

ARE INVESTORS INFLUENCED BY HOW EARNINGS PRESS RELEASES ARE WRITTEN?

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This two-part study begins with a rhetorical analysis of the genre of earnings press releases. Then, a quantitative analysis uses capital markets data to assess the investor impact of tone and other stylistic attributes. The genre analysis explores the regulatory context, structural attributes, and dual informational-promotional role of earnings press releases, using individual releases as illustrations. The quantitative analysis explores the relation between the stock market reaction to earnings press releases and quantitative measures of style developed using elementary computer-based content analysis of a corpus of releases. Results suggest that tone influences investors' reactions. An explanation for this result is provided by prospect theory, which predicts that framing financial performance in positive terms causes investors to think about the results in terms of increases relative to reference points. Results also suggest that longer press releases reduce the market impact of unexpected earnings.

Keywords: *investor communications; earnings announcements; event study; content analysis; tone*

Many firms issue press releases several weeks after the end of each quarter to announce their results for the period. These earnings press releases, though voluntary, are an important means by which firms communicate to investors about their financial performance, prior to subsequently filing their formal financial statements with the U.S. Securities and Exchange Commission (SEC). Although the SEC regulates the way in which firms communicate certain financial measures, content of these earnings press

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releases is mostly discretionary. In addition, the way such disclosure is written is discretionary, other than the requirement that it be written in "plain English," a phrase that is used extensively in disclosure regulation.

The purpose of this study is to gain an increased understanding of the firm-investor communication process. The study comprises two parts, one qualitative and the other quantitative. The first part of the study explores the genre of earnings press releases, using a selection of individual releases. The quantitative part of the study assesses investor impact by analyzing the stock market reaction following earnings press releases and the relation between that reaction and how earnings press releases are written: their tone and other stylistic attributes.

The rhetorical analysis of the genre describes the relevant regulatory context and then examines the structural attributes of earnings press releases, applying concepts from communication research that analyzed corporate annual reports as narratives (Jameson, 2000). The analysis then explores the dual informational-promotional role of earnings press releases, illustrating subtle promotion techniques in individual releases. The dual informational-promotional role links communication research on promotional features of corporate press releases (Maat, 2007) and shareholder letters in annual reports (e.g., Hildebrandt & Snyder, 1981; Rutherford, 2005) with accounting research on impression management (e.g., Clatworthy & Jones, 2003) and on strategic selection of benchmarks (e.g., Schrand & Walther, 2000).

The quantitative part of this study examines the market impact of tone and other stylistic attributes of earnings press releases using 1,366 firm-year observations of annual press releases issued by firms in the telecommunications and computer industries between 1998 and 2002. To examine market impact, the article employs a methodology widely used in capital markets research, an event study. Event studies, which are based on the financial concept that new information is quickly reflected in a company's stock price, examine what is called *abnormal returns*: whether a firm's stock exhibited higher or lower returns around the time of an event than would have been expected absent any new information. Abnormal returns are commonly measured as the difference between returns on the firm's stock and returns on a broad sample of stocks (Brown & Warner, 1980, 1985). The period of time during which abnormal returns are measured is known as the event window, and event studies about earnings announcements typically measure abnormal returns over a short window (e.g., Francis, Schipper, & Vincent, 2002). In the context of earnings announcements, the new financial information usually studied is the amount of

unexpected earnings announced. A classic application of the short-window event study methodology is the examination of the stock market reaction to earnings announcements (e.g., Campbell, Lo, & MacKinlay, 1997), and the study reported here thus builds on a rich body of capital markets research showing that the stock market reacts positively to unexpectedly positive earnings (e.g., Ball & Brown, 1968; Ball & Kothari, 1991; Hoskin, Hughes, & Ricks, 1986). The quantitative study reported here examines the market reaction both to unexpected earnings and to the tone and other stylistic attributes of the earnings press release.

Tone, defined in this study as the affect of a communication, is closely linked to the promotional role of earnings press releases because many promotional techniques employed in a release would create a positive tone. One distinction is that promotion implies a communicator's intent to influence, whereas a positive tone need not imply intent. The impact of tone on investors, examined in the quantitative part of this study, can be understood in the context of prospect theory (Tversky & Kahneman, 1981, 1986), which predicts that framing financial performance in positive terms will cause investors to think about the results in terms of increases relative to reference points. Prospect theory has been widely applied in experimental research but has received limited attention in capital markets research (Koonce & Mercer, 2005) and in communications research. Furthermore, the impact of tone on market reaction also relates to the notion of a reinforced statement being "a stronger argument for a particular conclusion than the nonreinforced version" (Maat, 2007, p. 68).

In the remainder of this article, I first describe the genre of earnings press releases, based on the analysis of individual releases. The quantitative part of the study begins with a description of hypotheses about how the tone and style of earnings press releases might influence investors. The method section then explains the event study method, sample selection, quantitative measures of tone and style, and results. The final section summarizes and discusses implications.

RHETORICAL ANALYSIS: THE GENRE OF EARNINGS PRESS RELEASES

Notable features of earnings press releases include the following: their importance in the firm-investor communication process and the regulatory context governing their issuance, their structural similarities to annual reports, and their potential to serve both informational and promotional purposes.

Regulatory Context

As noted in the introduction, earnings press releases are voluntary, although since 2003 any earnings press releases along with any other material announcements must be filed with the SEC (SEC, 2003). These press releases are an important element of the firm-investor communication process. Anecdotal evidence, firm behavior, and regulatory actions illustrate the importance of earnings press releases in the firm-investor communication process. As anecdotal evidence, a former managing director of investor relations for Enron testified that analysts relied more on earnings releases than on SEC filings (Emshwiller & McWilliams, 2006). Firms have demonstrated the importance of earnings press releases by increasing the length of their releases. For example, in a sample of earnings press releases between 1980 and 1999, the average word count increased from 517 to more than 2,400 (Francis et al., 2002). Regulators' actions also evidence the importance of earnings press releases. The Financial Accounting Standards Board (1978) specifically identifies news releases as examples of financial reporting. Also, as noted, the SEC now formally requires firms to file all earnings press releases. Furthermore, the SEC's 2005 Securities Offering Reform rules, which significantly liberalized communications around the time of public stock offerings, allow all issuers to continue publishing "regularly released factual business information . . . [for example] an earnings release consistent with past practice, including the posting of and maintaining the release on an issuer's web site" (SEC, 2005, p. 51).

Firms have demonstrated the importance of earnings press releases by increasing the length of their releases.

Notwithstanding the importance of earnings press releases, their content is largely discretionary, with two notable exceptions. First, the SEC requires that earnings announcements be written in "plain English." The phrase "plain English" is extensively used in disclosure regulation. For example, revisions by the SEC (1998a) to the Securities Act require plain English in key portions of registration statements and prospectuses, and the Sarbanes-Oxley Act of 2002 calls for real-time disclosures in plain

English. Second, if a press release presents a financial metric that is not calculated in conformity with generally accepted accounting principles (GAAP), SEC rules constrain the way in which that metric (known as a non-GAAP measure) is presented (SEC, 2003).

Multipart Structure and Multivocality

Similar to annual reports, earnings press releases typically include a *text* portion that describes the performance of the period and an *accounting* portion that documents the performance of the period using formal financial statements. The text portion of an earnings press release describes operational and financial aspects of the firm's performance in the previous quarter and also typically includes a quotation attributed to the senior executive of the firm. In addition, the text portion may include information about expected future performance. Finally, the text portion typically includes cautionary language that warns investors of the risk that future performance may change. Inclusion of this cautionary language provides a "safe harbor" against potential litigation as prescribed in the Private Securities Litigation Reform Act of 1995.

The accounting portion of an earnings press release contains financial statements with information about the firm's financial performance, typically an abbreviated version of the firm's full financial statements. In essence, then, an earnings press release, like an annual report, tells the story of how a firm performed during an accounting period, using both verbal language (e.g., English) and numerical business language (i.e., accounting). The text and accounting portions of an earnings press release can be viewed as embedded subgenres, similar to Jameson's (2000) characterization of the components of the annual report. Furthermore, similar to annual reports' multivocality (Jameson, 2000), earnings press releases also involve multiple narrators, including the firm itself, named senior executives to whom quotes are attributed, and the unnamed creator of the financial statements. The firm itself appears as a narrator because authors of corporate press releases generally adopt a third-person perspective, stating, for example, that "Company XYZ announced results for the fourth quarter."

The accounting portion and the text portion of an earnings press release present both overlapping and nonoverlapping information. The overlapping information consists of financial data. For example, the amount of sales revenues, which appears in the financial statements, may also be described in the text portion of a press release. Nonoverlapping information appearing in the text portion but not the accounting portion includes

some or all of the following: evaluative comments, explanations of the performance such as how the overall economy or particular operational aspects affected the firm's performance, and expectations about future performance such as the amount of sales revenues expected in the next quarter. Nonoverlapping information appearing in the accounting portion but not in the text portion includes *all* the financial information other than the items selected for inclusion in the text portion.

Potential to Serve Both Informational and Promotional Purposes

Unlike the accounting portion of an earnings press release, in which accounting rules known as GAAP prescribe the content of financial statements, the text portion of an earnings press release is largely discretionary. So the text portions, in particular, exhibit the potential duality of purpose: informational and promotional. The informational purpose is to impart facts about the company's performance, and the promotional (or even persuasive) purpose is to favorably influence readers' views of that performance. Promotional aspects of earnings press releases may aim to influence financial journalists to write about the company favorably, equity analysts to evaluate the company's past and future performance favorably, and investors to increase their estimated values of the company's securities.

Earnings press releases' potential duality of purpose is a particular instance of the promotion-information conflict in the genre of corporate communication generally. Some communications research has examined how journalists deal with often-present promotional features in corporate press releases (Maat, 2007). A larger body of literature has examined promotional features in annual reports, particularly impression management. Letters to shareholders in annual reports are more positive than negative, regardless of financial performance, according to studies by Hildebrandt and Snyder (1981) and Rutherford (2005). In the chairman's statements, executives tend to take credit for good results but blame negative results on environmental factors, consistent with attribution theory (Clatworthy & Jones, 2003). The letters from chairmen in annual reports may also include linguistic devices to create a positive corporate image (Hyland, 1998) or to shape readers' attitudes during periods of crisis (Prasad & Mir, 2002). In general, the potentially dual purpose of corporate communication—including earnings press releases that are the subject of the current study—illustrate Bhatia's (2002) notion of an informational genre being influenced by promotional concerns.

Perhaps because of the importance of their informational role, earnings announcements can reasonably be expected to employ only subtle, if any, promotion-oriented techniques. CEO presentations to analysts around the time of announcing poor earnings show little evidence of promotional communication, according to a study by Rogers (2000). Some promotional techniques may be so subtle as to be imperceptible, with little distinction between hype and fact. Consider the following illustration. Although SEC regulations do not allow companies to hype or promote their stock around the time of securities offerings, regulations do allow companies to continue to issue earnings announcements, which are considered to be "factual business information" (SEC, 2005). It is interesting that a typical positive officer comment appearing in earnings announcements is arguably similar to a statement considered to be hype. An accounting study on earnings announcements provided the following example of a positive officer comment: "Looking further ahead Allen said that the company possibly will double its revenue thus topping \$2 billion in 1983" (cited in Hoskin et al., 1986, p. 30). A former regulator provided the following examples in the context of one SEC-enforced delay of a public offering because of comments by the company's chairman: A statement such as "we manufacture widgets" is acceptable, but a statement such as "our widgets are the best and demand for widgets is expected to double in five years" is viewed as an attempt to excite investor interest, that is, to hype a company's stock (Bank, 2004).

Notwithstanding the subtlety of promotion techniques, the following paragraphs offer some examples. The first two examples, which are comparative, are hypothetical. The other examples come from press releases used in the quantitative analysis and from press releases published later.

One example of a subtle promotion technique is for the text portion to include favorable items of information appearing in the accounting portion and to exclude unfavorable items. Such a technique could provide an opportunity to pursue a "sanitization strategy" in which firms announce good news and suppress bad, modeled by Shin (1994). Any company with reasonably complex operations has a broad body of "news" from which to select items it will report in the text portion of its earnings press release and many ways to present the selected items. As explained in Jameson's (2000) analysis of shareholder reports as narratives, "One fabula [set of underlying materials of a story] can yield a myriad of stories" and "one story, told by different narrators in different ways, yields many texts" (p. 9).

Even extremely noncomplex operations create choices for earnings announcements, as demonstrated in Example 1 and Example 2. These

examples provide two simplified income statements for hypothetical firms, each showing only sales, expenses, and net income. Also, one can use these income statements to calculate a simple profitability ratio: return on sales (ROS), which equals net income divided by sales. (This ratio, also known as the net profit margin, though not part of a firm's financial statements, uses information from the financial statements.) In the first year, 2006, the ROS ratio for the companies in both examples was 20% (\$20 divided by \$100).

Example 1.
Simplified Income Statement for Company ABC

	2007	2006	Percentage change
Sales (\$)	95	100	-5.0
Expenses (\$)	74	80	-7.5
Net income (\$)	21	20	5.0
Return on sales (%)	22.1	20.0	

Alternative textual descriptions, each of which is factually correct:

- In 2007, sales totaled \$95, and net income was \$21.
- In 2007, sales and net income were \$95 and \$21, respectively, compared to \$100 and \$20 for 2006.
- In 2007, sales decreased by 5%.
- In 2007, net income increased by 5%. Profitability improved, with return on sales increasing from 20% to over 22%.

Example 2.
Simplified Income Statement for Company XYZ

	2007	2006	Percentage change
Sales (\$)	110	100	10.0
Expenses (\$)	95	80	18.8
Net income (\$)	15	20	-25.0
Return on sales (%)	13.6	20.0	

Alternative textual descriptions, each of which is factually correct:

- In 2007, sales totaled \$110, and net income was \$15.
- In 2007, sales and net income were \$110 and \$15, respectively, compared to \$100 and \$20 for 2006.
- In 2007, net income decreased by 25%. Profitability deteriorated, with return on sales declining from 20% to 13.6%.
- In 2007, sales increased by 10%.

Below each of the income statements in Examples 1 and 2, four alternatives describe each income statement for the year 2007. The textual descriptions labeled *a* in Examples 1 and 2 simply state the amount of sales and net income for the most recent year. The second descriptions, labeled *b*, state the amount of sales and net income for both years, linked with the words *compared to*. The third descriptions, *c*, in each example select financial items that deteriorated in the most recent year and make the unfavorable comparison explicit by using words such as *decreased*, *deteriorated*, and *declining*. The fourth descriptions, *d*, in each example mention only financial items that improved in the most recent year and make the favorable comparison explicit by using words such as *increased*, *improved*, and *increasing*. All four textual descriptions are factually correct, yet the fourth description, *d*, in each example achieves a more promotional purpose by selecting a positive aspect of performance, by making an explicit positive comparison, and by using explicitly positive evaluative words.

The simplified information in Examples 1 and 2 illustrates some of the basic choices among financial statement measures for inclusion in the text portion of earnings press releases. In practice, most companies have a far broader body of news from which to select and can, for example, selectively describe outcomes for one particular geographic segment, one product segment, one organizational unit, or some particular time segment. Alternatively, firms can describe positive expectations about future periods. Example 3 illustrates a selective focus on one organizational unit.

Example 3. Selective Inclusion of Information in the Text Portion of Earnings Press Releases

In a bulleted introductory point in the text portion, the company reports that the operating margin of *one division* “rises 0.7 percentage points to 29.7%.”

In the accounting portion’s income statement, the numbers reveal that the operating margin for the company *as a whole* fell by nearly one percentage point.

Source: Novartis (2006, italics added).

Another subtle promotion technique is selection of a benchmark that allows favorable period-to-period comparison, that is, allows the firm to describe its performance as better compared to that benchmark. Some firms strategically select prior periods’ nonrecurring earnings components as benchmarks (Schrand & Walther, 2000), allowing favorable performance comparisons. Similarly, earnings press releases sometimes present financial measures that are not computed in accordance with GAAP, so-called non-GAAP financial measures, the use of which is subject to regulation (SEC,

2003). A non-GAAP measure of earnings in the text portion of a press release, for example, might adjust the net income figure reported in a firm's financial statements to exclude some expense items. In Example 4, the press release explains that earnings per share (EPS) would have been \$0.50 if the company had not been required to make severance payments to an executive. What EPS would have been (known as *pro forma* EPS) is a non-GAAP measure. Because the company did make the severance payments, the company's actual EPS was lower, \$0.46.

Example 4. Selection of a Non-Generally Accepted Accounting Principles Financial Measure in Earnings Press Releases

"The Home Depot®, the world's largest home improvement retailer, today reported fourth quarter net earnings of \$925 million, or \$0.46 per diluted share, compared with \$1.3 billion, or \$0.60 per diluted share, in the same period in fiscal 2005. Excluding a \$0.04 per diluted share expense related to executive severance, the Company reported, on an adjusted basis, \$0.50 per diluted share."

Source: Home Depot (2007).

Excluding a particular expense item can serve a promotional purpose, making the firm's performance seem better by describing what the results would have been if certain (usually "bad") things had not happened. For this reason, the SEC requires firms to give at least equal emphasis to GAAP measures when using a non-GAAP measure and to provide a reconciliation between the two measures (SEC, 2003). Prior research has found that some firms strategically elect to present non-GAAP earnings to allow favorable comparisons and are significantly more likely to present non-GAAP earnings when their GAAP earnings failed to increase relative to the prior period or failed to exceed analysts' expectations (Lougee & Marquardt, 2004).

Another subtle promotion technique is selection of a benchmark that allows favorable period-to-period comparison, that is, allows the firm to describe its performance as *better* compared to that benchmark.

Yet another example of a subtle promotion technique is the amount of emphasis placed on particular items of information. Research indicates that some firms strategically place emphasis on metrics that allow them to say—in the headlines or text of earnings press releases—more positive things about their performance (Bowen, Davis, & Matsumoto, 2005). In practice, emphasis can be achieved through placement in the text, through repetition, or both. Example 5 illustrates emphasis on positive items of information, despite an overall negative performance. Example 6 illustrates emphasis on a company's good sales performance, both by text placement and by repetition. Here, the company announces the amount of sales (which also appears in financial statements in the accounting portion of the release) and/or the percentage increase in three places: the headline, the second paragraph of text, and the eighth paragraph of text.

Example 5. Emphasis Through Placement in the Text of Earnings Press Releases

The headline and lead state, "Company Achieves Record Quarterly Revenues; Balance Sheet boasts nearly \$1.1 billion in cash and marketable securities."

In the accounting portion's income statement, the numbers reveal that the company reported a *loss* per share of \$3.54 compared to a year earlier *earnings* per share of \$2.70.

Source: IDT (2001, italics added).

Example 6. Emphasis Through Placement in the Text and Through Repetition

Headline: "Blue Nile Announces Fourth Quarter and Fiscal Year 2006 Financial Results; Reports Record Fourth Quarter Net Sales of \$90.7 Million, up 23.9%"

Body (second paragraph): "Blue Nile reported fourth quarter net sales of \$90.7 million, compared to net sales of \$73.2 million in the fourth quarter of 2005, an increase of 23.9%."

Body (eighth paragraph): "Mark Vadon, Chief Executive Officer, said, 'Blue Nile had an excellent fourth quarter, posting results that balance strong growth and profitability. . . . We generated sales growth of 23.9%'."

Source: Blue Nile (2007).

Each of the preceding examples illustrates the potential promotion-information conflict in earnings press releases. Although each of the choices can serve a promotional purpose, each can also serve an informational purpose. For example, pointing out a nonrecurring expense could assist investors in making better forecasts about the firm's future performance, selecting a particular aspect of performance could guide investors

to understand which aspects of the business are most important, and describing the performance of an important product segment could save investors time. To fulfill a promotional purpose, the text could exhibit the same choices simply to convey a message: We did a good job.

Another somewhat less subtle promotional technique is the inclusion of evaluative comments. In Example 6, the officer quote includes the evaluative adjectives *excellent* and *strong*. Examples 7 and 8 further illustrate positive evaluative comments, signified by words and phrases such as *pleased*, *strong growth*, *strong profits*, *strong financial results*, *broad strength*, and *leading margins*.

Example 7. Positive Evaluative Comments

“We are extremely pleased with our fourth quarter results, especially the strong growth in Optical Internet, Wireless Internet, and Core IP Networking,” said John Roth, president and chief executive officer, Nortel Networks.”

Source: Nortel Networks (2001).

Example 8. Positive Evaluative Comments

“Mike Jeffries, Chief Executive Officer and Chairman of the Board of Abercrombie & Fitch Co., said: ‘During the third quarter, Abercrombie & Fitch demonstrated its ability to consistently drive strong profits. This strong financial result reflects the broad strength of our brands and their ability to drive leading margins.’”

Source: Abercrombie & Fitch (2007).

Press releases with negative evaluative comments can still reflect some aspects of promotion. Example 9 illustrates negative evaluative comments, signified by words such as *challenging*, *disappointed*, *lower*, and *challenged*. This example also provides explanations for the performance, some of which are operational (i.e., poor selection of merchandise and delayed store openings) and some of which are environmental (i.e., warm weather and general economic conditions).

Example 9. Negative Evaluative Comments

“The third quarter was challenging on a variety of levels and clearly, we are disappointed with the results,” said Chuck Crovitz, Interim Chief Executive Officer of The Children’s Place Retail Stores, Inc. ‘Total sales were lower than planned due to merchandise that did not resonate with our Children’s Place customer, the unusually warm weather and the challenging macroeconomic environment, which impacted both brands. Our results were further challenged by the impact of merchandise purchased for Disney Stores that are opening later in the year than originally scheduled.’”

Source: Children’s Place (2007).

It is interesting that the language choices in Example 9 exhibit some of the same characteristics found in the management report sections of a firm with declining financial performance (Thomas, 1997). One such characteristic, the use of passive voice as in the final sentence of Example 9, serves to “distance the messenger from the message” (Thomas, 1997, p. 53). Another characteristic, the use of nonhuman agents, appears in the phrase “merchandise did not resonate with the customer,” which is essentially equivalent to an alternative that does not appear in the press release: “We selected products that our customers didn’t like.” By using nonhuman agents including *merchandise*, *warm weather*, and *macroeconomic environment*, the explanations in Example 9 “give a strong but subtle impression of a factual situation . . . caused by circumstances . . . not attributable to any person or persons who might otherwise be thought responsible” (Thomas, 1997, p. 56). Example 9 also exhibits the “blame” theme found in the annual reports of underperforming mutual funds that blame various forces for their underperformance (Jameson, 2000) and illustrates impression management in shareholders’ letters that allocate blame to external forces (Clatworthy & Jones, 2003).

Generally, the techniques of subtle promotion in earnings press releases relate to the notion of a reinforced statement being “a stronger argument for a particular conclusion than the nonreinforced version” (Maat, 2007, p. 68). In the context of earnings press releases, the reinforcement can occur on several levels. At one level of reinforcement, particular aspects of performance can be specifically mentioned. At another level of reinforcement, a particular item can be emphasized by placement within the text and/or by repetition. At yet another level of reinforcement, a particular benchmark can be selected because it permits a favorable comparison. Finally, the aspects of performance can be reinforced by evaluative words to describe results.

Research on the overall genre of corporate press releases assumes that firms want to influence what and how financial journalists write about the information contained in the press release (Maat, 2007). Because earnings press releases are distributed directly to investors, it is also possible that firms may want to directly influence investors rather than solely trying to influence what and how financial journalists write about the information. Specifically, firms e-mail or broadcast fax earnings press releases directly to investors, who can thus obtain information directly from the earnings press release, not just from sources intermediated by a financial journalist. The directness with which earnings press releases are communicated to investors makes the potential influence of their tone and stylistic attributes, which are not necessarily similar to the tone and stylistic attributes of mediated press releases, particularly relevant.

In summary, as a result of the broad discretion concerning earnings press releases, firms make many choices about the way their earnings press releases are written. Are investors influenced by the way earnings press releases are written? Overall, this question is relevant to understanding the role of earnings announcements in the firm-investor communication process.

HYPOTHESIS DEVELOPMENT: THE TONE AND STYLE OF EARNINGS PRESS RELEASES

The qualitative part of this study has examined the regulatory context, structure, and duality of purpose of earnings press releases. In the quantitative part of this study, I now examine the tone and several stylistic attributes of earnings press releases—length, numerical intensity, and verbal complexity. Each of these attributes is posited to influence investors' reactions to earnings press releases as assessed by market reaction. In addition, in this section I also explore whether investors' level of sophistication influences their responses to the tone and style of earnings press releases.

In the quantitative part of this study, I now examine the tone and several stylistic attributes of earnings press releases—length, numerical intensity, and verbal complexity.

Tone

Tone is defined in this study as the affect or feeling of a communication. Distinct from promotion, which implies an intent of the speaker to influence a reader's views, a positive tone as defined here need not imply intent, although many of the techniques for subtle promotion would create a positive tone. This study does not directly address the intent of the author but rather whether a more positive tone affects investors. In archival capital markets research, investor impact is typically assessed using some measure of a company's stock performance, such as market

reaction around the date of some event (e.g., abnormal returns). Archival capital markets research uses historical stock market data, as distinct from experimental capital markets research that typically simulates some aspect of the stock market.

Two archival accounting studies have specifically examined “tone” as a variable affecting the performance of a company’s stock, without offering a formal definition of the word but rather relying on the generally understood meaning of the word as describing the optimism versus pessimism or positive versus negative nature of the communication. Each of these studies judgmentally assessed the tone of disclosures, including both news released by the firm as well as news from other media sources. One found that announcement-day market returns are not associated with the tone of press coverage in the year prior to an adverse earnings announcement (Francis, Philbrick, & Schipper, 1994). In contrast, the other found a positive correlation (untabulated results) between market returns and the frequency of optimistic statements by companies in the 18 months prior to another type of adverse announcement (Lang & Lundholm, 2000). The type of adverse announcement examined in the second study was a seasoned common stock offering. A seasoned common stock offering is a sale of stock by a company whose stock is already publicly owned, as distinct from an initial public stock offering, which is a company’s first public sale of its stock. The reason that an announcement of a seasoned common stock offerings is considered an adverse announcement is that such an offering will typically dilute the ownership of existing common stockholders; that is, the existing common stockholders will own a smaller percentage of the company after the new offering. Note, however, that study’s coding rule that “absent some disclosed benchmark, earnings announcements are assigned a tone based on a random walk of quarterly earnings,” which suggests that its results could have simply captured the market’s response to quarterly earnings (Lang & Lundholm, 2000, p. 657).

Tone, as defined in this study, is a function of both content and word choice. A more positive tone can be achieved by focusing on positive outcomes and/or by describing outcomes in a positive way. Archival research has shown that strategically selected benchmarks do influence investors, where investor reaction is measured using abnormal returns around the announcement date (Lougee & Marquardt, 2004; Schrand & Walther, 2000). Archival research also has suggested that giving greater emphasis to the strategically selected benchmarks affects investors (Bowen et al., 2005). Experimental research has corroborated those results by demonstrating that benchmarks allowing favorable comparisons influence investors, where

investor reaction is measured based on differences in subjects' estimates of a company's future earnings (Elliott, 2006; Krische, 2005).

Yet another way to create a positive message is to offer positive comments about future performance. Officer comments in earnings press releases that convey positive (or negative) future expectations have been shown to be significantly associated with market reaction to the press release (Francis et al., 2002; Hoskin et al., 1986). Other research has shown that aspects of corporate strategy communications around the time of initial public offerings are associated with postoffering returns (Gao, Darroch, Mather, & MacGregor, 2007).

Tone is also affected by word choice. Negative words in annual reports letters have been shown to be associated with future market returns (Abrahamson & Amir, 1996) and firm failure (Smith & Taffler, 2000). Negative and positive words in earnings press releases have been used in a composite style measure to predict postannouncement market overperformance, although that research did not individually examine tone (Henry, 2006).

Although the disclosure content of earnings announcements is largely discretionary, firms differ in their ability to "manufacture" a positive tone depending on how their actual earnings compare to key benchmarks. Key benchmarks include the following analysts' expectations, prior period results, and profit versus loss (Graham, Harvey, & Rajgopal, 2005). The study reported here, therefore, controls for firms' actual results relative to each of these benchmarks.

In summary, accounting research on the influence of tone on investors is limited and inconclusive. In situations analogous to financial reporting, research has provided evidence of the influence of verbal descriptions. Experimental research (Kahneman, 2002; Tversky & Kahneman, 1981, 1986) has shown that individuals' probability-dependent judgments are affected by the terms in which expected outcomes are expressed, that is, "framing effects"; and prospect theory predicts that choices differ when outcomes are framed in positive versus negative terms in relation to some neutral reference outcome. For example, medical choices differ when outcomes are couched in terms of survival rates instead of mortality rates (Tversky & Kahneman, 1986). As another example, business investment decisions differ when outcomes are couched in terms of jobs and plants lost instead of jobs and plants gained (Bazerman, 2002). This economic framing research focuses on radically different ways of describing outcomes rather than the style of communication but is related to the issue of earnings press releases describing positive aspects of performance and/or describing performance using positive language.

Overall, evidence that readers are influenced by how information is written appears in analogous research in judgment and decision making. This

body of research, as well as empirical research in accounting and communications, motivates the hypothesis that the tone of the textual portion of earnings press release, as well as actual financial results, affects investors.

Hypothesis 1a (H1a): A more positive tone of earnings press releases positively affects investors' reaction to earnings announcements.

Hypothesis 1b (H1b): The tone of earnings press releases positively affects investors' reaction to earnings announcements, even controlling for actual financial results.

Length

Research suggests that the relationship between the length of an item of corporate disclosure and the firm's financial performance depends on the context. One study of shareholders' reports of 200 mutual funds found no relation between the length of disclosure by funds with top performance and those funds with mixed performance (Jameson, 2000). In contrast, another study of more than 55,000 annual reports found a negative relation between the length of a firm's annual report narrative and the firm's earnings; that is, firms with higher earnings wrote shorter annual reports (Li, in press). Yet another study of 50 annual reports showed that the letters for more profitable firms were longer than those for less profitable ones (Kohut & Segars, 1992). Differences across these studies' findings may be the result of differences in how they measured of financial performance, differences in the type of firms making the disclosure, and/or differences in the item of corporate disclosure examined.

Research has also produced conflicting implications about whether disclosure length has a positive, neutral, or negative impact on users of the disclosure. One study implies a neutral impact of disclosure length, finding no significant association between the length of a firm's annual report and the performance of the firm's stock in the following years (Li, in press). Other studies look at the quantity of information disclosed, which is relevant because presenting more items of information can usually be expected to result in longer disclosure. One study included quantity of disclosure in annual reports as an element that has a positive impact on investors, as reflected in a lower cost of capital (Botosan, 1997). Botosan (1997) argued that quantity of disclosure is often used to measure disclosure quality on the grounds that regulation and litigation threats, as well as reputation effects, will ensure that all disclosure is of high quality. Yet another study showed a negative impact of increased disclosure quantity. In an experimental setting, increased amounts of accounting information, that is, notes in addition to financial statements, did not improve loan officers' decision

making, possibly because of information overload (Casey, 1980). This alternative view that excessive disclosure diminishes investors' decision-making ability is evident in the Supreme Court's statement:

If the standard of materiality is unnecessarily low, . . . management's fear of exposing itself to substantial liability may cause it simply to bury the shareholders in an avalanche of trivial information—a result that is hardly conducive to informed decision making. (Choi & Pritchard, 2003, n. 225)

These conflicting implications may be a result of the studies' different measures of length and/or quantity of information and different measures of the impact on users of the disclosure; however, collectively, prior research has suggested no clear view about how the length of disclosure affects investors.

Overall, these conflicting views give rise to the hypothesis (nondirectional) that the length of earnings press release affects investors' reaction to unexpected earnings.

Hypothesis 2 (H2): The length of earnings press release affects investors' reaction to the financial results reported.

Numerical Intensity

Numerical intensity refers to the amount of quantitative information in financial disclosure. Capital markets research has typically viewed quantitative information as having a positive impact on users of disclosure. For example, Botosan (1997) argued that a greater amount of numerical data in a firm's annual report lowers the firm's cost of capital because investors consider numerical data to be more precise, useful, and possibly credibility enhancing. Similarly, Mercer (2004) argued that greater numerical precision in management's forecasts enhances investors' assessment of the credibility of management disclosure.

In contrast, decision-making research, although possibly not uniformly applicable to accounting settings, offers reasons for the preference of words over numbers in communicating generally: "Most people understand words better than numbers," and "numbers are perceived as conveying a level of precision and authority that people do not associate with their opinions" (Budescu, Weinberg, & Wallsten, 1988, p. 281). In communicating about uncertainty, people prefer to express their beliefs in words rather than numbers but prefer to receive information numerically, although the mode does not alter the quality of decision making (Wallsten, Budescu, & Zwick, 1993).

Collectively, this research gives rise to the hypothesis (nondirectional) that the numerical intensity of the earnings press release affects investors' reaction to unexpected earnings.

Hypothesis 3 (H3): The numerical intensity of earnings press releases affects investors' reaction to the financial results reported.

Complexity

Basic readability is a widely used measure of style. Measures of readability, such as the Fog Index, the Kincaid Index, and the Flesch Index, incorporate metrics such as words per sentence and some measure of verbal complexity such as syllables per word (Li, in press). In financial disclosure, regulatory attention to complexity is apparent in the emphasis on "plain English," for example, in the Securities Exchange Act of 1934, the Sarbanes-Oxley Act of 2002, and SEC rules (SEC, 1998a). Furthermore, the SEC created a handbook for companies on how to make clear disclosures (SEC, 1998b). A former SEC Chairman wrote, "The SEC could do a lot more to improve disclosures by requiring companies to use plain English in their financial statements. . . . It would be one of the most pro-investor steps the SEC could take to avoid future Enrons" (Levitt, 2002, p. 157).

Research on the association between the readability of a firm's annual report narrative and its earnings has suggested that firms may opportunistically increase complexity to obscure adverse information from investors, although complexity does not affect future market prices in the following years (Li, in press). In general, to the extent that verbal complexity obfuscates information in earnings press releases, such complexity could diminish investors' reactions to the information reported.

Hypothesis 4 (H4): Greater verbal complexity of earnings press releases diminishes investors' reaction to the financial results reported.

Research on the association between the readability of a firm's annual report narrative and its earnings has suggested that firms may opportunistically increase complexity to obscure adverse information from investors.

Investor Sophistication

If investors have the ability to gather private information from other sources and to correctly evaluate public information, attempts by companies to mislead investors by focusing only on positive news (“hyping” and “spinning”) cannot be successful (P. B. Miller & Bahnson, 2002).

Though the nature of the influence may depend on the relative sophistication of the investor, there are reasons to believe that both unsophisticated and sophisticated investors may be influenced by the text portions of financial disclosure. Unsophisticated investors may lack the ability to fully understand the information in press releases and thus fail to receive clear communication. Investors who lack the ability to fully understand the information in the press release may rely only on the portion of the press release with which they are familiar, using the text portion of press releases as a *substitute* for the financial statements. Such a reliance on the text portion would be an instance of the recognition heuristic examined by Gigerenzer (2001) in studies of judgment and decision making. The recognition heuristic refers to the overweighting of the value of items with which an individual is familiar. Some experimental accounting research has shown that less sophisticated investors place greater reliance on the president’s letter in annual reports when inconsistency existed between the tone of the report and the direction of change in earnings (Hofstede, 1972).

For sophisticated investors, the text portions of earnings press releases likely *complement* the financial statement information because such investors are less likely to be misled by lack of clarity or consistency. Warren Buffet, for example, has been quoted as saying he would not invest in a company whose disclosure (in this case, footnotes) he cannot understand because he believes this would imply intentional obfuscation (P. B. Miller & Bahnson, 2002). Disclosure tone and complexity may be interpreted as offering signals about intangible features such as management’s credibility. Such signals might be recognizable to a sophisticated investor and useful in evaluating firm performance. Sophisticated investors may also have a better ability to understand longer disclosure and more numerically intense data.

The research discussed above motivates the following hypothesis.

Hypothesis 5 (H5): The impact of the tone and other stylistic aspects of earnings press releases varies with investors’ sophistication.

QUANTITATIVE ANALYSIS: METHOD AND RESULTS

The previous section developed hypotheses that build on the qualitative analysis of earnings press releases and provide a linkage with the quantitative analyses that follow. To test these hypotheses formally, I combine a methodology commonly used in capital markets research, an event study, with a methodology commonly used in quantitative analysis of textual material, content analysis. Following a description of the event study method and sample selection, the sections below explain the approaches to measuring the variables used in the analysis and present the results for each of the hypotheses.

Short-Window Event Study Method

Event study methodology, a common tool in capital markets research, aims to assess the impact of some event on the stock price of the firm. This method is useful because it links financial performance to management decision making:

In a corporate context, the usefulness of event studies arises from the fact that the magnitude of abnormal performance at the time of an event provides a measure of the (unanticipated) impact of this type of event on the wealth of the firms' claimholders. Thus, event studies focusing on announcement effects for a short-horizon around an event provide evidence relevant for understanding corporate policy decisions. (Kothari & Warner, 2006, p. 4)

Accounting research commonly employs event studies to examine the effect of earnings announcements on stock prices in different contexts. The basic structure of such an event study is a regression, with abnormal stock market returns around the time of the event as the dependent variable. The key independent variable is the amount of reported earnings that had not been expected by the market prior to the earnings announcement. In the event study reported here, additional independent variables are included to capture the tone and other stylistic elements of the earnings announcement itself. (Following sections describe the measurement of each variable.)

The window of an event study refers to the time horizon around the event in which abnormal stock market returns are measured. Capital markets research has shown that short-horizon methods, that is, short-window studies, are reliable, but long-horizon methods have serious statistical limitations (Barber & Lyon, 1997; Kothari & Warner, 1997, 2006). The study

reported here, therefore, uses a short-window event study primarily because of its wide acceptance as a reliable methodology. In addition, use of a short-window event study is consistent with previous accounting research that has examined market response to financial and other information disclosed in earnings press releases (e.g., Bowen et al., 2005; Francis et al., 2002; Lougee & Marquardt, 2004; Schrand & Walther, 2000).

Sample Selection

The sample in this study includes firms from the telecommunications and computer services industries and related equipment manufacturers for the period 1998 to 2002. During the period covered by this sample, there were close, notable linkages among companies in these industries, implying a similar disclosure environment. The specific SIC codes in the sample include the following: 4800 to 4899, covering telecommunications; 3661 to 3669, covering telecommunications equipment manufacturers; 7370 to 7374, covering computer services; and 3570 to 3579, covering related equipment manufacturers. The main rationale for examining these industries during this period is the greater uncertainty created by the Internet-related stock market boom of the late 20th century. Research has shown that investors rely more heavily on nonfinancial information in periods of uncertainty and rapid technology change (Amir & Lev, 1996).

The sample includes only companies with a fiscal year end of December and share price greater than \$1 and is restricted to those companies for which data from the following three sources matched: (a) Compustat (source for report date and accounting data), (b) Center for Research in Securities Prices (CRSP; source for market data), and (c) Institutional Brokers' Estimate System (IBES; source for analysts' forecasts). In addition, because of the study's focus on firm-investor communication, the sample includes only companies whose earnings press release is available on Lexis-Nexis or Factiva. (The study predates the SEC requirement that all firms file their earnings press releases. Now all earnings press releases are available in the SEC database.) A company's direct press release is identified by source (typically *PRNewswire* or *Business Wire*), by length (longer than non-company-authored reports), and ultimately by inclusion of a company contact (usually an investor relations contact). The sample includes 1,366 firm-year observations for 562 firms. The sample is an unbalanced panel because of missing data in some years.

Measurement of Abnormal Market Returns and Unexpected Earnings

As noted, the basic event study reported here uses abnormal market returns around the earnings announcement dates as the dependent variable. The study defines abnormal returns (*CAR*) as the accumulated returns in excess of a broad market portfolio during the period around the earnings announcement. As the broad market portfolio, this study uses the equal-weighted market portfolio from the database compiled by CRSP. The event window used in this study is a 3-day window around the date of the earnings announcement as provided in the Compustat database, which is the date the earnings are first publicly reported in various news media such as the *Wall Street Journal*. This study uses a time horizon beginning the day prior to the Compustat date in part because that date can reflect the date of print media based on a press release issued on the previous day. Another reason for using a time horizon beginning the day prior to the Compustat date is that prior research has empirically shown that the market exhibits significant reaction to earnings announcements beginning on day $t-1$ when day 0 is the announcement date (e.g., Ball & Kothari, 1991; Patell & Wolfson, 1981). In addition, use of a 3-day event window from day $t-1$ to $t+1$ is consistent with related previous accounting research that has examined market response to financial and other information disclosed in earnings press releases (e.g., Bowen et al., 2005; Francis et al., 2002; Schrand & Walther, 2000).

The cumulative abnormal return for firm j for a period of T days, as calculated in the CRSP database, can be written as

$$CAR_j = \prod (1 + AR_{j,t}) - 1, \quad (1)$$

where $AR_{j,t}$ = abnormal returns for firm j 's stock on day t , calculated as the actual return of the stock minus the return on the CRSP equal-weighted market portfolio on day t .

The amount of unexpected earnings (*UE*) is calculated as actual EPS minus EPS reported in the previous year, divided by share price at the beginning of the period, consistent with previous research (e.g., Bowen et al., 2005; Lougee & Marquardt, 2004).

Measurement of Tone and Style

This study creates measures of tone and style using computer-based content analysis. I selected the content analysis software Diction 5.0 (available

from dictionsoftware.com) because it is Windows based and allows user-defined word lists for frequency counts (known as dictionaries). The measure of length of disclosure (*H2*) is a count of the total words in the earnings press release (*WORDS_AL*). *NUMERICAL*, the measure of numerical intensity (*H3*), is the percentage of the text portion of the earnings press release (i.e., not including the financial statements) that is numerical. This percentage is calculated as the count of numerical terms divided by total word count. The count of numerical terms as provided by the Diction 5.0 software includes integers, numbers in lexical format such as *one*, and terms referring to numerical operations (Hart, 2000). The measure of verbal complexity (*H4*) provided by the Diction 5.0 software (Hart, 2000) is the average number of characters per word (*COMPLEX*). The proxy for sophisticated investors (*H5*) is the percentage of shares owned by institutional investors (*INSTITUTIONAL*), as reported in the Compustat database, with a higher percentage indicating greater sophistication.

The measure of tone (*H1*) is based on a frequency count of the number of positive and negative words, obtained using Diction 5.0. The words counted as positive and negative within earnings press releases are shown in Figure 1.

TONE is calculated as the count of positive words minus the count of negative words, divided by the sum of positive and negative word counts. The maximum and minimum values of *TONE* are 1 and -1, respectively. The formula is based on that used in a study of the tone of auditors' opinion letters (Uang, Citron, Sudarsanam, & Taffler, 2006). This tone measure contrasts with previous accounting studies that examined "tone" as a judgmentally assessed variable (Francis et al., 1994; Lang & Lundholm, 2000). A word frequency count approach to measuring tone may at first seem too simplistic to be useful, but similar metrics have been found to be useful in prior research.

In communication research, stylistic elements based on word frequency counts have been used to quantify an increasingly objective tone (use of passive voice and non-human agents) in the annual report of a company with declining performance (Thomas, 1997). Word frequency counts have been used to quantify aspects of the CEO's letters in annual reports, including relative optimism (Hildebrandt & Snyder, 1981) and persuasive elements (Hyland, 1998). In accounting research, word frequency counts have been used to capture the relative pessimism of president's letters in annual reports (Abrahamson & Amir, 1996), the relatively neutrality of news in chairman's statements (Clatworthy & Jones, 2003), and a tone component of overall style of earnings announcements (Henry, 2006). Text analysis

POSITIVITY word list

positive positives success successes successful succeed succeeds succeeding succeeded accomplish accomplishes accomplishing accomplished accomplishment accomplishments strong strength strengths certain certainty definite solid excellent good leading achieve achieves achieved achieving achievement achievements progress progressing deliver delivers delivered delivering leader leading pleased reward rewards rewarding rewarded opportunity opportunities enjoy enjoys enjoying enjoyed encouraged encouraging up increase increases increasing increased rise rises rising rose risen improve improves improving improved improvement improvements strengthen strengthens strengthening strengthened stronger strongest better best more most above record high higher highest greater greatest larger largest grow grows growing grew grown growth expand expands expanding expanded expansion exceed exceeds exceeded exceeding beat beats beating

NEGATIVITY word list

negative negatives fail fails failing failure weak weakness weaknesses difficult difficulty hurdle hurdles obstacle obstacles slump slumps slumping slumped uncertain uncertainty unsettled unfavorable downturn depressed disappoint disappoints disappointing disappointed disappointment risk risks risky threat threats penalty penalties down decrease decreases decreasing decreased decline declines declining declined fall falls falling fell fallen drop drops dropping dropped deteriorate deteriorates deteriorating deteriorated worsen worsens worsening weaken weakens weakening weakened worse worst low lower lowest less least smaller smallest shrink shrinks shrinking shrunk below under challenge challenges challenging challenged

Figure 1. Tone Thesauruses Used to Develop the Tone Measures for Earnings Press Releases

Note: Positive tone and negative tone are defined as the frequency count of the words on these lists, scaled by the total word count of the press releases. *TONE* is calculated as the count of positive words minus the count of negative words, divided by the sum of positive and negative word counts.

software and keywords such as *expect* and *will* have been used to quantify forward-looking statements in research on stock prices leading earnings (Hussainey, Schleicher, & Walker, 2003). Studies have used frequency counts of keywords in CEO letters (Smith & Taffler, 2000) and in auditors' going-concern narratives (Uang et al., 2006) to predict bankruptcy.

Term frequency count metrics have also been found to be very useful in other domains. Using term frequency counts to capture the content of a document is commonly used for textual analysis in the social sciences, where such techniques fall into the general category of analysis referred to as content analysis (Neuendorf, 2002). In addition, term frequency counts are commonly used both for text-based information retrieval (IR) and for text categorization (Hand, Mannila, & Smyth, 2001; Manning &

Schutze, 1999). Most currently used IR systems “rely on simple term matching and counting techniques, where the content of a document is implicitly and approximately captured (at least in theory) by a vector of term occurrence counts” (Hand et al., 2001, p. 457). In other words, an IR system would represent a document as a row of numbers, where each number is a count of the number of times that a particular word occurred in that document.

When employing term frequency count metrics, two generic issues that must be addressed are synonymy and polysemy (lexical ambiguity). The issue of synonymy results from the fact that similarity of terms is not captured when texts are represented using term frequency counts. To overcome the issue of synonymy, this study uses a thesaurus-based approach, which is one of the generic approaches used to overcome that issue (Hand et al., 2001). Here, a thesaurus-based approach means that lists of positive and negative words include words with similar meanings. The thesaurus-based approach is appropriate given that this study focuses only on corporate earnings press releases that cover a limited domain of discourse.

The issue of polysemy generally results from the fact that the meaning of a word may differ depending on its context. In this study, the issue of polysemy primarily arises when the affect of a word differs depending on its context. Many of the words in the tone word lists are relatively unambiguously positive or negative. For example, it is reasonably clear that *delighted* and *excellent* are positive, whereas *disappointed* and *worst* are negative. However, the directional words, for example, *increased* and *decreased*, carry a particular potential for ambiguity. As an example, the word *increased* is included in the positive tone word list, but if an earnings press release states that some generally undesirable item increased (e.g., expenses increased), then the word *increased* could not be considered unambiguously positive in that context. To determine whether an upward (downward) directional word is generally used in a positive (negative) sense, I developed and analyzed data on the context of each directional word as it appears in the corpus of 1,366 press releases. Results of the analysis confirmed that the upward (downward) directional words are, in the majority, consistent with a positive (negative) affect. Additional detail is provided in the appendix.

Results

Table 1 provides descriptive statistics on each variable, and Table 2 presents a correlation matrix. Table 1 shows that the mean value of *TONE* is 0.568. By construction, a value of 1.0 would indicate a completely positive

Table 1. Descriptive Statistics

<i>Variable</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>25th Percentile</i>	<i>75th Percentile</i>
<i>CAR</i> ^a	-0.010	-0.008	0.114	-0.073	0.054
<i>UE</i> ^a	-0.006	0.000	0.235	-0.019	0.016
<i>TONE</i>	0.568	0.600	0.247	0.415	0.750
<i>WORDS_AL</i> ^a	1,969	1,730	977	1,307	2,479
<i>NUMERICAL</i> ^a	0.138	0.132	0.040	0.110	0.164
<i>COMPLEX</i> ^a	5.242	5.254	0.247	5.090	5.405
<i>lnMV</i>	6.223	5.935	1.997	4.804	7.455

Note: $N = 1,366$. Variables are defined as follows: *CAR* = cumulative abnormal returns from day $t-1$ to $t+1$, where day 0 is defined as the earnings announcement date in Compustat; *UE* = earnings per share (EPS) minus EPS reported in the previous year, scaled by beginning of period share price; *TONE* = (positive - negative) ÷ (positive + negative), where *positive* is the count of positive words in text portion of press release scaled by total words in the text portion and *negative* is the count of negative words in text portion of press release scaled by total words in the text portion; *WORDS_AL* = total word count of the press release; *NUMERICAL* = numerical terms in text portion of press releases scaled by total words in the text portion; *COMPLEX* = verbal complexity defined as characters per word; *lnMV* = natural log of market value.

a. Data winsorized to the 99% and 1% levels to reduce potential impact of outliers.

tone, and a value of -1.0 would indicate a completely negative tone. The relatively high value of *TONE* is consistent with other research noting the general bias toward positive language in annual reports (Hildebrandt & Snyder, 1981; Rutherford, 2005).

As shown in Table 2, *TONE* is positively associated with the abnormal returns measure (*CAR*), as evidenced by the correlation of .098 ($p < .001$). *UE* is also positively associated with *TONE*, implying that earnings press releases issued by more profitable firms have a more positive tone. This finding is consistent with prior research showing that presidents' letters in annual reports of profitable firms include a higher percentage of sentences addressing favorable financial performance (Kohut & Segars, 1992).

The negative association between profitability *NIgt0* and length of earnings press release *WORDS_AL* implies that profitable firms issue shorter earnings press releases. The negative association between profitability *NIgt0* and verbal complexity *COMPLEX* implies that profitable firms also issue less verbally complex earnings press releases. These findings are comparable to findings in previous research that profitable firms issue shorter and less complex annual reports (Li, in press) but differ from other studies' findings concerning the relation between firm performance

Table 2. Correlations Among Main Variables

	CAR	UE	TONE	WDA	NUMERICAL	COMPLEX	lnMV	NIgt0	MBE
<i>CAR</i>									
<i>UE</i>	.103 (.000)								
<i>TONE</i>	.072 (.008)	.116 (.000)							
<i>WORDS_AL</i>	.002 (.931)	.026 (.337)	-.035 (.190)						
<i>NUMERICAL</i>	-.025 (.347)	.053 (.050)	.037 (.166)	-.028 (.300)					
<i>COMPLEX</i>	.044 (.106)	-.018 (.513)	.0003 (.991)	.005 (.842)	-.639 (.000)				
<i>lnMV</i>	.028 (.307)	.040 (.136)	.228 (.000)	.252 (.000)	.165 (.000)	-.039 (.145)			
<i>NIgt0</i>	.065 (.017)	.128 (.000)	.176 (.000)	-.093 (.001)	.120 (.000)	-.044 (.105)	.311 (.000)		
<i>MBE</i>	.134 (.000)	.127 (.000)	.136 (.000)	.008 (.781)	.023 (.3858)	.036 (.188)	.143 (.000)	.138 (.000)	

Note: Pearson correlations are above the diagonal; Spearman correlations are below the diagonal, with two-sided *p* values in parentheses. Variables are defined as follows: *CAR* = cumulative abnormal returns from day *t*-1 to *t*+1, where day 0 is defined as the earnings announcement date in Compustat; *UE* = earnings per share (EPS) minus EPS reported in the previous year, scaled by beginning of period share price; *TONE* = (positive - negative) ÷ (positive + negative), where *positive* is the count of positive words in text portion of press release scaled by total words in the text portion and *negative* is the count of negative words in text portion of press release scaled by total words in the text portion; *WORDS_AL* = total word count of the press release; *NUMERICAL* = numerical terms in text portion of press releases scaled by total words in the text portion; *COMPLEX* = verbal complexity defined as characters per word; *lnMV* = natural log of market value; *NIgt0* = an indicator variable equal to 1 if EPS is greater than 0; *MBE* = an indicator variable equal to 1 if earnings exceed analysts' forecasts.

and length of disclosure (Jameson, 2000; Kohut & Segars, 1992). Differences may be attributable to differences in contexts.

Table 3 presents the results of the short-window event study. In each regression, the dependent variable is the abnormal returns measure (*CAR*). Because the sample is a panel data set, all the regressions account for fixed company and year effects, that is, include both group and time dummy variables. These effects capture constant firm-specific and time-specific factors not explicitly captured in the regression equation. Such constant firm-specific effects may include, for example, firm's ritualistic disclosure behavior, defined as passive, repetitive procedures (Gibbins, Richardson, & Waterhouse, 1990).

Each regression also includes three control variables. First, inclusion of the variable *lnMV* controls for firm size because previous research has shown that abnormal returns during earnings announcement periods are related to firm size (Ball & Kothari, 1991). The variable *lnMV* is defined as the log of the market value of the firm's common equity. Second, research has also shown evidence of a difference in market response to firms reporting losses versus profits (Hayn, 1995); therefore, each regression includes a control variable *NI_gt0*, which is an indicator variable equal to 1 if earnings are greater than zero. Third, each regression includes a control variable *MBE* to indicate whether a firm's earnings exceeded the earnings expected by equity analysts. A firm's ability to create a positive tone is presumably constrained by how its actual financial performance compares to commonly used benchmarks. Important benchmarks include prior year's results, profit versus loss, and analysts' forecast (Graham et al., 2005). The variables *UE* and *NI_gt0* capture performance relative to the first two of these benchmarks, and the variable *MBE* (an indicator variable equal to 1 if the company's earnings exceeded the average of analysts' forecasts) captures performance relative to the third of these benchmarks.

The first regression includes only unexpected earnings and the control variables. Estimated coefficients and *p* values are shown in the first two columns labeled 1 in Table 3. The regression estimated can be expressed as

$$CAR = \alpha_0 + \beta_1 UE + \beta_2 \ln MV + \beta_3 MBE + \beta_4 NI_gt0 + \varepsilon, \quad (2)$$

where *CAR* = cumulative abnormal returns from day *t*-1 to *t*+1, with day 0 as earnings announcement day, *UE* = unexpected earnings, *lnMV* = log of the market value of the firm's common equity, *MBE* = an indicator variable equal to 1 if earnings exceed analysts' forecast, and *NI_gt0* = an indicator variable equal to 1 if earnings are greater than zero.

Table 3. Panel Regression of Abnormal Returns on Tone, Length, Numerical Intensity, Verbal Complexity, and Interactions

	1		2		3		4		5		6		7	
	Coeff.	p Value	Coeff.	p Value	Coeff.	p Value	Coeff.	p Value	Coeff.	p Value	Coeff.	p Value	Coeff.	p Value
<i>Intercept</i>	.036	.36	.026	.50	.006	.89	.009	.84	.024	.60	-.137	.24	-.118	.45
<i>UE</i>	.037	.03	.033	.05	.033	.06	.135	.00	.155	.01	-.296	.51	.195	.77
<i>InMV</i>	-.009	.16	-.012	.08	-.011	.11	-.009	.18	-.011	.09	-.011	.11	-.009	.17
<i>MBE</i>	.028	.00	.026	.00	.025	.00	.024	.00	.025	.00	.025	.00	.024	.00
<i>Nlgt0</i>	-.008	.46	-.008	.43	-.008	.47	-.009	.38	-.006	.57	-.007	.51	-.008	.47
<i>TONE</i>			.047	.01	.129	.00	.132	.00	.130	.00	.125	.01	.134	.00
<i>TONE_SQUARED</i>					-.085	.04	-.095	.02	-.082	.04	-.079	.05	-.092	.03
<i>WORDS_AL</i>							-.553D-05	.36					-.730D-05	.24
<i>WORDS_AL-UE</i>														
interaction							-.429D-04	.01					-.414D-04	.02
<i>NUMERICAL</i>									-.123	.36			-.061	.72
<i>NUMERICAL-UE</i>														
interaction														
<i>COMPLEX</i>									-.917	.04			-.767	.22
<i>COMPLEX-UE</i>											.027	.19	.026	.31
interaction														
<i>F</i> value	1.27		1.29		1.30		1.31		1.31		.063	.46	.007	.95
<i>p</i> value	.000		.000		.000		.000		.000		1.30		1.32	
Adjusted <i>R</i> ²	.103		.108		.110		.116		.114		.000		.000	
											.111		.118	

Note: $N = 1,366$. Dependent variable = *CAR*. All regressions include fixed company and year effects. Table shows coefficients with p values. p values for control variables and nondirectional test variables are two-tailed; p values for directional test variables are one-tailed. Variables are defined as follows: *CAR* = cumulative abnormal returns from day $t-1$ to $t+1$, where day 0 is defined as the earnings announcement date in Compustat; *UE* = earnings per share (*EPS*) minus *EPS* reported in the previous year, scaled by beginning of period share price; *InMV* = natural log of market value; *Nlgt0* = indicator equal to 1 if net income is greater than 0; *MBE* = indicator equal to 1 if actual *EPS* exceeds average of analysts' estimates; *TONE* = (positive - negative) ÷ (positive + negative), where positive is the count of positive words in text portion of press release scaled by total words in the text portion and negative is the count of negative words in text portion of press release scaled by total words in the text portion; *TONE_SQUARED* = the square of *TONE*; *WORDS_AL* = total word count of the press release; *WORDS_AL-UE* interaction = *WORDS_AL* × *UE*; *NUMERICAL* = numerical terms in text portion of press releases scaled by total words in the text portion; *NUMERICAL-UE* interaction = *NUMERICAL* × *UE*; *COMPLEX* = verbal complexity defined as characters per word; *COMPLEX-UE* interaction = *COMPLEX* × *UE*.

As expected, both unexpected earnings and earnings in excess of analysts' expectations are associated with positive market reaction, as shown by the significant positive coefficients on *UE* ($p = .03$) and *MBE* ($p < .001$). The market reacts positively to earnings announcements by firms that report earnings higher than expected and earnings in excess of analysts' forecasts.

Tone Affects Market Reaction, Up to a Point

The second regression reported in Table 3 includes *TONE* as an independent variable, along with variables capturing financial results and control variables. The regression estimated can be expressed as

$$CAR = \alpha_0 + \beta_1 UE + \beta_2 \ln MV + \beta_3 MBE + \beta_4 NI_gt0 + \beta_5 TONE + \varepsilon \quad (3)$$

where variables are defined as in Equation 2 above and *TONE* = tone of the press release, measured as (positive word count – negative word count) ÷ (positive word count + negative word count).

The columns labeled 2 in Table 3 present the results of this regression. The significant positive coefficient on *TONE* ($p = .01$) indicates a positive relation between abnormal returns and *TONE*. This result provides support for *H1a* and *H1b* that a more positive *TONE* positively affects the market reaction to earnings announcements, even controlling for actual financial results.

The impact of tone on market reaction is consistent with prospect theory (Tversky & Kahneman, 1981, 1986), which predicts that framing financial performance in positive terms will cause investors to think about the results in terms of increases relative to reference points. To examine a further implication of prospect theory, namely whether market reaction to framing is concave above a neutral reference point, the third regression in Table 3 includes the *TONE* variable as well as the square of that term, *TONE_SQUARED*. Results are shown in the columns labeled 3 in Table 3. The positive coefficient on *TONE* and the negative coefficient on *TONE_SQUARED* show that the effect of tone on market reaction is positive and concave. This can be interpreted as an indication that market reaction increases as tone becomes more positive, but only up to a point.

A question may arise as to whether *TONE* captures only an increased overall amount of disclosure. To address this question, an additional regression was estimated including one additional variable for the length of the earnings announcement *WORDS_AL*. Results (untabulated) are robust to the inclusion of this control. The coefficient on *TONE* remains significant.

The impact of tone on market reaction is consistent with prospect theory . . . which predicts that framing financial performance in positive terms will cause investors to think about the results in terms of increases relative to reference points.

The columns labeled 4 through 7 present results of regressions addressing the market impact of additional stylistic attributes. The general form of the equation to estimate these regressions can be written as

$$\begin{aligned}
 CAR = & \alpha_0 + \beta_1 UE + \beta_2 \ln MV + \beta_3 MBE + \beta_4 NI_gt0 + \beta_5 TONE \\
 & + \beta_6 TONE_SQUARED + \beta_7 STYLE^a \\
 & + \beta_8 STYLE^a Interact_UE + \varepsilon,
 \end{aligned}
 \tag{4}$$

where variables are defined as in Equation 2 above and $TONE_SQUARED$ = tone of the press release, squared, $STYLE^a$ = alternately, length $WORDS_AL$, numerical intensity $NUMERICAL$, or verbal complexity $COMPLEX$, and $STYLE^a Interact_UE$ = the interaction of each style variable with unexpected earnings UE .

Length Diminishes the Market Impact of Unexpected Earnings

The columns labeled 4 in Table 3 present results of the regression addressing the market impact of the length of the earnings press release. This regression adds two variables: (a) $WORDS_AL$, defined as the total word count of the press release, and (b) $WORDS_AL-UE$, which is an interaction of the two variables, length $WORDS_AL$ and unexpected earnings UE . In this regression, unexpected earnings UE , $TONE$, $TONE_SQUARED$, and the control variable MBE all remain significant. The insignificant coefficient on $WORDS_AL$ indicates no relation between market reaction and length. However, the interaction between the length of the press release and unexpected earnings, $WORDS_AL-UE$, is significantly negative. These results imply that there is no main effect of length on market reaction, but a longer press release diminishes the positive market impact of unexpected earnings. These results support $H2$.

Numerical Intensity May Diminish the Market Impact of Unexpected Earnings, but Evidence Is Weaker

The next regression in Table 3, results of which are shown in the columns labeled 5, addresses the market impact of the numerical intensity of the text portion of the earnings press release. This regression adds two variables to the regression reported in the columns labeled 3. The first additional variable is *NUMERICAL*, defined as the numerical terms in the text portion of the press release divided by total words, and the second additional variable is *NUMERICAL-UE*, which is an interaction of two variables, *NUMERICAL* and *UE*. Again, unexpected earnings *UE*, *TONE*, *TONE_SQUARED*, and the control variable *MBE* all remain significant. The insignificant coefficient on *NUMERICAL* indicates no relation between market reaction and numerical intensity. The interaction between the numerical intensity of the press release and unexpected earnings, *NUMERICAL-UE*, is significantly negative. These results suggest that there is no main effect of numerical intensity on market reaction, but a more numerically intensive press release diminishes the positive market impact of unexpected earnings. These results support *H3*.

Results of the regression including all variables, shown in column 7 of Table 3, weaken the evidence supporting *H3*. In those results, the interaction between length and unexpected earnings, *WORDS_AL-UE*, remains significantly negative ($p = .02$), but the interaction coefficient *NUMERICAL-UE* becomes statistically insignificant. Thus, the evidence supporting *H3*, concerning the market impact of numerically intensive press releases, is weaker than the evidence supporting *H2*, concerning the market impact of longer press releases. In sum, although the evidence supports both *H2* and *H3* considered separately, when the style variables are considered collectively, only the length of press releases appears to diminish the impact of unexpected earnings.

Verbal Complexity Does Not Affect Market Reaction

The columns labeled 6 in Table 3 present results of the regression adding *COMPLEX* and its interaction variable *COMPLEX-UE*. The insignificant coefficient on *UE* suggests that verbal complexity may be a suppressor variable; that is, verbal complexity in earnings press releases suppresses the relation between *UE* and abnormal returns that exists when that variable is not included in the regression. The results do not, however, support *H4* because neither *COMPLEX* nor its interaction variable is significant. Inclusion of the verbal complexity variables does not affect the

significance of either the variable indicating earnings in excess of analysts' forecasts *MBE* or *TONE*. Both *MBE* and *TONE* remain significant in explaining abnormal returns across each specification in Table 3.

Sophistication of Investors Does Not Matter

Analysis to address whether investor sophistication plays a role in the market impact of tone and unexpected earnings (*H5*) uses a proxy for investor sophistication, namely the percentage of a firm's shares owned by institutional investors. An additional regression includes the investor sophistication proxy and variables separately interacting investor sophistication with *UE* and with *TONE* to Regression Equation 3. Results of that regression, untabulated, show no relation between abnormal returns and the investor sophistication proxy or its interactions. Furthermore, inclusion of the investor sophistication variables does not affect the relation between market returns and either *TONE* or *UE*. In other words, both unexpected earnings and tone of the earnings press release have the same market impact regardless of variations in the percentage of institutional owners in firms' shareholder bases.

CONCLUSION

In summary, the rhetorical analysis of the genre indicates that earnings press releases share some structural similarities with annual reports and that, as with corporate communication generally, these press releases exhibit a potential duality of purpose: information and promotion.

The results of the quantitative analysis suggest that the tone of earnings press releases, even controlling for financial performance, influences investors, as indicated by market reaction. Specifically, abnormal market returns are higher as the tone of the press release becomes more positive, up to a point. Results also indicate that longer press releases diminish the market impact of unexpected earnings. Also, somewhat weaker results suggest that more numerically intensive press releases may diminish the market impact of unexpected earnings.

The study has several limitations. The quantitative measures capturing tone and style cannot capture the subtleties and complexities that can be analyzed by case studies of individual companies' earnings press releases. Furthermore, the quantitative measures themselves reflect research-design decisions and could be refined in further research. For example, quantitative measures of textual complexity, such as the Fog Index, the Kincaid Index, and the Flesch Index, are more sophisticated than the measure of

verbal complexity produced by the software chosen for this study. In addition, the sample chosen for this study was intentionally selected because of the heightened importance of nonfinancial information during periods of uncertainty such as that created in the telecommunications and computer industries during the Internet-related stock market boom of the late 20th century. Although this sample permits a focused examination, it nonetheless limits the generalization of results.

Despite limitations, the study does offer a type of insight that can complement studies undertaken using other research methodologies. Overall, the article offers several contributions to the literature. First, the article provides an analysis of the genre of earnings press releases, an important means by which many firms communicate to investors. Second, the article builds on streams of literature in accounting research and in communication research and positions the analysis in the context of both. Prior accounting research has shown the influence on investors of strategically selected benchmarks (e.g., Lougee & Marquardt, 2004; Schrand & Walther, 2000) and of prospective officer comments in earnings press releases (Francis et al., 2002; Hoskin et al., 1986), but little research has examined the influence of tone and other stylistic attributes on investors. Prior research using stylistic attributes of earnings press releases to predict overperforming stocks has not examined individual stylistic components (Henry, 2006). Accounting research has also examined the relation between certain words in, and overall readability of, annual report narratives and investor responses (Li, *in press*), but a similar examination has not been applied to earnings press releases and the market response to the release. Communication research has examined promotional aspects in corporate press releases by comparing those releases to journalists' news reports of the same event (Maat, 2007) and has shown that corporate strategy communications affect market responses (Gao et al., 2007). The study reported here examines how attributes of earnings press releases affect market responses.

Third, the article links its findings to prospect theory (Tversky & Kahneman, 1981, 1986), which has received limited attention in capital markets research and in communications research. Prospect theory predicts that framing financial performance in positive terms will cause investors to think about the results in terms of increases relative to reference points. The results of the study showing that abnormal market returns are higher as the tone of the press release becomes more positive, up to a point, are consistent with that theory.

Finally, this article applies computer-aided content analysis to develop a numeric measure of the tone of earnings press releases. By developing a numeric measure of tone, this study facilitates extension and replication.

Opportunities for further research include an examination of whether the analyses and results reported here generalize to other samples. In addition, further research can assess the market impact of alternative specifications of the quantitative measures of tone and style. Additional research can also explore further nuances of earnings press releases and the firm-investor communication process, including the impact on media reputation (Deephouse, 2000) and on management credibility. If the verbal portions of earnings announcements are relatively unconstrained, do all firms make opportunistic choices, for example, maximizing the positive tone of press releases? Anecdotal evidence suggests they do not. Consider, for example, the inaugural earnings press release of Berkshire Hathaway, Inc. on November 3, 2006. The company had historically not issued earnings press releases, and this release followed its March 2006 acquisition of Business Wire, a distributor of corporate news and regulatory filings. The company's CEO, Warren Buffet, made the following candid comments about a quarter in which the company reported earnings *5 times higher* than the previous year: "This is due not to managerial brilliance but rather to good luck." Further research might assess whether subtle communication choices, including the choice to communicate candidly, affect management credibility and media reputation, either immediately or over time.

APPENDIX

Affect disambiguation

This appendix describes the corpus-linguistics approach to disambiguation of the affect of the directional words included in the positive and negative word lists, also referred to as the tone thesauruses.

A generic issue in computational linguistics is the potential for polysemy (i.e., lexical ambiguity). A rich literature exists in the field of natural language processing (NLP) dealing with word sense disambiguation (e.g., Preiss & Stevenson, 2004). "Disambiguation" in NLP generally refers to sense disambiguation (e.g., distinguishing between use of the word *rock* to mean a type of music versus a piece of stone). Because earnings press releases are essentially a "sublanguage," that is, with a limited domain of discourse (Kittredge, 1982), the sense of most words is fairly clear, lessening the need for sense disambiguation. For example, in earnings press releases, it can be expected that the word *net* is more likely being used as an antonym to *gross* (although its part of speech may be an adjective, verb, or noun) than as an item used by fishermen or hockey players.

In measuring tone of press releases, therefore, this study's focus is on *affect* disambiguation rather than *sense* disambiguation, specifically on

distinguishing the positive versus negative context-dependent affect of the specific words included in the tone thesauruses. Many of the words in the tone thesaurus are relatively unambiguously positive or negative, but the directional words such as *increased* and *decreased* carry a particular potential for ambiguity and are the focus of this discussion.

To determine whether a particular directional word is generally used in a positive or negative sense, I obtained summary information for each of the directional terms in the tone thesauruses based on the context of their occurrences in the corpus of earnings press releases. I used the lexical analysis software WordSmith Tools (available at <http://www.lexically.net/wordsmith/index.html>). From this summary information, I calculated the percentage of occurrences in the context of inherently desirable or undesirable financial items, where desirable (undesirable) items are defined as those that are positively (negatively) related to increases in firm valuation in commonly used equity valuation models. Commonly used equity valuation models are explicated in Stowe, Robinson, Pinto, and McLeavey (2002). In commonly used equity valuation models (e.g., the dividend discount model, free cash flow models, and residual income models), firm value is expressed as an increasing function of dividends, cash flows, or income in excess of capital charges. Dividends and cash flows are generally an increasing function of income, and income is generally an increasing function of margins and revenues. Generally undesirable items (e.g., losses, expenses, and costs) are those that reduce income.

This approach is analogous to statistical disambiguation methods, reliant on a basic assumption “that word senses are strongly correlated with certain contextual features like other words in the same phrasal unit” (Manning & Schutze, 1999, p. 250). Roughly, the approach is to disambiguate first on the strongest collocational feature and then to assign all instances of the ambiguous word to the majority sense in a document. This approach to disambiguation is not based on the assumption of independence of occurrences of words as with certain other methods (e.g., the naïve Bayes classifier explicated in Lewis, 1998) but avoids the need to model specific interdependencies.

Context of words is typically described in terms of collocates. Words occurring near the target word are collocates. The position of a collocate is designated by direction, that is, to the left (L) or right (R) of a target word, and by words away from the target word. As examples, L1 refers to the word occurring immediately to the left of the target word, and R2 refers to the word occurring two words to the right of the target word. In this analysis, I counted as collocates only those words appearing near thesaurus terms at least five times. Note that a distinction should be made between the terms collocate and collocation. A collocation is “an expression consisting of two

or more words that correspond to some conventional way of saying things” (Manning & Schutze, 1999, p. 151). If two or more words form a collocation, the meaning of the group of words is different from that of any individual word (e.g., “best practice”). In contrast, any word can be a collocater of any other as long as they appear near one another in a text.

Empirical evidence shows that people can identify the sense of a word when given a relatively narrow collocater horizon, for example, a window of ± 2 words of context (G. Miller & Leacock, 2000). The approach to affect disambiguation in this study used a slightly wider collocater horizon of ± 3 words to capture more context.

The 1,366 annual earnings press releases used in this study formed the corpus for statistical disambiguation. The total number of tokens (individual occurrences of terms, which includes strings of numbers or letters) in the corpus was 3.3 million, and the total number of different words (also called types) was 26,109, after excluding stop words. Stop words, also sometimes known as “filter words,” are words appearing so often as to provide little discriminatory power in information search and retrieval. A common procedure in analyzing text, particularly in IR, is to eliminate stop words. For this analysis, I used a brief stop word list, including the following words: *a, an, and, as, at, by, for, in, of, on, or, that, the, this, to, \$*. Additional words appear on generic stop word lists; however, because an accepted precedent does not exist for analysis of earnings press releases, and because one objective of this study was a detailed examination of the verbal component of press releases, the stop list used was intentionally brief.

As is generally the case in NLP, the distribution of occurrences of words was highly skewed (i.e., most words are rare). Within the entire corpus, only 2,158 words (8%) made up 90% of all the occurrences, and the remaining 23,951 words (92%) made up only 10% of occurrences. Only 58 different words appeared more than 5,000 times, making up more than 30.0% of all the occurrences, and 19,307 words appeared 10 or fewer times, making up about 2.7% of all occurrences.

As noted, affect disambiguation in this study focused on the directional words used in the tone thesaurus. Of the directional words included in the positive and negative tone thesauruses, the five from each that occurred most frequently are shown in Table A1, Panel A, along with total frequency counts for each word. As shown, overall, earnings press releases included far more occurrences of upward directional words than downward. The relatively greater frequency of upward versus downward words in this corpus corroborated evidence from studies of annual report narratives that show language biased toward the positive, a phenomenon referred to as the “Pollyanna effect” (Hildebrandt & Snyder, 1981; Rutherford, 2005).

For each of the directional words in the tone thesaurus, I sorted the L3 to R3 collocates by frequency of occurrence and categorized those collocates that made up at least 80% of the total as generally desirable, generally undesirable, or neutral based on their relationship with firm value in common equity valuation models. For the upward directional words, the percentage of non-neutral collocates that were consistent with a positive affect are presented in Panel B. For the downward directional words, the percentage of non-neutral collocates that were consistent with a negative affect are reported in Panel C.

As an illustration, of the 9,682 L1 to L3 collocates examined for the word *increased*, 3,118 collocates were non-neutral (i.e., they referred to either generally desirable or undesirable items), whereas the remaining 6,564 collocates were neutral (i.e., they did not refer to either generally desirable or undesirable items). Of the non-neutral collocates, 2,602 (83%) related to a desirable item, most often *revenues* (695 times) or *revenue* (479 times). The other non-neutral collocates (17%) referred to a generally undesirable item, most often *expenses* (266 times). Similarly, of the 5,457 R1 to R3 collocates examined for the word *increased*, 909 were non-neutral, of which 606 (66%) were related to a desirable item, most often revenues (143 times) and sales (98 times). To summarize, of the L3 to L1 non-neutral collocates, 83% of the occurrences (and for the R1 to R3 collocates, 66%) indicated that some generally desirable item increased, indicating that the word *increased* was appropriately included in the positive tone thesaurus.

In summary, this examination of the collocates of the most frequently occurring upward (downward) directional words indicates that the non-

Table A1. Data From Corpus of 1,366 Earnings Press Releases: Most Frequently Used Directional Words in the Tone Thesauruses and Percentage of Non-Neutral Collocates Consistent With Positive and Negative Tone

Panel A. Overall Frequency Counts of Directional Words in the Tone Thesauruses

<i>Positive: Upward Directional Words</i> ↑	<i>Overall Frequency Count</i>	<i>Negative: Downward Directional Words</i> ↓	<i>Overall Frequency Count</i>
Increased	6,173	Decrease	1,531
Increase	5,936	Decreased	1,238
Growth	5,035	Down	1,089
More	3,290	Less	1,042
Up	2,517	Lower	1,034

Panel B. Percentage of Non-Neutral Collocates That Are Consistent With a Positive Affect

	<i>L3 to L1 Collocates</i>			<i>R1 to R3 Collocates</i>		
	Total Examined	Non-Neutral	Non-Neutral Collocates Consistent With Positive Affect	Total Examined	Non-Neutral	Non-Neutral Collocates Consistent With Positive Affect
		n	%		n	%
Increased	9,682	3,118	83	5,457	909	66
Increase	4,965	612	77	6,703	1,503	75
Growth	7,848	2,073	98	5,414	836	93
More	3,634	544	95	4,845	392	86
Up	3,168	530	100	2,577	161	68

Panel C. Percentage of Non-Neutral Collocates That Are Consistent With a Negative Affect

<i>Negative: Downward Directional Words ↓</i>	<i>L3 to L1 Collocates</i>			<i>R1 to R3 Collocates</i>		
	<i>Total Examined</i>	<i>Non-Neutral</i>	<i>Non-Neutral Collocates Consistent With Negative Affect</i>	<i>Total Examined</i>	<i>Non-Neutral</i>	<i>Non-Neutral Collocates Consistent With Negative Affect</i>
		<i>n</i>	<i>%</i>		<i>n</i>	<i>%</i>
Decrease	1,120	82	89	1,761	378	82
Decreased	1,831	798	68	922	71	45
Down	1,338	166	87	1,021	183	94
Less	1,117	411	67	1,478	217	46
Lower	1,121	136	75	1,395	600	63

Note: Context of words is typically described in terms of collocates. Words occurring near the target word are collocates. The position of a collocate is designated by direction, that is, to the left (L) or right (R) of a target word, and by words away from the target word. As examples, L1 refers the word occurring immediately to the left of the target word, and R2 refers to the word occurring two words to the right of the target word.

neutral collocates are, in the majority, consistent with a positive (negative) affect. An examination of the collocates of the less frequently occurring directional words (untabulated) gives similar results.

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