

Beyond the Numbers: Measuring the Information Content of Earnings Press Release Language*

ANGELA K. DAVIS, *University of Oregon*

JEREMY M. PIGER, *University of Oregon*

LISA M. SEDOR, *DePaul University*

1. Introduction

Earnings press releases are “the major news event of the season for many companies as well as investors, analysts, financial media, and the market” (Mahoney and Lewis 2004). The information content of earnings press releases has increased significantly over time (Kross and Kim 2000; Lo and Lys 2001; Francis, Schipper, and Vincent 2002a, 2002b; Landsman and Maydew 2002; Collins, Li, and Xie 2005) and has been accompanied by a corresponding increase in press release length. Specifically, the number of words used in earnings press releases increased approximately five times between 1980 and 1999 (Francis et al. 2002b). This trend continued over our sample period, with median earnings press release length increasing to more than 1,700 words by 2003, a greater than 90 percent increase from 1998. This dramatic increase in the sheer number of words used in earnings press releases suggests an important question: Does the language used throughout an earnings press release provide a signal regarding managers’ expectations about future performance? If so, does the market respond to this information?

Earnings press releases are characterized as a disclosure mechanism revealing a “package of information” to investors (Francis et al. 2002b). An important element of this information package is language used in the earnings press release, which provides the unifying framework within which earnings are announced and other quantitative and qualitative disclosures are made. Prior research on earnings press releases examined the incremental information content of specific, qualitative disclosures like officers’ comments. For instance, officers’ comments communicating good and bad news about the future are informative above and beyond the announcement of earnings per se (Hoskin, Hughes, and Ricks 1986; Francis et al. 2002b). The information revealed to investors via earnings press release language, however, likely extends beyond specific officers’ comments. Consistent with this proposition, promotional language in press releases (including, but not limited to, earnings press releases) is observed not only in officer comments, but also in the more prevalent, nonquotation sections of the release (Maat 2007).

We argue that managers use language throughout an earnings press release to signal, both directly and more subtly, their expectations about future performance. Managers’ earnings press release language varies significantly across firms and ranges from straightforward to promotional (Mahoney and Lewis 2004). Managers generally report financial performance in comparative terms, and so we expect managers’ earnings press release

* Accepted by Michael Welker. The authors would like to thank Franklin Williams, Mikhail Pevzner, Michelle Armesto, and Nam Tram for research assistance. We thank Mike Welker, three anonymous reviewers, Bob Bowen, Rich Frankel, Greg Hess, Ron King, Dawn Matsumoto, Bill Mayew, James Morley, Terry Shevlin, Shankar Venkataraman, Michael Williams and workshop participants at the University of Oregon, University of Utah, Washington University, the 2005 Washington University Accounting Research Conference, and the 2008 FEA Conference for helpful comments and suggestions.

language to communicate both positive (i.e., optimistic) and negative (i.e., pessimistic) sentiments. It is well-established that presenting information in positive terms results in more favorable evaluations than does presenting information in negative terms (see Levin, Schneider, and Gaeth 1998 for a review). At the most basic level, positive and negative language has a substantial influence on how information is processed. Language also influences how information is both perceived and understood (Katz 2001; Morris, Sheldon, Ames, and Young 2005). Consequently, we expect to observe a market response to managers' earnings press release language.

Prior research on earnings press release disclosures (e.g., Hoskin et al. 1986; Francis et al. 2002b) employed manual coding and relied on judgment to determine the future-earnings implications of officers' comments and specific qualitative disclosures, which limited sample sizes.¹ We exploit the advantages of an established, textual-analysis program (DICTION) to examine the full texts of approximately 23,000 quarterly earnings press releases published on PR Newswire between 1998 and 2003. We use DICTION to count words characterized by linguistic theory as optimistic and pessimistic (Hart 1984, 1987, 2000a, 2000b, 2001). We subtract the latter count from the former to obtain a measure of the (net) signal about future performance communicated by managers' language use for each earnings press release.

Consistent with expectations, net optimistic language in earnings press releases is positively associated with future return on assets (ROA) and generates a market response. We include in our models the earnings surprise and other quantifiable disclosures in earnings press releases likely associated with future firm performance and the market's reaction to earnings press releases. We interpret our results to suggest that, taken as a whole, managers' earnings press release language communicates credible information about expected future firm performance to the market and that the market responds to this information.

Our use of DICTION to analyze earnings press releases is novel in that the program uses categories derived from linguistics theory (e.g., optimistic words) to identify words to be counted. In contrast, prior research analyzing officers' comments necessarily relied on the exercise of judgment both to code thematic content (e.g., future operations) and to discern related future-earnings implications (i.e., good or bad news). In addition to allowing for a vast increase in the number of press releases that can be analyzed, the use of DICTION in this setting eliminates potential concerns about objectivity and inter-rater reliability, increasing comparability across the present and future studies. The generality of DICTION's theoretically derived categories enhances its applicability to the full texts of earnings press releases, facilitating comprehensive analysis of managers' language use — a logistic impossibility for prior research.

Of course, the use of DICTION is not without potential tradeoffs. In particular, a possible weakness of our language measure is that it does not analyze language conditional on the context of a particular statement.² This could introduce noise into the language measure, making it less accurate than a measure that contemplates context (i.e., that is manually coded). To validate our language measure, we manually coded a subsample of our data using the frameworks established in Hoskin et al. 1986 and Francis et al. 2002b. We find that our language measure is significantly correlated with the manual measures, with a correlation coefficient of 0.43. These results provide some assurance that our

-
1. For example, MBA students interpreted a disclosure's impact on expected future cash flows in Hoskin et al. 1986.
 2. There is a lack of consensus regarding the methodology most appropriate for studying and analyzing language (Pennebaker, Mehl, and Niederhofer 2003). Although some argue that language is by definition contextual, others argue that the analysis of language is facilitated by word count strategies (e.g., DICTION) precisely because human judges tend to "read" content and are unable to monitor word choice while reading text (e.g., Hart 2001).

approach provides a reasonable measure of managers' earnings press release language, and does so in a relatively efficient manner.

Our study makes several contributions to the voluntary disclosure literature. First, we extend prior research (i.e., Hoskin et al. 1986; Francis et al. 2002b) by demonstrating that managers use language throughout an earnings press release to signal their expectations for future firm performance to the market, and that the market responds to this signal.³ Second, our study is one of the first to use a textual-analysis software program (DICTION) to count words characterized by linguistic theory as optimistic and pessimistic in a large sample of quarterly earnings press releases.⁴ Finally, to our knowledge, this is the first study to demonstrate both that managers' earnings press release language is associated with future firm performance and generates a market response.⁵

The remainder of the paper is organized as follows. Section 2 develops the hypotheses. Section 3 discusses the sample, presents variable definitions, and describes our measure of earnings press release language. Section 4 presents hypothesis test results and supplemental analyses. Section 5 summarizes and concludes.

2. Hypothesis development

Managers' earnings press release disclosures

The reduction of information asymmetry is a compelling incentive for managers to issue voluntary disclosures (Verrecchia 2001). This incentive underlies the *expectations-adjustment hypothesis*: managers use voluntary disclosures to align investors' expectations of future earnings with management's own assessment (Ajinkya and Gift 1984; Hassell and Jennings 1986; King, Pownall, and Waymire 1990).⁶ Consistent with this hypothesis, managers often adopt an integrated approach to disclosure in which mandatory financial reporting is supplemented with other voluntary communications (Hutton 2004). Of these communications, earnings press releases are among the most prominent and informative (Kross and Kim 2000; Lo and Lys 2001; Francis et al. 2002a, 2002b; Landsman and Maydew 2002; Collins et al. 2005).

Prior research shows that the information content of earnings press releases has increased with the inclusion of other, concurrent disclosures in the earnings announcement, particularly the provision of detailed income statements (Francis et al. 2002b).

-
3. Results of our abnormal returns tests are consistent with some form of semi-strong market efficiency, yet a demonstration of market efficiency would require additional tests demonstrating that the market response to earnings press release language is of the appropriate size. We leave this question for future research.
 4. Henry (2006, 2008) also employs DICTION to process earnings press release texts. However, both studies count small sets of judgmentally determined, positive and negative words (approximately 100 and 80 words, respectively) versus using DICTION's theoretically derived word lists (approximately 630 optimistic and 850 pessimistic words). Descriptions of DICTION's word lists and sample words are presented in the appendix. Tetlock, Saar-Tsechansky, and Macskassy (2008) use a textual analysis program similar to DICTION (i.e., General Inquirer's Harvard-IV-4 classification dictionary) to count negative words in firm-specific financial news stories.
 5. Li (2006, 2008) investigates whether the use of the words "risk" and "uncertain" in annual reports is associated with future earnings and returns, and whether annual report readability is related to earnings persistence. Henry (2006) uses classification and regression trees (CART) to examine whether predictions of the market response to earnings announcements for a sample of telecommunications and computer firms in 2002 can be improved by including judgmentally determined measures of verbal content and style in the regressions. Henry (2008) examines whether investors respond to judgmentally determined measures of verbal style for a relatively small sample of telecommunications and computer firms. Frost (1997) examines whether the market responds to positive statements made by managers of financially distressed U.K. firms.
 6. Healy and Palepu (2001) provide an extensive summary and review of research regarding managers' incentives to issue voluntary disclosures.

However, the disclosures made by managers in earnings press releases are not limited to quantitative information. Prior research also demonstrates that there is incremental information content in managers' qualitative disclosures including officers' comments regarding current and future operations (Hoskin et al. 1986; Francis et al. 2002b). The incremental information content of these qualitative disclosures is consistent with results from research in other disclosure venues, including: management earnings forecasts (Baginski, Hassell, and Hillison 2000; Baginski, Hassell, and Kimbrough 2004); Management's Discussion and Analysis (MD&A) (Bryan 1997; Barron, Kile, and O'Keefe 1999; Clarkson, Kao, and Richardson 1999); and sell-side analysts' reports (Asquith, Mikhail, and Au 2005).

By nature, qualitative disclosures provide opportunities for managers to influence, more subtly, market participants' perceptions of future firm performance. Best practice guidelines of both the National Investor Relations Institute and the Financial Executives Institute recommend that managers present in earnings press releases a "reasonably balanced perspective of operating performance". Additionally, New York Stock Exchange (NYSE) rules require that press releases place news in the "proper perspective" and that managers avoid "overly optimistic forecasts, exaggerated claims, and unwarranted promises" (NYSE Manual). These guidelines and rules reflect the inherent flexibility of qualitative disclosures in general, but also highlight the importance of earnings press release language to the market as well as to regulators.

Managers' earnings press release language

Prior research documents a significant increase in the number of words used by managers in earnings press releases between 1980 and 1999 (Francis et al. 2002b). Our data reveal that by the end of 2003, median earnings press release length exceeded 1,700 words, an increase of 90 percent from 1998. This increase in earnings press release length is due, in part, to the provision of additional qualitative disclosures as examined in prior research (Hoskin et al. 1986; Francis et al. 2002b). Yet, prior studies were limited to labor-intensive, judgmental measures of both the thematic content of officers' comments and other qualitative disclosures (e.g., future operations) as well as the related future-earnings implications of those disclosures (e.g., good news). We argue that the language used throughout an earnings press release not only provides managers with a unifying framework for the disclosure of other information, but also provides managers with multiple opportunities to signal, directly and more subtly, their future-performance expectations.

We expect managers to communicate non-neutral sentiments in earnings press releases because managers generally report financial performance (both historical and expected) in comparative terms with reference to relevant benchmarks (e.g., same quarter's earnings in the prior year or analysts' consensus forecasts; Graham, Harvey, and Rajgopal 2005). Consequently, we expect managers' earnings press release language to contain both positive (i.e., optimistic) and negative (i.e., pessimistic) words. Research demonstrates that positive and negative messages influence attitude change (e.g., Petty and Cacioppo 1986; Chaiken 1987; Kruglanski and Thompson 1999) as well as attention to and memory for media communications (Gunter 1987; Newhagen and Reeves 1992; Geiger and Reeves 1993). Moreover, the influences of positive and negative messages on judgment appear to be additive (Basil, Schouter, and Reeves 1999; Erb and Bohner 2007). Despite redundancy across signals, message recipients are unlikely to adjust their judgments for these effects (DeMarzo, Vayanos, and Zwiebel 2003).

In sum, the literatures reviewed offer predictions consistent with managers' earnings press release language communicating information to the market regarding future earnings expectations. We develop a (net) measure of managers' earnings press release language

from the numbers of words characterized as positive (optimistic) and negative (pessimistic) by linguistic theory.⁷ Our first hypothesis (in alternative form) follows:

HYPOTHESIS 1. *Ceteris paribus, net optimistic language in earnings press releases is positively associated with future firm performance.*

Our first hypothesis is predicated on the assumption that managers use earnings press release language to communicate truthful, value-relevant information to investors. The validity of this assumption depends on managers' incentives to disclose truthfully, in general, and on the relative costs and benefits of implementing a truthful versus an opportunistic disclosure strategy. As long as managers' incentives to disclose truthfully dominate those to disclose opportunistically for the majority of firms, we expect to observe, on average, a significant association between our language measure and measures of future firm performance.

Market response to managers' earnings press release language

Consistent with the *expectations-adjustment hypothesis* (Ajinkya and Gift 1984; Hassell and Jennings 1986; King et al. 1990), we argue that managers use earnings press release language to align investors' expectations of future firm performance with management's own assessment. If results from tests of Hypothesis 1 reveal a positive association between our language measure and future firm performance, it is likely that investors learn that managers use language to provide credible signals regarding their future-earnings expectations. In this case, we would expect a market response to managers' language use. However, language possesses several characteristics that, in combination with its inherent subtlety, are likely to influence investors' ability to evaluate the credibility of these disclosures. These characteristics (enumerated below) increase the likelihood that investors either discount or ignore managers' earnings press release language. Consequently, even if managers use language to provide a credible signal about expected future firm performance (Hypothesis 1), whether or not investors respond to this signal remains an empirical question.⁸

First, although language use is regulated in other contexts (e.g., the U.S. Federal Trade Commission and the U.S. Food and Drug Administration for product markets), securities regulations do not specifically address language use in earnings press releases (Trautmann and Hamilton 2003). Earnings press releases fall within the scope of the anti-fraud requirements of federal securities laws, which require simply that disclosures be "accurate and complete so as not to mislead" (Trautmann and Hamilton 2003). The Safe Harbor provisions established by the Private Securities Litigation Reform Act of 1995 also limit the threat of regulatory enforcement and/or legal action with respect to managers' forward-looking disclosures. The relative leniency of regulations governing language use in earnings press releases (particularly when compared to generally accepted accounting principles-based disclosures subject to Securities and Exchange Commission evaluation/oversight) could increase the likelihood that investors perceive managers' earnings press

-
7. An example of optimistic language use appears in a 2002 earnings press release for Home Depot. The chief executive officer stated: "We are grateful to our loyal customers who continued to make us the most admired specialty retailer in the Fortune Most Admired List for the ninth consecutive year. The company's financial performance reflects a growing ability at Home Depot to perform well in a variety of economic climates. The increasing strength of our balance sheet and improving fundamentals in sales and margins are allowing us to continue to invest for the future." This officer's comment communicating good news about the future contained 85 words, many of which are characterized by linguistic theory as "optimistic". We discuss the theory behind and the construction of our language measure (*NETOPT*) in detail in section 3.
 8. Although results from Hoskin et al. 1986 and Francis et al. 2002b suggest that the market responds to officer's comments in earnings press releases, Frost's 1997 results suggest that the market response to managers' voluntary disclosures is not without bounds: the market discounts positive disclosures made by financially distressed U.K. firms.

release language as a self-serving disclosure. Second, managers' earnings press release language is not subject to the primary, credibility-enhancing mechanism of independent third-party assurance (i.e., auditing), which is a factor likely relevant to investors' assessments of disclosure credibility (Mercer 2004). Third, language provides more subtle signals regarding managers' future-earnings expectations, which are not followed by a specific, observable reporting event likely to act as a behavior-constraining mechanism. The importance of an observable reporting event that is sufficiently useful for assessing the credibility of managers' voluntary disclosures via ex post evaluation both has been demonstrated in theoretical research (e.g., Stocken 2000) and has been observed in archival research. For instance, Hutton, Miller, and Skinner (2003) show that the subject matter of narrative disclosures accompanying management earnings forecasts has no effect on security prices unless the content of the disclosures is verifiable ex post. These prior studies suggest that, in the absence of a sufficiently informative reporting event for use as an evaluative benchmark, investors could have difficulty assessing the credibility of managers' earnings press release language.

The unique characteristics of managers' earnings press release language presented in the preceding paragraph increase the likelihood that investors could either discount or ignore this information. However, if managers' language signals truthfully their expectations for future firm performance to the market (Hypothesis 1), then we assume that investors will learn that managers use language as a credible disclosure mechanism. We further assume that investors develop expectations regarding managers' earnings press release language (i.e., managers likely develop reputations for language use; Wilson 1985), and that the market response around the earnings announcement will be limited to the unexpected language use. We predict the following (in alternative form):

HYPOTHESIS 2. Ceteris paribus, the unexpected level of net optimistic language in earnings press releases is positively associated with market returns around the earnings announcement date.

3. Data and sample selection

Quarterly earnings press releases

We collect quarterly earnings press releases published by PR Newswire between January 1, 1998 and December 31, 2003. We rely on PR Newswire's classification of press releases by subject to identify earnings press releases. To further ensure that the sample includes only earnings press releases, we read all electronic files with a size of less than two kilobytes and eliminate those files containing conference call announcements or other non-earnings-related announcements.⁹ We are able to match tickers from the earnings press releases to tickers (and permnos) provided in the Center for Research in Security Pricing (CRSP)/COMPUSTAT merged database for an initial sample of 39,221 firm quarters.¹⁰ As described below, our analyses require a number of accounting and financial market variables, as well as the prior-quarter press release for use in our expectations model for managers' language

-
9. It is possible that larger electronic files are not earnings press releases. However, when we collect COMPUSTAT data, we require that firms have a report date that falls within three days of the press release date. Thus, any non-earnings-related press releases that have been misclassified by PR Newswire will remain in our final sample only if the press release date is within three days of the report date, which generally corresponds to the earnings announcement date. This data restriction ensures that non-earnings-related press releases are unlikely to be included in our final sample and thus unlikely to influence our results.
 10. We collected 73,758 earnings press releases from PR Newswire. Relying on the ticker provided in the earnings press release as a firm identifier, we are able to successfully match 39,221 (approximately 53 percent) of these press releases to the CRSP/COMPUSTAT merged database. Primary reasons leading to unmatched press releases include firms' tickers changing across time and firms that are not covered by CRSP/COMPUSTAT (e.g., firms traded on the over-the-counter market) issuing press releases on PR Newswire.

use. These specific data requirements result in the loss of firm quarter observations as follows: no prior-quarter press release (8,496 observations); unable to match to I/B/E/S ticker or missing I/B/E/S data (4,969 observations); and missing data items from COMPUSTAT and/or CRSP (1,790 observations). Finally, we eliminate observations greater than five standard deviations from the mean for each of the accounting, financial market, and language variables (949 observations).¹¹ Our final sample consists of 23,017 firm quarters.

Measure of earnings press release language

We employ computerized textual-analysis software to measure managers' language throughout each of the quarterly earnings press releases in our sample. In particular, we use word lists from DICTION 5.0 (Hart 2000a, 2001), which have been used extensively to analyze narrative discourse including speeches of politicians (Hart 1984; Hart and Jarvis 1997; Hart 2000a, 2000b; Bligh, Kohles, and Meindl 2003, 2004), speeches of Federal Reserve policymakers (Bligh and Hess 2005a, 2005b), annual reports to stockholders (Yuthas, Rogers, and Dillard 2002), and other business communications (Ober, Zhao, Davis, and Alexander 1999).¹² DICTION is a dictionary-based program that counts types of words most frequently encountered in contemporary American public discourse (Hart 1984). Consequently, DICTION is well-suited for analyzing managers' narrative disclosures, which share common themes with public discourse (e.g., discussing past, present, and future; discussing goals and plans). The principle weakness of DICTION is that, although the program counts words based on linguistic theory (Hart 1984, 1987, 2000a, 2000b, 2001), it does not analyze language conditional on the context of a particular statement.

DICTION uses 10,000 search words assigned to 35 theoretically based linguistic categories to characterize text on several dimensions (Pennebaker et al. 2003). DICTION assigns the contents of three word lists to the linguistic category of optimism-increasing language (i.e., *praise*, *satisfaction*, and *inspiration*) and the contents of three word lists to the linguistic category of optimism-decreasing language (i.e., *blame*, *hardship*, and *denial*) (Hart 1984, 1987, 2000a, 2000b, 2001). Because earnings press releases report on financial performance in comparative terms, we expect managers' earnings press release language to communicate both positive and negative sentiments.

We argue that earnings press release language provides a unifying framework for managers' disclosures. Consequently, we develop a net measure of earnings press release language. We use DICTION word lists to count both optimism-increasing words (i.e., optimistic) and optimism-decreasing words (i.e., pessimistic) in the full text of each earnings press release.¹³ We then construct our language measure, *NETOPT*, by calculating the difference between the percentage of optimistic words and the percentage of pessimistic words (numerical characters are excluded from either calculation).¹⁴ For our tests of

-
11. We conduct all analysis using rank regressions estimated using the full (untrimmed) sample and obtain qualitatively similar results.
 12. Yuthas et al. (2002) analyze annual report narratives to assess the ethical characteristics of the disclosures by reference to Habermas's norms, which require communications to be comprehensible, truthful, sincere, and legitimate. They do not examine associations between narrative disclosures and either future firm performance or the market response to the disclosures. Demers and Vega (2010) also use DICTION word lists to analyze earnings press releases.
 13. We use QDA Miner 1.1 along with the Wordstat 4.0 module to obtain incidence counts for the DICTION word lists and total word counts for sample earnings press releases as well as to perform all other coding and processing.
 14. The DICTION word lists used to construct *NETOPT* are summarized in the appendix. We made one modification to the DICTION word lists, which was to remove the word "loss" from DICTION's "Hardship" word list. This was done to prevent the pessimistic word count from being mechanically correlated with whether or not the press release announced negative earnings. However, our results are qualitatively similar when "loss" is included in the "Hardship" word list.

Hypothesis 2, we develop a model for the expected level of net optimistic language, which requires that we measure *NETOPT* in both the current and the immediately preceding quarters. We label this lagged variable *LAGNETOPT*.

Accounting and financial market variables

For each earnings press release in the sample, we collect a number of accounting and financial market variables. As dependent variables for our tests of Hypothesis 1 and Hypothesis 2, we require measures of future firm performance and market returns around the date of the earnings press release. To measure future firm performance, we use the average of return on assets (*ROA*) for the four quarters subsequent to the earnings press release date, where *ROA* is calculated as COMPUSTAT earnings scaled by total assets as of the beginning of the quarter. To measure market returns, we define *CAR* as the cumulative abnormal return (relative to the firm's size-decile portfolio) over the three-day window centered on the earnings press release date (−1 day to +1 day).

For control variables in our regressions, we collect variables likely associated with future firm performance and the market response around the date of the earnings announcement, including variables meant to proxy for quantifiable information in earnings press releases other than language. We collect current quarter COMPUSTAT sales (*REV*) and use its natural logarithm (*LOGREV*) as a measure of firm size. We measure the current quarter earnings surprise (*SURP*) as the difference between I/B/E/S actual earnings and the most recent consensus analyst earnings forecast made prior to the earnings announcement, scaled by stock price measured at the beginning of the current quarter. We define the dummy variable *BEAT* to be 1 if announced earnings for the current quarter met or exceeded analysts' expectations (i.e., when *SURP* ≥ 0) and 0 otherwise. We identify loss firms by defining the dummy variable *LOSS* to be 1 if COMPUSTAT earnings are negative and 0 otherwise.

We construct proxies for the concurrent disclosures made with earnings press releases found to be significant in prior research (i.e., Hoskin et al. 1986 and Francis et al. 2002b): the presence of detailed financial statements, the announcement of dividend increases, and the reporting of nonrecurring earnings components. We include these proxies in our models as additional controls for other quantifiable information in earnings press releases likely to be associated with future firm performance and market returns in the announcement period.¹⁵

To identify the presence of detailed financial statements, we count words or phrases, such as “total liabilities” or “from financing activities”, related to the presence of a detailed balance sheet or a statement of cash flows, respectively. We define dummy variables *BS_D* and *SCF_D* to be 1 if these word counts are greater than two for balance sheet related words and greater than one for statement of cash flow related words, respectively.¹⁶ We then construct a variable, *DET_FS*, equal to one if the sum of *BS_D* and *SCF_D* is greater than zero and include it in our analyses as a control for the presence of detailed financial statements.¹⁷ To control for the announcement of dividend increases, we

15. To provide some validation for these proxies, we read a randomly selected subsample of 52 press releases and manually code them using the frameworks presented in Hoskin et al. 1986 and Francis et al. 2002b. We find our proxies are positively correlated with the manually coded measures for this subsample of firm quarters.

16. We verify the effectiveness of this procedure by reading a randomly selected sample of 50 press releases. We find that press releases that have at least two balance sheet-related words (or phrases) generally contain a balance sheet, whereas press releases that have one or more statement of cash flow-related words (or phrases) contain a full or reduced-form statement of cash flows.

17. Francis et al. (2002b) find the inclusion of detailed income statements is an especially important concurrent disclosure in explaining the market response to earnings press releases. We assume that firms providing a detailed balance sheet or a statement of cash flows in their earnings press release also provide a detailed income statement. Moreover, we find a positive correlation between *DET_FS* and the presence of a detailed income statement in the subsample of firms for which we code press releases manually.

use CRSP data to determine whether there was a distribution declaration in the three-day window surrounding the earnings press release date. For firm quarters in which there was a dividend declaration during this period, we calculate the amount of dividend change and define a dummy variable, *DIV_INCREASE* to be one if the dividend change is positive. *DIV_INCREASE* is 0 if the dividend change is less than or equal to zero, or if there was no dividend announcement made at the time of the earnings press release. We collect quarterly extraordinary items and discontinued operations from COMPUSTAT as a measure of the reporting of nonrecurring income components. We define a dummy variable *NONRECUR_NEG* to be one if the net effect of these components on current period earnings is negative and zero otherwise. Likewise, we define a dummy variable *NONRECUR_POS* to be one if the net effect of these components on current period earnings is positive and zero otherwise.

Finally, as additional measures of quantifiable information, we collect current quarter *ROA* and its two components: profit margin (*PM*) measured as COMPUSTAT current quarter earnings scaled by current quarter sales, and asset turnover (*AT*) measured as current quarter sales scaled by total assets at the end of the current quarter. We define a measure of firm leverage (*DA*) as total liabilities scaled by total assets (both measured at the end of the current quarter). We also measure the book-to-market ratio (*BM*) as the book value of equity scaled by the market value of equity (both measured at the end of the current quarter).

4. Results

Descriptive evidence

Table 1 presents descriptive statistics for all accounting, financial market, and textual-analysis variables. Sample firms are relatively large as indicated by the mean (median) of *REV*, \$734 million (\$133 million), respectively. The distribution of *REV* is highly skewed, so we use the natural logarithm of *REV* in the analyses. During the sample period, approximately 71 percent of sample firms report earnings that meet or beat analysts' earnings expectations, and approximately 25 percent of sample firms report negative earnings. The mean of *DET_FS* is 0.765, indicating that earnings press releases included detailed financial statements in approximately 77 percent of the firm quarters in our sample. Table 2 presents the correlation matrix for all accounting, financial market, and textual-analysis variables. Several variables are significantly correlated, and thus we employ multivariate analyses for all hypothesis tests.

Test of Hypothesis 1

Hypothesis 1 predicts that net optimistic language in earnings press releases is positively associated with future firm performance. To test Hypothesis 1, we augment a baseline multivariate regression model to explain future firm performance, based on that used in Core, Holthausen, and Larcker 1999 and Bowen, Rajgopal, and Venkatachalam 2007. Future firm performance (*FUTROA*) is measured as the average of *ROA* in the four quarters subsequent to the current quarter. The following model is then used to explain *FUTROA*:

$$\begin{aligned}
 FUTROA_i = & \beta_0 + \beta_1 ROA_i + \beta_2 \sigma_{ROA,i} + \beta_3 LOGREV_i + \beta_4 SURP_i + \beta_5 BEAT_i + \beta_6 LOSS_i \\
 & + \beta_7 DET_FS_i + \beta_8 DIV_INC_i + \beta_9 NONREC_POS_i + \beta_{10} NONREC_NEG_i \\
 & + \beta_{11} PM_i + \beta_{12} AT_i + \beta_{13} DA_i + \beta_{14} BM_i + \beta_{15} NETOPT_i \\
 & + \sum_j \beta_{16j} ID_{ij} + \sum_k \beta_{17k} YEAR_{ik} + \varepsilon_i \quad (1)
 \end{aligned}$$

TABLE 1
Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. dev.
<i>NETOPT</i>	0.817	0.740	4.250	-1.470	0.700
<i>CAR</i>	0.005	0.003	0.490	-0.483	0.090
<i>FUTROA</i>	0.001	0.007	0.132	-0.281	0.036
<i>SURP</i>	-0.001	0.000	2.767	-3.658	0.049
<i>BEAT</i>	0.707	1.000	1.000	0.000	0.454
<i>LOSS</i>	0.252	0.000	1.000	0.000	0.434
<i>ROA</i>	0.002	0.007	0.315	-0.323	0.043
<i>REV</i>	734.31	133.22	66,903	0.009	2,638
<i>DET_FS</i>	0.765	1.000	1.000	0.000	0.424
<i>DIV_INC</i>	0.012	0.000	1.000	-1.000	0.134
<i>NONREC_POS</i>	0.064	0.000	1.000	0.000	0.244
<i>NONREC_NEG</i>	0.085	0.000	1.000	0.000	0.279
<i>PM</i>	-0.272	0.056	235.61	-270.62	6.88
<i>AT</i>	0.204	0.165	1.217	0.000	0.184
<i>DA</i>	0.544	0.555	1.872	0.000	0.262
<i>BM</i>	0.580	0.482	4.31	-2.85	0.485

Notes:

This table presents descriptive statistics for all accounting, financial market, and textual-analysis variables. *CAR* is the cumulative abnormal return (relative to the firm's size-decile portfolio) over the three-day window centered on the earnings press release date. *SURP* is the difference between actual I/B/E/S earnings for the current quarter and the I/B/E/S consensus forecast from the summary file, scaled by price at the beginning of the current quarter. *BEAT* is equal to 1 if *SURP* \geq 0 and is 0 otherwise. *LOSS* is equal to 1 if COMPUSTAT earnings are negative and 0 otherwise. *ROA* is COMPUSTAT earnings in the current quarter scaled by total assets (measured at the beginning of the current quarter). *NETOPT* is the difference between the percentage of "optimism-increasing" words in the earnings press release (i.e., words included in DICTION's praise, satisfaction, and inspiration word lists) and the percentage of "optimism-decreasing" words in the earnings press release (i.e., words included in DICTION's blame, hardship, and denial word lists). *REV* is current quarter COMPUSTAT sales. *DET_FS* is equal to 1 if the sum of *BS_D* and *SCF_D* is greater than zero and is 0 otherwise (*BS_D* and *SCF_D* are equal to 1 if words or phrases identified in the corresponding earnings press release indicate the presence of a detailed balance sheet or statement of cash flows, respectively, and 0 otherwise). *DIV_INC* is equal to 1 if a distribution declaration was made during the three-day window surrounding the earnings press release and the dividend change is positive, and 0 otherwise. *NONREC_POS* is equal to 1 if the net effect of quarterly extraordinary items and discontinued operations on current period earnings is positive, and 0 otherwise. *NONREC_NEG* is equal to 1 if the net effect of quarterly extraordinary items and discontinued operations on current period earnings is negative, and 0 otherwise. *PM* is COMPUSTAT current quarter earnings scaled by current quarter sales. *AT* is current quarter sales scaled by total assets at the end of the current quarter. *DA* is total liabilities scaled by total assets (both measured at the end of the current quarter). *BM* is the book value of equity scaled by market value of equity (both measured at the end of the current quarter).

TABLE 2
Correlation statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 <i>NETOPT</i>	1.00															
2 <i>CAR</i>	0.04	1.00														
	0.00															
3 <i>FUTROA</i>	0.16	0.10	1.00													
	0.00	0.00														
4 <i>SURP</i>	0.02	0.04	0.04	1.00												
	0.01	0.00	0.00													
5 <i>BEAT</i>	0.10	0.17	0.14	0.17	1.00											
	0.00	0.00	0.00	0.00												
6 <i>LOSS</i>	-0.20	-0.08	-0.55	-0.06	-0.20	1.00										
	0.00	0.00	0.00	0.00	0.00											
7 <i>ROA</i>	0.16	0.08	0.71	0.08	0.17	-0.65	1.00									
	0.00	0.00	0.00	0.00	0.00	0.00										
8 <i>LOGREV</i>	0.14	0.02	0.42	0.02	0.09	-0.36	0.38	1.00								
	0.00	0.01	0.00	0.01	0.00	0.00	0.00									
9 <i>DET_FS</i>	-0.10	0.02	-0.12	0.01	0.03	0.14	-0.12	-0.11	1.00							
	0.00	0.01	0.00	0.06	0.00	0.00	0.00	0.00								
10 <i>DIV_INC</i>	0.04	0.00	0.02	0.01	0.12	-0.04	0.02	0.03	-0.01	1.00						
	0.00	0.98	0.00	0.23	0.02	0.00	0.00	0.00	0.22							
11 <i>NONREC_POS</i>	-0.00	0.00	0.01	0.01	-0.01	-0.01	0.01	0.10	-0.00	-0.00	1.00					
	0.65	0.76	0.34	0.18	0.03	0.18	0.42	0.00	0.59	0.56						
12 <i>NONREC_NEG</i>	-0.02	-0.01	-0.01	-0.01	-0.03	0.03	-0.02	0.10	0.00	-0.01	-0.10	1.00				
	0.01	0.28	0.09	0.05	0.00	0.00	0.00	0.00	0.90	0.43	0.00					
13 <i>PM</i>	0.07	0.03	0.22	-0.00	0.02	-0.16	0.22	0.25	-0.04	0.03	0.02	0.01	1.00			
	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.06				
14 <i>AT</i>	0.02	0.05	0.24	0.00	0.04	-0.12	0.23	0.01	0.03	-0.05	-0.09	-0.05	0.05	1.00		
	0.00	0.00	0.00	0.78	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00			
15 <i>DA</i>	0.12	0.00	0.11	0.00	-0.02	-0.19	0.06	0.42	-0.13	0.07	0.08	0.09	0.08	-0.20	1.00	
	0.00	0.61	0.00	0.91	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
16 <i>BM</i>	-0.11	0.02	-0.16	-0.05	-0.14	0.17	-0.13	-0.05	0.00	-0.02	0.03	0.06	-0.01	-0.03	-0.02	1.00
	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.01	0.00	0.00	0.11	0.00	0.00	

Notes:

This table reports Pearson coefficients for all accounting, financial market, and textual analysis variables. *p*-values are presented below each coefficient. Variable definitions are presented in Table 1.

where $\sigma_{ROA,i}$ is the standard deviation of *ROA* over the four quarters subsequent to the current quarter, ID_{ij} is an indicator variable taking the value 1 if the press release represented in observation *i* is for a firm in the *j*th two-digit SIC industry and 0 otherwise, and $YEAR_{ik}$ is an indicator variable taking the value 1 if the earnings press release represented in observation *i* was released in year *k* and 0 otherwise. Thus, *ID* and *YEAR* are included in the model to capture any industry and year fixed effects. In equation 1, *ROA* is included to capture persistence in performance metrics, and $\sigma_{ROA,i}$ and *LOGREV* are included to control for the effects of risk and size on future firm performance. *SURP*, *BEAT*, *LOSS*, *DET_FS*, *DIV_INC*, *NONREC_POS*, *NONREC_NEG*, *PM*, *AT*, *DA*, and *BM* serve as control variables for the quantifiable information in earnings announcements other than language. Finally, to test whether earnings press release

language is predictive of future accounting performance, equation 1 includes our language measure, *NETOPT*.¹⁸

Table 3 presents the estimation results for equation 1 where we have suppressed the estimated coefficients on the industry and year dummy variables (i.e., *ID* and *YEAR*, respectively) for presentation purposes. The coefficient on *ROA* is estimated to be positive and less than 1, consistent with prior research documenting mean reversion in performance metrics (e.g., Barber and Lyon 1997). Also consistent with prior research (e.g., Core et al. 1999), the coefficient on $\sigma_{ROA,i}$ is negative, and the coefficient on *LOGREV* is positive and statistically significant. The coefficients on *SURP* and *LOSS* are also statistically significant, suggesting that earnings surprises and reporting negative earnings are both negatively correlated with future firm performance. The coefficients on *DET_FS* and *NONRECUR_POS* are negative and significant, whereas the coefficients on *DIV_INC* and *NONRECUR_NEG* are insignificant at conventional levels. The coefficient on the leverage variable *DA* is negative and statistically significant. The coefficients on both *PM* and *AT* are positive and statistically significant, indicating that components of *ROA* are positively correlated with future firm performance. Finally, we find a negative association between *BM* and future firm performance.

Consistent with Hypothesis 1, the coefficient on *NETOPT* is positive and significant, suggesting that higher values of *NETOPT* predict higher future performance.¹⁹ The significant coefficient on *NETOPT* indicates that there is at least *some* information in earnings press release language incremental to that captured by other variables in (1). However, we cannot rule out the possibility that managers may also use language opportunistically to mislead investors and other stakeholders. In sum, these results suggest that managers use language in earnings press releases to communicate incremental, value-relevant information to investors and other stakeholders.

We constructed the measure of future accounting performance, *FUTROA*, using overlapping windows for a given firm over time, which introduces serial correlation in model residuals and renders the coefficient standard errors implicit in Table 3 invalid. To address this issue, we estimate (1) on a subset of our sample obtained by retaining only nonoverlapping observations for each firm (i.e., 8,235 firm-quarter observations). The estimation results for this subsample are presented in the second column of Table 3 and are generally consistent with those obtained for the full sample. In particular, estimated coefficients are of similar magnitude to those in the larger sample, and coefficients that were statistically significant at the 5 percent level in the full sample remain statistically significant in the subsample estimation. Most notably, the coefficient on *NETOPT* is essentially unchanged (0.0008 versus 0.0010) and remains significant at the 1 percent level in the nonoverlapping sample.

Test of Hypothesis 2

Hypothesis 2 predicts that the unexpected level of net optimistic language in earnings press releases is positively associated with market returns around the earnings announcement

18. As discussed in section 3, we construct *NETOPT* by calculating the difference between the percentage of optimistic words and the percentage of pessimistic words (numerical characters are excluded from either calculation) used in the full text of each earnings press release.

19. The interquartile range of *NETOPT* is 0.85, which, for the median-length press release of 1,270 words, is an increase (decrease) of approximately 11 optimistic (pessimistic) words. Based on the parameter estimates, such a change in *NETOPT* would lead to a change in *FUTROA* of 0.00068, which is roughly 1/28 of the interquartile range of *FUTROA*. An alternative way to view the size of the effect of *NETOPT* is relative to the effects of other variables in the regression. For example, the response of *FUTROA* to whether or not a firm has negative earnings (*LOSS*) in the current quarter is roughly one-sixth of the interquartile range of *FUTROA*.

TABLE 3
Tests of the association between earnings press release language and future firm performance

Variable	Regressand: <i>FUTROA</i>			
	Full sample		Nonoverlapping sample	
	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat
Intercept	0.0159***	3.84	0.0120**	2.21
<i>ROA</i>	0.4087***	30.11	0.4453***	18.46
σ_{ROA}	-0.4999***	-30.11	-0.4867***	-18.33
<i>LOGREV</i>	0.0028***	20.99	0.0027***	11.98
<i>SURP</i>	-0.0110	-1.20	-0.0210	-1.23
<i>BEAT</i>	-0.0001	-0.28	0.0009	1.53
<i>LOSS</i>	-0.0032***	-5.05	-0.0032**	-2.82
<i>DET_FS</i>	-0.0012***	-3.93	-0.0016**	-3.07
<i>DIV_INC</i>	-0.0002	-0.34	-0.0007	-0.91
<i>NONREC_POS</i>	-0.0009*	-1.66	-0.0011	-1.31
<i>NONREC_NEG</i>	0.0003	0.56	-0.0002	-0.22
<i>PM</i>	0.0002***	3.95	0.0001**	2.52
<i>AT</i>	0.0268***	22.43	0.0264***	12.64
<i>DA</i>	-0.0054***	-4.42	-0.0040**	-1.93
<i>BM</i>	-0.0057***	-14.39	-0.0048***	-7.61
<i>NETOPT</i>	0.0008***	3.57	0.0010***	2.70
Adjusted <i>R</i> ²	0.640		0.649	
Sample size	23,017		8,235	

Notes:

This table presents estimation results for equation 1, which is used to test hypotheses regarding the association between measures of future firm performance and net levels of optimistic language in earnings press releases. *FUTROA* and σ_{ROA} are the mean and standard deviation, respectively, of *ROA* in the four quarters subsequent to current quarter. *LOGREV* is the natural logarithm of *REV*. The regression includes *ID* and *YEAR*, which are two-digit SIC industry and year dummy variables, respectively. Coefficient estimates for *ID* and *YEAR* are omitted for presentation purposes. Table 1 presents all other variable definitions. “Nonoverlapping sample” refers to a subsample consisting of only nonoverlapping observations on *FUTROA* for each firm. *t*-statistics are constructed using White 1980 heteroskedasticity robust standard errors. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1percent levels, respectively, based on a two-tailed *t*-test.

date. To test Hypothesis 2, we measure the unexpected level of net optimistic language using a simple random-walk expectations model. The random-walk model implies that the unexpected portion of *NETOPT* is given by (*NETOPT* – *LAGNETOPT*). Although more complicated expectations models are certainly possible, for example a model that incorporates mean reversion, the random walk is a widely used baseline expectation model in economic, financial, and accounting applications, and as such is a natural starting point for modeling expectations regarding language use.

We estimate a multivariate regression model in which *CAR* (i.e., the size-adjusted cumulative abnormal return over the three-day window centered on the earnings press release date) is regressed on (*NETOPT* – *LAGNETOPT*). To measure the incremental market response to managers’ language, we include control variables in our analyses that

are known to have information content, namely *SURP*, *BEAT*, and *LOSS*. To proxy for other quantifiable information in earnings press releases, we include *DET_FS*, *DIV_INC*, *NONREC_POS*, *NONREC_NEG*, *PM*, *AT*, *DA*, and *BM* in the model. The formal specification of the regression model is as follows:

$$\begin{aligned}
 CAR_i = & \beta_0 + \beta_1 SURP_i + \beta_2 BEAT_i + \beta_3 LOSS_i + \beta_4 DET_FS_i + \beta_5 DIV_INC_i \\
 & + \beta_6 NONREC_POS_i + \beta_7 NONREC_NEG_i + \beta_8 PM_i + \beta_9 AT_i + \beta_{10} DA_i + \beta_{11} BM_i \\
 & + \beta_{12} (NETOPT_i - LAGNETOPT_i) + \sum_j \beta_{13j} ID_{ij} + \sum_k \beta_{14k} YEAR_{ik} + \varepsilon_i \quad (2)
 \end{aligned}$$

where i indexes the firm-quarter observation and all variables are defined as in section 3.

Table 4 presents estimation results for equation 2. Consistent with existing literature, the coefficient on *BEAT* is positive and statistically significant, and the coefficient on *LOSS* is negative and statistically significant. Interestingly, the coefficient on *SURP* is not significant when *BEAT* is included in the regression. We also find a positive and statistically significant coefficient on *DET_FS*, suggesting that the market responds positively to the inclusion of detailed financial statements in earnings press releases. This result is consistent with prior research (Francis et al. 2002b) documenting an association between the absolute value of announcement period returns and the presence of detailed financial statements. The coefficients on the other variables controlling for qualitative disclosures found to be significant in prior research (i.e., *DIV_INC*, *NONREC_POS*, and *NONREC_NEG*) are insignificant. Finally, we find positive and statistically significant coefficients on *PM*, *AT* and *BM*, suggesting that the market responds positively to higher profit margins, asset turnover, and book-to-market ratios.

Consistent with Hypothesis 2, the coefficient on (*NETOPT* - *LAGNETOPT*) is positive and significant, suggesting that higher unexpected values of *NETOPT* are associated with positive abnormal returns around the issuance of the earnings press release.²⁰ This result also supports our assertion that managers use language in earnings press releases to signal their future expectations. It is important to note that these results do not rule out the potential for managers' opportunistic use of language in earnings press releases. However, taken together, the results from tests of Hypothesis 1 and Hypothesis 2 do support managers' use of language, at least to some extent, to communicate information about expected future performance. Further tests of Hypothesis 2 suggest that investors recognize and respond to managers' use of language as a voluntary disclosure mechanism.

Language in officers' comments

In their analysis of additional earnings press release disclosures, Hoskin et al. (1986) find an incremental market response to prospective officer comments during their sample period (i.e., 1984). In a study of the increased informativeness of earnings announcements over time, Francis et al. (2002b) find that both current and prospective officer comments contribute to the market's response to earnings announcements from 1980 to 1999.

20. The interquartile range of (*NETOPT* - *LAGNETOPT*) is 0.57, which, for the median-length press release of 1,270 words, is an increase (decrease) of approximately 7 optimistic (pessimistic) words relative to last period's press release. Based on the parameter estimates, such a change in (*NETOPT* - *LAGNETOPT*) would lead to a change in *CAR* of 0.00425, which is roughly 1/20 of the interquartile range of *CAR*. An alternative way to view the size of the effect of (*NETOPT* - *LAGNETOPT*) is relative to the market response to other variables in the regression. For example, the response of *CAR* to whether or not a firm beats analyst earnings forecasts (*BEAT*) is roughly one-third of the interquartile range of *CAR*.

TABLE 4
Tests of the market response to earnings press release language

Regressand: <i>CAR</i>	
Variable	
Intercept	-0.0293*** (-10.96)
<i>SURP</i>	0.0231 (0.77)
<i>BEAT</i>	0.0324*** (23.32)
<i>LOSS</i>	-0.0093*** (-5.55)
<i>DET_FS</i>	0.0041*** (3.33)
<i>DIV_INC</i>	-0.0017 (-0.60)
<i>NONREC_POS</i>	0.0019 (0.82)
<i>NONREC_NEG</i>	-0.0006 (-0.27)
<i>PM</i>	0.0002* (1.74)
<i>AT</i>	0.0198*** (5.89)
<i>DA</i>	0.0028 (1.06)
<i>BM</i>	0.0094*** (5.89)
<i>NETOPT - LAGNETOPT</i>	0.0075*** (6.45)
Adjusted R^2	0.037
Sample size	23,017

Notes:

This table presents estimation results for equation 2, which is used to test hypotheses regarding the market response to net optimistic language in earnings press releases. *LAGNETOPT* is the value of *NETOPT* in the quarter immediately prior to the current quarter. Table 2 presents all other variable definitions. *t*-statistics constructed using White 1980 heteroskedasticity robust standard errors are presented in parenthesis. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-tailed *t*-test.

Results from these studies suggest that officers' comments are an important qualitative disclosure in earnings press releases. In additional analyses, we attempt to isolate the effects of language in officers' comments by constructing separate language measures for the portions of earnings press releases corresponding to officers' comments (i.e., quotations) and the remaining nonquotation sections. We then reestimate our models for these separate language measures. We use this analysis to assess whether the importance of language is limited to officers' comments or extends to the full text of an earnings press release.

To differentiate the language in officers' quotations from that used in the remainder of the earnings press release, we code all occurrences of quotation marks using computerized search and coding tools. We then divide each earnings press release into two subsections of text: one consisting of all officers' comments (i.e., quotation section), and the other consisting of the remainder of the earnings press release text (i.e., nonquotation section). We calculate our language variables (i.e., *NETOPT* and *LAGNETOPT*) separately for each of the two subsections. We then estimate the future performance regression (1) and the market response regression (2) separately for the quotation and nonquotation sections of the earnings press releases in our sample.

Table 5 presents coefficient estimates from the future performance regression for both the quotation and nonquotation sections. The coefficient on *NETOPT* is positive

TABLE 5

The association between earnings press release language and future firm performance in quotation and nonquotation sections

Variable	Regressand: <i>FUTROA</i>			
	Quotation		Nonquotation	
	Coefficient	<i>t</i> -stat	Coefficient	<i>t</i> -stat
Intercept	0.0174***	3.76	0.0160***	3.88
<i>ROA</i>	0.4082***	28.02	0.4089***	30.13
σ_{ROA}	-0.4977***	-28.55	-0.4999***	-30.10
<i>LOGREV</i>	0.0027***	19.05	0.0028***	20.94
<i>SURP</i>	-0.0210	-1.35	-0.0101	-1.20
<i>BEAT</i>	0.0000	0.16	-0.0000	-0.18
<i>LOSS</i>	-0.0030***	-4.44	-0.0033***	-5.12
<i>DET_FS</i>	-0.0009***	-2.70	-0.0012***	-4.01
<i>DIV_INC</i>	0.0000	0.03	-0.0002	-0.31
<i>NONREC_POS</i>	-0.0010*	-1.75	-0.0009*	-1.66
<i>NONREC_NEG</i>	0.0000	0.09	0.0003	0.56
<i>PM</i>	0.0002**	3.05	0.0002***	3.95
<i>AT</i>	0.0262***	20.59	0.0269***	22.50
<i>DA</i>	-0.0048***	-3.61	-0.0054***	-4.42
<i>BM</i>	-0.0057***	-13.35	-0.0057***	-14.49
<i>NETOPT</i>	0.0002***	3.97	0.0006***	2.47
Adjusted R^2	0.630		0.640	
Sample size	19,995		23,017	

Notes:

This table presents estimation results for equation 1, which is used to test hypotheses regarding the association between measures of future firm performance and net levels of optimistic language in earnings press releases. *FUTROA* and σ_{ROA} are the mean and standard deviation, respectively, of *ROA* in the four quarters subsequent to current quarter. *LOGREV* is the natural logarithm of *REV*. The regression includes *ID* and *YEAR*, which are two-digit SIC industry and year dummy variables, respectively. Coefficient estimates for *ID* and *YEAR* are omitted for presentation purposes. Table 1 presents all other variable definitions. "Nonquotation sample" refers to a subsample consisting of only nonquotation observations on *FUTROA* for each firm. *t*-statistics are constructed using White 1980 heteroskedasticity robust standard errors. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-tailed *t*-test.

and significant for both subsections of the earnings press release, indicating that the statistical significance of the relationship between future firm performance and earnings press release language does not depend on where the language is presented within the press release. This result suggests that our main results are not driven by language in officers' comments — in fact, the coefficient on *NETOPT* for the nonquotation section is larger in magnitude than it is for the quotation section. The coefficients on the other variables in the regression are very similar in magnitude and significance for both subsections.

Table 6 presents estimates for the coefficients on (*NETOPT* – *LAGNETOPT*) from the market response regression (2). Results indicate a significant market response to the unexpected net optimistic language in both the quotation and nonquotation sections. The coefficient on (*NETOPT* – *LAGNETOPT*) is statistically significant regardless of where the language is presented in the earnings press release. Similar to the results from the future performance regression, the coefficient on (*NETOPT* – *LAGNETOPT*) is larger in magnitude for the nonquotation section than it is for the quotation section. The coefficients on other variables in the returns regression are similar in magnitude and significance for both subsections. The sole exception is *SURP*, which is positive and significant in the regression estimated for the quotations section, but is insignificant in the nonquotation section specification.

Analysis of the quotation section of earnings press releases confirms findings from prior work that officers' comments are an important component of earnings press release language (Hoskin et al. 1986; Francis et al. 2002b). Furthermore, results from the analysis of the nonquotation sections suggest that our language measure captures information beyond that provided via the officers' comments investigated in prior research. These findings support the assertion that analysis of the full text of an earnings press release allows researchers to capture the signal about expected future firm performance communicated by managers' language use.

Management forecasts

Hoskin et al. (1986) note that 31 percent of the earnings press releases in their sample include management earnings forecasts, and there is extensive prior research documenting a market response to the news in management earnings forecasts (e.g., Patell 1976; Penman 1980; Waymire 1984; Jennings 1987; Pownall and Waymire 1989; Pownall, Wasley, and Waymire 1993; Baginski, Conrad, and Hassell 1993; Skinner 1994; Hutton et al. 2003; Baginski et al. 2004; Hutton and Stocken 2006). To assess whether the importance of language is related to management forecasts included in earnings press releases, we reestimate (1) and (2) for a subset of firm quarters, which we identify as not including management forecasts.²¹ The coefficients on *NETOPT* and (*NETOPT* – *LAGNETOPT*) remain positive and significant for this subsample, indicating that our main results are not limited to earnings press releases that include management forecasts.

The preceding analysis does not rule out the possibility that in the absence of an explicit management earnings forecast, managers' language use provides an imprecise forecast of earnings or other performance metrics. For example, the statement “next quarter's earnings will be disappointing” contains both pessimistic language and an imprecise

21. We classify earnings press releases as including management earnings forecasts if the word “guidance” is found in the earnings press release. We base our selection of the word “guidance” as an indicator of the presence of a management earnings forecast on a review of a random sample of the earnings press releases across all years. Our review indicated that sample firms did not use unique or systematic language to describe management earnings forecasts in earlier years, but began regularly using the term “guidance” to describe management earnings forecasts in later years. Consequently, we focus our analysis on earnings press releases issued in 2003.

TABLE 6

The market response to earnings press release language in quotation and nonquotation sections

Regressand: <i>CAR</i>		
Variable	Quotation	Nonquotation
Intercept	-0.0308*** (-10.33)	-0.0293*** (-10.97)
<i>SURP</i>	0.1100*** (3.32)	0.0233 (0.77)
<i>BEAT</i>	0.0322*** (20.89)	0.0324*** (23.37)
<i>LOSS</i>	-0.0100*** (-5.44)	-0.0093*** (-5.56)
<i>DET_FS</i>	0.0041*** (2.91)	0.0041*** (3.36)
<i>DIV_INC</i>	0.0022 (0.63)	-0.0017 (-0.59)
<i>NONREC_POS</i>	0.0011 (0.43)	0.0018 (0.77)
<i>NONREC_NEG</i>	0.0004 (0.17)	-0.0006 (-0.29)
<i>PM</i>	0.0001 (1.08)	0.0002* (1.74)
<i>AT</i>	0.0201*** (5.38)	0.0197*** (5.84)
<i>DA</i>	0.0040 (1.41)	0.0028 (1.06)
<i>BM</i>	0.0111*** (6.34)	0.0093*** (5.87)
<i>NETOPT - LAGNETOPT</i>	0.0006*** (3.14)	0.0071*** (5.58)
Adjusted R^2	0.033	0.036
Sample size	18,925	23,017

Notes:

This table presents estimation results for the market returns regression (2), where estimation is conducted separately for the quotation and nonquotation sections of the earnings press release. Coefficient estimates for all parameters other than *NETOPT* are omitted for presentation purposes. The column labeled “Quotations” reports parameter estimates for a regression in which (*NETOPT - LAGNETOPT*) is measured in the section of the earnings press release presenting officer quotations. The column labeled “Nonquotations” reports the corresponding estimates when (*NETOPT - LAGNETOPT*) is measured in the remaining section of the earnings press release. *t*-statistics constructed using White 1980 heteroskedasticity robust standard errors are presented in parenthesis. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-tailed *t*-test.

management earnings forecast. To investigate the possibility that full-sample results are attributable to managers’ language use providing relatively imprecise signals of future firm performance to investors, we focus on the subsample of earnings press releases that do not

contain management earnings forecasts and perform an alternative test.²² From the subset of earnings press releases identified as not including management forecasts, we select a random sample of 10 percent of the more than 89,000 words classified as optimistic or pessimistic by DICTION. We then read the sentence containing each of these words to determine whether or not it could be considered to provide an imprecise forecast of future performance. This analysis reveals that: only eight (0.09 percent) of the words in the subsample present what could be interpreted as an imprecise earnings forecast; three (0.03 percent) of the words in the subsample presented what could be interpreted as an imprecise revenue forecast; and nine (0.10 percent) of the words presented what could be interpreted as an imprecise forecast of another financial performance metric (e.g., cash flow). In sum, these analyses demonstrate that the significant associations observed between measures of net optimistic language and both future ROA and market returns are not likely attributable to managers' imprecise forecast of a future performance metric in a firm's earnings press releases.

5. Conclusion

Earnings press releases are the primary mechanism by which managers announce quarterly earnings and make other concurrent disclosures to investors and other stakeholders. We argue that earnings press release language both provides a unifying framework for these disclosures and provides managers with opportunities to signal, both directly and more subtly, their expectations about future firm performance. Consequently, we examine whether a measure of language used throughout an earnings press release is associated with future firm performance and generates a market response.

We analyze a sample of approximately 23,000 quarterly earnings press releases published on PR Newswire between 1998 and 2003. We construct a measure of net optimistic language using an established, textual-analysis software program (DICTION), which counts words characterized as optimistic and pessimistic. We find that levels of net optimistic language in earnings press releases are predictive of firm performance in future quarters. We interpret this evidence to suggest that managers use language in earnings press releases, at least to some extent, to communicate information about expected future firm performance to the market. We also find a significant market response to unexpected net optimistic language. These results suggest that market participants consider at least some level of managers' language to be a credible signal, despite the potential for managers to behave opportunistically when selecting language for inclusion in earnings press releases. In sum, our results suggest that managers use language as a voluntary disclosure mechanism to provide credible information about expected future firm performance.

Our results also demonstrate the efficacy of using textual-analysis software (e.g., DICTION) to obtain objective measures of nonquantitative earnings press release disclosures for large samples. This is an important methodological advantage, because prior studies required the construction of qualitative disclosure measures using manual coding methods.

22. We thank an anonymous reviewer for raising this point and suggesting the analysis reported in this section.

Appendix

DICTION 5.0 word lists used to construct language measures

Panel A: Word lists used to construct optimistic tone measure (*OPT*)

Praise word list

Description:²³ Affirmations of some person, group or abstract entity. Included are terms isolating important social qualities, physical qualities, intellectual qualities, entrepreneurial qualities, and moral qualities. All terms in this list are adjectives.

Number of words: 195

Sample words: best, better, capable, favorable, good, great, important, positive, profitable, strong, successful

Satisfaction word list

Description: Terms associated with positive affective states, with moments of undiminished joy and pleasurable diversion, or with moments of triumph. Also included are words of nurturance.

Number of words: 315

Sample words: applaud, attracts, celebrate, comfortable, confident, delighted, enjoy, enthusiasm, excited, pleased, satisfied

Inspiration word list

Description: Abstract virtues deserving of universal respect. Most of the terms are nouns isolating desirable moral qualities as well as attractive personal qualities. Social and political ideals are also included.

Number of words: 122

Sample words: commitment, dedication, enrichment, improvement, loyalty, productivity, progress, promise, quality

Panel B: Word lists used to construct pessimistic language measure (*PESS*)

Blame word list

Description: Terms designating social inappropriateness and evil. In addition, adjectives describing unfortunate circumstances or unplanned vicissitudes are included. Also contains outright denigrations.

Number of words: 346

Sample words: adverse, bad, bleak, careless, costly, grim, hard, mediocre, struggling, troubled, unstable, upsetting

Hardship word list

Description: Contains natural disasters, hostile actions and censurable human behavior. Also includes unsavory political outcomes as well as normal human fears and incapacities.

Number of words: 470

Sample words: abuse, alarmed, battle, burden, conflict, depressed, disappointing, discouraged, fail, fear, hardship, problem, regret, setback, threaten, unfortunately, weakness

Denial word list

Description: Consists of standard negative contractions, negative function words, and terms designating null sets.

Number of words: 39

Sample words: aren't, cannot, didn't, shouldn't, don't, nor, not, nothing

23. Descriptions of each word list obtained from DICTION documentation (Hart 2000a).

References

- Ajinkya, B. B., and M. J. Gift. 1984. Corporate managers' earnings forecasts and symmetrical adjustments of market expectations. *Journal of Accounting Research* 22 (2): 425–44.
- Asquith, P., M. B. Mikhail, and A. S. Au. 2005. Information content of equity analyst reports. *Journal of Financial Economics* 75 (2): 245–82.
- Baginski, S., E. Conrad, and J. M. Hassell. 1993. The effects of management forecast precision on equity pricing and on the assessment of earnings uncertainty. *The Accounting Review* 68 (4): 913–27.
- Baginski, S., J. M. Hassell, and W. A. Hillison. 2000. Voluntary causal disclosures: Tendencies and capital market reaction. *Review of Quantitative Finance and Accounting* 15 (4): 371–89.
- Baginski, S., J. M. Hassell, and M. D. Kimbrough. 2004. Why do managers explain their earnings forecasts? *Journal of Accounting Research* 42 (1): 1–29.
- Barber, B., and J. Lyon. 1997. Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics* 43 (3): 341–71.
- Barron, O. E., C. O. Kile, and T. B. O'Keefe. 1999. MD&A quality as measured by the SEC and analysts' earnings forecasts. *Contemporary Accounting Research* 16 (1): 75–109.
- Basil, M., C. Schouter, and B. Reeves. 1999. Positive and negative political advertising: Effectiveness of advertisements and perceptions of candidates. In *Television and political advertising*, vol. 1, ed. F. Biocca, 245–62. New York: Taylor and Francis.
- Bligh, M. C., J. C. Kohles, and J. R. Meindl. 2004. Charisma under crisis: Presidential leadership, rhetoric, and media responses before and after the September 11th terrorist attacks. *The Leadership Quarterly* 15 (2): 211–39.
- Bligh, M. C., and G. Hess. 2005a. Leading cautiously: Alan Greenspan, rhetorical leadership, and monetary policy. Working paper, Claremont Graduate University and Claremont McKenna College.
- Bligh, M. C., and G. Hess. 2005b. A quantitative assessment of the qualitative aspects of Chairman Greenspan's communication. Working paper, Claremont Graduate University and Claremont McKenna College.
- Bowen, R., S. Rajgopal, and M. Venkatachalam. 2007. Accounting choice, corporate governance and firm performance. *Contemporary Accounting Research* 25 (2): 351–405.
- Bryan, S. H. 1997. Incremental information content of required disclosures contained in management discussion and analysis. *The Accounting Review* 72 (2): 285–301.
- Chaiken, S. 1987. The heuristic model of persuasion. In *Social influence: The Ontario symposium (5)*, ed. M. P. Zanna, J. M. Olson, and C.P. Herman, 3–40. Hillsdale, NJ: Erlbaum.
- Clarkson, P. M., J. L. Kao, and G. D. Richardson. 1999. Evidence that management discussion and analysis (MD&A) is a part of a firm's overall disclosure package. *Contemporary Accounting Research* 16 (1): 111–34.
- Collins, D., O. Li, and H. Xie. 2005. What drives the increased informativeness of earnings announcements over time? Working paper, University of Iowa, University of Notre Dame, and University of Illinois at Urbana-Champaign.
- Core, J., R. Holthausen, and D. Larcker. 1999. Corporate governance, chief executive officer compensation and firm performance. *Journal of Financial Economics* 51 (3): 371–406.
- DeMarzo, P. M., D. Vayanos, and J. Zwiebel. 2003. Persuasion bias, social influence, and unidimensional opinions. Working paper, Stanford University and MIT Sloan School of Management.
- Demers, E., and C. Vega. 2010. Soft information in earnings announcements: News or noise? Working paper, INSEAD.
- Erb, H. P., and G. Bohner. 2007. Social influence and persuasion: Recent theoretical developments and integrative attempts. In *Social communication*, ed. K. Fiedler, 191–221. New York: Psychology Press.

- Francis, J., K. Schipper, and L. Vincent. 2002a. Earnings announcements and competing information. *Journal of Accounting and Economics* 33 (2): 313–42.
- Francis, J., K. Schipper, and L. Vincent. 2002b. Expanded disclosures and the increased usefulness of earnings announcements. *The Accounting Review* 77 (3): 515–46.
- Frost, C. A. 1997. Disclosure policy choices of UK firms receiving modified audit reports. *Journal of Accounting and Economics* 23 (2): 163–87.
- Geiger, S., and B. Reeves. 1993. The effects of scene changes and semantic relatedness on attention to television. *Communication Research* 20 (2): 155–75.
- Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1–3): 3–73.
- Gunter, B. 1987. *Poor reception: Misunderstanding and forgetting broadcast news*. Hillsdale, NJ: Erlbaum.
- Hart, R. P. 1984. *Verbal style and the presidency: A computer-based analysis*. Orlando, FL: Academic Press.
- Hart, R. P. 1987. *The sound of leadership: Presidential communication in the modern age*. Chicago: University of Chicago Press.
- Hart, R. P. 2000a. *DICTION 5.0: The text-analysis program*. Thousand Oaks, CA: Scolaris/Sage.
- Hart, R. P. 2000b. *Campaign talk: Why elections are good for us*. Princeton, NJ: Princeton University Press.
- Hart, R. P. 2001. Redeveloping DICTION: Theoretical considerations. In *Theory, method, and practice of computer content analysis*, ed. M. West, 26–55. New York: Ablex.
- Hart, R. P., and S. Jarvis. 1997. Political debate: Forms, styles, and media. *American Behavioral Scientist* 40 (8): 1095–122.
- Hassell, J. M., and R. H. Jennings. 1986. Relative forecast accuracy and the timing of earnings forecast announcements. *The Accounting Review* 61 (1): 58–75.
- Healy, P. M., and K. G. Palepu. 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31 (1–3): 405–40.
- Henry, E. 2006. Market reaction to verbal components of earnings press releases: Event study using a predictive algorithm. *Journal of Emerging Technologies in Accounting* 3 (1): 1–19.
- Henry, E. 2008. Are investors influenced by how earnings press releases are written? *Journal of Business Communication* 45 (4): 363–407.
- Hoskin, R., J. Hughes, and W. Ricks. 1986. Evidence on the incremental information content of additional firm disclosures made concurrently with earnings. *Journal of Accounting Research* 24 (Supplement): 1–32.
- Hutton, A. 2004. Beyond financial reporting: An integrated approach to corporate disclosure. *Journal of Applied Corporate Finance* 16 (4): 8–16.
- Hutton, A., G. Miller, and D. Skinner. 2003. The role of supplementary statements with management earnings forecasts. *Journal of Accounting Research* 41 (5): 867–90.
- Hutton, A., and P. Stocken. 2006. Effect of reputation on the credibility of management forecasts. Working paper, Boston College and Dartmouth College.
- Jennings, R. 1987. Unsystematic security price movements, management earnings forecasts, and revisions in consensus analyst earnings forecasts. *Journal of Accounting Research* 25 (1): 90–110.
- Katz, S. B. 2001. Language and persuasion in biotechnology communication with the public: How not to say what you're not going to say and not say it. *AgBioForum* 4 (2): 93–97.
- King, R., G. Pownall, and G. Waymire. 1990. Expectations adjustment via timely management of forecasts: Review, synthesis, and suggestions for future research. *Journal of Accounting Literature* 9: 113–44.
- Kross, W., and M. Kim. 2000. Differences between market responses to earnings announcements in the 1990s vs. 1960s. Working paper, Purdue University.

- Kruglanski, A.W., and E. P. Thompson. 1999. Persuasion by a single route: A view from the unimodel. *Psychological Inquiry* 10 (2): 83–109.
- Landsman, W., and E. Maydew. 2002. Has the information content of quarterly earnings announcements declined in the past three decades? *Journal of Accounting Research* 40 (3): 797–807.
- Levin, I. P., S. L. Schneider, and G. J. Gaeth. 1998. All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes* 76 (2): 149–88.
- Li, F. 2006. Do stock market investors understand the risk sentiment of corporate annual reports? Working paper, University of Michigan.
- Li, F. 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics* 45 (2–3): 221–47.
- Lo, K., and T. Lys. 2001. Bridging the gap between value relevance and information content. Working paper, University of British Columbia and Northwestern University.
- Maat, H. P. 2007. How promotional language in press releases is dealt with by journalists: Genre mixing or genre conflict? *Journal of Business Communication* 44 (1): 59–95.
- Mahoney, W., and J. Lewis. 2004. *The IR book*. Available online at <http://www.ir-book.com>.
- Mercer, M. 2004. How do investors assess the credibility of management disclosures? *Accounting Horizons* 18 (3): 185–96.
- Morris, M. W., O. J. Sheldon, D. R. Ames, and M. J. Young. 2005. Metaphor in stock market commentary: Consequences and preconditions of agentic descriptions of price trends. Working paper, Columbia University, Cornell University, and University of California, Los Angeles.
- Newhagen, J., and B. Reeves. 1992. This evening's bad news: Effects of compelling negative television news images on memory. *Journal of Communication* 42 (2): 25–41.
- Ober, S., J. Zhao, R. Davis, and M. Alexander. 1999. Telling it like it is: The use of certainty in public business discourse. *The Journal of Business Communication* 36 (3): 280–300.
- Patell, J. 1976. Corporate forecasts of earnings per share and stock price behavior: Empirical tests. *Journal of Accounting Research* 14 (2): 246–76.
- Penman, S. H. 1980. An empirical investigation of the voluntary disclosure of corporate earnings forecasts. *Journal of Accounting Research* 18 (1): 132–60.
- Pennebaker, J. W., M. R. Mehl, and K. G. Niederhoffer. 2003. Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology* 54: 547–77.
- Petty, R. E., and J. T. Cacioppo. 1986. *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer.
- Pownall, G., C. Wasley, and G. Waymire. 1993. The stock price effects of alternative types of management earnings forecasts. *The Accounting Review* 68 (4): 896–912.
- Pownall, G., and G. Waymire. 1989. Voluntary disclosure credibility and securities prices: Evidence from management earnings forecasts, 1963–1973. *Journal of Accounting Research* 27 (2): 227–45.
- Skinner, D. J. 1994. Why firms voluntarily disclose bad news. *Journal of Accounting Research* 32 (1): 38–60.
- Stocken, P. C. 2000. Credibility of voluntary disclosure. *RAND Journal of Economics* 31 (2): 359–74.
- Tetlock, P., M. Saar-Tsechansky, and S. Macskassy. 2008. More than words: Quantifying language to measure firms' fundamentals. *The Journal of Finance* 63 (3): 1437–67.
- Trautmann, B., and G. Hamilton. 2003. *Informal corporate disclosure under federal securities law: Press releases, analyst calls, and other communications*. Chicago: CCH.
- Verrecchia, R. E. 2001. Essays on disclosure. *Journal of Accounting and Economics* 32 (1–3): 97–180.
- Waymire, G. 1984. Additional evidence on the information content of management earnings forecasts. *Journal of Accounting Research* 22 (2): 703–18.

- White, H. 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48 (4): 817–38.
- Wilson, R. 1985. Reputations in games and markets. In *Game-theoretic models of bargaining*, ed. A. Roth, 27–62. New York: Cambridge University Press.
- Yuthas, K., R. Rogers, and J. Dillard. 2002. Communicative action and corporate annual reports. *Journal of Business Ethics* 41 (1–2): 141–57.

Copyright of Contemporary Accounting Research is the property of Canadian Academic Accounting Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.