, we hear this from #3: "Somebody's in left field...It's not Sunday. We don't need a sermon"; and, from #7: "You're alone. What do you think you're gonna accomplish?"

To combat this tendency and ensure that the full range of views is aired, the CFA curriculum suggests that a group's chair ask each participant for her opinion in advance, then explicitly prompt for all comments during the meeting. Kahneman (2011) agrees that this is the best way to draw out everyone's information. However, in *12 Angry Men*, a (bored) judge fails even to instruct the jurors to keep an open mind until they have deliberated, and an (indifferent) foreman calls for a vote before any evidence is discussed. Only as juror #8 presses them to talk about the case, and the foreman then suggests "we go once around the table," do the others become more willing to contribute their own impressions (Marder, 2007b).

These deliberations reflect an unusual sort of group interaction, which MacCoun (2012) describes as the "deliberation paradigm." While the jury structure imparts an egalitarian official power structure and fairly well-defined common sense of the ideal outcome, the jurors themselves are strangers. They have only one interaction, which makes it difficult for them to develop group norms and behaviors that mitigate biases (MacCoun, 2012, calls this "low dependence"). Thus, jurors are more like a "crowd" than a committee (see Pompian, *et al.*, 2014).

Nonetheless, once they start talking, the jurors do "the peculiar thing that juries do" (Babcock and Sassoubre, 2007): bring their own experiences and impressions to bear on the evidence. The experiences of the jurors in the play are more diverse than students may initially expect. According to Burns (2007), "Each person's individuality plays an important role in the deliberation, but it provides diversity of perspective rather than diversity of individual interest." The CFA curriculum stresses that diverse groups, whose members respect each other, may be better able to withstand the social pressure to conform to strong views expressed by group leaders. As the jurors provide their unique perspectives, they contribute to a sense of community (Babcock and Sassoubre, 2007), "develop a sense of 'groupness' through communication" (Proctor, 1991), and achieve "the emergence of common sense" (Burns, 2007). Viewers will believe the result is just.

This successful outcome is contingent upon the confident, independent actions of juror #8. This brings us to the CFA curriculum's second main point about group interactions: that the individual members need to take responsibility for offering their opinions. This is not as easy as it sounds. People want to fit in, so as a group seeks to enforce consensus, its members seek to conform—preferring to be part of the herd rather than conspicuous outliers. This tendency drives the quick move to consensus, for good or ill, and is called the "social proof bias."

12 Angry Men's jurors are clearly susceptible to this bias. As Hans (2007) describes their initial deliberations: "The discussion is cursory. The jurors exchange insults and put-downs. The comments about the trial and the defendant reflect judgments and prejudice. In short, the men are really bad jurors." Two in particular are especially noteworthy here, and are critical foils for juror #8.

On one end of the jury's personality scale is juror #2, a "meek, hesitant man who finds it difficult to maintain any opinions of his own." His main contribution to the deliberations is to vote guilty, then explain himself

by “timidly” offering that “I thought it was obvious.” Juror #2 clearly has not developed a thoughtful rationale to support his initial vote—at least one he can articulate. It may even be too generous to suggest that he is satisficing. Were it not for the insistence of juror #8, juror #2’s blasé approach to his responsibilities would have helped to quickly convict a possibly innocent man.

At the other personality extreme is juror #3, a dramatic example of what Devine, *et al.* (2001) call “high-authoritarian” jurors: people who are “rigid, conventional, conservative, power-oriented, and deferential to authority.” (Notably, Rose, in his description of juror #3, starts with the power-oriented terms “very strong, very forceful,” then adds “extremely opinionated” and “intolerant.”) Juries with many high-authoritarian jurors are more likely to convict. However, these jurors are more susceptible to the influence of authority figures and to “group conformity pressure”; they are also more likely to change their verdicts after deliberating.

MacCoun (2012) asserts that a juror may change his vote not because of the weight of evidence but rather because of the pressure of the question “how unpopular must my position be before I’m willing to change it and adopt the majority view?” He calls this the “burden of social proof.” Rose uses juror #9 to explain it in the play: “It takes a great deal of courage to stand alone even if you believe in something very strongly.” Juror #3 must feel this sort of pressure at the end of Act 3, when three lines after his yelling that “you’re not going to intimidate me!” he “looks around at them for a long time,” and recognizes that “all of them despise him for his stubbornness.” Suddenly, “his face contorts,” he slams his fist, and he changes his vote. He finally “crumbles” in the face of social pressure (Astimow, 2007).

Of course, juror #8 is the main instigator of that pressure. As he models the CFA’s prescription to be responsible for offering his opinions in the face of colleagues who feel quite differently, he is aided by at least three things: the legal standard required for conviction in this case, the “visibility” inherent in the deliberations, and—most importantly—his very nature.

First, in capital cases like that faced by the *12 Angry Men* jurors, the beyond-a-reasonable-doubt standard gives asymmetric influence to jurors like our protagonist who argue for acquittal. “If jurors favoring conviction discover that well-meaning peers feel strongly that the defendant is innocent, this might serve as ‘social proof’ that there is, in fact, a reasonable doubt” (MacCoun, 2012). The standard of proof itself is a social construct.

Second, juror #8’s consistent defense of the boy increases the “visibility” of his minority position and enhances its persuasiveness (MacCoun, 2012). The numerous votes allow those voting for acquittal to “find” each other (as when juror #9 announces that he was the first to change his vote to not guilty), and for those favoring conviction to observe the opposition (higher “vision”—as demanded by juror #7: “Who was it [who changed his vote]? I think we have a right to know”). Higher visibility enhances the development of “social coordination norms” (MacCoun, 2012).

The most important element of the social pressure, though, is juror #8’s very character, whether one sees him as “Christ-like” (Hay, 2007) or as an “internal enemy” who must be dealt with if the jurors are to escape the hot jury room (Proctor, 1991). He is “generally confident” (Sunstein, 2007), and people are impressed by messages delivered with confidence. Thus, #8 is persuasive when he concludes that “he couldn’t have made the kind of wound which killed his father,” or “I say she saw only a blur” (Act 3). No other juror can match this persuasive eloquence (Vidmar *et al.*, 2007). He is also “highly likeable” (Sunstein, 2007). This very “agreeableness” bolsters his willingness to maintain his position when faced with opposition (MacCoun, 2012), as it allows him to appealing to the other jurors’ humanity with humility and without ridicule (Garfinkle, 2011).

He is also fortified by his desire to reach an accurate conclusion (MacCoun, 2012). He is rational, has more information than the jurors most enthusiastic about a guilty verdict (Sunstein, 2007), and is able to marshal more arguments and support them with “logic and experimentation” (Garfinkle, 2011; see also Abramson, 2007 and Gertner, 2007). As he builds his case, more jurors are swayed: “the ubiquitous majority effect is mediated by information exchange as opposed to conformity pressure” (Devine, *et al.*, 2001). Because the more “competent” jurors are the least invested in their initial positions—and therefore the most amenable to rational counterargument—juror #8 is able to persuade them by asking the right questions (Sunstein, 2007).

As he asks those questions, he reveals himself to be as Rose imagined him: “A quiet, thoughtful, gentle man. A man who sees all sides of every question and constantly seeks the truth. A man of strength tempered with compassion. Above all, he is a man who wants justice to be done and will fight to see that it is.” Less poetically, he is also the perfect embodiment of the CFA curriculum’s summary observation on group decision-making: “An individual expressing strong contrarian views within the group can help in avoiding too quick of a move to consensus before all evidence is discussed” (Pompian, 2014b).

CLASSROOM SUGGESTIONS AND CONCLUSIONS

I have used *12 Angry Men* for four years in my senior-level undergraduate portfolio management elective. This course’s content is informed by the CFA’s Level III curriculum (specifically, Pompian, 2014a; Pompian, 2014b; and Pompian, *et al.*, 2014). Each time I have used it, the heart of the students’ assignment has been to identify as many behavioral biases in the play as they can, justifying each of their answers. Students always work in teams.

Given time and pandemic constraints, the way I have used classroom time to support this exercise has varied. The least effective version was simply to have students do the assignment on their own, without any associated classroom discussion. Their answers were sufficient, but not having the classroom interaction robbed the exercise of most of its fun and obviously all of its potential to develop positive classroom dynamics. A better approach was to play clips in class (as McCambridge, 2003, does with the movie version) and have small groups work to identify relevant biases. However, the best approach for my classroom has been to have students watch the video on their own time, work in teams to identify biases, then come to class prepared with their own chosen clips to show their colleagues. This ensures that everyone is completely familiar with the entire play (which is a not an onerous requirement, since the play runs less than one hour and is freely available on the internet) and that everyone is prepared to discuss it. To ensure that all students’ views are aired, I ask everyone to prepare initial answers before meeting in teams. Finally, at the end of our classroom session, I introduce Vidmar, *et al.*’s (2007) arguments supporting the guilt of the defendant and ask students to consider whether their own conclusions were affected by social proof bias, the halo effect, or other biases as they reviewed the evidence through the play.

No matter how much classroom time I have devoted to *12 Angry Men*, incorporating it into my course has always been productive and engaging for the students. The play was meant to be entertaining, and it is. But that does not prevent it from being relevant and “teachable” (Babcock and Sassoubre, 2007), since it explores “universal themes” and inspires interpretations “on many different levels” (Marder, 2007a). The jurors’ interactions demonstrate the full range of the Chartered Financial Analyst curriculum’s individual behavioral biases—admittedly, some more clearly than others—as well as the associated group dynamics. It also may elicit some of those biases and group behaviors in its own viewers, which makes the classroom debrief all the more interesting.

Statman (2017) says that finance knowledge can be divided into financial-facts knowledge, human-behavior knowledge, and information knowledge. Finance professors are unlikely to omit information and facts from their courses, but may be less experienced and comfortable tackling human behavior. (Their

marketing counterparts, especially those teaching consumer behavior, are undoubtedly much more experienced in this area; they may also find the exercise described in this paper useful). Nonetheless, finance students are unlikely to encounter only rational economic actors in their portfolio management careers—in fact, a financial “consultant’s new role is not unlike the role of a psychotherapist” (Lo, 2005). Students therefore must be trained to mitigate or adapt to client biases. *12 Angry Men* is a fun way to begin that training.

Table 1: Examples of Individual Behavioral Biases in *12 Angry Men*

Bias	Example
<u>COGNITIVE</u>	
<i>belief perseverance</i>	
<u>conservatism</u>	
choose to maintain beliefs rather than experience the stress of updating them	juror #7: "You couldn't change my mind if you talked for a hundred years"; "wake me up when this is all over"
<u>confirmation</u>	
search for/notice information that confirms beliefs	juror #10: "Look, what about the woman across the street? If her testimony doesn't prove it, then nothing does."
<u>representativeness</u>	
use stereotypes/small samples/patterns to classify new information	juror #10: "...knowing what he is. I've lived among 'em all my life. You can't believe a word they say."; juror 3: "I think I know him [the old witness] better than anyone here."
<u>illusion of control</u>	
believe active involvement in a decision, more familiarity with choices, and incorporation of more information means better outcomes	jurors re-enact aspects of the trial evidence (e.g., neighbor getting out of bed and walking down hall; killer stabbing switchblade downward)
<u>hindsight</u>	
view outcomes as having been more predictable (once they have happened)	the audience sees innocence as more likely after having seen the play
<i>processing</i>	
<u>anchoring and adjustment</u>	
make comparisons by adjusting an initial anchoring estimate	the jurors estimate, then adjust, how long it takes an el train to pass a given point and how long it took the elderly neighbor to reach his door
<u>mental accounting</u>	
compartmentalize goals, addressing each separately and ignoring possible correlations	juror #5 separates his current life and his jury duties from his prior life in a bad neighborhood; audience initially may not appreciate the diversity of the jury, since there are no obvious visual categorizing clues
<u>framing</u>	
make choices based on how question is posed (e.g., "gain" v. "loss" frame)	juror #3 views the evidence through the frame of the defendant's being a "dangerous killer," while juror #8 sees it through the defendant's being 19 years old and a victim of paternal abuse; juror #2 says the boy is guilty because "nobody proved otherwise"; juror #5 says the others should "take a few tips from people who come running here"
<u>availability</u>	
assume things more easily recalled are more likely (e.g., more recent, more easily categorized, more resonant with personal experience)	juror #11 is very concerned with the democratic process underlying jury service, because things were so different in the country from which he came; jurors who have once constructed a narrative of the boy's guilt have that narrative easily available to them, making it less likely that they will abandon their perception of guilt

Table 1: Examples of Individual Behavioral Biases in *12 Angry Men* (continued)

<u>EMOTIONAL</u>	
<u>loss aversion</u>	
prefer to avoid loss than achieve gains, even if must accept more risk	juror #7 wants to end deliberations quickly so he does not waste his theater tickets
<u>overconfidence</u>	
have a illusion of knowledge; take credit for successes (but see failures as bad luck)	juror #10: "Sure he lied!"
<u>status quo</u>	
prefer to do nothing--it's easier (inertia)	juror #3 would rather play tic-tac-toe than consider evidence
<u>self-control</u>	
prefer smaller payoffs now to larger payoffs later	juror #10 displays a lack of self-control when he allows his temper to flare up, satisfying his immediate need for emotional release over the broader goal of group cohesion
<u>endowment</u>	
value something more highly if already owned; prefer status quo, but not because of inertia	juror #7 may value his theater tickets more highly since he already has them
<u>regret avoidance</u>	
prefer to make no decision than one that might end badly; error of commission worse than error of omission	juror #8 is unwilling to send a boy off to die without some "talk"; other jurors' acceptance of eyewitness testimony allows them to "launder" responsibility (Heller, 2006)

This table gives descriptions of each of the individual behavioral biases covered in the paper, as well as examples from 12 Angry Men.

APPENDIX

This summary of the case in *12 Angry Men* comes from Vidmar, et al. (2007).

Around 8:00 p.m. on the evening of the murder, the defendant and his father had an argument. The father hit the defendant at least twice. The father apparently had hit the defendant many times prior to this night. Shortly after this violent encounter the defendant left the apartment.

The defendant, whose mother had died when he was nine, had a troubled past. He had been in reform school. At approximately midnight a woman who lived in an apartment across the elevated train tracks from the father's apartment awoke from her sleep. Through the windows of a noisy passing train, she saw a man stabbing the father in the chest. Immediately after the attack ended, the lights in the father's apartment went out. The woman called the police and identified the defendant as the assailant.

An old man who lived in the apartment below the father's apartment testified that at approximately the same time that the woman witnessed the stabbing, he heard the defendant yell "I'll kill you" and a "second" later heard a body hit the floor. He got up from his bed, went to the door, and saw the defendant running down the stairs.

The defendant returned to his father's apartment at approximately 3:00 a.m. in the morning. The police questioned him in the kitchen... He later testified at trial that he went to the movies alone at about 11:00 p.m., returning home at 3:00 a.m. to find the police in his father's apartment. He could not remember the titles of the movies or their plots and he could not identify any witnesses who saw him at the theater.

The defendant admitted that shortly after the 8:00 p.m. fight with his father he went to a store and bought an "unusual" switchblade knife that appeared identical to the one found embedded in his father's chest. ...[H]e lost the knife when it fell through a hole in his pocket.

REFERENCES

- Abramson, J. (2007) "Anger at Angry Jurors," *Chicago-Kent Law Review*, vol. 82(2), p. 591-611
- American Bar Association (2020) "In Response to Ramos v. Louisiana, All Verdicts in State Criminal Trials Will Now Require Unanimous Juries," American Bar Association, 7/24/20. Retrieved December 25, 2020 from the ABA Web site:
https://www.americanbar.org/groups/committees/death_penalty_representation/project_press/2020/summer/supreme-court-mandates-unanimity-in-state-criminal-trials/
- Astimow, Michael (2007) "*12 Angry Men*: A Revisionist View," *Chicago-Kent Law Review*, vol. 82(2), p. 711-716
- Babcock, B. A. and T. M. Sassoubre (2007) "Deliberation in *12 Angry Men*," *Chicago-Kent Law Review*, vol. 82(2), p. 633-642
- Barber, Brad M. and Terrance Odean (2001) "Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment," *Quarterly Journal of Economics*, vol. 116(1), p. 261-292
- Bharara, Preet (2019) *Doing Justice: A Prosecutor's Thoughts on Crime, Punishment, and the Rule of Law*, Alfred A. Knopf, New York
- Buchanan, David and Andrzej Huczynski (2004) "Images of Influence: *12 Angry Men* and *Thirteen Days*," *Journal of Management Inquiry*, vol. 13(4), December, p. 312-323
- Burnett, D. G. (2007) "Foreword," *Chicago-Kent Law Review*, vol. 82(2), p. 551-555
- Burns, R. P. (2007) "A Jury between Fact and Norm," *Chicago-Kent Law Review*, vol. 82(2), p. 643-660
- Devine, D. J., L. D. Clayton, B. B. Dunford, R. Seying, and J. Pryce (2001) "Jury Decision Making: 45 Years of Empirical Research on Deliberating Groups," *Psychology, Public Policy, and Law*, vol. 7(3), p. 622-727
- Ellsworth, P. C. and B. O'Brien (2009) "Prosecutorial Blind Spots: Features of the Adversarial Criminal Justice System That Promote Confirmation Bias," Society of Experimental Social Psychology, Annual Conference Paper, October, Portland, ME
- Fried, C. B. (1998) "Using *12 Angry Men* as an Integrative Review of Social Psychology," ERIC Clearing House Accession No. ED4200084, 9 pages
- Garfinkle, E. (2011) "Psychic Barriers to Truth in *Twelve Angry Men*," *Canadian Journal of Psychoanalysis*, vol. 19(1), May, p. 169-184
- Gertner, N. (2007) "*12 Angry Men* (and Women) in Federal Court," *Chicago-Kent Law Review*, vol. 82(2), p. 613-625
- Hans, V. P. (2007) "Deliberation and Dissent: *12 Angry Men* Versus the Empirical Reality of Juries," *Chicago-Kent Law Review*, vol. 82(2), p. 579-589
- Hay, B. L. (2007) "Charades: Religious Allegory in *12 Angry Men*," *Chicago-Kent Law Review*, vol. 82(2), p. 811-861

Heller, K. J. (2006) "The Cognitive Psychology of Circumstantial Evidence," *Michigan Law Review*, vol. 105(2), November, p. 241-305

Hoffman, M. B. (2007) "The Myth of Factual Innocence," *Chicago-Kent Law Review*, vol. 82(2), p. 663-690

Jimeno-Bulnes, M. (2007) "A Different Story Line for 12 Angry Men: Verdicts reached by Majority Rule—The Spanish Perspective," *Chicago-Kent Law Review*, vol. 82(2), p. 759-775

Kahneman, D. (2011) *Thinking Fast and Slow*, Farrar, Straus, and Giroux, New York

Kahneman, D. and A. Tversky (1979) "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, vol. 47. no. 2, March, p. 263-291

Landsman, S. (2007) "Mad about 12 Angry Men," *Chicago-Kent Law Review*, vol. 82(2), p. 749-758

Lo, A. W. (2017) *Adaptive Markets: Financial Evolution at the Speed of Thought*, Princeton University Press, Princeton, N.J.

Lo, A. W. (2005) "Reconciling Efficient Markets with Behavioral Finance: The Adaptive Markets Hypothesis," *Journal of Investment Consulting*, vol. 7(2), p. 21-44

MacCoun, R. J. (2012) "The Burden of Social Proof: Shared Thresholds and Social Influence," *Psychological Review*, vol. 119(2), p. 345-372

Marder, N. S. (2007a) "Introduction to the 50th Anniversary of 12 Angry Men," *Chicago-Kent Law Review*, vol. 82(2), p. 557-576

Marder, N. S. (2007b) "The Banality of Evil: A Portrayal in 12 Angry Men," *Chicago-Kent Law Review*, vol. 82(2), p. 887-899

McCambridge, J. (2003) "12 Angry Men: A Study in Dialogue," *Journal of Management Education*, vol. 27(3), June, p. 384-401

Nofsinger, J. R. (2014) *The Psychology of Investing*, 5th ed., Pearson, Boston, MA

Papke, D. R. (2007) "12 Angry Men is Not an Archetype: Reflections on the Jury in Contemporary Popular Culture," *Chicago-Kent Law Review*, vol. 82(2), p. 735-748

Pompian, M. M. (2014a) "The Behavioral Finance Perspective," *Behavioral Finance, Individual Investors, and Institutional Investors*, CFA Program Curriculum, Level III, vol. 2

Pompian, M. M. (2014b) "The Behavioral Biases of Individuals," *Behavioral Finance, Individual Investors, and Institutional Investors*, CFA Program Curriculum, Level III, vol. 2

Pompian, M. M., C. McLean, and A. Byrne (2014) "Behavioral Finance and Investment Processes," *Behavioral Finance, Individual Investors, and Institutional Investors*, CFA Program Curriculum, Level III, vol. 2

Prince, N. and J. Jackson (2005) *Exploring Theater*, McGraw-Hill, New York

Proctor, R. F. II (1991) "Teaching Group Communication with Feature Films," Proceedings of the Annual Meeting of the Speech Communication Association, Atlanta, GA, November 1

Rose, R. (1954) *12 Angry Men*, teleplay for Westinghouse Studio One, initially aired September 20, 1954

Shefrin, H.M. and .R. Thaler (1981) "An Economic Theory of Self-Control," *The Journal of Political Economy*, vol. 89(2), p. 392-406

Simon, H. A. (1972) "Theories of Bounded Rationality," in *Decision and Organization*, C.B. McGuire and Roy Radner, eds., North-Holland Publishing

Statman, M. (2017) *Finance for Normal People: How Investors and Markets Behave*, Oxford University Press, New York

Sunstein, C. R. (2007) "Group Polarization and *12 Angry Men*," *Negotiation Journal*, October, p. 443-447

The Week (2021) "A Juror's View of Chauvin's Trial," People section, May 14

Tversky, A. and D. Kahneman (1974) "Judgment under Uncertainty: Heuristics and Biases," *Science*, vol. 185, p. 1124-1131

Vidmar, N., S. S. Beale, E. Chemerinsky, and J. E. Coleman, Jr. (2007) "Was He Guilty as Charged? An Alternative Narrative Based on the Circumstantial Evidence from *12 Angry Men*," *Chicago-Kent Law Review*, vol. 82(2), p. 691-710

Weisselberg, C. D. (2007) "Good Film, Bad Jury," *Chicago-Kent Law Review*, vol. 82(2), p. 717-731

ACKNOWLEDGMENTS

The author acknowledges the very helpful comments of two anonymous reviewers and of the editor. She is also very grateful to Mr. Delba A, King, Jr., who provided thoughtful comments and insights into this research.

BIOGRAPHY

Lynda S. Livingston is a professor of finance at the University of Puget Sound in Tacoma, Washington. She is also a founder of the financial not-for-profit, Four Horsemen Investments.