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Who Likes Jargon? The Joint Effect of Jargon Type and Industry Knowledge on Investors' Judgments

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ABSTRACT: We experimentally investigate how jargon affects investment willingness for investors with different industry knowledge, and whether such effects vary with good or bad jargon. We find that for investors *without* industry knowledge, jargon decreases investment willingness because it decreases understanding. However, for investors with *some but low* industry knowledge, jargon increases investment willingness because it increases perceived product premium. Such effects exist whether good or bad jargon is used. Finally, investors with *high* industry knowledge differentiate between good and bad jargon, and reduce investment willingness only when bad jargon is used. These findings have implications for regulators, managers, and investors.

JEL Classification: D83, M41

Keywords: jargon; industry knowledge; good jargon; bad jargon.

1. Introduction

Jargon, which refers to the use of technical or obscure language (Merriam-Webster, 2003), is an important feature that affects the readability of management disclosures (Bonsall et al., 2017). The amount of jargon used in management disclosures varies among companies, and such variations exist even among companies in the same industry with similar business models and product lines.¹ In this study, we investigate how the use of jargon in management disclosures alters investors' willingness to invest in a stock. Specifically, we investigate whether the effect of jargon on investment judgments varies with investors' industry knowledge, and whether such effects are contingent on the type of jargon (good jargon versus bad jargon).

The U.S. Securities and Exchange Commission (SEC)'s Plain English Handbook (SEC, 1998) states that jargon makes it difficult for investors to understand management disclosures. This is consistent with survey findings that too much jargon gets in the way of clarity and makes information hard to understand for non-professional investors (SEC, 2009), a sentiment also shared by professional investors (FRC, 2009; KPMG, 2013). While the SEC's Plain English Handbook (SEC, 1998) suggests that managers avoid business and technical jargon in their disclosures, managers have not limited their use of jargon (Accounting WEB, 2011). One possibility for managers' use of jargon is that they intend to signal their competence and expertise to attract more investment. This is possible as psychological research shows that people consider jargon a signal of an author's expertise (Sawyer et al., 2008) and believe that complex words are indicative of a more intelligent author (Pennebaker and King, 1999). Given these competing views, it is important to examine whether and how management's use of jargon affects investor judgment.

One factor that could potentially moderate the effect of jargon is investors' industry knowledge, as previous research suggests that knowledge is an important factor that affects judgment and decision making (Ericsson and Lehman, 1996; Ericsson and Smith, 1991; Frederick and Libby, 1986; Libby and Luft, 1993). Communication research suggests that jargon is perceived differently by different readers. Specifically, readers who have the knowledge to

¹ For example, in Ocular Therapeutics' management's disclosure and analysis (MD&A), it uses jargon such as "our bioresorbable hydrogel-based product candidates are designed to provide sustained delivery of therapeutic agents to the eye." In contrast, Avalanche Biotechnologies uses less jargon in its MD&A (e.g., "we have leveraged our next-generation gene therapy platform to create a pipeline of product candidates"). See Appendix A for more details.

understand jargon can adapt to it better than others (Hirst, 2003). For example, sell-side analysts who have high industry knowledge are more likely to understand management's use of jargon (Brown et al., 2015), which helps them come up with more informative earnings forecasts and stock recommendations, receive more competitive compensation, and provide more insights for buy-side clients (Brown et al., 2016; Clement, 1999; Jacob et al., 1999). In contrast, investors or other financial statement users who do not have sufficient industry knowledge may have difficulty understanding jargon or even be misled by management's use of jargon. Given that financial statement users with various levels of industry knowledge often coexist in many firms, understanding how the impact of jargon varies with investors' industry knowledge will help managers make better disclosure choices.

Another factor that could influence the effect of jargon is jargon type. According to the definitions of jargon in Merriam-Webster (2003), there are two types of jargon: (1) the technical terminology or characteristic idiom of a special activity or group; and (2) obscure and often pretentious language marked by circumlocutions and long words. Nash (1993) distinguishes the "uses" and "abuses" of jargon, whereby the term "uses" means the legitimate use of jargon (also known as shop talk or good jargon), and the term "abuses" means the pretentious use of jargon (also known as show talk or bad jargon). Despite the fact that jargon can be good or bad (Hirst, 2003), capital market regulators seem to have concerns over jargon at a generic level, without differentiating between the uses and abuses of jargon. However, some investors (especially those with high industry knowledge) may well appreciate good jargon, which is, on occasions, "a necessary evil" to facilitate efficient and precise communication of technical knowledge (Rickard, 1908). Thus, it is important for managers to understand the different effects of good and bad jargon on investors' judgments to facilitate information dissemination and attract more capital market investment.

Building on communication and psychological research, we expect that jargon affects not only investors' feeling of difficulty in processing information (i.e., processing disfluency) but also their comprehension (i.e., understanding) of information (Nash, 1993; Oppenheimer, 2006).²

² Processing disfluency is conceptually distinct from understanding (Tan et al., 2015). While processing disfluency is an individual's subjective feeling of difficulty in processing information (Winkielman et al., 2012), understanding is an individual's mental grasp of the meaning of the text content (Flood, 1984; Miele and Molden, 2010). For example, for an individual without accounting or finance background, the term 'book-to-market' is easier to process

Furthermore, we expect that the impact of jargon varies with investors' industry knowledge. Tybout et al. (2005) suggest that when task-relevant knowledge is not-at-all accessible or highly accessible, individuals' judgments tend to be based on information content. In contrast, when task-relevant knowledge is between these two extremes of accessibility, processing disfluency is considered to be diagnostic and has a larger impact on individuals' judgments. Accordingly, we classify investors into three groups: investors without industry knowledge, investors with some-but-low industry knowledge, and investors with high industry knowledge.

Investors without industry knowledge naturally cannot understand jargon due to their lack of the requisite industry knowledge. The use of jargon in management disclosures and the associated difficulty these investors experience when they try to process jargon provide an immediate reminder to these investors that they lack knowledge about the topic. This reduces their understanding, and correspondingly, investment willingness. Since investors without industry knowledge cannot distinguish good jargon from bad jargon, we expect that jargon (regardless of whether it is good or bad jargon) will reduce investment willingness for investors without industry knowledge. We also expect that investors with some-but-low industry knowledge will experience difficulty when they try to process jargon in management disclosures. However, given that these investors have some knowledge about the industry, they are less likely to attribute the processing difficulty they experience to their insufficient level of industry knowledge. Instead, these investors tend to believe their feelings of difficulty in processing information are diagnostic about the specialized nature of the company. As jargon reinforces the unfamiliarity that is expected for a highly specialized company and leads to higher perceived product premium, we expect that jargon (regardless of whether it is good or bad jargon) will result in greater investment willingness for investors with some-but-low industry knowledge. Last, while we do not expect investors with no or little industry knowledge to be able to differentiate between good and bad jargon, we predict that investors with high industry knowledge can easily access industry knowledge to understand jargon. As a result, they can assess whether management's use of jargon is good or bad, and reduce investment willingness only when bad jargon is used.

as it is a combination of two seemingly plain words, 'book' and 'market.' However, it is difficult to understand what the term actually means.

To examine the joint effect of jargon type and investors' industry knowledge on investors' judgments, we conduct a 3 (investors without industry knowledge *versus* investors with some-but-low industry knowledge *versus* investors with high industry knowledge) $\times$ 4 (no jargon *versus* good jargon alone *versus* bad jargon alone *versus* both-good-and-bad jargon) between-participants experiment, with Professional MBA (PMBA) students from a U.S. university as participants. One important feature of the PMBA program is that a large proportion of its students have educational backgrounds or working experience in the biomedical or biotech industry. Hence, we design our case based on a real biotech company's Initial Public Offering (IPO) prospectus summary. We first consult an expert in the field when designing the jargon manipulation and further validate the jargon manipulation with a panel of experts. We measure industry knowledge based on the number of biology, biomedicine, and other related courses that participants have taken. Finally, we ask participants to indicate their willingness to invest in the stock and the attractiveness of the stock, and we use the average of these two measures as our main dependent variable—investment willingness.

We conduct an analysis of variance (ANOVA) test with jargon type and industry knowledge as the independent variables and investment willingness as the dependent variable. The interaction effect of jargon type and industry knowledge is significant, suggesting that the impact of jargon on investment willingness is contingent on industry knowledge. We then conduct separate contrast tests for investors with various levels of industry knowledge. In terms of investors without industry knowledge, we find that investment willingness is the highest in the no jargon condition, followed by the good or bad jargon alone condition, and the lowest in the both-good-and-bad jargon condition, consistent with our prediction that jargon (regardless of whether it is good or bad) reduces investment willingness. To understand the underlying causal mechanism, we conduct a mediation analysis and find that jargon reduces these investors' investment willingness because it decreases their understanding. In contrast, with respect to investors with some-but-low industry knowledge, investment willingness is the lowest in the no jargon condition, followed by the good or bad jargon alone condition, and the highest in the both-good-and-bad jargon condition. This result is consistent with our prediction that jargon (regardless of whether it is good or bad) increases investment willingness. Furthermore, the mediation analysis indicates that jargon makes these investors accord more premium toward the company's products, which in turn increases their investment willingness. Last, in terms of

participants with high industry knowledge, we find that only the presence of bad jargon (rather than the presence of good jargon) decreases investment willingness. The mediation analysis suggests that investors lower investment willingness because the use of jargon is perceived to be unnecessary.

Additional analysis on content recall suggests that for investors with no or little industry knowledge, jargon (regardless of whether it is good or bad) prevents them from processing management disclosures. In contrast, for those with high industry knowledge, we find that while good jargon facilitates their information processing, bad jargon does not. Furthermore, our credibility results show that while investors with no or little industry knowledge perceive managers to be more credible when more jargon is used, investors with high industry knowledge do not perceive credibility differently based on the use of jargon. Last, given that managers often vary both jargon and syntactic complexity (e.g., the use of short sentences, active voice, and bullet points/tabular formats) in their disclosures (Bonsall et al., 2017), we conduct another experiment to investigate whether the joint effect of jargon and industry knowledge on investor judgment varies with syntactic complexity. We find that the effect of jargon on investors with low industry knowledge is dampened when syntactic complexity is higher than when it is lower. However, the effect of jargon on investors with high industry knowledge does not vary with levels of syntactic complexity.

Our study contributes to the recent accounting literature that identifies jargon as an important linguistic attribute but has not examined its impact on investors' judgments (Bonsall et al., 2017). We propose and demonstrate that the use of jargon in management disclosures can lead to either positive or negative investor reaction, which is contingent on jargon type and investors' industry knowledge. Regarding investors with little industry knowledge or those without industry knowledge, jargon type does not matter, but the presence of jargon affects these investors in opposite directions. Specifically, we find that while the presence of jargon decreases investment willingness for investors without industry knowledge, it increases investment willingness for investors with some-but-low industry knowledge. These findings counter the SEC's assumption that investors with different levels of knowledge behave similarly to jargon (SEC, 1998), and suggest that it is important to consider investors' industry knowledge when determining the use of jargon in management disclosures. In contrast, jargon type matters for

investors with high industry knowledge; they reduce their investment willingness only when bad jargon is used.

In addition, our paper demonstrates that jargon could affect investors' judgments through either understanding or processing disfluency, which is determined by investors' industry knowledge. Investors with high industry knowledge can understand jargon and assess whether jargon is good or bad, and thus form their investment judgments based on their assessments of the appropriate use of jargon. Investors without industry knowledge make investment judgment based on the extent to which they can understand management disclosures containing jargon. In contrast, investors with some-but-low industry knowledge have difficulty telling the source of disfluency they experience, causing them to believe disfluency is diagnostic about the message conveyed in management disclosures and thus rely more on processing disfluency to make their judgments. This could reflect a heuristic judgment strategy that investors with some-but-low industry knowledge adopt, resulting in potentially irrational behavior such as overly optimistic reactions to management disclosures containing jargon (Ljungqvist, 2007).

Last, our study provides some evidence consistent with the information asymmetry explanation for IPO underpricing. As a result of the strict disclosure rules in the U.S., IPO underwriters and issuers face considerable risk of litigation if material facts in IPO prospectuses are misstated or omitted (Ljungqvist, 2007; Lowry and Shu, 2002). In order to minimize litigation risk and communicate industry-specialized information more precisely and accurately, underwriters and issuers may intentionally choose to use jargon in IPO prospectuses, which could exaggerate the information asymmetry problem. According to the information asymmetry explanation for IPO underpricing (Ritter 1984; Beatty and Ritter 1986), if underwriters and issuers anticipate that uninformed investors will avoid investing in the stock when information asymmetry is high, they have to underprice IPO stocks to encourage more investment from such investors (Rock, 1986). Consistent with the anticipations of underwriters and issuers, we find that the presence of jargon (which increases information asymmetry) does reduce the investment willingness for investors without industry knowledge. In addition, when bad jargon makes information vague, complicated, and pretentious (Hirst, 2003), resulting in larger information asymmetry, we find that investors with high industry knowledge will also reduce investment willingness. Overall, our results suggest that investment willingness is lower for both uninformed

and informed investors when information asymmetry is higher in the presence of jargon (Habib and Ljungqvist, 2001).

The next section reviews related literature and develops our hypotheses. Section 3 describes the research design and experimental procedure. Section 4 presents the results. Section 5 concludes.

2. Theory and Hypotheses

Communication research classifies jargon into two categories: well-used jargon and badly-used jargon (Hirst, 2003).³ Jargon is well used when it is well adapted to its audience and necessary to achieve the goal of efficient and precise communication. In contrast, jargon is badly used when it is ill-adapted to its audience or whenever jargon is excessive or unnecessary (Hirst, 2003). Following this argument, we identify two factors that could affect investors' perceptions of jargon and their subsequent investment decisions: (1) jargon type, which relates to whether the jargon used in management disclosures is necessary (hereafter, good jargon) or unnecessary (hereafter, bad jargon); and (2) investors' industry knowledge, which determines whether the use of jargon in management disclosures is well- or ill-adapted to its audience. We classify investors' industry knowledge into three levels: no industry knowledge, some-but-low industry knowledge, and high industry knowledge, and consider investors to be those with higher industry knowledge if they have accumulated knowledge in an industry via more education experience or more related working experience.

While communication research suggests that jargon can affect people's understanding of information (Nash, 1993), psychological research indicates that jargon can also affect an individual's subjective feeling about how difficult it is to process information, i.e., processing disfluency (Oppenheimer, 2006). Recent disfluency research shows that individuals with different personal backgrounds or attributes can have different perceptions when they experience disfluency (Galak and Nelson, 2011; Hélène et al., 2013; Labroo et al., 2009; Miele and Molden, 2010). Oppenheimer (2008) suggests that how processing disfluency is interpreted depends on

³ In addition to the classification of well- versus badly-used jargon, Hirst (2003) also classifies jargon into well versus ill-formed jargon (i.e., bad formation, intervention or metaphorical application of technical terms). He then defines good jargon as language that is well formed and well used, and bad jargon as language that is either ill-formed or badly used. In our study, we do not vary how jargon (good or bad) is structured or formed in the communication, and thus our discussion will focus only on the good or bad use of jargon.

people's naïve theories of what fluency represents. More importantly, psychological studies show that people do not use processing disfluency as a cue for their judgment when its informational value is called into question; for example, when processing disfluency is easily traced back to one's own state of knowledge (Schwarz, 2004). Specifically, Tybout et al. (2005) suggest that when task-relevant knowledge is either not at all accessible or highly accessible, individuals' judgments are based on information content. However, when task-relevant knowledge is between these two extremes of accessibility, judgments are based on processing disfluency. Below, we discuss how different types of jargon affect investors with no industry knowledge, some-but-low industry knowledge, and high industry knowledge, respectively.

2.1. Investors without Industry Knowledge

According to Tybout et al. (2005), when task-relevant knowledge is not at all accessible, individuals tend to attribute the subjective feeling of difficulty in information processing (i.e., processing disfluency) to their lack of knowledge. In our context, we expect that investors without industry knowledge will experience difficulty in understanding the content when they are exposed to jargon in management disclosures. Exposure to jargon and the associated difficulty remind them that they do not have the required knowledge related to the industry. This reduces their understanding of the content they read, and decreases their investment willingness. Moreover, due to their lack of industry knowledge, we do not expect these investors to be able to assess whether the use of jargon is good or bad in management disclosures; hence, holding constant the amount of jargon usage, we predict similar effects when either bad jargon or good jargon is present. In other words, we expect these investors to react merely to the presence of jargon rather than the type of jargon. Accordingly, we predict that investment willingness is higher when either good or bad jargon is absent, but lower when either good or bad jargon is present.

Our predictions above do not distinguish between whether the judgment effects of bad jargon occur in isolation (i.e., there is only bad jargon but no good jargon present) or in the concurrent presence of good jargon (i.e., there is both good and bad jargon), and vice versa in the case of the judgment effects of good jargon. In the case of investors without industry knowledge, our premise is that these investors cannot differentiate between good and bad jargon. However, a practical reality when both good and bad jargon is used is that the amount of jargon usage is also

likely to increase relative to the use of either jargon alone. The reason for this is that bad jargon often involves the inclusion of highly-technical firm-specific terms (e.g., “our basal medium optimization technology”) with no corresponding good-jargon equivalent (i.e., the alternative is to simply refer to “our technology”). As a result, including both good and bad jargon in management disclosures can increase the amount of jargon used. In this case, compared to a disclosure containing either bad jargon or good jargon alone, a disclosure that has both good and bad jargon will be construed by investors without industry knowledge to be one that has more jargon and that is less understandable. Accordingly, we predict that the effects of either bad or good jargon in isolation will be magnified in the presence of both good and bad jargon, which essentially involves more jargon.⁴ Combined, our first hypothesis is formally stated as follows:

H1: Investment willingness for investors without industry knowledge is highest in the absence of jargon, followed by the presence of either bad or good jargon alone, and lowest in the presence of both bad and good jargon.

2.2. Investors with Some-but-Low Industry Knowledge

Based on Tybout et al. (2005), when task-relevant knowledge is between the extreme of not at all accessible and the extreme of highly accessible, the cause of processing disfluency cannot be easily attributed to the state of knowledge. As a result, individuals tend to believe processing disfluency to be informative about the target object, and they rely on it to make their judgments. In our study, investors with some-but-low industry knowledge likely feel difficulty in processing management disclosures, but they are reluctant to attribute such difficulty to their insufficient levels of knowledge. Rather, these investors tend to believe their feelings of difficulty has information value for their investment judgments.

Psychological studies suggest that people may prefer processing disfluency when they read descriptions of special or unique products (Pocheptsova et al., 2010). Specifically, Pocheptsova et al. (2010) find that while people prefer an easy-to-process description to a difficult-to-process description for an everyday cheese product, their preferences reverse for a special occasion cheese product as the difficulty of processing matches the feelings of the

⁴ Similarly, given that investors without industry knowledge do not distinguish bad jargon from good jargon, we also predict a decrement in investment willingness for these investors if there is more versus less good jargon (or more versus less bad jargon).

uniqueness of the product. In a similar experiment with an advertisement for chocolate truffles, the authors measure consumers' agreement on whether they think chocolate truffles are for special occasions. They find that difficult-to-read advertisements increase purchase intentions for people who believe that chocolate truffles are for special occasions, but not for people who do not believe so. The above discussion suggests that processing disfluency plays an important role in peoples' perceptions of a product and that the interpretation of processing disfluency depends on whether they expect the product to be special and unique.

Since investors with some-but-low industry knowledge are not that familiar with industry matters and related technology development, they are more likely to perceive the company's product or technology to be unique and special. Accordingly, we expect that investors with some-but-low industry knowledge will interpret processing disfluency as a positive signal of the company's product. Specifically, these investors' expectations of highly specialized products are reinforced by their feelings of disfluency arising from management's use of jargon, resulting in stronger perceptions that the product is superior and unique. Porter (1985) suggests that superior and unique products create competitive advantages for firms and thereby command a price premium (hereafter, product premium). Such superiority and uniqueness are recognized by the market and are the reasons why customers might choose one product over another (Porter, 1985). As a result, we predict that more jargon increases perceptions of product premium for investors with some-but-low industry knowledge, which in turn increases their investment willingness.

In addition, given the insufficient level of industry knowledge, we do not expect investors with some-but-low industry knowledge to be able to assess whether the use of jargon is good or bad in management disclosures. Accordingly, we predict that investment willingness will be higher in the presence of jargon than in its absence and that this prediction holds for either bad jargon or good jargon. However, as discussed in Section 2.1, when both good and bad jargon is used, investors are likely to feel that the total amount of jargon increases, which will magnify the effects of bad jargon alone or good jargon alone.⁵ We formally state our second hypothesis as follows:

⁵ Likewise, as investors with some-but-low knowledge do not differentiate between good and bad jargon, we predict that investment willingness for these investors will be higher in the presence of more versus less good jargon (or more versus less bad jargon).

H2: Investment willingness for investors with some-but-low industry knowledge is lowest in the absence of jargon, followed by the presence of either bad or good jargon alone, and highest in the presence of both bad and good jargon.

2.3. Investors with High Industry Knowledge

Following Tybout et al. (2005), who suggest that individuals' judgments are based on information content when task-relevant knowledge is highly accessible, we expect that investors with high industry knowledge will make their judgments based on their assessments of management's use of jargon in their disclosures. Since investors with high industry knowledge can understand jargon contained in management disclosures, they are able to assess whether the jargon used is good or bad. While the use of jargon is well-adapted for investors with high industry knowledge, the excessive or unnecessary use of jargon could still be considered as "bad jargon" (Hirst, 2003). In psychological research, Oppenheimer (2006) also finds that using needlessly long words has a negative impact on evaluations of the authors' competence. He also provides evidence that individuals give lower evaluations for essays with needlessly long words because these essays are unnecessarily difficult to read. Hence, we predict that investors with high industry knowledge will consider bad jargon to be unnecessary and that their investment willingness will decrease when bad jargon is present.

Because investors with high knowledge disdain management's use of bad jargon, these investors likely react negatively in the bad jargon condition compared to the no jargon condition. In fact, the mere presence of bad jargon, regardless of whether good jargon is present or not, is likely sufficient to induce negative judgments among these investors. Note that this prediction holds even when the total amount of jargon usage increases in the presence of both good and bad jargon, since investors with high industry knowledge are expected to react to the mere presence of bad jargon. Hence, we expect that the presence of both bad and good jargon will not magnify the impact of bad jargon alone for investors with high industry knowledge. We formally state our H3a as follows:

H3a: Investment willingness for investors with high industry knowledge is higher in the absence of jargon than in the presence of bad jargon, regardless of the presence or absence of good jargon.

There is ambiguity in terms of how good jargon affects investment willingness for investors with high industry knowledge. On one hand, these investors may recognize the communication efficiency associated with the use of good jargon and place a premium on firms that are able to judiciously utilize such good jargon in their disclosures. On the other hand, it may also be that these investors expect such good jargon to be used, and therefore no premium is placed when managers use such good jargon. As a result, we do not make a directional prediction on the incremental effect of good jargon versus no jargon on the investment willingness for investors with high industry knowledge.

Recall that in H3a, we predict that investors with high industry knowledge will have lower investment willingness in the presence of both bad and good jargon compared to the case when no jargon is present. Given that we do not expect a difference between no jargon and the presence of good jargon alone, we expect the presence of both bad and good jargon (i.e., a situation where bad jargon is present) will result in lower investment willingness compared to the good jargon alone condition as well. We formally state H3b as follows:

H3b: Investment willingness for investors with high industry knowledge is higher in the presence of good jargon alone compared to the presence of both bad and good jargon.

3. Experiment

3.1. Participants and Case Material

We recruit 284 PMBA students from a major U.S. university to participate in our experiment. Each participant is compensated with a \$20 Amazon Gift Card. On average, our participants have taken 2.47 accounting courses and 2.26 finance courses, and they have 7.25 years of work experience. About 88 percent of them have previously read annual reports and/or earnings releases. These attributes are comparable to the retail investors recruited in Elliott et al. (2007), who have taken an average of 1.9 accounting courses and 1.6 finance courses, and 97 percent of them have previously evaluated financial statements. Hence, our PMBA participants are appropriate proxies for investors.

One feature of the PMBA program from which we recruit participants is that a large proportion of its students are doctors, physicians, or people who hold Doctor of Medicine (MD), biology, or chemistry degrees. Thus, we capitalize on this unique feature of the program, and design our case based on a real biotech company, given the increasing importance of healthcare

companies in the capital market.⁶ Specifically, we provide participants with a biotech company's initial public offering (IPO) prospectus summary, which describes the company's products and business model.⁷ After reading the IPO prospectus summary, participants first indicate their willingness to invest, and then answer a series of debriefing questions, manipulation check questions, and demographic questions such as those used to measure industry knowledge. Below, we discuss how we measure participants' industry knowledge, and how we manipulate jargon in the content of the IPO prospectus summary.

3.2. Industry Knowledge

Following prior accounting studies on knowledge and expertise (Tan et al. 2014), we measure participants' knowledge in the biotech industry based on the total number of bio-courses they have taken (e.g., biology, biomedicine, or other related courses), which ranges from 0 to 40, with a median of 1.00 and a mean of 5.00. We then split participants into three groups: investors with no industry knowledge, those with some-but-low industry knowledge, and those with high industry knowledge. Specifically, we have 92 participants (32.39%) who have not taken any bio-courses and are classified as investors without industry knowledge; 91 participants (32.04%) who have taken one or two bio-courses and are classified as investors with some-but-low industry knowledge; and 101 participants (35.56%) who have taken at least three bio-courses and are classified as investors with high industry knowledge. The average numbers of bio-courses for the no knowledge, some-but-low knowledge, and high knowledge groups are 0.00, 1.34, and 12.85, respectively, and they are significantly different from one another ($F_{2, 281} = 161.70$, $p < 0.01$).

In addition, we ask participants to self-assess their levels of knowledge on issues related to stem cells on an 11-point scale with "0" indicating "very low" and "10" indicating "very high." The mean rating is significantly different among the three groups of investors (3.20 for investors

⁶ As of September 30, 2016, the number of healthcare companies (646) accounts for 21% of the total number of companies listed in NASDAQ, and the market value of healthcare companies (\$1.06 trillion) is approximately 12% of the total market value of NASDAQ. Similarly, 12% of the market value of NYSE comes from healthcare companies (\$2.97 trillion).

⁷ In addition, to mimic the real IPO prospectus summary, we add a cautionary notice that the prospectus is not a guarantee of future performance and may involve significant risks and uncertainties and that actual results may vary materially from those in the prospectus because of various factors. Also, the cautionary notice states that the company's management can promote the offering via a series of roadshow presentations at financial centers where investors can learn more about the company.

with no knowledge *versus* 3.89 for investors with some-but-low knowledge *versus* 6.01 for investors with high knowledge; $F_{2, 281} = 34.12, p < 0.01$). To further confirm that investors have different levels of industry knowledge, we ask participants to answer three multiple choice questions regarding stem cells. We find a significant difference in the number of correct answers among the three groups of investors (1.53 for investors with no knowledge *versus* 1.71 for investors with some-but-low knowledge *versus* 2.19 for investors with high knowledge; $F_{2, 281} = 12.79, p < 0.01$).

In order to ensure that participants' investment experience does not vary with their industry knowledge, we ask participants to indicate their frequency of investment in the stock market, their frequency of reading companies' annual reports, and their frequency of reading companies' financial disclosures such as earnings announcements, on 11-point scales with "0" indicating "never" and "10" indicating "high frequency." We take the average of participants' responses to these three measures (Cronbach's $\alpha = 0.75$) and calculate a composite measure capturing participants' investment experience. Our results show that there is no difference in investment experience among the no knowledge, some-but-low knowledge, and high knowledge groups (3.75 *versus* 3.94 *versus* 4.09; $F_{2, 281} = 0.56, p = 0.57$).

3.3.Jargon Manipulation

By manipulating the presence versus absence of good and/or bad jargon, we have four different conditions of jargon as follows: (1) no jargon—the absence of both good and bad jargon; (2) good jargon alone—the presence of good jargon and absence of bad jargon; (3) bad jargon alone—the presence of bad jargon and absence of good jargon; and (4) both-good-and-bad jargon—the presence of both good and bad jargon.

We first create the both-good-and-bad jargon version of the IPO prospectus summary by modifying an actual prospectus summary issued by a stem cell company. We modify the prospectus summary following Plain English Rules such as short sentences, simple sentence structures, and active voice along with table and bullet presentations (Loughran and McDonald, 2014; SEC, 1998). The prospectus summary contains a great amount of jargon (e.g., human parthenogenetic stem cell, human embryonic stem cell, and basal medium optimization technology) and a number of technical terms (e.g., cultivating, *in vitro*, similarly pluripotent, graft-related versus host-related disease, morphology, and absence of pathogens). We ask an

expert in the biotechnology industry to verify the appropriate use of these jargon terms and to classify those jargon into good and bad jargon.

To create the no jargon version, we ask the same expert to help us replace jargon and technical terms with easy-to-understand words and sentences. For example, in the no jargon condition, good jargon words such as “cultivating human stem cells,” “similarly pluripotent,” and “in vitro” are replaced by “growing human stem cells,” “potential to become virtually any cell in the human body,” and “generally outside their (cell’s) natural environment,” respectively, and bad jargon words such as “human parthenogenetic stem cell,” “human embryonic stem cell,” and “basal medium optimization technology” are replaced by “patented human stem cell,” “traditional human stem cell,” and “our technology,” respectively. Next, we create the good jargon alone version by keeping good jargon and replacing bad jargon with common language. In contrast, we keep the bad jargon and replace the good jargon with common language for the bad jargon alone version (see Appendix B, Panel A, for the comparison between good jargon and its corresponding common language, and Panel B for the comparison between bad jargon and its corresponding common language).

3.4. Validation of Jargon Manipulation

We ask a panel of experts to validate our manipulation of good jargon and bad jargon. The panel consists of fifteen investors recruited from a medical school.⁸ On average, the expert panel members have taken 22.00 bio-courses. We ask the expert panel members to read two versions of the IPO prospectus summary, one in the good jargon alone condition (labeled as version A) and the other in the bad jargon alone condition (labeled as version B), and indicate whether the following five statements are more applicable to Version A or Version B. The first three state that ISC's management uses jargon and technical terms to (1) make the prospectus summary a mouthful and disfluent; (2) communicate in an excessive and unnecessarily specific manner; and (3) make the summary pretentious, complicated, and vague. The last two statements state that (4) the jargon and technical terms used in the ISC's prospectus summary are more easily understood; and (5) ISC’s management communicates information precisely and efficiently. These questions

⁸ In order to make sure our expert panel participants have sufficient industry knowledge and investment experience, we ask participants to answer three multiple choice questions regarding stem cells. Only participants who correctly answer all three questions and have more than one year of experience in investing stocks can proceed with our expert panel study. Participants who complete our expert panel study are compensated with \$20 Amazon Gift Cards.

are captured on 11-point scales with “-5” indicating “definitely version A” and “5” indicating “definitely version B.” We find that for the first three questions, the mean ratings are 1.93, 1.87, and 1.67, respectively, which are significantly above the mid-point of “0” (smallest $p = 0.02$), suggesting that experts perceive that bad jargon is (1) more of a mouthful and more disfluent; (2) excessive and unnecessary; and (3) pretentious, complicated, and vague. In contrast, the mean responses for the last two questions are -1.93, and -1.67, which are significantly lower than the mid-point of “0” (smallest $p = 0.04$), suggesting that experts believe that (1) they can better understand good jargon; and (2) good jargon communicates information more precisely and efficiently. These results are consistent with the literature on jargon as well as our manipulation intention of good jargon and bad jargon. Also, they provide evidence that expert investors are able to differentiate between good jargon and bad jargon.⁹

4. Results

4.1. Hypothesis Testing

We measure participants’ investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest”; and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach’s Alpha = 0.94), and thus we use the average of these two measures as our main dependent variable—investment willingness.¹⁰

[Insert Table 1 and Figure 1 about here]

The descriptive statistics of investment willingness are presented in Table 1, Panel A, with a graphical illustration presented in Figure 1. We conduct a two-way ANOVA with the four jargon conditions and industry knowledge as the independent variables and investment willingness as

⁹ We also compare the demographic information of our participants in the high industry knowledge group with that of expert panel members. We find that there is no significant difference in the mean rating for the self-assessed level of knowledge on stem cells (6.73 for panel experts versus 6.01 for participants with high industry knowledge; $t = 0.90$, $p = 0.37$) and their investment experience (3.96 for panel experts versus 4.09 for participants with high industry knowledge; $t = -0.20$, $p = 0.84$). These results suggest that the average profile of our participants with higher industry knowledge is similar to that of the expert panel members in terms of industry knowledge and investment experience.

¹⁰ Our measure for investment willingness is a widely used variable in prior behavioral accounting papers. See Clor-Proell et al. (2016) and Tang and Venkataraman (2018) for examples.

the dependent variable. The ANOVA results are shown in Table 1, Panel B. We find a significant interaction effect of jargon and industry knowledge ($F_{6, 272} = 3.04, p = 0.01$), suggesting that the effect of jargon on investment willingness is contingent on industry knowledge. No other effects are significant (smallest $p = 0.26$).

4.1.1. Test of H1: The Effect of Jargon on Investors without Industry Knowledge

Our prediction for investors without industry knowledge is that investment willingness is higher when jargon is absent than when jargon is present, regardless of whether the type of jargon is bad or good. Further, when both good and bad jargon is present (i.e., the both-good-and-bad jargon condition), the negative impact of the presence of bad jargon alone or good jargon alone on investment willingness is magnified because the amount of jargon essentially increases. Combined, we therefore expect that investment willingness is the highest in the no jargon condition, followed by the good or bad jargon alone condition, and the lowest in the both-good-and-bad jargon condition. Since our hypotheses suggest a downward impact of jargon on investment willingness, we conduct a planned contrast test by weighting “+4” for the no jargon condition, “-1” for the good or bad jargon alone condition, and “-2” for the both-good-and-bad jargon conditions (Buckless and Ravenscroft, 1990; Guggenmos et al., 2018). As presented in Table 2, Panel A, the planned contrast is significant ($F_{1, 88} = 5.63, p = 0.01$, one-tailed), supporting our prediction.

Next, we perform a one-way, two-level nested model that compares the no jargon *versus* bad jargon alone *versus* both-good-and-bad jargon conditions.¹¹ As shown in Table 2, Panel B, we find that investment willingness is significantly higher when bad jargon is absent than when bad jargon is present (2.56 for the no jargon condition versus 1.33 for the average of two bad jargon-present conditions; $F_{1, 68} = 6.27, p < 0.01$, one-tailed). However, we do not find a significant difference between the bad jargon alone condition and the both-good-and-bad jargon

¹¹ Nested ANOVA is a more appropriate and powerful test, given that our experimental conditions exist in a hierarchical structure and the conditions are nested within one another (Doncaster and Davey, 2007). Specifically, our no jargon, bad jargon alone, and both-good-and-bad jargon conditions are structured by incrementally altering words from one condition to the next (i.e., adding bad jargon to the no jargon condition to create the bad jargon alone condition, and then adding good jargon to the bad jargon alone condition to create the both-good-and-bad jargon condition); the same structure applies to the no jargon, good jargon alone, and both-good-and-bad jargon conditions.

condition (1.63 versus 1.00; $F_{1, 68} = 1.12$, $p = 0.15$, one-tailed), although results are directionally consistent with the predicted pattern of cell means.

Last, we test a one-way, two-level nested model that compares the no jargon *versus* good jargon alone *versus* both-good-and-bad jargon conditions. As shown in Table 2, Panel C, we find that investment willingness is significantly higher in the absence of good jargon than in its presence (2.56 for the no jargon condition versus 1.69 for the average of two good jargon-present conditions; $F_{1, 65} = 5.01$, $p = 0.01$, one-tailed). In addition, investors report lower investment willingness in the both-good-and-bad jargon condition relative to the good jargon alone condition (1.00 versus 2.40; $F_{1, 65} = 9.13$, $p < 0.01$, one-tailed). Overall, with one exception, our results are generally consistent with the effect of jargon predicted in H1 for investors without industry knowledge.

[Insert Table 2 about here]

The development of H1 suggests that jargon reduces investment willingness for investors with no industry knowledge because it decreases the extent to which they can understand management's disclosures. We conduct a mediation analysis to test the underlying causal mechanism predicted in H1. We capture investors' understanding of management disclosures by asking participants to indicate the extent they can understand the company's prospectus summary on an 11-point scale with "0" labeled "do not understand at all" and "10" labeled "completely understand" (hereafter, disclosure-understanding). We conduct the mediation analysis with the presence of jargon ("0" for the no jargon condition and "1" for the rest of the three jargon-present conditions) as the independent variable, disclosure-understanding as the mediator, and investment willingness as the dependent variable. Following the biased-corrected bootstrapping method (Hayes, 2013; Preacher and Hayes, 2008), we use the Hayes PROCESS macro (Model 4) to estimate the path coefficients through 10,000 bootstrapped samples with a 90% confidence level. The results of mediation analysis are presented in Table 3 and are graphically depicted in Figure 2, Panel A.

[Insert Figure 2 and Table 3 about here]

Table 3, Panel A shows that the presence of jargon negatively affects disclosure-understanding (Link 1a; coefficient = -1.499, $p < 0.01$, one-tailed), which in turn leads to lower

investment willingness (Link 2a; coefficient = 0.348, $p < 0.01$, one-tailed). In addition, the direct link between the presence of jargon and investment willingness is not significant (Link 3a; coefficient = -0.374, $p = 0.39$), indicating that disclosure-understanding fully explains the effect of jargon on investment willingness (i.e., a full mediation). Table 3, Panel B presents the indirect effect of the presence of jargon on investment willingness through disclosure-understanding. We find that the 90% bootstrapped confidence interval (-0.958, -0.233) does not contain zero, suggesting that the indirect effect of jargon is significant at the (one-tailed) 5% level of significance.¹² Overall, the mediation results support our argument that for investors without industry knowledge, jargon reduces their investment willingness because it decreases their understanding of management disclosures.

4.1.2. *Test of H2: The Effect of Jargon on Investors with Some-But-Low Industry Knowledge*

Our prediction for investors with some-but-low industry knowledge is that they will lower investment willingness when jargon is absent in management disclosures compared to the case when jargon is present, regardless of whether jargon is bad or good. The effect of the presence of bad jargon alone or good jargon alone will be magnified in the presence of both bad and good jargon because the amount of jargon increases. Overall, we expect that investment willingness is the lowest in the no jargon condition, followed by the good or bad jargon alone condition, and the highest in the both-good-and-bad jargon condition. Given that our hypotheses suggest an upward impact of jargon for investment willingness, we conduct a planned contrast test with weights of “-4” for the no jargon condition, “+1” for the good or bad jargon alone condition, and “+2” for the both-good-and-bad jargon condition. Table 4, Panel A presents a significant planned contrast ($F_{1,87} = 3.96$, $p = 0.02$, one-tailed), consistent with our prediction.

Next, we test a one-way, two-level nested model that compares the no jargon *versus* bad jargon alone *versus* both-good-and-bad jargon conditions. As shown in Table 4, Panel B, we find that investors exhibit lower investment willingness in the absence of bad jargon than in its

¹² As a robustness test, we perform our mediation model by replacing “jargon-understanding” with “premium” or “unnecessary-jargon” (see the sections 4.1.2. and 4.1.3. for how we measure these mediators). When we use premium in place of jargon-understanding, the link between the presence of jargon and premium is insignificant ($p = 0.40$). Also, when we use unnecessary-jargon as a mediator, we find that while the link between the presence of jargon and unnecessary-jargon is significant ($p < 0.01$), the link between unnecessary-jargon and investment willingness is insignificant ($p = 0.34$), suggesting that disclosure-understanding is the only mediator for investors without industry knowledge.

presence (0.93 for the no jargon condition versus 2.16 for the average of the two bad jargon-present conditions; $F_{1,66} = 4.23$, $p = 0.02$, one-tailed). However, the bad jargon alone condition is not significantly different from the both-good-and-bad jargon condition (1.85 versus 2.48; $F_{1,66} = 0.84$, $p = 0.18$, one-tailed), although cell means are directionally consistent with our prediction.

Last, we test a one-way, two-level nested model that compares the no jargon *versus* good jargon alone *versus* both-good-and-bad jargon conditions. As shown in Table 4, Panel C, we find that investment willingness is lower when good jargon is absent versus when it is present (0.93 for the no jargon condition versus 1.88 for the average of the two good jargon-present conditions; $F_{1,65} = 2.87$, $p = 0.05$, one-tailed). Further, our results show that the presence of both good and bad jargon significantly increases investment willingness relative to the presence of good jargon alone (2.48 versus 1.25; $F_{1,65} = 3.70$, $p = 0.03$, one-tailed). Overall, with one exception, our results are broadly consistent with the effect of jargon predicted in H2 for investors with some-but-low industry knowledge.

[Insert Table 4 about here]

In developing H2, we argue that jargon increases investment willingness because it increases investors' perceived product premium. We ask two questions that are intended to proxy for this construct: the extent they feel the company's technology and products are (1) superior and (2) unique. Both questions are measured on 11-point scales with "-5" labeled "not at all" and "5" labeled "extremely." The two measures are correlated (Pearson Correlation = 0.57, $p < 0.01$; Cronbach's Alpha = 0.65), and thus we use the average of the two responses as our measure of participants' perceived product premium (hereafter, premium). To conduct the mediation analysis, we use the Hayes Process Model to run 10,000 bootstrapped samples with a 90% confidence level, where the presence of jargon ("0" for the no jargon condition and "1" for the rest of the three jargon-present conditions) as the independent variable, premium as the mediator, and investment willingness as the dependent variable. Our mediation model and its results are presented in Table 5 and graphically represented in Figure 2, Panel B.

[Insert Table 5 about here]

As shown in Table 5, Panel A, we find that the presence of jargon has a significant effect on premium (Link 1b; coefficient = 1.286, $p = 0.02$, one-tailed), and premium has a positive impact on investment willingness (Link 2b; coefficient = 0.620, $p < 0.01$, one-tailed). The direct link between jargon and investment willingness is insignificant (Link 3b; coefficient = 0.135, $p = 0.73$), indicating that premium fully explains the effect of jargon on investment willingness (i.e., a full mediation). More importantly, as presented in Table 5, Panel B, we find a significant indirect effect of jargon on investment willingness through premium, with a 90% confidence interval not including zero (0.229, 1.401). Overall, the mediation results support our argument that jargon increases premium, which in turn increases the investment willingness for investors with some-but-low industry knowledge.¹³

4.1.3. *Test of H3a and H3b: The Effect of Jargon on Investors with High Industry Knowledge*

With respect to investors with high industry knowledge, we predict that they will exhibit greater investment willingness in the absence of jargon versus the presence of bad jargon. Further, we predict that the presence of both bad and good jargon does not magnify the negative impact of the bad jargon alone (H3a). In contrast, we do not expect an effect of the presence of good jargon alone relative to no jargon on investment willingness. Instead, we predict that the presence of both bad and good jargon leads to lower investment willingness relative to the good jargon alone condition (H3b). Overall, we expect that investment willingness is lower in the presence of bad jargon conditions compared to the absence of bad jargon conditions, regardless of the presence or absence of good jargon. In contrast, we do not expect the absence or presence of good jargon to make a difference, regardless of the presence or absence of bad jargon. To examine the overall effect of jargon, we perform a planned contrast by weighting “+1” for the no jargon and the good jargon alone conditions, and “-1” for the bad jargon alone and the both-good-and-bad jargon conditions. In support of our prediction, as presented in Table 6, Panel A, the planned contrast is significant ($F_{1,97} = 4.22$, $p = 0.02$, one-tailed).

Next, we test a one-way, two-level nested model that compares the no jargon *versus* bad jargon alone *versus* both-good-and-bad jargon conditions. As documented in Table 6, Panel B,

¹³ We also repeat the mediation analysis by replacing “premium” with either “disclosure-understanding” or “unnecessary-jargon.” We find that both the link between the presence of jargon and disclosure-understanding and the link between the presence of jargon and unnecessary-jargon are insignificant ($p = 0.50$ and $p = 0.29$, respectively), suggesting that premium is the only mediator for investors with some-but-low industry knowledge.

the presence of bad jargon lowers investment willingness (0.97 for the average of the two bad jargon-present conditions versus 1.77 for the no jargon condition; $F_{1, 73} = 2.08$, $p = 0.08$, one-tailed). In addition, we find that when bad jargon is present, the effect of additional good jargon is insignificant (0.96 for the bad jargon alone condition versus 0.98 for the both-good-and-bad jargon condition; $F_{1, 73} = 0.00$, $p = 0.97$), supporting H3a.

Last, we test a one-way, two-level nested model that compares the no jargon *versus* good jargon alone *versus* both-good-and-bad jargon conditions, results of which are presented in Table 6, Panel C. We find that the presence of good jargon does not affect investment willingness (1.77 for the no jargon condition versus 1.44 for the average of the two good jargon-present conditions; $F_{1, 74} = 0.39$, $p = 0.53$). We also find that when good jargon is present, the presence of additional bad jargon leads to a lower investment willingness (1.92 for the good jargon alone condition versus 0.98 for the both-good-and-bad jargon condition; $F_{1, 74} = 2.50$, $p = 0.06$, one-tailed), supporting our prediction in H3b. Overall, our results are consistent with the effect of jargon predicted in H3a and H3b for investors with high industry knowledge.

[Insert Table 6 about here]

The theory underlying our prediction in H3a and H3b suggests that jargon reduces investment willingness because it is perceived to be unnecessary. To capture this perception of unnecessary use of jargon, we ask participants to indicate the extent to which they agree that the company's management intentionally uses jargon to communicate technical information in an unnecessarily specific manner. We also ask participants to indicate the extent to which participants think the jargon and technical terms used in the disclosure make it a mouthful and disfluent. Both measures are captured on 11-point scales where "0" is "definitely disagree" and "10" is "definitely agree." The two measures are correlated (Pearson Correlation = 0.50, $p < 0.01$; Cronbach's Alpha = 0.66), and thus we use the average of these two measures to capture the perception that jargon is unnecessary (hereafter, unnecessary-jargon). We test our theoretical argument using the Hayes Process Model, present our mediation model and the results in Table 7, and illustrate them in Figure 2, Panel C. Panel A of Table 7 indicates that the more jargon is perceived to be unnecessary (Link 1c; coefficient = 0.983, $p = 0.02$, one-tailed), the more investment willingness decreases (Link 2c; coefficient = -0.183, $p = 0.05$, one-tailed). We find that the link between the presence of jargon and investment willingness is insignificant (Link 3c;

coefficient = -0.303, $p = 0.54$), suggesting that unnecessary-jargon fully explains the effect of jargon on investment willingness (i.e., a full mediation). Regarding the indirect effect of jargon on investment willingness through unnecessary-jargon (see Table 7, Panel B), we find that the bootstrapped confidence interval does not include zero (-0.507, -0.021), suggesting that the indirect effect is significant. Overall, our findings suggest that investors with high industry knowledge reduce their investment willingness when bad jargon is used because they perceive the use of bad jargon to be unnecessary.¹⁴

[Insert Table 7 about here]

4.2. Additional Analyses

4.2.1. How does Jargon Affect Information Processing?

To investigate how jargon affects investors' information processing, we ask participants to recall details related to ISC's product. One author of this paper and two doctoral students independently code the recall responses. The doctoral students are unaware of our hypotheses and all of the coders are blind to participants' experimental conditions. Each coder assesses the total number of distinctive recall points independently and then sums up all the recall points for each participant. Inter-rater agreement is 83.21% and discrepancies are resolved by discussion. We identify eight recall points as follows: (1) the description of Innovation Stem Cell (ISC)'s business; (2) the general description of stem cells; (3) the research and development (e.g., patent) of ISC's stem cell products; (4) the similarity and difference between ISC's stem cells and traditional human stem cells; (5) the number of products the company is selling; (6) the company's new production technology; (7) the fact that there is no containment of non-human animal proteins; and (8) that products are quality tested for customers' specifications.

Untabulated results show that compared to the no jargon condition, the presence of jargon, regardless of whether it is good or bad, decreases the number of recall points for investors without industry knowledge (2.00 for the no jargon condition versus 1.51 for the average of the three jargon-present conditions; $F_{1, 90} = 4.11$, $p = 0.02$, one-tailed) and investors with some-but-

¹⁴ We also repeat the mediation analysis by replacing “unnecessary-jargon” with “disclosure-understanding” or “premium.” When we use disclosure-understanding in place of unnecessary-jargon, we find that while the link between the presence of jargon and disclosure-understanding is significant ($p < 0.01$, one-tailed), the link between disclosure-understanding and investment willingness is not significant ($p = 0.24$). When premium is a mediator, the link between the presence of jargon and premium is insignificant ($p = 0.49$), suggesting that only unnecessary-jargon plays a mediating role for investors with high industry knowledge.

low industry knowledge (1.91 for the no jargon condition versus 1.40 for the average of the three jargon-present conditions; $F_{1, 89} = 5.65$, $p < 0.01$, one-tailed). In contrast, for investors with high industry knowledge, the presence of jargon has no effect on the number of recall points (2.00 for the no jargon condition versus 1.83 for the average of the three jargon-present conditions; $F_{1, 99} = 0.44$, $p = 0.51$). These results suggest that the presence of jargon hinders investors from processing information only when they have no or little industry knowledge, but has no impact on the information processing of investors with high industry knowledge.

We further investigate how jargon type affects the recall for investors with high industry knowledge. We find that the presence of good jargon increases the number of recall points (1.70 versus 2.04; $F_{1, 99} = 2.24$, $p = 0.07$, one-tailed), but the presence of bad jargon has no effect on the number of recall points (1.96 versus 1.78; $F_{1, 99} = 0.63$, $p = 0.43$). This is consistent with our argument that while good jargon facilitates information processing, only investors who have sufficiently high industry knowledge are well adapted to disclosures with good jargon.

4.2.2. How does Jargon Affect Investors' Credibility Judgment?

Psychological studies suggest that jargon could increase credibility judgment as it suggests a higher level of management competence and a higher level of exerted effort (Thompson and Ince, 2013). With respect to investors with no industry knowledge, it is possible that they believe management is the expert and thus rely on the use of jargon to infer management credibility. It is also possible that these investors do not make different credibility assessments based on jargon because they do not perceive that they have the knowledge to assess credibility. With respect to investors with some-but-low industry knowledge, as discussed in our theory section, they are more likely to rely on heuristic cues to make judgments. More particularly to an IPO setting, since management is motivated to reduce information asymmetry in order to reduce IPO underpricing, investors may infer that management's use of jargon is inconsistent with their incentives at IPO and conclude that management is correspondingly more credible (Koonce et al., 2016). Thus, investors with some-but-low knowledge will perceive managers to be more credible with more jargon used in the IPO prospectus. However, such an effect of jargon on credibility is less likely for investors with high industry knowledge, given that they have the requisite knowledge to complete a task and are less likely to rely on simple cues to infer

credibility (Ericsson and Lehmann, 1996; Ericsson and Smith, 1991; Frederick and Libby, 1986; Libby and Luft, 1993).

In order to measure investors' credibility judgments, we ask participants to assess management competence and trustworthiness (Mercer, 2005). Both questions are measured on 11-point scales with "0" labeled "not at all competent/trustworthy" and "10" labeled "absolutely competent/trustworthy." Given that two measures are highly correlated (Cronbach's Alpha = 0.82; Pearson Correlation = 0.70, $p < 0.01$), we use the average of these two responses as our measure of participants' credibility judgments (hereafter, credibility). Since the amount of jargon is the highest in the both-good-and-bad jargon condition, followed by the good or bad jargon alone condition, and the least in the no jargon condition, we conduct planned contrast tests using the following contrast weights: "-2" for the no jargon condition, "-1" for the good or bad jargon alone condition, and "+4" for the both-good-and-bad jargon condition, with credibility as the dependent variable.

We find that credibility linearly increases with the use of jargon for investors without industry knowledge ($F_{1, 88} = 7.63$, $p < 0.01$, one-tailed). As predicted, credibility also increases with the use of jargon for those with some-but-low industry knowledge ($F_{1, 87} = 2.70$, $p = 0.05$, one-tailed). In contrast, we do not find credibility assessment to be different across jargon conditions for investors with high industry knowledge ($F_{1, 97} = 1.52$, $p = 0.22$), consistent with our argument that investors with high industry knowledge do not use simple cues to infer credibility. Overall, these results suggest that managers' use of jargon is perceived differently depending on investors' industry knowledge.

4.2.3. The Moderating Effect of Syntactic Complexity

Prior linguistic studies identify jargon and syntactic complexity as two conceptually distinct and independent constructs (Gibson, 1998; Glasersfeld, 1970; Pitler and Nenkova, 2008). Specifically, jargon relates to a specialized and technical text that describes a product (e.g., stem cells in our case) and its attributes (e.g., parthenogenetic and pluripotent), while syntactic complexity relates to the choice of words (e.g., using active or passive voice) and the way the text is organized (e.g., using bullet points). Jargon and complex constructions are two common causes for less readable disclosures (SEC, 1998), and managers often vary both aspects in their disclosures (Bonsall et al., 2017). In our main experiment, we demonstrate that the effect of

jargon is contingent on industry knowledge and jargon type when syntactic complexity is low. To assess whether the joint effects of jargon and investor type on investor judgment applies to a context with high syntactic complexity, we conduct another experiment.

Given that high syntactic complexity could make the entire communication disfluent, any incremental impact of jargon may be marginal. Hence, it is possible that high syntactic complexity may dampen the impact of jargon on investor judgment. To test this possibility, we recruit a total of 227 participants (123 PMBA students and 104 PMBA alumni) from the same U.S. university in a different academic year, who are also compensated with \$20 Amazon Gift Cards.¹⁵ We manipulate syntactic complexity to be either low or high. Similar to our main experiment, the low syntactic complexity condition follows the Plain English Rules issued by the SEC (1998) (e.g., short sentences, active voice, organized structures with table/bullet presentation). In contrast, the high syntactic complexity condition adopts the reverse of these principles (e.g., long sentences, passive voice, mixed structures without table or bullet presentation). Since we are mainly interested in the effect of jargon presence versus absence rather than different types of jargon (good versus bad), we only include the no jargon and both-good-and-bad jargon (which has the most amount of jargon) conditions from our main experiment. Similar to our main experiment, we measure participants' knowledge in the biotech industry based on the total number of bio-courses they have taken (e.g., biology, biomedicine, or other related courses), then median-split participants into investors with low industry knowledge and those with high industry knowledge.¹⁶

We conduct two ANOVAs with jargon and syntactic complexity as the independent variables, and investment willingness as the dependent variable for investors with low industry knowledge and those with high industry knowledge, respectively.¹⁷ With respect to investors

¹⁵ We do not find any systematic difference in responses between PMBA students and PMBA alumni, and thus we include both groups of participants in our analyses.

¹⁶ Specifically, we have 117 participants (51.55%) who have taken at least three bio-courses and are classified as investors with high industry knowledge. Among the remaining 110 participants, 51 participants (22.5%) have never taken bio-courses (i.e., investors without industry knowledge in our main experiment), and 59 participants (26.00%) have taken one or two bio-courses (i.e., investors with some-but-low industry knowledge in our main experiment). Due to the small sample size for each of the above two investor groups, we combine the two groups and classify them as investors with low industry knowledge.

¹⁷ Likewise, we construct a measure for investment willingness by taking the average of participants' responses to their willingness to invest in the stock and the attractiveness of the stock (on 11-point scales where "0" = "absolutely not willing to invest" or "not at all attractive," and "10" = "absolutely willing to invest" or "extremely attractive;" Pearson Correlation = 0.73, $p < 0.01$; Cronbach's Alpha = 0.84).

with low industry knowledge, we find a significant positive main effect of jargon (5.20 for the no jargon condition versus 5.82 for the both-good-and-bad jargon condition; $F_{1, 106} = 2.89$, $p = 0.05$, one-tailed) and a marginally significant interaction effect of jargon and syntactic complexity ($F_{1, 106} = 2.50$, $p = 0.06$, one-tailed).¹⁸ Consistent with our main experiment, we find that jargon increases the investment willingness for investors with low industry knowledge from 5.16 to 6.40 ($F_{1, 106} = 4.82$, $p = 0.02$, one-tailed) when syntactic complexity is low. However, when syntactic complexity is high, jargon does not affect their investment willingness (5.24 versus 5.29; $F_{1, 106} = 0.01$, $p = 0.94$). Given that our main experiment provides evidence that the greater investment willingness associated with more jargon is due to the heuristic perceptions of product premium from investors with low industry knowledge, our results suggest that high syntactic complexity (that makes information more difficult to process) can reduce those investors' reliance on heuristic perceptions. Such a finding is consistent with recent psychological research showing that disfluency can promote systematical processing and reduce heuristic processing (Hernandez and Preston, 2013).

With respect to investors with high industry knowledge, we find that jargon decreases investment willingness (6.74 for the no jargon condition versus 5.51 for the both-good-and-bad jargon condition; $F_{1, 113} = 9.03$, $p < 0.01$, one-tailed), replicating the findings in our main experiment. We do not find syntactic complexity moderates the effect of jargon for investors with high industry knowledge ($F_{1, 113} = 0.26$, $p = 0.61$).¹⁹ These findings indicate that while

¹⁸ Further analysis suggests that these effects are significant only for investors who have taken one or two bio-courses (i.e., the investors with some-but-low industry knowledge group in our main experiment, $p = 0.08$, one-tailed for the positive main effect of jargon and $p = 0.09$, one-tailed for the interaction effect), but insignificant for investors who have not taken any bio-courses (i.e., the investors without industry knowledge group in our main experiment, smallest $p = 0.38$). This is consistent with findings in our main experiment that only investors with some-but-low industry knowledge have higher investment willingness when there is more jargon.

¹⁹ We also find that when syntactic complexity is high, investors with high industry knowledge exhibit greater number of recall points than investors with low industry knowledge (1.72 for low knowledge versus 2.04 for high knowledge; $F_{1, 108} = 2.10$, $p = 0.07$, one-tailed). In contrast, when syntactic complexity is low, there is no significant difference in the number of recall points between the two groups (2.25 for low knowledge versus 2.29 for high knowledge; $F_{1, 115} = 0.02$, $p = 0.89$). In addition, when syntactic complexity is high, as a result of the difference in understanding, investors with high industry knowledge are more willing to invest than investors with low industry knowledge (5.26 for low knowledge versus 6.45 for high knowledge; $F_{1, 108} = 9.10$, $p < 0.01$). In contrast, given that the difference in understanding between the two groups becomes smaller in the low syntactic complexity condition, consistent with the argument that low syntactic complexity facilitates information processing and helps investors with low industry knowledge understand messages, there is an insignificant difference in investment willingness between investors with low industry knowledge and those with high industry knowledge (5.75 for low knowledge versus 5.82 for high knowledge; $F_{1, 115} = 0.04$, $p = 0.85$).

investors with low industry knowledge seem to react to syntactic complexity, investors with high industry knowledge are not affected by syntactic complexity.

5. Discussion and Conclusion

We investigate how the effects of jargon on investors' investment willingness are moderated by industry knowledge and jargon type. In an experiment with PMBA students, we find that including more jargon in management disclosures reduces investment willingness for investors without industry knowledge, but increases investment willingness for investors with low industry knowledge; these effects exist regardless of whether good or bad jargon is used. However, with respect to investors with high industry knowledge, they do differentiate good jargon from bad jargon, and their investment willingness is reduced only when bad jargon is present but not when good jargon is present. We also conduct another experiment to investigate the moderating role of syntactic complexity on jargon impact. Our results suggest that while the effect of jargon on investors with low industry knowledge varies with syntactic complexity, its impact on investors with high industry knowledge prevails irrespective of syntactic complexity.

Our study contributes to recent literature examining the effect of linguistic features on investors' judgments. Prior studies have examined the effects of readability, tone, and language concreteness on investors' judgments and decisions (Elliott et al., 2015; Hwang and Kim, 2017; Rennekamp, 2012; Tan et al., 2014, 2015). Specifically, Hwang and Kim (2017) examine the effect of readability on firm valuation and finds that difficult-to-read reports decrease firm value. Our paper is different from prior readability studies in that we specifically identify and document the effect of jargon (one particular element of readability) on investor judgment, while holding other attributes of readability (e.g., passive verbs, hidden verbs, overwriting, and wordy phrases) constant. More importantly, we identify three different groups of investors with various levels of industry knowledge and show that jargon effect varies with industry knowledge. In addition, one particular feature of the impact of jargon is that different investors could interpret management's use of jargon differently—this impact depends not only on their own industry knowledge, but also on the type of jargon and an overall contextual linguistic attribute (i.e., syntactic complexity). Thus, our paper contributes to the literature by demonstrating the joint effect of jargon type, industry knowledge, and syntactic complexity on investors' judgments. Our findings help managers better understand the implications of including jargon (and different types of

jargon) in their disclosures, and they can also better understand the impact of their disclosure choices on their primary investor base.

As discussed in our results, jargon will reduce investment willingness for investors without industry knowledge due to their lower understanding of management disclosures, but increase investment willingness for investors with low industry knowledge because it induces feelings of product premium. Managers need to understand these contrasting effects. Compared to managers who incorporate more jargon in their disclosures, well-meaning managers who follow the prescription of the SEC in using less jargon in their public disclosures may attract more investment from investors without industry knowledge but less investment from investors with low industry knowledge. Correspondingly, investors, especially those with some but not sufficient levels of industry knowledge, should be careful in terms of not getting unduly influenced by managers' use of jargon and technical terms. Our results also show that investors with high industry knowledge can tell good jargon from bad jargon, and their investment willingness is reduced with the presence of bad jargon, which is considered unnecessary in management disclosures. This challenges the conventional wisdom that managers can use more jargon in disclosures targeted at investors with more knowledge, as our results suggest that more bad jargon may actually reduce investment willingness for such investors.

Our study examines investors' investment willingness only in the case of an IPO. We use an IPO prospectus summary as our experimental setting because managers often use more jargon to describe their companies and businesses in such disclosures. While we expect similar results for tasks that require knowledge in other fields, future research could look at other disclosure settings such as conference calls where managers use jargon in discussing their firm performance. Another feature of an IPO prospectus summary is that it usually does not contain much financial performance information, which helps us to first establish the effect of jargon in a clean setting without other confounding factors. Specifically, if our setting contains more financial performance information, it is possible that investors will over-rely on financial performance information and ignore the qualitative information, especially when they do not understand jargon. Still, it is not clear whether jargon will have similar effects in the presence of financial performance information, and this is an issue which can be examined in future studies. In addition, it is also unknown whether the jargon effect documented in our paper will be

dampened in cases where management is able to do roadshows and live presentations. For example, if investors expect that they can find out more about the company through roadshows, those who cannot comprehend the jargon are more likely to rely on other information channels when evaluating the firm, rather than responding to a jargon-ridden IPO prospectus. Future research can examine these issues.

Appendix A

Examples of variations in the use of jargon in financial disclosures

Example 1: Disclosures containing less jargon

An excerpt from management's discussion and analysis in the annual report of Avalanche Biotechnologies, Inc.

We are a gene therapy company committed to discovering and developing novel medicines that can offer potentially life-changing therapeutic benefit to patients suffering from chronic or debilitating disease. We have leveraged our next-generation gene therapy platform to create a pipeline of product candidates. Our product candidates are designed to provide durable efficacy by inducing sustained expression of a therapeutic protein.

We are targeting diseases with unmet medical need, including ophthalmic diseases such as wet age-related macular degeneration (AMD), as well as rare genetic diseases. We believe that there are several important benefits to focusing on the development of rare genetic diseases including the following:

- well-known disease pathways which we believe are particularly amenable to gene therapy, especially in conditions that are caused by a defect in expression of a single gene;
- gene therapy is believed to offer a versatile protein delivery system with persistent expression;
- local delivery of the therapeutic protein; and
- significant market demand for therapies that can offer long-term clinical benefit with potentially a one-time administration.

For ophthalmic diseases, such as wet AMD, there are further benefits including the following:

- reduced risk of harmful immune responses and systemic side effects due to localized delivery in a self-contained organ; and
- well-defined and objective clinical endpoints such as the ability to read an eye chart.

To date, our primary focus has been the development of AVA-101 for the treatment of wet age-related macular degeneration (wet AMD). We generated human proof-of-concept data for AVA-

101 in a Phase 1 trial with eight wet-AMD subjects conducted at Lions Eye Institute (LEI) in Australia, of whom six were randomized to treatment with AVA-101 and two to standard-of-care therapy in the form of ranibizumab injections on an as-needed basis per protocol. Six of these subjects were available for evaluation at 36 months, and of these six subjects, four were treated with AVA-101. In June 2015, we announced the 36-month follow-up data on the six subjects, which confirmed the safety profile of the drug previously reported at 12 months.

Additionally, we conducted a Phase 2a trial for AVA-101 at LEI with 32 additional wet AMD subjects, for which we announced top-line results in June 2015. The primary endpoint of the Phase 2a study was based on ophthalmic and systemic safety, and secondary endpoints included retinal thickness (which can be a sign of reoccurrence of fluid in the retina), visual acuity and the need for anti-vascular endothelial growth factor (VEGF) therapy in the form of rescue injections with ranibizumab. The Phase 2a clinical study met its 12-month primary endpoint, demonstrating that AVA-101 was well tolerated with a favorable safety profile in subjects with wet AMD. No serious adverse events related to AVA-101 were observed. Overall, we did not observe evidence of a complete and/or durable anti-VEGF response in the majority of subjects treated with AVA-101 as administered in the Phase 2a study. We decided not to move forward with the Phase 2b clinical trial for AVA-101 with the dose and administration procedure that we had planned to initiate in the second half of 2015. Instead, we are conducting additional preclinical studies to inform further development of our wet AMD program.

Regeneron had a time-limited right of first negotiation for certain rights to AVA-101 as part of our collaboration. In September 2015, we initiated, by notice and delivery of AVA-101 clinical data to Regeneron, the time period for Regeneron to elect whether to exercise its right of first negotiation. On November 2, 2015, Regeneron notified the Company that it was not exercising this right of first negotiation.

In addition to AVA-101, we are working on other product candidates for the treatment of ophthalmic diseases, including:

- **AVA-201.** We are developing AVA-201 as a next-generation product candidate for the prevention of wet AMD. AVA-201 produces the same anti-VEGF protein as AVA-101 using a proprietary, customized delivery mechanism, or vector.
- **AVA-311.** As part of our research collaboration with Regeneron, AVA-311 is being

evaluated in preclinical studies for the treatment of juvenile X-linked retinoschisis (XLRS), a rare genetic disease of the retina with no approved therapy. There are approximately 10,000 boys and young men in the United States suffering from the disease. XLRS is caused by mutation of the RS1 gene and results in splitting of retinal layers and corresponding loss of vision. In preclinical studies in animals to date, AVA-311 has delayed the progression of XLRS and improved vision by delivering functional copies of the RS1 gene in retinal cells of mice.

- **AVA-322** and **AVA-323**. We are developing AVA-322 and AVA-323 for the treatment of color vision deficiency (CVD), commonly known as red-green color blindness. CVD is a highly prevalent genetic disorder that affects approximately 8 percent of males and 0.5 percent of females, with some variation by race, and is most commonly caused by genetic mutations in the opsin genes that impact the ability of the cone cells to respond to various wavelengths of light in the retina.

Example 2: Disclosures containing more jargon

An excerpt from management's discussion and analysis in the annual report of Ocular Therapeutics, Inc.

We are a biopharmaceutical company focused on the development and commercialization of innovative therapies for diseases and conditions of the eye using our proprietary hydrogel platform technology. Our bioresorbable hydrogel-based product candidates are designed to provide sustained delivery of therapeutic agents to the eye. Our lead product candidates are DEXTENZA and OTXTP, sustained-release, drug-eluting intracanalicular depots that are inserted into the canaliculus through a natural opening called the punctum located in the inner portion of the eyelid near the nose. Our intracanalicular depots combine our hydrogel technology with US Food and Drug Administration, or FDA, approved therapeutic agents with the goal of providing sustained delivery of drug to the eye. We also have an intravitreal hydrogel depot which is in preclinical development for the treatment of diseases and conditions of the back of the eye including wet age related macular degeneration, or wet AMD. Our intravitreal depot is designed to be delivered via intravitreal injection to release therapeutic agents, such as antibodies to vascular endothelial growth factor, or VEGF, over a sustained period. In addition to our ongoing product development, we have launched our first commercial product, ReSure Sealant, a hydrogel-based ophthalmic wound sealant approved by the FDA in January 2014 to seal corneal incisions following cataract surgery. ReSure Sealant is the first and only surgical sealant to be approved by the FDA for ophthalmic use.

Our most advanced product candidate, DEXTENZA, incorporates the FDA-approved corticosteroid dexamethasone as an active pharmaceutical ingredient into a hydrogel-based drug-eluting intracanalicular depot. DEXTENZA is in Phase 3 clinical development for the treatment of postsurgical ocular inflammation and pain, and, in September 2015, we submitted to the FDA a New Drug Application, or NDA, for DEXTENZA for the treatment of postsurgical ocular pain. The FDA has accepted the NDA for filing. We have completed two Phase 3 clinical trials of DEXTENZA for postsurgical ocular inflammation and pain. The data from these two completed Phase 3 clinical trials and a prior Phase 2 clinical trial are being used to support our NDA for postsurgical ocular pain. In October 2015, we initiated a third Phase 3 clinical trial for the treatment of postsurgical ocular inflammation and pain. We expect to have topline efficacy data

available from this third trial in the second half of 2016. If the results of this third trial are favorable and subject to receiving approval for the pain indication pursuant to the initial NDA, we plan to submit an NDA supplement for DEXTENZA for the treatment of postsurgical ocular inflammation. DEXTENZA is also in Phase 3 clinical development for the treatment of allergic conjunctivitis. In October 2015, we announced topline results of our first Phase 3 clinical trial for allergic conjunctivitis. We initiated enrollment of our second Phase 3 clinical trial for allergic conjunctivitis in November 2015. Finally, DEXTENZA is in Phase 2 clinical development for the treatment of inflammatory dry eye disease. We announced topline results from an exploratory Phase 2 clinical trial for this indication in December, 2015.

Our second product candidate, OTXTP, incorporates travoprost, an FDA-approved prostaglandin analog that reduces elevated intraocular pressure, as its active pharmaceutical ingredient into a hydrogel-based drug-eluting intracanalicular depot. OTXTP is in Phase 2 clinical development for glaucoma and ocular hypertension. We reported topline results from a Phase 2b clinical trial for this indication in October 2015. We expect to have an end of Phase 2 meeting with the FDA in the second quarter of 2016 and to initiate a Phase 3 clinical trial of OTXTP in the third quarter of 2016.

In addition to DEXTENZA and OTXTP, we are engaged in the preclinical development of our intravitreal depot administered via intravitreal injection to address the large and growing markets for diseases and conditions of the back of the eye. Our initial development efforts are focused on the use of our sustained-release hydrogel depot in combination with antiangiogenic drugs, such as protein-based anti-VEGF drugs or small molecule antiangiogenic drugs, such as tyrosine kinase inhibitors, or TKIs, for the treatment of wet age-related macular degeneration, or wet AMD. Our initial goal for this program is to provide sustained release of an antiangiogenic protein or a TKI drug over a four-to-six month period following administration of a bioresorbable hydrogel incorporating the drug by an injection into the vitreous humor, thereby reducing the frequency of the current monthly or bimonthly intravitreal injection regimen for wet AMD and other back-of-the-eye diseases. We also have a pipeline of earlier stage intracanalicular depot product candidates, including OTXMP, which has completed a Phase 1 clinical trial evaluating safety and pharmacokinetics in patients following cataract surgery.

Following our receipt of FDA approval for ReSure Sealant, we commercially launched this product in the United States in 2014 through a network of ophthalmology-focused distributors. ReSure Sealant is approved to seal corneal incisions following cataract surgery and is the first and only surgical sealant to be approved by the FDA for ophthalmic use. In the pivotal clinical trials that formed the basis for FDA approval, ReSure Sealant provided superior wound closure and a better safety profile than sutured closure.

Appendix B

Jargon Manipulation

Panel A: Good jargon versus its corresponding common language

Good jargon	Common language
Cultivating human stem cells	Growing human stem cells in controlled conditions <explanation of technical meaning of “cultivating” in layman’s terms>
Differentiate into another type of cell	Become another type of cell <explanation of technical meaning of “differentiate into” in layman’s terms>
A problem with the use of stem cells is its incompatibility with the human body	A problem with the use of stem cells is that the human body can reject stem cells that do not match with the body’s immune system <explanation of technical meaning of “incompatibility with human body” in layman’s terms>
Human cell culture	Growing human cells in controlled conditions <explanation of technical meaning of “culture” in layman’s terms>
Both are similarly pluripotent	Both have the potential to become virtually any cell in the human body <explanation of technical meaning of “pluripotent” in layman’s terms>
Tissues that are less likely to cause graft-related versus host-related disease following transplantation.	Tissues that are likely to be accepted by the recipient’s body following transplantation. <removal of technical adjectives and using layman’s terms in place of “less likely to cause graft-related versus host-related disease” >
Cell culture is the process by which cells are grown in vitro	Cell culture is the process by which cells are grown generally outside their natural environment <explanation of technical meaning of “in vitro” in layman’s terms>

Words in angle brackets explain the basis for forming the common language version from the good jargon alone version. They are not shown to participants.

Panel B: Bad jargon versus its corresponding common language

Bad jargon	Common language
Growing human parthenogenetic stem cells in controlled conditions.	Growing human stem cells in controlled conditions <removal of technical adjectives>
We are the first company to develop and patent human parthenogenetic stem cells	We are the first company to develop and patent a new class of human stem cells <removal of technical adjectives>
Our patented human parthenogenetic stem cells with human embryonic stem cells	Our patented human stem cells with traditional human stem cells <removal of technical adjectives>
Our patented human parthenogenetic stem cells offer the potential for the creation of immune-matched cells	Our patented human stem cells offer the potential for the creation of immune-matched cells <removal of technical adjectives>
A new technology called basal medium optimization	A new technology <removal of technical term>
Our basal medium optimization technology creates human parthenogenetic stem cell products	Our technology creates products <removal of technical term>
Our human parthenogenetic stem cell products are quality tested for the expression of specific cell markers, proliferation rate, viability, morphology and absence of pathogens to ensure that they meet standards specified by customers	Our products are quality tested for various indicators to ensure that they meet standards specified by customers <removal of technical adjectives>

Words in angle brackets explain the basis for forming the common language version from the bad jargon alone version. They are not shown to participants.

Also, the both-good-and-bad jargon version is the combination of the good jargon in Panel A and the bad jargon in Panel B, and the no jargon version is the combination of the common language columns of Panel A and Panel B.

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Figure 1

All Participants' Investment Willingness

Figure 1 illustrates the mean investment willingness, by condition. We measure participants' knowledge in the biotech industry based on the total number of bio-courses they have taken (e.g., biology, biomedicine, or other related courses). We then split participants into three groups: investors with no industry knowledge, some-but-low industry knowledge, and high industry knowledge. For the manipulation of jargon, we first identify jargon used in the real IPO prospectus summary and ask an expert in the field to classify the jargon into good jargon and bad jargon. Then, we create four different conditions of jargon as follows: (1) no jargon – absence of both good and bad jargon, (2) good jargon alone – presence of good jargon and absence of bad jargon, (3) bad jargon alone – presence of bad jargon and absence of good jargon, and (4) both-good-and-bad jargon – presence of both good and bad jargon. We measure participants' investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest,” and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach's Alpha = 0.94), and thus we use the average of these two measures as investment willingness.

Figure 2

Mediation Analysis

Panel A: Investors without Industry Knowledge

Panel B: Investors with Some-but-Low Industry Knowledge

Panel C: Investors with High Industry Knowledge

Panel A illustrates the mediation analysis for investors without industry knowledge, with the presence of jargon (“0” for the no jargon condition and “1” for the rest of the three jargon-present conditions) as the independent variable, disclosure-understanding as the mediator, and investment willingness as the dependent variable. Panel B illustrates the mediation analysis for investors with some-but-low industry knowledge, with the presence of jargon as the independent variable, premium as the mediator, and investment willingness as the dependent variable. Panel C illustrates the mediation analysis for investors with high industry knowledge, with the presence of jargon as the independent variable, unnecessary-jargon as the mediator, and investment willingness as the dependent variable. Following the biased-corrected bootstrapping method (Hayes, 2013; Preacher and Hayes, 2008), we use the Hayes PROCESS macro (Model 4) to estimate the path coefficients through 10,000 bootstrapped sample with a 90% confidence level. We capture participants’ understanding of management disclosure by asking them to indicate the extent they understand the company’s prospectus summary on an 11-point scale with “0” labeled “do not understand at all” and “10” labeled “completely understand.” We use participants’ responses to this question as our measure of disclosure-understanding. We also ask two questions to capture participants’ feelings of product premium. We ask participants to indicate the extent they feel the company’s technology and products are (1) superior and (2) unique. Both questions are measured on 11-point scales with “-5” labeled “not at all” and “5” labeled “extremely.” The two measures are correlated (Pearson Correlation = 0.57, $p < 0.01$; Cronbach’s Alpha = 0.65), and thus we use the average of the two responses as our measure of participants’ perceived product premium (also known as, premium). We ask two questions to capture participants’ perception of the unnecessary use of jargon. We ask participants to indicate the extent to which they agree that the company’s management intentionally uses jargon to communicate technical information in an unnecessarily specific manner. We also ask participants to indicate the extent to which participants think the jargon and technical terms used in the disclosure make it a mouthful and disfluent. Both measures are captured on 11-point scales where “0” is “definitely disagree” and “10” is “definitely agree.” The two measures are correlated (Pearson Correlation = 0.50, $p < 0.01$; Cronbach’s Alpha = 0.66), and thus we use the average of these two measures as perceptions of the unnecessary use of jargon (also known as, unnecessary-jargon). All p-values are two-tailed unless noted with *.

TABLE 1
All Participants' Investment Willingness

Panel A: Descriptive Statistics – Mean (Standard Deviation) [Sample Size]

Industry knowledge	Jargon type				Overall
	<u>No jargon</u>	<u>Good jargon alone</u>	<u>Bad jargon alone</u>	<u>Both-good-and-bad</u>	
<u>No industry knowledge</u>	2.56 (1.46) [25]	2.40 (1.24) [21]	1.63 (2.58) [24]	1.00 (1.81) [22]	1.91 (1.93) [92]
<u>Some-but-low industry knowledge</u>	0.93 (2.18) [23]	1.25 (1.76) [22]	1.85 (2.42) [23]	2.48 (2.41) [23]	1.63 (2.26) [91]
<u>High industry knowledge</u>	1.77 (2.05) [26]	1.92 (1.57) [25]	0.96 (2.19) [24]	0.98 (2.60) [26]	1.41 (2.15) [101]
Overall	1.78 (2.00) [74]	1.85 (1.59) [68]	1.47 (2.40) [71]	1.47 (2.29) [71]	1.64 (2.12) [284]

Panel B: Two-Way ANOVA for All Participants

Source	Sum of Squares	df	Mean Square	F	p-value
Jargon type	7.74	3	2.58	0.60	0.62
Industry knowledge	11.55	2	5.78	1.34	0.26
Jargon type * Industry knowledge	78.71	6	13.12	3.04	0.01
Error	1174.23	272	4.32		

Panel A reports the mean investment willingness, by condition. Panel B presents results of two-way ANOVA with the four jargon conditions and industry knowledge as the independent variables, and investment willingness as the dependent variable. We measure participants' knowledge in the biotech industry based on the total number of bio-courses they have taken (e.g., biology, biomedicine, or other related courses). We then split participants into three groups: investors with no industry knowledge, some-but-low industry knowledge, and high industry knowledge. For the manipulation of jargon, we first identify jargon used in the real IPO prospectus summary and ask an expert in the field to classify the jargon into good jargon and bad jargon. Then, we create four different conditions of jargon as follows: (1) no jargon – absence of both good and bad jargon, (2) good jargon alone – presence of good jargon and absence of bad jargon, (3) bad jargon alone – presence of bad jargon and absence of good jargon, and (4) both-good-and-bad jargon – presence of both good and bad jargon. We measure participants' investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest;” and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach's Alpha = 0.94), and thus we use the average of these two measures as investment willingness. All p-values are two-tailed unless noted with *.

TABLE 2
Investment Willingness for Investors without Industry Knowledge

Panel A: Contrast-Coded Analysis of Variance – Test of *H1*

Source	df	F	p-value
Contrast weight: “+4” in the no jargon condition, “-1” in the good jargon alone condition, “-1” in the bad jargon alone condition, and “-2” in the both-good-and-bad jargon condition	1	5.63	0.01*

Panel B: Nested Analysis of Variance – no jargon vs. bad jargon alone vs. both-good-and-bad jargon

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of bad jargon	25.19	1	25.19	6.27	<0.01*
Presence of bad jargon alone vs. presence of both good and bad jargon	4.48	1	4.48	1.12	0.15*
Error	273.29	68	4.02		

Panel C: Nested Analysis of Variance – no jargon vs. good jargon alone vs. both-good-and-bad jargon

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of good jargon	11.63	1	11.63	5.01	0.01*
Presence of good jargon alone vs. presence of both good and bad jargon	21.20	1	21.20	9.13	<0.01*
Error	150.97	65	2.32		

Panel A reports the contrasts-coded analysis of variance for investors without industry knowledge. Panel B presents results of nested ANOVA model that compares the no jargon versus bad jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. Panel B shows results of nested ANOVA model that compares the no jargon versus good jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. All p-values are two-tailed unless noted with *.

TABLE 3
The Mediation Analysis for Investors without Industry Knowledge

Panel A: Path Estimates and Coefficients

	Coefficient	t-statistic	p-value	LLCI	ULCI
DV: Disclosure-understanding					
Constant	2.320	5.31	<0.01*	1.594	3.046
Presence of jargon (Link 1a)	-1.499	-2.93	<0.01*	-2.350	-0.648
DV: Investment willingness					
Constant	1.752	4.36	<0.01*	1.085	2.420
Disclosure-understanding (Link 2a)	0.348	4.12	<0.01*	0.208	0.489
Presence of jargon (Link 3a)	-0.374	-0.87	0.39	-1.088	0.341

Panel B: Indirect Effects of the Presence of Jargon on Investment Willingness

	Effect	LLCI	ULCI
Through disclosure-understanding	-0.522	-0.958	-0.233

Panel A presents path estimates and coefficients for the mediation analysis for investors without industry knowledge, with the presence of jargon (“0” for the no jargon condition and “1” for the rest of the three jargon-present conditions) as the independent variable, disclosure-understanding as the mediator, and investment willingness as the dependent variable. Panel B shows indirect effects of jargon on investment willingness through disclosure-understanding. Following the biased-corrected bootstrapping method (Hayes, 2013; Preacher and Hayes, 2008), we use the Hayes PROCESS macro (Model 4) to estimate the path coefficients through 10,000 bootstrapped sample with a 90% confidence level. We measure participants’ investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest;” and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach’s Alpha = 0.94), and thus we use the average of these two measures as investment willingness. We capture participants’ understanding of management disclosure by asking them to indicate the extent they understand the company’s prospectus summary on an 11-point scale with “0” labeled “do not understand at all” and “10” labeled “completely understand.” We use participants’ responses to this question as our measure of disclosure-understanding. All p-values are two-tailed unless noted with *.

TABLE 4
Investment Willingness for Investors with Some-but-Low Industry Knowledge

Panel A: Contrast-Coded Analysis of Variance – *Test of H2*

Source	df	F	p-value
Contrast weight: “-4” in the no jargon condition, “+1” in the good jargon alone condition, “+1” in the bad jargon alone condition, and “-2” in the both-good-and-bad jargon condition	1	3.96	0.02*

Panel B: Nested Analysis of Variance – no jargon vs. bad jargon alone vs. both-good-and-bad jargon

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of bad jargon	23.13	1	23.13	4.23	0.02*
Presence of bad jargon alone vs. presence of both good and bad jargon	4.57	1	4.57	0.84	0.18*
Error	361.11	66	5.47		

Panel C: Nested Analysis of Variance – no jargon vs. good jargon alone vs. both-good-and-bad jargon

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of good jargon	13.14	1	13.14	2.87	0.05*
Presence of good jargon alone vs. presence of both good and bad jargon	16.96	1	16.96	3.70	0.03*
Error	297.77	65	4.58		

Panel A reports the contrasts-coded analysis of variance for investors with some-but-low industry knowledge. Panel B presents results of nested ANOVA model that compares the no jargon versus bad jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. Panel B shows results of nested ANOVA model that compares the no jargon versus good jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. All p-values are two-tailed unless noted with *.

TABLE 5
The Mediation Analysis for Investors with Some-but-Low Industry Knowledge

Panel A: Path Estimates and Coefficients

	Coefficient	t-statistic	p-value	LLCI	ULCI
DV: Premium					
Constant	1.478	2.81	<0.01	0.602	2.354
Presence of jargon (Link 1b)	1.286	2.11	0.02*	0.273	2.300
DV: Investment willingness					
Constant	0.018	0.05	0.96	-0.560	0.596
Premium (Link 2b)	0.620	9.25	<0.01*	0.509	0.732
Presence of jargon (Link 3b)	0.135	0.34	0.73	-0.522	0.792

Panel B: Indirect Effects of the Presence of Jargon on Investment Willingness

	Effect	LLCI	ULCI
Through premium	0.798	0.229	1.401

Panel A presents path estimates and coefficients for the mediation analysis for investors with some-but-low industry knowledge, with the presence of jargon (“0” for the No Jargon condition and “1” for the rest of the three jargon-present conditions) as the independent variable, premium as the mediator, and investment willingness as the dependent variable. Panel B shows indirect effects of jargon on investment willingness through premium. Following the biased-corrected bootstrapping method (Hayes, 2013; Preacher and Hayes, 2008), we use the Hayes PROCESS macro (Model 4) to estimate the path coefficients through 10,000 bootstrapped sample with a 90% confidence level. We measure participants’ investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest;” and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach’s Alpha = 0.94), and thus we use the average of these two measures as investment willingness. We also ask two questions to capture participants’ feelings of product premium. We ask participants to indicate the extent they feel the company’s technology and products are (1) superior and (2) unique. Both questions are measured on 11-point scales with “-5” labeled “not at all” and “5” labeled “extremely.” The two measures are correlated (Pearson Correlation = 0.57, $p < 0.01$; Cronbach’s Alpha = 0.65), and thus we use the average of the two responses as our measure of participants’ perceived product premium (also known as, premium). All p-values are two-tailed unless noted with *.

TABLE 6
Investment Willingness for Investors with High Industry Knowledge

Panel A: Contrast-Coded Analysis of Variance

Source	df	F	p-value
Contrast weight: “+1” in the no jargon condition, “+1” in the good jargon alone condition, “-1” in the bad jargon alone condition, and “-1” in the both-good-and-bad jargon condition	1	4.22	0.02*

Panel B: Nested Analysis of Variance – no jargon vs. bad jargon alone vs. both-good-and-bad jargon – *Test of H3a*

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of bad jargon	10.93	1	10.93	2.08	0.08*
Presence of bad jargon alone vs. presence of both good and bad jargon	0.01	1	0.01	0.00	0.97
Error	384.31	73	5.26		

Panel C: Nested Analysis of Variance – no jargon vs. good jargon alone vs. both-good-and-bad jargon – *Test of H3b*

Source	Sum of Squares	df	Mean Square	F	p-value
No jargon vs. presence of good jargon	1.75	1	1.75	0.39	0.53
Presence of good jargon alone vs. presence of both good and bad jargon	11.24	1	11.24	2.50	0.06*
Error	333.20	74	4.50		

Panel A reports the contrasts-coded analysis of variance for investors with high industry knowledge. Panel B presents results of nested ANOVA model that compares the no jargon versus bad jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. Panel B shows results of nested ANOVA model that compares the no jargon versus good jargon alone versus both-good-and-bad jargon conditions with investment willingness as the dependent variable. All p-values are two-tailed unless noted with *.

TABLE 7
The Mediation Analysis for Investors with High Industry Knowledge

Panel A: Path Estimates and Coefficients

	Coefficient	t-statistic	p-value	LLCI	ULCI
DV: Unnecessary-jargon					
Constant	1.077	2.74	<0.01*	0.425	1.728
Presence of jargon (Link 1c)	0.983	2.19	0.02*	0.227	1.739
DV: Investment willingness					
Constant	1.966	4.34	<0.01*	1.246	2.686
Unnecessary-jargon (Link 2c)	-0.183	-1.70	0.05*	-0.360	-0.005
Presence of jargon (Link 3c)	-0.303	-0.61	0.54	-1.128	0.521

Panel B: Indirect Effects of the Presence of Jargon on Investment Willingness

	Effect	LLCI	ULCI
Through unnecessary-jargon	-0.179	-0.507	-0.021

Panel A presents path estimates and coefficients for the mediation analysis for investors with high industry knowledge, with the presence of jargon (“0” for the no jargon condition and “1” for the rest of the three jargon-present conditions) as the independent variable, unnecessary-jargon as the mediator, and investment willingness as the dependent variable. Panel B shows indirect effects of jargon on investment willingness through unnecessary-jargon. Following the biased-corrected bootstrapping method (Hayes, 2013; Preacher and Hayes, 2008), we use the Hayes PROCESS macro (Model 4) to estimate the path coefficients through 10,000 bootstrapped sample with a 90% confidence level. We measure participants’ investment willingness by asking them to indicate (1) how willing they are to invest in the stock on an 11-point scale, with “-5” labeled “absolutely not willing to invest” and “5” labeled “absolutely willing to invest;” and (2) the attractiveness of the stock on an 11-point scale, with “-5” labeled “not at all attractive” and “5” labeled “extremely attractive.” The two measures are highly correlated (Pearson Correlation = 0.89, $p < 0.01$; Cronbach’s Alpha = 0.94), and thus we use the average of these two measures as investment willingness. We ask two questions to capture participants’ perception of unnecessary use of jargon. We ask participants to indicate the extent to which they agree that the company’s management intentionally uses jargon to communicate technical information in an unnecessarily specific manner, on an 11-point scale where “0” is “definitely disagree” and “10” is “definitely agree.” We also ask participants to indicate the extent to which participants think the jargon and technical terms used in the disclosure make it a mouthful and disfluent. The two measures are correlated (Pearson Correlation = 0.50, $p < 0.01$; Cronbach’s Alpha = 0.66), and thus we use the average of these two measures as perceptions of unnecessary use of jargon (also known as unnecessary-jargon). All p-values are two-tailed unless noted with *.