**UNIVERSITY OF SAO PAULO
COLLEGE OF ECONOMICS, BUSINESS, AND ACCOUNTING**

SAMANTHA VALENTIM TELLES

**Legibilidade e Compreensibilidade das Notas Explicativas
Readability and Understandability of Notes to the Financial Statements**

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Prof. Dr. Marco Antonio Zago
Reitor da Universidade de São Paulo

Prof. Dr. Adalberto Américo Fischmann
Diretor da Faculdade de Economia, Administração, Contabilidade e Atuária

Prof. Dr. Ariovaldo dos Santos
Chefe do Departamento de Contabilidade e Atuária

Prof. Dr. Lucas Ayres Barreira de Campos Barros
Coordenador do Programa de Pós-Graduação em Ciências Contábeis

SAMANTHA VALENTIM TELLES

Legibilidade e Compreensibilidade das Notas Explicativas

Readability and Understandability of Notes to the Financial Statements

Corrected Version

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*“In daylights, in sunsets, in midnights, in cups of coffee,
in inches, in miles, in laughter, in strife,
in five hundred twenty-five thousand and six hundred minutes,
how do you measure a year in the life?”*
Seasons of Love (Rent, the Musical)

RESUMO

Telles, S. V. (2018). Legibilidade e Compreensibilidade das Notas Explicativas (Tese de Doutorado). Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo.

A Contabilidade como ferramenta para comunicar informação relevante a múltiplos usuários, deve superar problemas e barreiras na apresentação dessa informação. Um dos problemas é sua compreensibilidade, dado que a falta de compreensão pode impactar as decisões. Contudo, compreensibilidade não é mensurada facilmente. Estudos anteriores usam métricas de legibilidade como proxies de compreensibilidade. Eles entendem que esses conceitos estão relacionados em certa medida, mas enquanto legibilidade foca no texto, compreensibilidade inclui características do leitor. Assim, o objetivo principal dessa pesquisa foi verificar como a legibilidade impacta na compreensibilidade das informações das Notas Explicativas. Foi verificado também se a distância entre elas se deve à língua do relatório. Os objetivos específicos eram: (i) verificar se diferentes níveis de legibilidade impactam a compreensibilidade das notas explicativas; (ii) verificar se os níveis de compreensibilidade dependem de termos específicos contábeis; (iii) verificar se a compreensibilidade e a legibilidade das notas são diferente em diferentes línguas; e (iv) verificar se a compreensibilidade e a legibilidade das notas mudaram depois da OCPC 07. Realizaram-se dois métodos de pesquisas diferentes, um de arquivo e outro experimental. A pesquisa de arquivo aplicou testes de média em 44 empresas abertas que apresentaram suas notas em português e em inglês de 2012 a 2015. Foram estudadas notas de Instrumentos Financeiros e Provisões. Utilizaram-se índices de inteligibilidade como proxies para compreensibilidade, calculados por um software linguístico. Os resultados mostram que a maior parte das empresas que possuíam os piores níveis de legibilidade, apresentaram os melhores níveis de inteligibilidade, o que é contrário ao esperado. Os resultados também mostram que, com algumas exceções, os índices de legibilidade e compreensibilidade são diferentes em português e inglês. Ademais, descobriu-se que não houve mudança após a adoção da OCPC 07 em ambos os índices de legibilidade e compreensibilidade. No experimento, foi aplicado um instrumento criado pela autora, baseado no teste MIT, a 112 estudantes no Brasil de cursos relacionados a negócios de graduação e pós-graduação, para verificar como a legibilidade impacta na compreensibilidade, manipulando os componentes de legibilidade do

índice Flesch (número de palavras por frase e número de sílabas por palavra). Controlou-se algumas características de cada participante e pela tecnicidade da linguagem contábil. Usou-se a ANCOVA para testar a diferença entre tratamentos e a Análise de Mediação para verificar o impacto de um glossário. Não foram encontradas diferenças de compreensão entre os diferentes níveis de legibilidade, enquanto que algumas características dos participantes – como habilidades de compreensão prévias, nível educacional, curso e tipo de universidade – se mostraram relevantes para explicar compreensibilidade. Os resultados também sugerem que o uso de um glossário para ajudar o leitor afetou compreensibilidade, mas mais para aqueles que possuíam menor conhecimento prévio sobre Notas Explicativas. Os resultados permitem concluir que as métricas de legibilidade não são boas proxies para mensurar compreensibilidade em Contabilidade, o glossário auxilia na compreensibilidade do leitor, a língua impacta legibilidade e compreensibilidade e legibilidade e compreensibilidade não mudaram com a OCPC 07.

Palavras-chave: Legibilidade, Compreensibilidade, Inteligibilidade, Notas Explicativas.

ABSTRACT

Telles, S. V. (2018). Readability and Understandability of Notes to the Financial Statements (Tese de Doutorado). Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo.

Accounting as a tool for communicating relevant information to multiple users must overcome issues and barriers of presenting such information. One of the issues is its understandability, once lack of understanding can impact decisions. However, understandability is not easily measured. Previous studies use readability metrics as proxies for understandability. They understand that these concepts are related to some extent, but while readability focuses on the text, understandability includes the reader characteristics. Thus, the main purpose of this research was to verify how readability impacts the understandability of the information from the notes to the financial statements. I also verified whether the distance between them was due to reporting language. The specific goals were: (i) to verify whether different readability levels have impact on the notes to the financial statements' understandability; (ii) to verify whether the understandability levels are due to accounting specific terms; (iii) to verify if those notes' understandability and readability are different for different languages; and (iv) to verify if the levels of readability and understandability changed after OCPC 07. I performed two different types of research methods, archival and experimental research. The archival research applied mean tests to 44 firms that presented their notes both in Portuguese and in English from 2012 to 2015. I studied the notes of Financial Instruments and Provisions. I used indexes of intelligibility as proxies to understandability, calculated by a linguistic software. I found that, for most indexes where firms had worse levels of readability, they showed better levels of intelligibility, which goes against the expected. My results also show that with few exceptions, the readability and intelligibility indexes are different for Portuguese and English. Moreover, I found that there was no change after the adoption of OCPC 07 on both readability and intelligibility indexes. In the experimental research, I applied a self-created instrument based on the MIT test to 112 students in Brazil of graduate and undergraduate courses related to business, to verify how readability impacts on understandability, by manipulating readability components of the Flesch index (number of words per sentence and number of syllables per word). I controlled for some characteristics of each participant and the technicality of accounting language. I used

an ANCOVA to test the difference between treatments and a Mediation Analysis to verify the impact of the glossary. I found no difference in understanding through different levels of readability, while some participant's characteristics – such as previous understanding skills, level of education, courses and the type of school – showed relevance in explaining understandability. The evidence also suggests that using a glossary to assist the reader affected understandability, but mostly for those who have less prior knowledge regarding notes to the financial statements. These results allow me to conclude readability metrics are not good proxies to measure understandability in Accounting, glossary assists on reader's understandability, language has an impact over readability and understandability, and readability and understandability did not change with the OCPC 07.

Key-words: Readability, Understandability, Intelligibility, Notes to the financial statements.

LIST OF FIGURES

Figure 1 – Financial and informational flows in a capital markets economy	32
Figure 2 – Sign-object-interpretant relation in Accounting	34
Figure 3 – Understandability level and the representamen-object-interpretant relation	42
Figure 4 – Readability vs. Understandability: Expected behavior	59
Figure 5 – Samples classification.....	92
Figure 6 – Box-plots: Readability Indexes.....	97
Figure 7 – Portuguese vs. English: Readability Indexes	101
Figure 8 – Variables' means evolution: Readability Indexes	103
Figure 9 – Box-plots: Connectives.....	110
Figure 10 – Portuguese vs English: Connectives	113
Figure 11 – Variables' means evolution: Connectives	114
Figure 12 – Box-plots: Content words and Personal Pronouns incidences.....	119
Figure 13 – Portuguese vs. English: Content words and Personal Pronouns incidences.....	122
Figure 14 – Variables' means evolution: Content words and Personal Pronouns incidences	123
Figure 15 – Box-plots: Overlaps	127
Figure 16 – Portuguese vs. English: Overlaps	129
Figure 17 – Variables' means evolution: Overlaps.....	130
Figure 18 – Box-plots: Other Indexes	134
Figure 19 – Portuguese vs. English: Other indexes	136
Figure 20 – Variables' means evolution: Other Indexes	137
Figure 21 – Readability vs. Understandability: Observed behavior	146
Figure 22 – Histograms: Dependent variables (Score – Phase 1)	148
Figure 23 – Histograms: Dependent variable by treatment.....	148
Figure 24 – Frequencies: Categorical variables	150
Figure 25 – Box plots: Dependent variable.....	153
Figure 26 – Box plots: Quantitative covariates	154
Figure 27 – Scatter plots: Covariates vs. Squared Score – Phase 1 and Covariates	160
Figure 28 – Dispersion plots (Fitted Values and Residuals): Model 1	164
Figure 29 – Dispersion plots (Fitted Values and Residuals): Model 2	167
Figure 30 – Dispersion plots (Fitted Values and Residuals): Model 4	171
Figure 31 – Mediation results: Score of phases 1 and 2 with and without the mediation of “Percentage use of glossary”	176
Figure 32 – Mediation model: Score of phases 1 and 2, “How much used glossary”, and the confidence level from phase 1	182

LIST OF TABLES

Table 1 – Nine categories of the sign	31
Table 2 – Coh-Metrix-Port variables and their impacts on understandability	47
Table 3 –Readability indexes applied to financial reports	56
Table 4 – Flesch scale comparison: English vs Portuguese	65
Table 5 – Experimental treatments.....	67
Table 6 – Experiment treatments’ scores of Flesch Index	72
Table 7 – Correct answers of Phases 1 and 2	83
Table 8 – Correct answers of Phase 3	84
Table 9 – Research sample.....	87
Table 10 – Studied firms	88
Table 11 – Mean test: Full notes x Partial notes	89
Table 12 – Variables chosen for this study	91
Table 13 – Descriptive statistics: Readability Indexes.....	94
Table 14 – Mean/Median tests Portuguese vs English: Readability Indexes.....	95
Table 15 – Correlations Portuguese vs English: Readability Indexes	99
Table 16 – Mean test (from 2012 to 2015): Readability indexes	105
Table 17 – Descriptive statistics: Connectives.....	107
Table 18 – Mean tests Portuguese vs English: Connectives	108
Table 19 – Correlations Portuguese vs English: Connectives.....	111
Table 20 – Means test (from 2012 to 2015): Connectives	114
Table 21 – Descriptive statistics: Content words and Personal Pronouns incidences	115
Table 22 – Mean tests Portuguese vs. English: Content words and Personal Pronouns incidences	116
Table 23 – Correlations Portuguese vs English: Content words and Personal Pronouns incidences	120
Table 24 – Mean test (from 2012 to 2015): Content words and Personal Pronouns incidences	124
Table 25 – Descriptive statistics: Overlaps	124
Table 26 – Means tests Portuguese vs. English: Overlaps.....	125
Table 27 – Correlations Portuguese vs English: Overlaps	129
Table 28 – Means test (from 2012 to 2015): Overlaps	131
Table 29 – Descriptive statistics: Other indexes	131
Table 30 – Mean tests Portuguese vs. English: Other Indexes	132
Table 31 – Correlations Portuguese vs English: Financial Instruments.....	136
Table 32 – Mean test (from 2012 to 2015): Other indexes	138
Table 33 – Means: Quartiles	139
Table 34 – Readability vs Intelligibility: Quartiles	140
Table 35 – Descriptive Statistics: Dependent Variables (Phase 1)	147
Table 36 – Descriptive Statistics: Quantitative covariates (Between-subject analysis).....	149
Table 37 – Participant’s Colleges/Universities	151
Table 38 – Normality tests: Dependent Variable (Score – Phase 1)	152

Table 39 – Normality tests: Squared Dependent Variables	152
Table 40 – Multicollinearity tests: Covariates	155
Table 41 – Homogeneity of Variance	157
Table 42 – Homogeneity of Regressions: Interactions between Treatments and the Covariates	161
Table 43 – ANCOVA test: Model 1.....	162
Table 44 – Lack of fit test: Model 1.....	163
Table 45 – Levene test: Model 1.....	163
Table 46 – Pair comparisons test: Model 1	163
Table 47 – ANCOVA test: Model 2.....	165
Table 48 – Lack of fit test: Model 2.....	166
Table 49 – Levene test: Model 2.....	166
Table 50 – Pair comparisons test: Model 2	166
Table 51 – ANCOVA test: Model 3.....	167
Table 52 –Lack of fit test: Model 3.....	168
Table 53 –Levene test: Model 3.....	168
Table 54 – Pair comparisons test: Model 3	168
Table 55 – ANCOVA test: Model 4.....	169
Table 56 – Lack of fit test: Model 4.....	170
Table 57 – Levene test: Model 4.....	170
Table 58 – Pair comparisons test: Model 4.....	170
Table 59 – Normality tests: Scores of phases 1 and 2.....	173
Table 60 – Wilcoxon test: Scores of phases 1 and 2.....	173
Table 61 – Descriptive statistics of Mediation analysis: Dependent Variable and Mediator	174
Table 62 – Score rate.....	178
Table 63 – Wilcoxon test: Scores comparison of phases 1 and 2	179
Table 64 – Indirect Effect by Treatment	179
Table 65 – Descriptive Statistics: Quantitative covariates (Within-subject analysis)	181
Table 66 – Wilcoxon test: Confidence levels of phases 1 and 2.....	181
Table 67 – Correlations: Scores and Confidence levels of phases 1 and 2.....	182

LIST OF ANACRONYMS

ANOVA	Analysis of Variance
ANCOVA	Analysis of Covariance
BM&FBOVESPA	<i>Bolsa de Valores, Mercadorias e Futuros</i> (São Paulo Stock Exchange)
BP	<i>Banco de Português</i>
BR GAAP	Brazilian Generally Accepted Accounting Principles
CIA	Central Intelligence Agency
CP	Collected Papers
CPC	<i>Comitê de Pronunciamentos Contábeis</i> (Brazilian Accounting Standards Committee)
CVM	<i>Comissão de Valores Mobiliários</i> (Brazilian Securities and Exchange Commission)
ED	Exposure Draft
FEA-USP	<i>Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo</i>
IAS	International Accounting Standard
IASB	International Accounting Standards Board
ICPC	<i>Interpretação Técnica do CPC</i> (Brazilian Accounting Standards Interpretation)
IFRIC	International Financial Reporting Interpretations Committee
IFRS	International Financial Reporting Standards
IRB	Institutional Review Board
MD&A	Management Discussion and Analysis
MIT	Meaning Identification Technique
NASDAQ	National Association of Securities Dealers Automated Quotations
NYSE	New York Stock Exchange
OCPC	<i>Orientação do CPC</i> (Brazilian Accounting Standards Guideline)
PCA	Principal Components Analysis
PME	<i>Pequenas e Médias empresas</i> (Small and Medium Enterprises)
PPE	Property, Plant, and Equipment
R&D	Research and Development
SEC	Securities and Exchange Commission
SEM	Structural Equations Model
SME	Small and Medium Enterprises
SMC	Squared Multiple Correlation
SVT	Sentence Verification Technique
USP	<i>Universidade de São Paulo</i> (University of São Paulo)
UTEP	University of Texas at El Paso, USA

SUMMARY

1. INTRODUCTION	20
1.1. Contextualization.....	21
1.2. Research Goal	22
1.3. Contributions and Justification	24
2. THEORETICAL FRAMEWORK	27
2.1. Building an Understandability Concept	27
2.1.1. General Communication and Semeiotics	27
2.1.2. Accounting Communication	32
2.1.3. Semeiotics and Accounting Information.....	34
2.1.4. Accounting Information Understandability	42
2.1.5. Measuring Understandability	43
2.1.6. Intelligibility as a Measure of Understandability	45
2.2. Readability.....	50
2.2.1. Accounting Information Readability.....	51
2.2.2. Measuring Readability	51
2.2.3. Limitations to Readability Formulas.....	57
3. HYPOTHESIS	59
4. METHODOLOGY	63
4.1. Archival Analysis	63
4.1.1. Analyzed Variable of Readability	64
4.2. Experimental Design	65
4.2.1. Experiment Protocol.....	67
4.2.2. Building the Instrument	69
4.2.3. Experiment Validity	85
5. RESULTS	87
5.1. Archival.....	87
5.1.1. Readability Indexes	92
5.1.2. Intelligibility Indexes.....	105
5.1.2.1. Connectives	105
5.1.2.2. Incidences of Content Words and Personal Pronouns.....	115
5.1.2.3. Overlaps.....	124

5.1.2.4. Other Indexes.....	131
5.1.3. Readability vs Intelligibility	138
5.2. Results Discussion – Archival Research.....	141
5.3. Experiment.....	143
5.3.1. Ethical Issues	144
5.3.2. Between Subjects Experiment: ANCOVA.....	145
5.3.2.1. Descriptive Analysis.....	145
5.3.2.2. ANCOVA’s Assumptions	151
5.3.2.2.1. Normality	151
5.3.2.2.2. Equal Sample Size.....	152
5.3.2.2.3. Absence of Outliers	153
5.3.2.2.4. Absence of Multicollinearity.....	155
5.3.2.2.5. Variances Homogeneity	157
5.3.2.2.6. Linearity	159
5.3.2.2.7. Homogeneity of Regression Slopes	161
5.3.2.3. Tests.....	161
5.3.2.3.1. Model 1: Score – Phase 3 plus Dummy Variables.....	162
5.3.2.3.2. Model 2: Model 1 plus “Time Studying Accounting” Variable	165
5.3.2.3.3. Model 3: Model 1 without “Score – Phase 3”.....	167
5.3.2.3.4. Model 4: Model 1 and Interactions Between Covariates	169
5.3.2.3.5. Results Rubustness.....	172
5.3.3. Within Subjects Experiment: Means Test and Mediation Analysis	173
5.3.4. Other Analysis	178
5.3.4.1. Combination of Between and Within Analysis	178
5.3.4.2. Confidence.....	180
5.3.4.3. Results Discussion – Experiment Research.....	183
6. CONCLUDING REMARKS.....	187
6.1. Conclusion	187
6.2. Study Implications	191
REFERENCES.....	193
APPENDIX	201
ATTACHMENTS	213

1. INTRODUCTION

1.1. Contextualization

It is possible to think Financial Accounting as a tool that makes possible to communicate relevant information from inside to outside the firm (Scott, 2003). To Smith and Smith (1971) and Iudícibus, Martins, and Carvalho (2005), Accounting can face the challenge of capturing and pricing the economic events and communicating selected financial information. Accounting narratives, then, are responsible, by using the corporate annual report, for communicating financial information to shareholders (Jones, 1997).

The Accounting difficulty in attending the need of its users goes beyond the number of stakeholders, getting to a problem in communication. The research of Valente (2014) showed that among the main problems and barriers faced in searching, accessing, attaining and using accounting information by market analysts are the lack of information and their presentation.

To Iudícibus, Martins, and Carvalho (2005), before achieving its goals, it is necessary that Accounting goes through a clear process of communication, in which the user clearly understands what it intends to transmit. According to them, this last question was so far from being efficiently solved because besides involving transmitter and receiver, it also involved noise, different capabilities of meaning absorption, and other aspects. Windhal, Signitzer, and Olson (1992) highlight that not always people consider the differences of meanings in the communication planning, which impacts on its effectiveness. Studies of Dias Filho (2000), Dias Filho and Nakagawa (2001), Lopes, Ribeiro and Cavalcante (2009) and Evans, Baskerville, and Nara (2015) mention these semantic problems, where the meaning of certain words for Accounting is not the same for other areas of knowledge. Evans, Baskerville, and Nara (2015) also indicate that accounting also has many terms from everyday language, which have different meanings in accounting (e.g., ‘material’, ‘reserve’, or ‘conservatism’).

Furthermore, to Evans, Baskerville, and Nara (2015), another problem that may arise is the translatability. To them, there may exist differences in perception and interpretation between subjects speaking the same language. Plus, accounting terminology and its concepts may differ internationally. Translation is also problematic when related to culture-dependent concepts, which can lead to a change in meaning (Evans, Baskerville, & Nara, 2015).

Therefore, by importing terms of different languages, we could have made our accounting even more difficult to understand.

Thus, it is possible to understand that the problem of accounting information communication lies partially in its (lack of) understandability. To Smith and Smith (1971), if accounting reports fail in their communication function, then they have no use. To be useful the financial statements information must help to forecast future returns of investments (Scott, 2003), if there is a difference from what was intended to communicate and what was received, then there is a high probability of distorted decisions (Adelberg, 1979). Similarly, to Smith and Taffler (1992), a narrative disclosure is useful if it is readable and understandable.

According to Hendriksen and Breda (1999), the qualitative characteristics of accounting (relevance and comparability) are subordinated to understandability. The Conceptual Framework (*Estrutura Conceitual para Elaboração e Divulgação de Relatório Contábil-Financeiro*) of Brazilian Accounting Standards Committee (*Comitê de Pronunciamentos Contábeis* – CPC) says that to be useful accounting information must be, among other things, understandable. To reinforce the search of regulators and standard setters for good quality information, at the end of 2014 the CPC published a new guideline, the Brazilian Accounting Standards Guideline number 7 (*Orientação do Comitê de Pronunciamentos Contábeis* – OCPC 07). This guideline presents the basic requirements for preparation and disclosure of accounting-financial reports, specially to the notes. One of the requirements is understandability; thus, firms are expected to improve this characteristic of their statements and notes. However, there is not a direct way for companies to measure such understandability.

1.2. Research Goal

Overall, to Jones (1997), readability and understandability have been treated as synonymous, but they are not necessarily equivalent, i.e., normally, passages that are difficult to read are also difficult to be understood, but it is not possible to say that both concepts are perfect correlates. Similarly, readability measures often used to analyze narrative statements may be inappropriate, once they do not measure its underlying complexity (Smith & Taffler, 1992). To Lewis et al. (1986) readability and understandability are different concepts, but together they can determine to what level a written message can be read and understood.

To Smith and Taffler (1992), while readability corresponds to the complexity of the display, understandability is the users' ability in discerning the proper meaning. It is also possible to understand the difference of these two concepts through Jones (1997) and Jones and Smith's (2014) view: while readability is passive and text-centered, understandability is a broader concept that measures text-reader interaction. To Jones (1997), readability is, then, a measure of a passage textual difficulty and understandability is a measure of a reader's ability to gain knowledge from a text, which depends on a syntactical difficulty and his/hers characteristics (background, prior knowledge, interest, and general reading ability). This idea is also captured by Smith and Taffler (1992), who suggest that understandability relates to the complexity of context, education, and experience.

Therefore, the main purpose of this research is **to verify how readability impacts the understandability of the information from the notes to the financial statements**. Also, I want **to verify whether the distance between these concepts is due to the reporting language**.

Thereby, the specific purposes are: (i) to verify whether different readability levels have impact on the notes to the financial statements' understandability; (ii) to verify whether the understandability levels are due to accounting specific terms; (iii) to verify if those notes' understandability and readability are different for different languages; and (iv) to verify if the levels of readability and understandability changed after OCPC 07.

The study of Loughran and McDonald (2014) found that file size is a better readability index than the one usually used by the literature, the Gunning FOG, at least to analyze 10-k. These authors believe that this happens because one of Gunning FOG metrics is words complexity but many of the considered complex words by this index are, actually, common business words which should be easily understood. Nonetheless, Worthington (1977) understands that if it is possible to find notes with less reading difficulty, then it is related to writing style and not to something inherent to notes; thus, it is possible to correct it. Therefore, my study thesis is that accounting understandability and accounting readability are similar concepts; however, they should not be interchangeable. This study wants to verify whether improving readability improves understandability.

1.3. Contributions and Justification

Information can be used to influence decision making. Brito and Pinheiro (2015) study how different forms of misinformation, such as disinformation, deception, and psychological operations, may be used by economic powers, such as the United States and agencies like the Department of Defense and the Central Intelligence Agency (CIA), to keep and increase their influence.

In a business-related matter, to Healy and Palepu (2001), information problems “... impede the efficient allocation of resources in a capital market economy” (p. 407), wherein disclosure is one of the main actors in mitigating these problems. According to Smith and Taffler (1992), it is important to study meaning measurement because the absence of shared meaning between preparer and user can impact negatively in decision-making relevance. Furthermore, Loughran and McDonald (2014) and Rennekamp (2012) see readability as something that improves perception regarding relevant information to the valuation of a company because it enhances investor’s confidence.

Das (2014) believes that text quality is better in company reports than in message postings, therefore, one may expect a greater meaning extraction in this type of disclosure. In Flores, Santos, and Carvalho (2015) view, the notes to Financial Statements are a section that provides sense to the financial statements information, which is related with the idea of the CPC 26 (R1), which states that notes must have additional information to the Financial Statements, and they must be relevant to its understanding. Therefore, they must also be understood. Glaum et al. (2013) verified that the notes quality is significantly associated with errors in analyst’s forecasts, concluding that more detailed information helps analysts to make more precise forecasts. Moreover, a study by KPMG (2011) verified that notes are the most significant source of disclosure complexity. Thereby, the inappropriate presentation of notes affects the informational relevance and, consequently, it affects the entire user's chain that uses them in decision making (Flores, Santos & Carvalho, 2015). Hence, according to Valente (2014), accounting information disclosed to the market do not meet users demands for information, which, according to her, should be reviewed and improved to meet them effectively.

On the other hand, the incomplete revelation hypothesis (IRH) implies that managers might, in case of bad news, reduce market response by making these more costly to analyze (Bloomfield, 2008). The results of Li (2008) reinforce this hypothesis, once it shows that

firms with losses write annual reports with longer sentences and bigger words and that changes in length have a negative correlation with future returns. Moreover, Bloomfield (2008) believes that firms would write longer annual reports to avoid litigation when they report poor performance or are expected to do so in the future.

Inanga and Schneider (2005) see a gap between the goal of accounting research and the goal of accounting practice to its users, which diminishes its utility. According to them, accounting research is disconnected from the real world, but my research can be seen as a path to connect both.

The quality of notes is also a concern for the regulatory agencies. The auditing firm EY monitors the comments on public company filings from the Securities and Exchange Commission (SEC) staff and provide a report for it (EY, 2016). It is possible to verify that many comments demand better disclosure to improve understandability of financial statements' information. Thus, it is possible to understand that if readability has a concept close to understandability, then companies have a way of improving understandability, by improving readability. Furthermore, analysts and investors can use it as another metric to evaluate a company, while regulators can use it to assure the quality of accounting information. On the other hand, if the distance between these two concepts is too wide, then the academy must rethink the use of readability metrics as understandability proxies, and it should not be used by companies either. But even if readability metrics show not to be good proxies for understandability, I introduced a new way of measuring understandability through intelligibility metrics, that has been used by researches in linguistics, and which could be used by preparers and users of Accounting information to measure the quality of financial disclosure. Thus, my research contributes to both accounting theory and accounting practice.

It is important to highlight that I could not find researches that relate both concepts as I do. The existing researches consider readability as a component of understandability, however, as stated above, they are different concepts. No research tried to verify how close they are in accounting, particularly for information in Portuguese.

As verified by my research for the theoretical framework for readability, Moreno and Casasola (2015) found that most readability studies focused on reports written in English, and they are mainly applied to anglophone countries, like the United States, the United Kingdom, Australia, and Canada. My study expands this research area in Brazil for reports written in Portuguese. Evans, Baskerville, and Nara (2015) indicate a gap in the literature regarding

translation problems in Accounting; therefore, the comparison with reports written in English allows me to fill this gap and to validate my results for information presented in Portuguese, given the gap in the literature regarding this language.

Furthermore, this research will be able to verify if the studied firms improved their understandability after CPC published the OCPC 07. It will serve as evidence for the actual application of this orientation by public companies. When studying the application of accounting standards, previous researches used a check list to verify if the studied firms applied the standard. My research uses a different approach looking to “how” the information was presented and not to “how much”.

2. THEORETICAL FRAMEWORK

2.1. Building an Understandability Concept

2.1.1. General Communication and Semeiotics

Shannon and Weaver (1949) have one of the first papers that initiated studies in Communication (Fiske, 2002). They use this word ‘communication’ in a wide sense, including all procedures through which a mind can affect another. According to Rüdiger (1998), this represents communication as an information transmission system, which does not consider the content of the signs. This communication process corresponds to the so-called Theory of Information, that is a signal transmission theory (Severin & Tankard Junior, 2001).

Adelberg (1983) applies this theory’s components to accounting process of communication where the writer (source, coder) overcomes interferences (noises) in information transmissions (message), using a printed page (channel) to a reader (receiver/decoder). He also adds the element of feedback that is used to answer communication responsibilities and guarantee that the message was received.

To Laswell (2007) a convenient way to describe the communication act is to answer: Who? Said What? In which channel? To whom? With which effect? According to him, the scientific study of communication processes usually concentrates on one of these questions.

Windhal et al. (1992) present three dimensions of the message: the message itself that describes the words or expressed images somewhere, somehow, and focused only in the surface; the intended meaning; and the meaning attributed by the receiver. Similarly, Smith and Smith (1971) highlight three major components in communication theory: communication, communication efficiency and communication influence. The communication component goal is, in their understanding, a receiver attributing the expected meaning to it; an efficient communication is the one that the receiver can use; and, an influent communication goes even further, and demands the behavior of the receiver to be the one expected by the communication source. Likewise, to Shannon and Weaver (1949), there are three levels of communication issues:

Level A: Technical problem – related with the transfer precision from sender to receiver (Shannon & Weaver, 1949). According to Fiske (2002), this is a simpler

problem and to which was created the Shannon and Weaver's model of message transmission.

Level B: Semantic problem – related with a satisfactory approximation between the meaning interpretation given by the receiver and the meaning intended by the sender (Shannon & Weaver, 1949). This problem is, to Fiske (2002), of ease identification, but difficult to solve, i.e., improve codification may improve semantics, but also considers cultural factors, not specified by Shannon's model.

Level C: Efficiency problem – related to the success to which the meaning was transmitted and whether the receiver took the wished conduct (Shannon & Weaver, 1949).

To Windhal et al. (1992) the communication definition has at least two lines of reasoning: the first is related to the aspect of the transmission process of communication, using a linear model; and the second considers elements such as reciprocity and perception. To Fiske (2002) while the first is concerned with how senders and receivers code and decode and how senders use the channels and medias, the second is related to the production and exchange of meaning, concerned with how messages, texts, interact with people to produce meaning.

Therefore, I understand that is possible to relate the first with the aforementioned Theory of Information, whereas the second form is the focus of the present research, the Semiotics.

Given that a message has semantic content, it must be organized to be sent through a channel and received by its receiver (Rüdiger, 1998). Therefore, it is possible to see the coding process as a translation of purpose, intention, or meaning of a message in codes and symbols (Severin & Tankard Junior, 2001). To Nöth (1995), semeiotics is the science of the signs and semiosis (meaning processes) in nature and culture.

There are a few different points of view of such area: the semeiotic, seen as a more general science of signs – once it includes animal and nature signs – and the semiology, which refers to human and cultural signs, specially, those textual (Nöth, 1995). While the studies of Charles S. Peirce normally represents the first, the second is represented by Ferdinand de Saussure. Peirce's semeiotics seems to fit better with the purpose of accounting understandability in general because it goes beyond the information transmission process and

the intrinsic meaning of a specific word, looking at the message transmitted as a whole, its sign.

But all those lines of reasoning are not completely untied. Peirce's semeiotics can also be a communication theory, once communication models embed semeiotics notions (Santaella & Nöth, 2004). To Santaella and Nöth (2004) there is only communication when something is transported to somewhere else, wherein the goal is to influence or to cause some modification in a receiver. The authors highlight that to have modification is necessary that what was transported take with it some information, which must be embodied by something (the message). The message only exists if embodied to some sign which must be codified to be capable of informing (Santaella & Nöth, 2004). Thus, to Santaella and Nöth (2004) to transport the information embodied in a message from its source to its destiny, it needs a channel. Thereby, they conclude that those aspects are what make evident the interrelations between communication, semeiotic and information.

To Santaella and Nöth (2004), the general semeiotics was created to work as a base theory, as a general method to scientific research, but given this generality, Semeiotics is a too abstract theory and, because of that, it is necessary that it dialogues with theories from specific areas of study (Santaella, 2007). It is possible to make this dialog with accounting, which is supported by the opinion of previous authors, like Basu and Waymire (2006) that understand that accounting studies could import the analysis made in journals related to linguistics to identify and systematize the accounting grammar. Nakagawa and Dias Filho (2002) and Iudícibus, Martins, and Carvalho (2005) indicate this potential, once they believe accounting information can be improved if one applies the assumptions of Semeiotics to it. Gouveia (2010) showed the existence of studies that make the bridge between accounting and semeiotics, but they only pointed to issues and errors in accounting information, not a real test of its assumptions.

According to Santaella (2004), the beginning of Peirce's work happened with the birth of its universal categories. In her understanding, he got to three general elements present in all phenomena: quality, relation, and representation (or mediation). Such categories were denominated firstness, secondness, and thirdness. The first relates to the immediate feeling, without reflection, with ideas by chance, with originality, quality, feeling, impression, etc.; the second is the comparison category, with ideas of action and reaction, conflict, and surprise, etc.; and the third has ideas of generality, learning, time, evolution, etc. (Nöth, 1995;

Santaella, 2000; Santaella, 2004; Romanini, 2005). Thus, the thirdness corresponds to the sign definition as a process related to mediation (Nöth, 1995; Santaella, 2000).

Santaella (2000) understands that sign is something that represents something else (object) to somebody; however, this “thing” must not be an existing entity. In accordance with Freadman (2001), in Peirce’s Semiotics anything could be a sign, what determines if it is a sign or something else is the intention, the function difference. The example she gives is of a color that can be both just a color or a sign of a chemical reaction. Thereby, it is possible to consider phrases, discourses, poems, plays, operas, etc. as signs (Santaella & Nöth, 2004). Similarly, Santaella (2007) understands that the sign must not have a full nature of language (words, draws, diagrams, pictures, etc.), but may be an action or reaction. Santaella and Nöth (2004) see the sign as an element of a more complex sign and that all elements of a complex sign are also signs. Moreover, to Santaella (2007), through quality, everything can be a sign; by existence, everything is a sign; and by law, everything must be a sign.

Peirce’s Semeiotics presents the sign as a triadic relation with its object and its interpretant; therefore, it may be analyzed in itself, particularly to what it indicates or represents and to the effects it can produce in its users (Santaella, 2000; Romanini, 2005; Santaella, 2007).

Bergman (2009) thinks that Peirce’s Semeiotics differs from other sign theories, such as Sausurre’s semiology because this last one has a dyadic relation. He understands that an analysis merely focused on sign content (represented object) is inappropriate, so it must consider the interpretative context and the sign’s pragmatic consequences. This way, Santaella and Nöth (2004) highlight some aspects of this Semeiotic triad: (i) the object determines the sign, thus, the object causes the sign; (ii) the sign represents the object, so it is a sign; (iii) the sign can only partially represent the object; (iv) the sign can only represent falsely the object; (v) to represent an object means that the sign can affect the mind, producing in it a certain effect; (vi) the effect of (v) is called interpretant; (vii) the interpretant is immediately determined by the sign and mediately by the object; (viii) the item (vii) means that the object also determines the interpretant but through the sign mediation.

It is possible to notice that interpretant is not the same as interpreter, but something more general (Santaella, 2007). To Santaella and Nöth (2004), the interpretant to Peirce is a refinement of a crude notion of interpretation. On the other hand, it is important to highlight

that to Nöth (1995), the sign does not correspond to a class of objects, but to the function this object has in the semiosis process, existing only in the receiver's mind.

Items (iii) and (iv) can be easily connected with Severin and Tankard Junior (2001) understanding that words do not change over time, they are static, while the world is dynamic and full of changes. The verbal models used are always outdated and no longer describes reality. Furthermore, the authors point to the limitation's existence in language which diminishes the possibility of a complete description of reality; thereby, there are more distinctions to reality than words to describe it. Besides, language is indeterminate, and its meaning depends on the context (Evan, Baskerville, & Nara, 2015). It is a way of explaining the existence of signs such as words and differing them from the object (what it represents).

Applying all three categories in the representamen (sign), object and interpretant perspectives, Nöth (1995) gets to nine categories:

Table 1 – Nine categories of the sign

Trichotomy/ Categories	I Representamen in itself	II Relation with the Object	III Relation with the Interpretant
Firstness	Quali-sign	Icon	Rhema
Secondness	Sin-sign	Index	Dici-sign
Thirdness	Legi-sign	Symbol	Argument

Source: Nöth (1995, p. 90)

As previously mentioned, the sign can be analyzed as to itself (sign fundament), particularly to what it represents (its suggestive, indicative and representative power) and to what it can produce in its users (interpretative levels) (Deledalle, 2001; Santaella, 2007). While the second step (suggestive power analysis) needs the first (sign fundament analysis), the third (interpretative levels analysis) need both previous ones (Deledalle, 2001).

Another aspect of Peirce's theory in the opinion of Bergman (2009), is that it is not possible to have verbal communication without common experience shared by two parts. Furthermore, to Peirce, the greatest cause of misunderstanding comes from the difference in both parts references. Thus, it is possible to understand that the problems in accounting communication can be related to experience differences between preparer and user.

2.1.2. Accounting Communication

Through accounting bias, one can say that an *ex-ante* definition for information is: some evidence with the potential to affect an individual decision. If some information is relevant, reliable and timely, it can be considered an informative input that can help investors in their payoffs forecasts (Scott, 2003).

Akerlof (1970) understands that the difficulty in distinguishing good quality goods from bad quality goods is inherent to the business world. However, according to him, some institutions may appear to suppress uncertainty regarding this quality, such as guarantees, brands, groups of companies and certifications.

Healy and Palepu (2001) affirm that if imperfections exist in auditing and accounting regulations, managers tend to choose between making accounting and disclosure decisions – communicating what he/she knows regarding the company's performance – and managing reported performance – given reasons like corporative governance, political or contracts. Then, the information asymmetry problem appears, when some part of a transaction has any informational advantage over the other (Scott, 2003).

Figure 1, extracted from Healy and Palepu (2001), shows disclosure, finance intermediaries and information roles in the capital market.

Figure 1 – Financial and informational flows in a capital markets economy
Source: Healy and Palepu (2001, p. 408)

The left side represents the capital flow, and the right side, the information flow, where locates my research. Companies communicate directly with their investors through financial statements and press releases, while there is the possibility of indirect communication through intermediaries like analysts (Healy & Palepu, 2001). Thus, a good quality disclosure contributes to reducing such asymmetry between managers and investors (Lourenço, 2014; Healy & Palepu, 2001).

As in Healy and Palepu (2001), many economic and institutional factors determine whether regulation and intermediaries eliminate this asymmetry or whether they leave behind some residual issue. It depends on the ability of writing contracts and some proprietary costs but also depends on the existence of regulatory imperfections and issues with those intermediaries' incentives.

When we focus on the communication process of this information, we can verify some peculiarities. To Das (2014), the text is a versatile tool which has nuances and behavioral expressions to which numbers are not capable of conveying. Lundholm, Rogo, and Zhang (2014) believe that a company's performance cannot be communicated efficiently only by numbers or only by words, there must be a combination of both, which brings meaning to this communication. Texts, then, have emotive content and can express opinions, connections, and disaggregated qualitative phenomena (Das, 2014).

Boards abroad also have understandability as a constant concern. In 2014's Exposure Draft (ED) of Disclosure Initiative, the International Accounting Standards Board (IASB) suggested some modifications on the International Accounting Standard (IAS) 1 which, among them, is the emphasis on understandability and comparability of accounting reports, regarding the decision over the systematic order of notes. Furthermore, this ED requires that companies make evaluations of information materiality to guarantee that presenting some information does not reduce the understandability of financial statements.

Smith and Smith (1971) showed that accounting was being made to a specific audience and with a high level of reading difficulty in notes to the financial statements. They believe that other sources of information and this difficulty in reading made even the ablest users opt to use information that demanded less of their efforts.

2.1.3. Semeiotics and Accounting Information

Gouveia (2010) analyzed 21 journals, seven conferences and 13 master and Ph.D. programs in Brazil and verified that among the theoretical studies regarding Semiotics and Accounting, most gave great importance to this discipline.

To Santaella (2000), the object is what determines the sign, and it is represented by it, not restricting it to a notion of a real object. Thus, if Accounting's goal is to inform, to Iudícibus, Martins, and Carvalho (2005), its object is the equity and its quantitative and qualitative variations.

Financial Statements are formal communicator documents that present quantitative, narrative and graphical information (Stanton & Stanton, 2002). Nevertheless, according to the CPC Accounting Standard #26 (R1) and the IAS 1, about Presentation of Financial Statements, these statements are a structured presentation of a firm's financial performance and financial position. To Martins, Diniz, and Miranda (2012), Accounting is a model with the purpose of representing what happened to a firm but is only an approximation to reality, and it will never be it (reality), but a more simplified version of it. Therefore, financial statements can be considered the sign of this semeiotic relation.

As Peirce's theory presents a triadic relation, there is still the interpretant to be established. To Santaella (2000) an interpretant is defined as the interpretative effect that a sign produces in a real or potential mind. Once financial statements are produced to help user's decision-making, one can consider the interpretant as the decision made, which depends on each interpretation of the information presented.

It is possible to see this relation in Figure 2:

Figure 2 – Sign-object-interpretant relation in Accounting

CPC Accounting Standard #26 (correlated to IAS #1) also establishes that a company must present the following statements: (i) balance sheet at the end of the period, (ii) income statement for the period, (iii) comprehensive income statement for the period, (iv) a statement of changes in equity for the period, (v) cash flow statement for the period, (vi) notes, (vii) comparative statements/information regarding previous periods, and (viii) value added statement for the period (value added statement is not required by IAS #1).

2.1.3.1. FUNDAMENT ANALYSIS OF ACCOUNTING SIGN

In firstness, the sign is a possibility, a given sign or an archetype or codified sign (Deledalle, 2001). To Peirce (Collected Papers – CP 2.244, 1958), quali-sign is a quality that is a sign, and which cannot act as such until embodied. Therefore, the sign is a pure qualitative possibility (Santaella, 2007).

Financial statements must represent transactions that happened in a determined period, as stated above, thus, given that each one has different transactions, each will also have different presentation. Besides, the way those transactions are measured also depends on the transaction characteristics, i.e., an investment could be measured by its cost, fair value, equity method, or being presented in partial or full consolidation. Furthermore, Martins et al. (2010) highlight that accounts with values of little significance must be grouped, regarding their nature. So, even if companies have the same transactions, they can be presented or measured differently. Thus, it is possible to see accounts and their values as qualities of each statement, differing one from another and differing for different companies.

Sin-sings are to Peirce things that exist through their qualities, which are signs, involving one or many quali-signs (CP 2.245, 1958). To Santaella (2007), it is related to how a phenomenon is determined and is an update to the legi-sign.

Each statement must represent something from a company's equity and its variations in a determined period. In accordance to Martins, Diniz, and Miranda (2012), there are not two companies with the same accounting; there are always choices to be made, especially because each sector reality differs and even inside a sector exists differences between companies. It is related to what Guthrie (1972) says in its paper: company 1's income is not the same to company 2's, company 1 has not the same buildings that company 2, and so on.

Also, there are not two correct balance sheets for the same company in the same period (unless it presents in different countries that follow different accounting standards). Therefore, I understand that each specific statement of each period is a sin-sign. For instance, the balance sheet of Petrobras as at December 31st, 2015 represents a sin-sign, its income statement, another, its balance sheet as at December 31st, 2014, another, and so forth.

Still, in firstness, there is also the legi-sign which, according to Peirce, is a sign that is a law (CP 2.246, 1958). To him, legi-sign is a general type that requires a sin-sign. Santaella (2007) relates it to the generalization capacity of abstraction from a particular thing to the general one, what it has in common with all signs of the general class to what it belongs.

Financial statements presentation must follow the accounting standards regarding recognition, measurement, and presentation. For instance, to be recognized as such, an asset must be under control of a company and provide some right over future benefits (Hendriksen & Breda, 1999; Iudícibus, 2009; Martins et al, 2010; CPC Conceptual Framework [R1]); a liability must refer to a present obligation, derived from past events, and paid in the future (Hendriksen & Breda, 1999; Iudícibus, 2009; Martins et al., 2010; CPC Conceptual Framework [R1]); and shareholder's equity is the residual interest of assets after all liabilities (CPC Conceptual Framework [R1]). It means that a leased car is not an asset for the bank (as Property, Plant, and Equipment – PPE), once its control belongs to the user; the allowance that one intends to make is not a liability, because it is not a past event; etc.

Therefore, it is possible to see every financial statement as legi-signs because they follow specific rules. Similarly, notes to the Financial Statements also follow some rules. The CPC 26 (R1) requires firms to present them systematically, considering factors such as understandability and comparability.

Based on Santaella (2007), it is possible to understand that, overall, a company's specific financial statements (sin-signs) embodies its accounts and balances (quali-signs), while its measurement, recognition and presentation rules (legi-signs) guide the presentation of these specific financial statements (sin-signs).

2.1.3.2. REPRESENTATIVE POWER ANALYSIS OF ACCOUNTING SIGN

Regarding its object, the sign can resemble it, indicate it or represent it (Deledalle, 2001). In this part of the analysis, one must verify the relation between the sign and the

object, starting with the immediate object (Santaella, 2007). To Peirce, the being of an immediate object depends on its representation in the sign (CP 4.536, 1958). According to Santaella (2007) and Bergman (2009), this object is the way through which what the sign represents is inside the sign, and which indicates the dynamic object. The dynamic object, on the other hand, is outside the sign and can only be indicated in the semiosis, but it is still able of determining or delimiting it (CP 4.536, 1958; Nöth, 1995; Bergman, 2009).

In accordance with the CPC and IASB's Conceptual Frameworks, measuring the elements of financial statements is a process of determination of monetary amounts at which elements from the financial statements must be recognized and presented. Then, the sign (financial statements) represents the dynamical object (equity) through the immediate object (accounting choices of measurement), applicable to all statements.

According to Santaella (2007), the way a sign represents an object depends on its fundament. If a quali-sign, then it will be an icon; if a sin-sign, it will be an index; and if a legi-sign, it will be a symbol.

If firstness, the sign will be an icon (Santaella, 2007). Peirce (1868) calls it similarity, once, as stated by Santaella (2000), it resembles the object, and its quality belongs to the sign itself. Thus, the quality of icon in a balance sheet can be seen in the balance characteristic that it must have, with asset and liability plus equity having the same value in any situation, good or bad. This balance can also be seen in all accounts once they were accounted in double entry.

The second representation type is the one where signs correspond to their object, the indexes (Peirce, 1868). According to Nöth (1995), they establish the dyadic relation between object and representamen (sign). To Santaella (2000) they are affected by an equally existing singular, their objects, to which the sin-signs refer, point or indicate. Its concrete existence provides it a fundament (Santaella, 2007); thus, it is related to an effective relation with its object (CP 5.66, 1958). Thereby, they provide the communication context (Bergman, 2009).

Indexes in financial statements are the notes numbers which allow the user to find the note that details that specific account. Other indexes are "Consolidated", "2015", because they indicate to what year and company the presented values relate. Similarly, expressions such as "in millions of dollars" also are indexes because indicate the notation and currency used. Moreover, net income and other accounts are indexes of a company financial position.

Peirce's (1868) third representation type is the symbol, in which the sign-object fundament is an attributed characteristic, and so, a general sign. The fundament of the symbol is the legi-sign (Santaella, 2007), related to the generality of a law, rule, habit or convention that it possesses (Santaella, 2000). To Santaella (2000), it is just a mediation for the interpretant development.

Convention, as Fiske (2002), is the social dimension of signs, i.e., it represents agreements between users over the proper use of or response to a sign. To Guthrie (1972), in the accounting system, economic events are represented by an organized set of symbols. Therefore, the accounts' names presented on the left side of each line can be considered symbols, because they are part of the conventional language, they follow accounting patterns and are very similar in comparison to statements of different companies. The use of parentheses to indicate negative numbers is a notation and, so, also a symbolic legi-sign.

2.1.3.3. INTERPRETATIVE LEVEL ANALYSIS OF ACCOUNTING SIGNS

In this sign-interpretant relation, the sign completes its action (Santaella, 2007). The sign can be simply conceived or represented, said demonstrated, or interpreted by inferences in every sense of the word (Deledalle, 2001).

A sign has three interpretants: immediate, dynamical and final. The immediate interpretant is the first level of an interpretant, inside the sign and an interpretative potential (Santaella, 2007). The interpretative potential of financial statements is in the possibility of judging equity variations as good or bad.

The dynamical interpretant is the second level and refers to the effect effectively produced in an interpreter and relates with the singular effect produced in each interpreter. So, in accounting, they can be referring to user's decision effectively made (buy, keep or sell), which relates with the interpretation made by him/her regarding net income and equity variations of a company.

The final interpretant is the third level and refers to the interpretative result to which every interpreter would be destined to get to if dynamical interpretants of a sign would have been taken until its final limit (Santaella, 2007). In the relation between sign and final interpretant, the sign can be a rhema, a dici-sign or an argument (Nöth, 1995; Santaella, 2007).

Rhema is interpreted by the final interpretant as possessing some quality ability that could be embodied in some possibly existing object (Santaella, 2000). Rhema is a predicate without indicated reference (Stjernfelt, 2014), it is nothing else than an interpretative conjecture, and represents its object only in its characters (Santaella, 2007). According to Peirce (1868), they are symbols that directly determine its attributed fundamentals and qualities, nothing else than terms and brands. In financial statements, rhemas are the words used because, according to Peirce, there is not any sign that is true or false, like the words itself, except for yes or no (CP 8.337, 1958).

To Stjernfelt (2014), dici-signs are signs that say something about something. They correspond to the logic of proposition, which can be true or false, but without offering information regarding that (Peirce, 1868; Nöth, 1995; Santaella, 2000). According to Peirce, the dici-sign presents information (CP 2.309, 1958) and cannot be an icon, once it is an existing sign (Santaella, 2007), i.e., only by indicating an object it is possible that a sign transmits information about the object (Stjernfelt, 2014). When the financial statements preparer puts a number (balance) beside the name of an account we have a proposition; for instance, if we analyze Petrobras' balance sheet regarding the year of 2014, one can conclude that the balance of the consolidated account of "Cash and cash equivalents" as at December 31st, 2014 was R\$ 44,239 million. And this is a proposition.

With origins in management accounting, Accounting ended up becoming interesting for other types of users, not only managers and owners (Iudícibus, 2007). The increase of users of accounting information, since the beginning of accounting until nowadays, according to Martins (2012) increases the number of different perspectives of values and events, making difficult to comply with all of them. These different perspectives lead to different needs of information; thus what one group may consider as information (dici-sign), others may not consider it as such.

The argument is when a symbol overcomes its propositional position and becomes a better understood discourse (Nöth, 1995). According to Santaella (2007), it is based on logical sequences to which the legi-sign depends. Stjernfelt (2014) understands that an argument involves more than one dici-sign and gives it reasons for its truthiness, something that the dici-sign itself cannot do. To Peirce (1868), arguments are symbols that independently determine its interpretants, putting propositions as premises.

Financial statements are only formed by propositions, and the arguments that provide veracity to them can be found in the notes. By CPC #26 (R1), the notes to the financial statements must contain additional information to those presented in financial statements, providing narratives, details regarding the disclosed items and information regarding items not recognized in financial statements, according to accounting criteria.

Flores, Santos, and Carvalho (2015) understand that during accounting evolution statements were developed that, jointly with notes to the financial statements, try to reach accounting's greater goal of well informing. The relevance of these notes is related to the presentation of generic information regarding a firm, adopted accounting policies and other information that complement other statements content. These authors give two examples of that: the "cash and cash equivalents" account provides information regarding financial investments considered as cash equivalents that will tell a lot about a company's liquidity; the evaluation of an inventory account permits one to verify in which moment and by which measurement metric the items were written-off of such account.

The notes to the financial statements are the arguments because, in its completeness, it must present basis of preparation and choices of measurement, recognition, and presentation of financial statements. The relevance of the notes relies on the fact that only numerical information is not enough, presenting only the final income does not inform how revenue was accounted or regarding the exposure to future risks, that can become material through losses (Flores, Santos & Carvalho, 2015). The notes go beyond the idea of *dici-sign* because they present the rational discourse that Nöth (1995) characterizes as being representative of an argument.

It is expected, then, that notes presentation must be very different from one firm to another.

2.1.3.4. COLLATERAL EXPERIENCE

Every person experience differs until the moment when the sign seems collective, but, they actually, have individual references (Bergman, 2009). To Santaella (2007), the idea of collateral experience is related to previous knowledge regarding an object. According to Bergman (2009), in Peirce's theory, it is not possible to exist verbal communication if both parts do not have a common experience, being the difference in reference the great cause of

misunderstandings. For the author, without a common territory the sign becomes inefficient, but the common experience does not need to be the same, so understanding exists.

To Hendriksen and Breda (1999) accounting numbers and classifications can have different interpretations depending on the reader because some items such as “differed expenses” cannot be interpreted beside the process that originated it, which does not happen with the “cash” account. Hence, Gouveia (2010) verified that many accounting terms are not understood by users, which varies depending on the person’s graduation.

Furthermore, accounting uses certain words which meaning is different from other sciences (Dias Filho, 2000, Dias Filho & Nakagawa, 2001, Lopes, Ribeiro & Cavalcante, 2009). It is related to accounting’s technical language mentioned by Worthington (1977); to this author, many users do not understand Accounting’s terminology, including the average investor. To Peirce, if two things have the same function they should be signified by the same word, however, if that is not the case, then one should use different words (CP 8.33, 1958).

Some conventions on financial statements presentation may generate doubts for users that do not have collateral experience with the information presented by it. An example is the use of parentheses for negative number aforementioned.

Thereby, a reader must possess, besides the syntactic, semantic, and textual ability, a specific ability related to the social-historical reality reflected by the text (Leffa, 1996). Thus, it is possible to understand from that that the problem with accounting communication lies on differences in references between preparer and user regarding used terms and statements presented. As Dias Filho and Nakagawa (2001), a significant communication of accounting data requires the preparers and users of such information to assign the same meaning to the adopted symbols. In Guthrie’s (1972) opinion, accountants must be aware that users may misunderstand their given issues with symbolization.

To reduce differences in references, one can use clear and simplified terminologies and less technical words in financial statements (Worthington, 1977; Iudícibus, 2009). In this way, OCPC 07 asks that the technical language should be only used when inevitable and to present a complete and concise glossary of such words alongside the statements.

Nevertheless, Iudícibus (2009) and Hendriksen and Breda (1999) understand that a minimum knowledge of accounting is necessary for analyzing financial statements. Iudícibus (2009) complements that a user of accounting information must not be that one with vague

notions of accounting and business, then, it is expected that the user has a minimum of collateral experience with accounting standards and terms.

2.1.4. Accounting Information Understandability

This framework presented allows us to connect the information of notes and understandability.

Notes for the Financial Statements is a grouped number of dici-signs that, together, create an argument related to a company's financial position. However, to understand these signs the user must have the same or similar collateral experience than the preparer (accountant). It allows both sign-object relations between user and preparer to be the same (as in Figure 3) and, then, making the intended message sent by the preparer to be efficiently received by the user, i.e., the intended meaning is the same as the interpreted meaning.

Figure 3 – Understandability level and the representamen-object-interpretant relation

The reader creates the meaning of a text by bringing, beside other things, his or her experience, and the closer the codes of writer and reader, the closer the attributed meanings of both (Fiske, 2002). Thus, the understandability level varies depending on how close are the sign-object relation of both accountant (preparer) and user. The sign is the same for both, but the user may not understand the object if they do not have collateral experience regarding that particular object.

2.1.5. Measuring Understandability

When a method of evaluation is reader-focused, the procedures rely on the feedback of the text's audience (Schrivver, 1989). Reader-text interactive texts have been used to measure understandability (Jones & Smith, 2014).

A reader-focused index used by the literature to analyze understandability of narrative disclosure is often the 'cloze' procedure, in which one leaves some gaps in the text, and the reader must fill it (Adelberg, 1979). The idea of this method is that a good quality text should present a high degree of lexical predictability (Schrivver, 1989). However, it seems that there is not a consensus regarding what this procedure measures, and if it does measure understandability (Jones & Smith, 2014).

To Gellert and Elbron (2012), in cloze, the gap is left for every fifth, seventh, or tenth word, or it can be made in a more considered manner. According to Adelberg (1979), this procedure allows one to analyze some aspects of understanding that other indexes are not capable of capturing. To Jones and Smith (2014), the principle of cloze procedure is that one will be able to fill the gaps correctly if he/she understands a piece of text.

In Gellert and Elbron's (2012) view, the gaps that should be used in comprehension tests are those that require full understanding to be filled correctly. Thereby, to these authors, the fixed conventions for creating the gap are mandatory when the procedure is used to measure readability and not, understandability. It is related to Jones and Smith (2014) view that cloze procedure may only be capable of measuring textual redundancy, i.e., it may relate to a type of missing words guessing capacity, and this can or cannot be the same as understandability (Jones, 1997; Jones & Smith, 2014). It happens because the cloze procedure "... involves puzzle solving and cognitive processes that may or may not be synonymous with understandability" (Jones & Smith, 2014, p. 196). It means that probably the skills needed to fill the gaps from accounting narratives are different from those needed to understand accounting text (Jones, 1997).

Adelberg (1979) had as goal describing and illustrating the application of a cloze procedure in different forms of narrative disclosure. This study used a mail survey in a non-random sample of 16 firms and four auditing firms, and a random sample of 1,711 professionals (accountants and loan officer trainees). He tested if the understandability level changes in different preparers, messages (accounting policies, contingencies, management's

analyses of operations, and qualified auditors' reports), and users. His research concluded that users do not understand very well the notes to the financial statements related to accounting policies, nor management's analyses of operations, and, that loan officer trainees do not understand much the narrative disclosures.

In a latter study, Adelberg (1983) tried to provide a pragmatic tool that would allow writers to evaluate the understandability of accounting information (message), before releasing them to readers. To do so, he used the results of two of his previous papers (including Adelberg, 1979) to create a model to predict understandability. I developed the new instrument by using 31 independent variables related to accounting texts (standards and notes to the Financial Statements) syntactic structure, the scores obtained by the cloze analysis of those two studies were the dependent variable, and, by using stepwise, he reduced the model for 14 independent variables. He concluded, then, that to analyze understandability of a text, one must use the coefficients he found, and the text should be reviewed if it scores less than 57%.

This conclusion of Adelberg (1983) relates to Bormuth's (1968) study. The latter author found that exact replacement of 57% of the gaps, using cloze test, is equivalent to 90% comprehension in a traditional question and answer test. He also found that a 44% replacement score of cloze is equivalent to 75% conventional comprehension tests. Therefore, if one scores more than 57% in cloze, it is said that the text is at the reader's independent reading level; if the score is between 44% and 57%, the text is at the reader's instruction level; and if it is below 44%, the text is at the reader's frustration level (Rush, 1985).

With a focus on general education research, Gellert and Elbron (2012) studied cloze tests as a way of measuring reading comprehension with adult participants and investigated if a fast cloze test can show the same level of reliability and validity as a question-answering test that demands more time to its conclusion. They found that cloze comprehension test assessed not only decoding, but also variation in vocabulary, and the reading skill of word decoding influenced participants' problems with reading and writing. Furthermore, they found that their use of a non-fixed gaps cloze test had a higher correlation with a standard question-answering comprehension test than cloze tests with fixed-ratio gaps, which led them to believe that regarding reliability and validity, a cloze test can have the same level than a question-answering test.

Jones and Smith (2014) also studied other measures that try to assess understandability on accounting texts: the meaning identification test (MIT), the sentence verification technique (SVT), a procedure based on the traditional cloze test (C-Test), and the cloze test. The C-test is similar to cloze test, but instead of deleting the complete word, it only deletes it partially; thus, the task to the participant remains the same. In the MIT and the SVT, the participant is asked to verify if two sentences have the same meaning. While in the MIT, phrases that must be compared with paraphrases or with the original sentence that suffered small changes in the meaning; in the SVT, besides changes in meaning and paraphrases, is also introduced distraction sentences in the text. They concluded that the results from the MIT and SVT comprehension tests are not significantly different from each other and they do not correlate with those from both Cloze tests, which indicates that the two pairs of test measure different things. The authors believe, though, that SVT and MIT are better to measure comprehension of a passage.

Given the theoretical construct based on semeiotics, seems reasonable to consider the MIT technique as a proper measure, once it aligns both writer's intention and user's comprehension. Moreover, as expected given the concept of understandability, prior knowledge regarding accounting information impacts on reader's performance. Thus, if reader and writer do not share prior knowledge, the first will not be able to understand what the second intended to communicate.

2.1.6. Intelligibility as a Measure of Understandability

The act of reading can be divided into three factors to allow understanding: (a) the role of the reader, (b) the role of the text, and (c) the process of interaction between reader and text (Leffa, 1996). Among the factor related to the text, Scarton, Almeida and Aluísio (2010) highlight readability (the graphical representation of the text) and intelligibility (the use of frequent words and less complex syntactic structures).

To Scarton, Almeida, and Aluísio (2010), some factors help improving understandability, like cohesion and coherence. These two concepts represent the way words and ideas informed relate to certain levels of discourse, language and global knowledge (McNamara et al., 2002) but they are still different concepts. While cohesion is a text

characteristic, coherence is a characteristic of a reader's mental representation of such text (Graesser et al., 2004).

In cohesion, the connections are based on explicit linguistic elements, such as words, characteristics, signals, etc., and how they are combined (McNamara et al., 2002). These elements are interpreted in a sociocultural context and guide the reader in interpreting the text's substantive ideas, in making connections between different ideas, and in making connections of these ideas with its topics or themes (McNamara et al., 2002; Graesser et al., 2004). There is an objective way of computing cohesion via computer programs (McNamara et al., 2002).

Coherence is the text characteristics (i.e., cohesion aspects) that must contribute to the coherence of the reader's mental representation (Scarton, Almeida, & Aluísio, 2010). It is a result of the interaction between reader and text (McNamara et al., 2002). The mental representation connections are based on elements available in the text and the reader's abilities, knowledge and intentions (McNamara et al., 2002; Graesser et al., 2004). This coherent mental representation of the text will be formed if the reader has enough world knowledge regarding the subject and if the linguistic and discourse cues are also enough (Graesser et al., 2004). The previous knowledge of coherence is the same idea of the collateral experience of the Semeiotics, presented earlier.

It is possible to conclude that a text will be understandable if it is coherent and has cohesion. However, there is nothing the writer can do to improve cohesion if the reader has no world knowledge of such subject, given that coherence depends on the characteristics of the reader and not only on the text.

Considering all of the above, intelligibility is the understandability that does not depend on the user. Thereby, the premise of this research is that, keeping all reader's world knowledge adequate and constant, the information preparer can only improve understandability by improving cohesion.

To analyze cohesion, researchers of the Institute for Intelligent Systems at the University of Memphis developed a system called Coh-Metrix, or coherence metrics. This system is a tool used to compute computational coherence and cohesion metrics (Coh-Metrix Website, 2017). This tool can be used to measure the overall cohesion and difficulty of a text (vocabulary issues, syntactic composition, and meaning), improving current readability indexes; it can provide scores of several cohesion features (lexical, syntactic, of discourse,

and conceptual); and it determines the coherence or adequacy of a text to a reader (McNamara et al., 2002, Scarton Almeida, & Aluísio, 2010).

Among the measures of Coh-Metrix are word frequency, density scores, logical operators, count of connectives, readability, among others. Over 500 metrics are available in a restrict version of Coh-Metrix; of those, 60 are available at the free online version, and 48 of those 60 metrics were adapted to Portuguese at the Coh-Metrix-Port (Finatto, 2011). The Coh-Metrix-Port metrics adapted to Portuguese are:

Table 2 – Coh-Metrix-Port variables and their impacts on understandability

Variables	How are they calculated?	What does it do?	Expected impact on understandability
Basic Counts			
Number of Paragraphs	Number of Paragraphs	It counts the number of elements.	Depends on the text
Number of Sentences	Number of Sentences		Depends on the text
Number of Words	Number of Words		Depends on the text
Adjective incidence	Number of adjectives / number of words / 1,000	It shows how often a part of speech appears in the text (Graesser et al., 2004)	Depends on the text
Adverb incidence	Number of adverbs / number of words / 1,000		Depends on the text
Function word incidence	Number of functions words / number of words / 1,000		Depends on the text
Noun incidence	Number of nouns / number of words / 1,000		Depends on the text
Verb incidence	Number of verbs / number of words / 1,000		Depends on the text
Content word incidence	Number of content words / number of words / 1,000		Depends on the text
Flesch index	As in Martins et al (1996).	I expected that greater readability increases understandability. It will be explained in detail in the next topic.	+
Mean sentences per paragraph	Number of sentences / number of paragraphs	The longest the paragraphs the more difficult to process it may be (Coh-Metrix Website, 2017).	-
Mean syllables per content word	Average number of syllables / number of content words	Sentences with more words are probably more difficult to process, because its syntax may be more complex (Coh-Metrix Website, 2017).	-
Mean words per sentence	Number of words / number of sentences	Usually, the shorter the sentence, the easier it is to read it (Coh-Metrix Website, 2017).	-
Pronoun incidence	Number of pronouns / number of words / 1,000	In general, texts with a greater number of pronouns are more difficult to understand (Graesser et al., 2004).	-

Variables	How are they calculated?	What does it do?	Expected impact on understandability
Logic operators			
Incidence of ANDs.	The frequency of “and” or “e” / number of words / 1,000	A text with a high incidence of logical operators (or, and, not and if) is analytically dense and requires a good memory from the reader (Graesser et al., 2004).	-
Incidence of IFs.	The frequency of “if” or “se” / number of words / 1,000		-
Incidence of ORs.	The frequency of “or” or “ou” / number of words / 1,000		-
Incidence of negations	The frequency of “not” or “não” “nem” “nenhum” “nenhuma” “nada” “nunca” “jamais” / number of words / 1,000		-
Logic operators incidence	The frequency of all logic operators / number of words / 1,000		-
Content word frequencies			
Content words frequency	Average of all frequencies of content words (nouns, verbs, adverbs, and adjectives)	The incidence score for content words shows how much substantive content the text has. More frequent words are more quickly read and better understood than non-frequent words (Graesser et al., 2004).	+
Minimum among content words frequencies	Average of all words with minimum frequencies		+
	Where words with minimum frequencies are the rarest content words (nouns, verbs, adverbs, and adjectives) in each sentence, according to the list of frequencies of a database (Banco de Português – BP corpus).		
Hypernyms			
Mean hypernyms per verb	Sum of each verb hypernyms / number of verbs	Words with many hypernym levels are considered more concrete (Graesser et al., 2004), therefore, easier to be understood.	+
Tokens			
Personal pronouns incidence	Number of personal pronouns / number of words / 1,000	In general, texts with a greater number of pronouns are more difficult to understand (Graesser et al., 2004).	-
Mean pronouns per noun phrase	Average number of pronouns / number of noun phrases		-
Type to token ratio	Number of unique words / number of instances of such words	A low ratio suggests that words are repeated many times in the text, which should increase a text’s processing speed and ease (Graesser et al., 2004).	-
Constituents			
Modifiers per Noun Phrase	Mean number of modifiers (adjectives, adverbs, and articles) / number of noun phrases	To be easier to process, the syntax in the text must have few words per noun-phase (Coh-Metrix-Port	-

Variables	How are they calculated?	What does it do?	Expected impact on understandability
		Website, 2017).	
Noun Phrase Incidence	Number of noun phrases / number of words / 1,000	A text that has a high noun phrase incidence will probably be more informationally dense and will have more complex syntax (Coh-Metrix-Port Website, 2017).	-
Words before Main Verb	Average number of words before main verbs	Metric used to assess memory load (Coh-Metrix-Port Website, 2017). The greatest the average number of words before the main verb, the greatest the memory load (Aluísio et al., 2008), and the lowest the understandability.	-
Connectives			
Connectives incidence	Number of connectives / number of words / 1,000	Connectives create cohesive links between ideas and clauses and assist on text organization (Coh-Metrix-Port Website, 2017). The greater the incidence of connectives, the easier the text (Pasqualini, Scarton, & Finatto, 2011).	+
The incidence of additive negative connectives	Number of negative connectives / number of words / 1,000		+
The incidence of additive positive connectives	Number of positive connectives / number of words / 1,000		+
The incidence of causal negative connectives	Number of causal negative connectives / number of words / 1,000		+
The incidence of causal positive connectives	Number of causal positive connectives / number of words / 1,000		+
The incidence of logical negative connectives	Number of logical negative connectives / number of words / 1,000		+
The incidence of logical positive connectives	Number of logical positive connectives / number of words / 1,000		+
The incidence of temporal negative connectives	Number of temporal negative connectives / number of words / 1,000		+
The incidence of temporal positive connectives	Number of temporal positive connectives / number of words / 1,000		+
Ambiguity			
Ambiguity of adjectives	Sum of senses of each adjective / number of adjectives	A word with more senses will be ambiguous and harder to be understood (Graesser et al., 2004).	-
Ambiguity of adverbs	Sum of senses of each adverb / number of adverbs		-
Ambiguity of nouns	Sum of senses of each noun / number of nouns		-
Ambiguity of verbs	Sum of senses of each verb / number of verbs		-
Coreference and Anaphors			

Variables	How are they calculated?	What does it do?	Expected impact on understandability
Adjacent argument overlap	The proportion of adjacent argument overlap that shares one or more arguments (nouns, pronouns, and noun phrases)	Usually, high cohesion texts are less difficult to process because many elements connect the ideas for the reader (Coh-Metrix-Port Website, 2017). The greater the repetition of words, stems, arguments, etc., the lower the complexity of the text (Pasqualini, Scarton, & Finatto, 2011).	+
Argument overlap	The proportion of argument overlap that shares one or more arguments (nouns, pronouns, and noun phrases)		+
Adjacent stem overlap	The proportion of adjacent sentences that share stems		+
Stem overlap	The proportion of all pairs of sentences that shares stems		+
Adjacent content word overlap	The proportion of adjacent sentences that shares content words (nouns, verbs, adjectives, and adverbs)		+
Adjacent anaphoric references	Proportion of anaphoric references among adjacent sentences		+
Anaphoric references	The proportion of anaphoric references related to a constituent present in up to five previous sentences		+

Source: Based on Coh-Metrix-Port Website, 2017.

2.2. Readability

Quality is an abstract noun with fast understanding through common sense, but, when one searches for such understanding, it becomes more complex (Oleto, 2006). In accordance to Oleto (2006), a construct of quality information does not serve as measures or tests; thus, an alternative way used by science is trying to quantify it through a definition able to be operationalized.

Klare (1974-1975) understands that a problem for mass communication is how one can say whether a text is readable to a certain group of readers. As Dreyer (1984), to simplify the task of analyzing readability, the firsts researchers of the subject simplified it to comprehensibility, focusing on the texts' linguistic elements. Thus, formulas were developed with the intent of creating an index of probable difficulty.

To Rush (1985), readability formulas are strictly text based; thus, they "... do not address the interactive nature of the reading process" (p. 274), i.e., they do not explore factors regarding meaning communication. According to Klare (1974-1975), readability formulas intent to provide indexes of probable difficulty for the reader, by using language variables. It is, then, a predictive device, once readers do not participate in it.

Also, because it does not use the reader to be estimated, readability formulas are quantitative and objective tools to measure the difficulty of a text. Readability formulas scores are, then, used to determine how suitable is the material to a certain grade-level (Rush, 1985).

2.2.1. Accounting Information Readability

Worthington (1977) understands that to communicate, the notes to the Financial Statements must have certain general characteristics, among them, readability. As Rennekamp (2012), a more readable disclosure enhances investors perception regarding its information reliability.

The readability metrics have many advantages: (i) it allows us to study a large and diversified group of companies, (ii) it is objective, not based on surveys or opinion, (iii) it can be calculated for any narrative disclosure, (iv) it allows us to capture the readability effect of a variety of financial items, and (v) it allows us to directly examine the syntactic complexity of written public communication of a firm, going beyond its specific content (Lehavy, Li & Merkley, 2011)¹. The examination of the syntactic complexity of the text helps to determine the readability of it, independently of the reader's intelligence, which is one of the critics over the aforementioned cloze method (Lehavy, Li & Merkley, 2011).

I found many papers about the readability of financial information in EBSCOHost from the end of 1960's until the beginning of 1980's. More recently, the theme began to grow stronger once again in many international journals, but with different focuses. The first time it became an important subject, many papers studied the relation between accounting information and the Theory of Information. Recently, studies focus on what influences such types of disclosures.

2.2.2. Measuring Readability

Readability metrics measure both the difficulty level of language (semantic factor) and its structure (syntactic factor) (Rush, 1985; Lewis et al., 1986). However, as stated by Soper and Dolphin Junior (1964) the readability index does not take into consideration another

¹ Lehavy, Li and Merkley (2011) highlights the advantages of FOG Index, but I believe that they can also be applicable to other types of text readability indexes that will be presented in this section.

factor that may also be important for the communication of accounting information, such as graphic elements, which could be attractive to users².

To analyze financial reports readability, Soper and Dolphin Junior (1964) and Smith and Smith (1971) used the Flesch index. This index considers two factors: number of syllables and the average size of a sentence. Thus, the bigger the sentences and/or the number of syllables per word, worse is the score given to accounting reports (Soper & Dolphin, 1964; Smith & Smith, 1971). Table 3 presents the formula to calculate this measure, according to Smith and Taffler (1992) this calculation represents deductions to the constant base of both word and sentence complexity, which means that the higher the score, the better the readability.

Soper and Dolphin Junior (1964) analyzed the improvement in accounting reports of 25 firms by comparing results from 1961 to a study of 1948, using the Flesch index. They tested the accuracy of Flesch index through analysis of the reports by judges and verified that, overall, the rankings converged. Their results showed that a decrease statistically significant happened in accounting information readability and that there is no evidence of improvement in human interest over accounting information. They also found through an experiment with four different groups of people that exist a relation between understandability and readability.

Another study that used the Flesch index is Kumar (2014). The author analyzed three variables that he believed could impact on readability, secrecy, ownership dispersion and profitability. He studied 68 Asian companies listed at the National Association of Securities Dealers Automated Quotations (NASDAQ) and the New York Exchange Commission (NYSE) and found that only secrecy was marginally statistically significant at 5%. As control variables, he used firm size, foreign sales, and debt ratio and found that only the first was significant. The author concluded that none of these companies were providing annual reports classified as easy to read and that the domestic culture regarding secrecy leads to a less readable financial statement.

Moreno and Casasola's (2015) is one of the few readability studies in non-English accounting documents. They analyzed the readability evolution of annual reports' narratives in Spanish using an adapted version of Flesch index. The documents studied were the president's letters of an oil company from 1930 until 2012 and the management reports of a

² They talk specifically about the Flesch index, but I understand that it is also applicable to the other indexes presented in Table 2.

brewery company from 1928 until 1992. Their results showed an improvement with time in readability for both companies and that the significant variable to impact readability was size, while profitability was not significant. They concluded that different cultures or legal systems do not have a significant impact on readability, as a proxy to the level of secrecy–transparency.

Dale-Chall index analyzes readability also by using two metrics. The first is the number of complex words based on Dale list of 3000 words; thus, words that do not belong to this list are considered complex. While the second is the average size of sentences (Smith & Smith, 1971).

Razik (1969) studied American newspaper readability in both metropolitan and non-metropolitan areas using the Dale-Chall method. He found significant differences between these two in most types of articles analyzed. Overall, the non-metropolitan newspapers were more difficult to read.

In 1971, Smith and Smith studied communication of accounting information through both indexes, Flesch and Dale-Chall. Their sample counted with 50 companies – the biggest of that time – and the period studied was the year of 1969. Their results showed that readability difficulty levels of accounting reports were considerably high (73.5% of studied companies had a readability level of “very hard”), and both indexes had similar results.

Worthington (1977) used Dale-Chall index in a 96-company sample taken from Fortune list of 1974. He analyzed each note and the entire group of notes as a whole, which resulted in 927 notes analyzed. He accessed the relation between this readability index and the level of education of shareholders and verified that 36% of shareholders would have problems in understanding the notes to the financial statements of 88% of companies. By the comparative analysis of notes, he also verified that is possible to write smaller sentences and to decrease the use of technical terms. In conclusion, he listed a few recommendations to accountants to improve accounting notes:

1. Know your audience and write notes on a readable level;
2. Avoid long phrases;
3. Choose words which meaning is clear to the reader;
4. Reduce the use of technical vocabulary; and
5. Avoid sentences and expressions with unnecessary words.

In most studies found recently, the used technique is the Gunning FOG Index - or FOG Index. To calculate this index, one must calculate the average size of sentences (sentence length) and the number of complex words, which in this case are those with three or more syllables (Li, 2008; Leheavy, Li, and Merkley, 2011; Lundholm et al., 2014; Merkley, 2014). Alternatively to the Flesch metric, the calculation for FOG is incremental, which means that the higher the score, the worse is the readability (Smith & Taffler, 1992).

The research performed by Li (2008) is one of the main references in accounting readability studies. The author examined the relation between the readability of public companies' annual reports and aspects such as firm performance and earnings persistence. The study used the FOG Index and the document length as readability indexes and found that when companies present lower earnings, their annual reports showed worse readability scores. Similarly, it also found that more readable annual reports are related to more persistent and positive earnings.

Leheavy, Li, and Merkley (2011) studied the relation between financial analysts' behavior (analyst following, analyst forecast's revision response time, analysts' reports content, and properties of analyst earnings forecasts) and readability of a firm's written communication of 10-K filings. They, as Li (2008), used the FOG Index. They found that less readable 10-K makes investors require greater amounts of analyst services, i.e., it is related to greater analyst following, greater effort spent to generate their reports, and greater informativeness of these reports. Regarding the properties of analyst earnings forecasts, they found that less readable 10-K is related to greater dispersion, lower accuracy, and greater uncertainty in these forecasts.

Lawrence (2013) examined whether investors benefit from more concise and more readable financial disclosures. To measure readability, he used the Fog index, while to measure length, he counted the number of words of annual reports. His results suggest that individual investors invest more in firms with more readable and more concise disclosures. He also found that investments in firms with more readable and less long disclosures can reduce information disadvantage.

Another technique used to analyze communication of accounting information is called Number of numbers. This method counts how many times numbers were used in a certain disclosure, except for dates, but including those presented in tables (Lundholm, 2014;

Merkley, 2014). According to Lundholm et al. (2014), it represents a communication that is universally understood and, usually, more precise than textual.

Lundholm et al. (2014) studied lexical and numerical properties of communication of foreign companies listed in the United States from 2000 to 2012. They verified that foreign companies with stocks in the US present more numerical data and write more readable texts in their Management Discussion and Analysis (MD&A) and press releases than American firms. The most distant from the US, the most readable was the text, and within a country, companies with more readable disclosures tend to attract more American investment.

Merkley (2014) used both readability indexes mentioned previously, the FOG index and the number of numbers. He also verified tone and the number of forward-looking statements and repetitions. He studied the disclosure narrative regarding Research and Development (R&D) of 10-k forms from 1996 to 2007, and its relationship with company's performance. He concludes that companies modify their type of disclosure based on its performance to provide relevant information to market participants, which reduces informational asymmetry.

The Kwolek index is measured by using sentence length and percentage of hard words, i.e., words with more than three syllables, abbreviations or symbols (Lewis et al., 1986). Lix index is measured through sentence length and words complexity, as the other readability indexes but, unlike the other measures of readability, the Lix formula was built with the intent of comparing readability across languages (Lewis et al., 1986).

Lewis et al. (1986) analyzed similarities in the internal structure of five different readability indexes, Dale-Chall, Flesch, Fog, Kwolek, and Lix, from 1977 to 1980. They Applied these formulae to extractions of "Managing Director" and "Operation review" of a 9-company sample in four years. Their results showed that, overall, the analysis using any of the studied indices indicated that financial reports to employees, which are supposed to be easily read, presented a score that classifies it as "difficult to read", not improving over time. However, the authors believe that using Lix formula is the best in diagnosing readability difficulties, once it gives the same weight for both of its components.

Smith and Taffler's (1992) research seeks to provide evidence of the differences between readability and understandability. To do so, they used two metrics to measure readability, Flesch, and Lix, while cloze measures understandability. They studied two groups of subjects, undergraduate students, and accountants, and found that for more sophisticated

users, such as accountants, Flesch and cloze scores were much closer than to a non-sophisticated group like undergraduate students.

Guay, Samuels, and Taylor (2016) analyzed a sample of 72,366 firm-year. They examined the relation between voluntary disclosure and financial statement complexity, which was measured using the length of 10-k's filings and multiple readability indexes in one single index to analyze such documents. They found a positive relation between these two variables; thus, the increase of the complexity increases voluntary disclosure. However, this association is greater after the 10-k filing than before it. They believe that firms tend to mitigate the negative effects the complex financial statements may have on the information environment by using the voluntary disclosure.

Table 3 presents all mentioned readability metrics in a summarized way. Other metrics not used in Accounting can be found on Klare (1974).

To Smith and Taffler (1992), the differences in readability measures come from different ways of measuring word length and from different weightings applied to both components. In Table 3 the only exception to this is the number of numbers metric.

Table 3 –Readability indexes applied to financial reports

Metrics	How it works	Some references in Accounting
Flesch	Calculated by: - Number of syllables per word - The average size of sentences	Soper e Dolphin Junior (1964) Smith e Smith (1971) Lewis et al. (1986) Smith and Taffler (1992) Kumar (2014) Moreno and Casasola (2015)
Dale-Chall	Calculated by: - Number of complex words (words that are not present in a list of words made by Dale) - The average size of sentences	Smith e Smith (1971) Lewis et al. (1986)
Gunning Fog Index	Calculated by: - Number of complex words (words with 3 or more syllables) - The average size of sentences	Lewis et al. (1986) Li (2008) Lehavy, Li, and Merkley (2011) Lawrence (2013) Lundholm et al. (2014) Merkley (2014) Loughran and McDonald (2014)
Kwolek	Calculated by: - Number of complex words (words with more than three syllables, abbreviations or symbols) - The average size of sentences	Lewis et al. (1986)
Lix	Calculated by: - Number of long words (words with more than six letters) - The average size of sentences	Lewis et al. (1986) Smith and Taffler (1992)

Number of Numbers	Calculated by: - Number of numbers presented in texts, including those presented in tables	Lundholm et al. (2014)
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All studies of Table 3 were performed using archival research. However, Rennekamp (2012) faced the issue using an experiment. In her study, 234 participants received a press release regarding a fictitious firm's financial performance. The manipulations she made were of readability and if the press release were of good or bad news. She found that more readable press releases cause stronger reactions from small investors, which means that more readable information increases investor's opinion over the reliability of it.

2.2.3. Limitations to Readability Formulas

It is important to say that, according to Dreyer (1984), readability formulas do not define readability at all. They measure factors that could be correlated with difficulty, but they cannot point to all text features that may impact comprehension (Dreyer, 1984).

According to Graesser et al. (2004), readability measures rely on shallow metrics such as sentence length and word length and ignore many other discourse and language components that, as theory indicates, have an impact on comprehension difficulty. Scarton, Almeida, and Aluísio (2010) mention the discourse markers, which are not considered in readability metrics, but that may help the text to be more understandable. Razik (1969) understands that these formulas neglect factors such as ideas complexity, sentence and paragraph construction, and individual differences. While, McNamara et al. (2002) discuss that to predict comprehension a metric would have to include a reader's knowledge, language abilities, and other cognitive characteristics, which are not considered by readability formulas.

The use of readability formulas by textbook writers, for instance, make them reduce sentences to improve their readability scores, but it usually has a negative impact on texts (Dreyer, 1984; Graesser et al., 2004). By doing so, the texts may end up with cut and short sentences with low levels of cohesion, maybe becoming even more difficult to understand, especially in cases where the reader does not have much knowledge on the subject or low reading proficiency (Dreyer, 1984; McNamara et al., 2002).

Moreover, such formulas are not able to assess more deeply the reasons and correlations of factors that make the text difficult to understand (Scarton, Almeida, and Aluísio, 2010). As an example of such disconnection, Schriver (1989) mentions the fact that a text written

backwards would have the same readability score like the one in normal order, but the understanding would be much more difficult. Regarding Financial Statements, in accordance with Beattie, McInnes, and Fearnley (2004), methods used to analyze accounting narratives normally suffer from two limitations. Firstly, they are essentially one-dimensional, while disclosure is something complex and multi-faceted concept, i.e., little consideration is given to the relation between the type of disclosure made and what is the studied topic. Secondly, many approaches are only partial, in their opinion, no detailed analysis of the whole narrative content was made over accounting reports.

3. HYPOTHESIS

In accordance to Worthington (1977), it is possible to establish a writing style that is appropriate to the average investor independently of firm size, the quantity of information presented, auditor influence, and industry.

Among the readability metrics presented in Table 2, most of them use sentence size and words complexity as determinants of the calculated index. Worthington (1977) understands that is necessary to reduce the use of complex words, once they can be misinterpreted or may mislead decisions. To this author, words must have a clear meaning to the reader. It is possible to verify that readability indexes try to create proxies for those possible problems in the text readability. Dale-Chall model uses a set of words in which words outside it are considered complexes; Lix index uses the number of letters as a proxy to complexity; while in Flesch, FOG and Kwolek techniques the proxy is the number of syllables, the greatest the number of syllables a word has, the more complex it is.

As mentioned earlier, Graesser et al. (2004) discussed how seeking for better scores of readability can have negative impact on a text understandability, however, if done maintaining the coherence and cohesion of a text, it is probable that understandability is improved, which is consistent to Razik (1969), who understands that the level of readability affects, significantly, the degree of comprehension. To Dreyer (1984), the levels of readability can correlate with understanding difficulty, but there might not be a cause-effect relation here.

Therefore, one would expect that the data would follow the behavior of Figure 4, starting with the worst readable and improving understandability while increasing each component of readability.

Figure 4 – Readability vs. Understandability: Expected behavior

Then, it is possible to create the following hypothesis:

H1: Improving readability increases the understandability of notes to the financial statements.

H1A: Reducing the sentences extension increases notes' understandability.

H1B: Reducing the words length increases notes' understandability.

H1C: Reducing sentence extension increases notes' understandability more than reducing words length.

To Rush (1985), science and social studies employ specialized vocabulary, which increases, artificially, the number of difficult words, impacting readability scores. In accounting, words such as “*lucro*” (income) or “*custo*” (cost), may not be considered complex but may cause differences in understanding between preparer and user, given its technical quality. Therefore, to improve readability in accounting information, Worthington (1977) understands that an opportunity to it is to reduce the use of technical vocabulary.

On the other hand, as stated by Loughran and McDonald (2014), words such as *company*, *operations*, and *management* would be considered complex by readability measures, but hardly would confuse users.

According to Hendriksen and Breda (1999), disclosed information must consider the user's nature, given that the information relevance may differ from a sophisticated user to another not sophisticated. Thereby, OCPC 07 suggests that technical language must be used only when inevitable and that companies present a complete and concise glossary of such words with the financial statements. It is in accordance to Fiske (2002), who says that to reach a larger and heterogeneous audience the message needs to be more redundant, i.e., highly predictable, while to reach a small, specialist and homogeneous audience, a less redundant message will be needed.

With that, and given the Semiotics collateral experience idea, it is possible to create the following hypothesis:

H2: Increasing collateral experience of accounting vocabulary increases notes' understandability.

According to Klare (1974-1975) and Martins et al. (1996), most readability studies were carried out for English. I could not find any research published in top Brazilian journals regarding this subject for financial statements written in Portuguese. Therefore, most literature related to readability and understandability, especially in Accounting, is based on texts in English.

Furthermore, Klare (1974-1975) showed that, once most readability formulas were developed to passages written in English, the application to other languages, in most cases, demands an adaptation in readability formulas. As explained in the next section, Martins et al. (1996) developed an adaptation to Portuguese of the Flesch index. Thus, I understand that if one analyzes the same text written in English and Portuguese, it should have the same readability if using the proper method for each language.

On the other hand, by the ideas of Semeiotics, it would be possible to say that translated information are different signs that represent a single object, which should result in the same interpretant. However, the study from Pasqualini, Scarton, and Finatto (2011) shows differences on the intelligibility of texts in Portuguese and English, which, they believe, may be due to its grammar, that functions differently in each language. Evans, Baskerville, and Nara (2015) add to this with the idea that translation problems are even worse for Accounting because it relies on specialized, culture-specific terminology.

With all that, it is possible to theorize that understandability of Accounting information can be affected by translation, while readability should not. Thus, I created the following hypothesis:

H3A: Reporting language has no impact on notes' readability.

H3B: Reporting language has impacts on notes' understandability.

Previous studies, such as Barth, Landsman, and Lang (2008), showed that applying the International Financial Reporting Standards (IFRS) improves information. Brazil already applies the IFRS since 2010, but one should expect that firms will continue improving their information, especially when a guideline such as the OCPC 07 is published. However, this guideline was published because firms were presenting too much non-relevant information, while some relevant information was being left aside.

To improve information, the OCPC 07 required, among other things, a better understandability of financial statements, including the notes. Therefore, one should expect that after it was published, firms would improve such characteristic of their information. Then, I created the last hypothesis:

H4: The understandability of notes to the financial statements improved after OCPC 07.

4. METHODOLOGY

To Adelberg (1979), the communication evaluation techniques cannot be properly applied to the bodies of accounting reports, but they can be applied to narrative disclosures – and here, it is possible to include the notes to the Financial Statements – given that they must be in a sentence format to be evaluated.

To perform the tests of the Archival and Experimental sections, I used two statistics software: Stata® and SPSS®. I mostly used Stata to create graphs, while I mainly used SPSS for testing my variables.

As mentioned, I divided this study into two: archival and experimental research. The experiment verified the connection between readability and understandability, and how a glossary would affect understandability. It will be used to test Hypotheses 1, its variants (1A, 1B, and 1C), and 2. While, the archival research verified how readability impacts on intelligibility in Brazil and United States' notes to the financial statements, how different levels of readability affect intelligibility and if the levels of readability and intelligibility changed from 2012 to 2015. Thus, it will be used to test Hypotheses 1, 3, and 4.

4.1. Archival Analysis

In general, accounting academics employed readability formulas and comprehension tests to assess the effectiveness of accounting narratives communication regarding both readability and understandability (Jones, 1997). According to Smith and Smith (1971), notes' readability analysis is an objective metric to measure a message's attribution level of the intended meaning in accounting reports. As previously discussed, the measures of intelligibility are better proxies once they consider the cohesion of the text.

To test H3A, i.e., whether readability of notes is affected by language, I studied public companies listed in American and Brazilian stock exchanges between 2012 and 2015. This section of my study was conducted to verify if there are differences in readability in different countries because few studies looked at readability of Brazilian accounting information. The comparison with the United States is something that was not done before, and it allowed me to verify if a company is more readable or not when presenting in their local language. Moreover, such analysis also allowed me to compare my results with those of previous

studies. To test the readability level of similarity, I used a mean test or equivalent for nonparametric cases to verify if they have the same scores on average.

Therefore, to test H1 through the archival research, I separated the firms of my sample in quartiles and then, also through mean tests and equivalents, I verified how different levels of readability are related to each of the multiple indexes presented on Table 2.

4.1.1. Analyzed Variable of Readability

Most readability metrics were created to evaluate sentences in English. I could not find any adaptation to Portuguese of other most commonly used techniques such as Dale-Chall and Gunning Fog. Thus, I chose to use Flesch index to calculate the variable of interest, because it was adapted to Portuguese by Martins et al. (1996). The Flesch index is, then, calculated in the original model as:

$$\begin{aligned} \text{FLESCH index} = & - 84.6 (\text{Number of syllables/Number of words}) \\ & - 1.015 (\text{Number of words/ Number of sentences}) \\ & + 206.835 \end{aligned}$$

Such index was created based on the text books written complexity of some disciplines of different levels of education (middle school, high school, and college), according to the number of syllables in words and number of words per sentence. The adaptation to Portuguese took in consideration that words in Portuguese usually have more syllables, leading to a shift of, approximately, 42 points in the Flesch scale. Therefore, in the formula adapted to Portuguese by Martins et al. (1996), instead of using a constant of 206.835, uses 248.835. Then, the formula that I used to evaluate the readability of passages in Portuguese is:

$$\begin{aligned} \text{Adapted FLESCH index} = & - 84.6 (\text{Number of syllables/Number of words}) \\ & - 1.015 (\text{Number of words/ Number of sentences}) \\ & + 248.835 \end{aligned}$$

Hereafter follows a classification of readability level and the comparison with the originals.

Table 4 – Flesch scale comparison: English vs Portuguese

English (Original)		Portuguese (Martins et al, 1996)	
Score	Difficulty level	Score	Difficulty level
0 – 30	Very Difficult	0 – 25	Very difficult
30 – 50	Difficult	25 – 50	Reasonably Difficult
50 – 60	Fairly Difficult	50 – 75	Easy
60 – 70	Standard	75 - 100	Very Easy
70 – 80	Fairly Easy		
80 – 90	Easy		
90 – 100	Very Easy		

To calculate the cohesion and Flesch indexes, I used the software Coh-Metrix to analyze notes in English, and the Coh-Metrix-Port, to analyze notes in Portuguese. Coh-Metrix-Port calculates the readability of each firm's notes for Brazilian Portuguese, using Martins et al. (1994) formula.

4.2. Experimental Design

Similarly, to all the ideas proposed by Peirce's Semeiotics, Leffa (1996) understands that the act of reading is a process of representation, to look at something and see something else. In his understanding, reading does not happen by directly assessing reality, but instead, by theintermediation of other reality elements. It is related to Peirce, once it is possible to understand the letters and words of the text as signs of the ideas the author wants to convey. Furthermore, he understands that the quality of reading is not measured by the intrinsic quality of the text, but by the quality of the reader's reaction; its meaning is not at the message of the text, but at the series of events it triggers at the reader's mind (Leffa, 1996). This idea can be compared to Peirce's interpretant. At last, Leffa (1996) also says that true reading is only possible when the reader has previous knowledge of the world, like Peirce's view of the common ground.

Given that understanding accounting reports depend on reading them, only analyzing the text is not enough to measure understandability. Therefore, I elaborated an experiment instrument and applied it to different possible users of accounting information, undergraduate and graduate students of business related courses. The use of students is in accordance to

Jones and Smith (2014), that see university students as not as sophisticated users, but whose performance in an experiment such as this will not deviate much from the actual decision makers. It allowed me to find differences in understanding between different groups of people once, as Leffa (1996), the same text can provoke in each reader and each reading a different view of reality.

To analyze readability, I considered the same metrics used in the Flesch index from the archival analysis, sentence length and number of syllables.

As mentioned earlier, studies point to the problem that cloze procedure does not capture reading understanding. Instead, it captures the ability to fill gaps. Jones and Smith (2014) understand that the SVT and MIT techniques are better options to analyze understandability.

The SVT technique works presenting a passage of some sort and then asking the participants if sentences presented afterwards have the same meaning of the original passage. These sentences can be of four kinds: the original sentence; a paraphrase constructed using the maximum of words possible, without changing the meaning of the original sentence; a sentence with meaning change, by modifying one or two words; and a distractor sentence, which is a sentence with similar structure to the original passage and consistent with its theme, but not meaning related to any sentence of the original passage.

On the other hand, the MIT is a variation of the SVT, and instead of using all kinds of sentences of the SVT, it uses only paraphrases, which keeps the meaning of the original sentence and meaning change paraphrases. The meaning change paraphrases is a modification on the SVT, i.e., before making modifications on the meaning of the constructed sentence, the scientist must transform the original sentence into a paraphrase. In accordance to Marchant et al. (1988), the advantage of this technique is that it only uses types of sentences that do not allow the participant to answer without evaluating the meaning, once both kinds are different from the original sentence present on the passage. Jones and Smith (2014) found that MIT is slightly superior to SVT and Marchant et al. (1988) found that MIT has greater reliability and validity than the SVT. Therefore, I chose to use the MIT technique to measure understandability, because it better captures this concept than cloze and SVT, according to the literature (Jones & Smith, 2014), and is less complex than SVT to administer.

To write the notes, I analyzed a real Brazilian firm (BRF, 2015).

4.2.1. Experiment Protocol

This experiment had two main rounds. In the first round, the participant received a simplified group of financial reports (balance sheet, income statement, changes in shareholders' equity statement, cash flow statement, and value added statement) with the notes to the financial statements. In this round, I presented sentences with words replacements. Participants would have to answer if these replacements changed the meaning (or not) from the original sentence of the notes.

To answer the first hypothesis, I had four types of treatments to the notes the participants received in the first round. All accounting reports were the same for every treatment.

The first level of the treatment is the number of syllables; one type of note had words with more syllables than the other. To make sure that understanding is caused by the different number of syllables and not because of the change in the meaning of the sentence, I used a dictionary and replaced a word by a larger/shorter synonym every time that it was possible. That means that the total amount of words of this created note remained the same. Therefore, no further change in sentence meaning was made from one treatment to the other.

The second level of treatment is regarding sentence length; one had sentences larger than the other. Considering that punctuation changes a sentence length, it did not affect the content of the notes and, then again, all meanings of the notes remained the same.

Therefore, I had four treatments for notes (as in Table 4): (i) Words with fewer syllables and smaller sentences; (ii) Words with fewer syllables and longer sentences; (iii) Words with more syllables and smaller sentences; and (iv) Words with more syllables and longer sentences. In all four treatments, the meanings of all sentences were the same as well as the information provided.

Table 5 – Experimental treatments

	Fewer syllables	More syllables
Fewer words	1	3
More words	2	4

Then, Treatment 1 received the most readable notes then, I expected that these notes would be more understandable. Similarly, Treatment 4 received the least readable notes, and

then, probably it would be the least understandable. Treatments 2 and 3 were used to verify which component of Flesch metric is more helpful to achieve understandability. Therefore, this can be considered a 2 X 2 experiment, between subjects.

So communication can take place, it is necessary for the preparer to create a message using signs, which will stimulate the user in creating meaning, plus, the closer the codes of both parties, the closer both meanings will be (Fiske, 2002). Thus, this experiment will verify if changing signs (words or how sentences are presented) that represent the same object (the accounting information of Financial Statements) change the interpretant, which, in this case, is the interpretation that the sentences do or do not have the same meaning.

No round of this experiment had a pre-settled time to be completed, once I expected the participants to be concerned with the understanding and not on being quick.

The size of the notes cannot be too long once, as shown by Smith and Taffler (1992) pilot test, something like this can cause fatigue in the participants and can be too long to process. Therefore, I simplified a real financial statement, to avoid this kind of problem.

After that, in the second round, the participants received, again, the same reports and notes, but this time, they also received a glossary with all technical words used in all reports, then he/she were asked again to answer the same MIT questions of the previous round. The participants had access to the answers of the previous round and could choose to keep them or to change them, with the use of the glossary. This way, it was possible for me to verify if improving the common ground of the users of financial statements improves understandability, as stated by H2.

I considered as technical terms those presented in the glossary of the CPC for small and medium enterprises (SME por *Pequenas e médias empresas* – PME). This standard's definition of terms was used in the glossary presented to participants in the second round.

This second round classifies my research also as within subjects. Then, the between subject part compared the results of each treatment independently, helping me to answer H1, whereas the within subjects is the glossary treatment related to H2.

However, manipulating meaning may be not such a trivial task. To Loughran and McDonald (2016), the meaning is an ambiguous item, because it depends on the context to which that sentence, document, etc. are inserted, when it was written and who wrote it. In my research, I controlled for all these factors. The context is the same for all treatments, and they were all developed simultaneously by the same person.

Moreover, to Jones (1997), different readers may present different understanding levels once they have individual reading abilities. Moreover, the theoretical framework used by Marchant et al. (1988) stands that the comprehension process implies an interaction between the linguistic message, the context, and the previous knowledge of the information user. In this research, I want to manipulate the linguistic message; thus, I need to control the other two factors. The context is the same in all treatments, then it will not be an issue, but I still had to control for reader's abilities. Therefore, after finishing both rounds, the participants answered a questionnaire based again on the MIT technique with questions not related to accounting, but to a general subject. This way, I could verify if the problem in understanding that they may have had was related to the accounting text and not with a personal difficulty of the participant. Differently from the first two rounds, in which I presented a passage, in this one, I presented them with pairs of sentences, and their task was to answer if they had the same meaning or not.

I also asked them if they changed any filling, and if they did, the reason for that, to be certified that the change was not made because they missed any information in the first round and only noticed in the second.

4.2.2. Building the Instrument

In this section, I present how I built the instrument applied to the participants.

As previously explained, to test if readability has a concept close to understandability, the treatments used were related to both factors that calculate most of the readability indexes: word complexity and sentence length.

I based the firm I used on the experiment in a real company, BRF (2015), because its main operation, which is related to making and selling industrialized food, is not too complex. Thus, the understanding of notes should not be affected by the complexity of the company's transactions.

However, it would not be possible to operationalize an experiment that uses all accounts of BRF, because it would take too long for the participants to finish it, once the original file has around 125 pages for 41 notes. Thereby, I summarized all statements, so a smaller number of notes would be required.

I used Flesch index as a parameter. As aforementioned, this index calculates word complexity as the average size of the word, i.e., the greater the number of syllables of a word, the more complex it is. I calculated the sentence length through the average size of sentences, which is the number of words per sentence, the longer the sentence (i.e., those that have more words in it), the more complex it is.

Therefore, my experiment used the operationalization of these factors in my treatments. Firstly, using an online dictionary for synonyms (Sinônimos, 2016), I replaced words with a smaller synonym, i.e., one with fewer syllables, whenever possible, in the treatments with smaller words. When no smaller synonym would keep the intended meaning of the sentence, I looked for a longer synonym, to replace in the treatment with longer words. It was intended to make both treatments as different, regarding readability, as they could be.

To treat the sentence length, I turned some closing punctuation mark into commas for the treatment with longer sentences, and vice-versa for the treatment with smaller sentences. In some situations, I had to take from it or include words in the text, so it would still respect the rules of proper writing. For instance, when two sentences were connected by “and”, I took this word from the text and replaced it with a closing punctuation mark, reducing the size of the sentence. The amount of words put or taken from the text is not large enough to impact on the first factor of word complexity.

Example:

Real Sentence (BRF, 2015). Flesch index of the passage: 12.954.

“A BRF S.A. (“BRF”), em conjunto com suas subsidiárias (coletivamente “Companhia”), é uma das maiores empresas brasileiras do ramo alimentício. A BRF é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), sob o ticker BRFS3 e na Bolsa de Valores de Nova Iorque (“NYSE”), sob o ticker BRFS, com sede localizada na Rua Jorge Tzachel, nº 475, no Bairro Fazenda, na cidade de Itajaí, no estado de Santa Catarina. Com foco na criação, produção e abate de aves e suínos, industrialização e/ou comercialização de carnes in-natura, produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja, entre os quais, destacam-se: (...)”

Simplified Versions

With fewer syllables per word and fewer words per sentence. Flesch index: 33.339.

A XYZ S.A. (“XYZ”), é uma das maiores firmas brasileiras do ramo alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”). Com foco na industrialização e venda de bens processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

With fewer syllables per word and more words per sentence. Flesch index: 24.035.

A XYZ S.A. (“XYZ”), é uma das maiores firmas brasileiras do ramo alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), com foco na industrialização e venda de bens processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

With more syllables per word and fewer words per sentence. Flesch index: 19.496.

A XYZ S.A. (“XYZ”), é uma das maiores empresas brasileiras do segmento alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”). Com foco na industrialização e comercialização de produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

With more syllables per word and more words per sentence. Flesch index: 10.192.

A XYZ S.A. (“XYZ”), é uma das maiores empresas brasileiras do segmento alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), com foco na industrialização e comercialização de produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

As it is possible to see, in cases when fewer syllables were needed, I changed ‘empresa’ (3 syllables) to ‘firma’ (2 syllables). However, if more syllables were needed, I replaced ‘ramo’ (2 syllables) with ‘segmento’ (3 syllables). Furthermore, to increase the size of the sentences, I turned the period before “Com foco na industrialização (...)” into a comma.

Table 6 presents all factors included in the measurement of Flesch Index. I calculated it using the same criteria of the archival research, presented in section 5.1.

Table 6 – Experiment treatments' scores of Flesch Index				
	Treatments			
	(1)	(2)	(3)	(4)
Flesch index	36.01	27.12	17.35	8.86
Mean syllables per word	2.34	2.32	2.56	2.54
Mean words per sentence	14.24	24.79	14.37	25.02
Number of Sentences	213	125	211	124
Number of Words	3,033	3,099	3,033	3,102
Number of Syllables	7,112.01	7,200.01	7,776.00	7,868.00
(1)	Fewer syllables per word + Fewer words per sentence (the most readable)			
(2)	Fewer syllables per word + More words per sentence			
(3)	More syllables per word + Fewer words per sentence			
(4)	More syllables per word + More words per sentence (the least readable)			

Treatment 1 has the most readable notes (36.01) while Treatment 4 has the least readable notes (8.86). As explained in section 4.2, Treatments 2 and 3 were used to verify which component of Flesch metric is more relevant to achieve understandability. Treatments 1 and 2 are classified as 'Reasonably Difficult' as in Martins et al. (1996), while Treatments 3 and 4 are 'Very Difficult'.

To create the MIT questions for the first two phases, I used the sentences I had already created for a different treatment, i.e., for the treatments with fewer syllables per word, I used the sentences of the treatments with more words as paraphrases, and vice-versa. In some cases, it was also possible to change words by other synonyms in all treatments. These new synonyms had the same number of syllables from the original passage, and that is why they were not used before to create the treatments. Moreover, when I wanted to create a paraphrase with a change of meaning, I changed one or more words of the paraphrase previously created by an antonym or a word with different meaning. This way, all participants would compare the same words.

Below, I present the criteria used for each of the 19 sentences created for the MIT. The idea was the same for all treatments, so I will only present below the criteria to one of them, the least readable, with more syllables per word and more words per sentence.

Original text

11. CONTEXTO OPERACIONAL

A XYZ S.A. (“XYZ”), é uma das maiores empresas brasileiras do segmento alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), com foco na industrialização e comercialização de produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

A Companhia opera somente no Brasil e conta com 20 unidades de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas próximas aos seus fornecedores de matérias-primas ou dos principais centros de consumo.

A Companhia conta com 20 centros de distribuição, os quais atendem a supermercados, lojas de varejo, atacadistas, restaurantes e outros compradores.

Question 1

*A XYZ atua apenas no Brasil e possui 20 itens de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas nas proximidades de seus fornecedores de insumos ou dos mais importantes centros de **distribuição**.*

Question 2

*A XYZ possui 20 centros de **consumo** e atendem supermercados, lojas de varejo, atacadistas, restaurantes e outros clientes.*

Analysis of questions 1 and 2:

All underlined words from both questions do not change the meaning of the sentence. However, distribution centers (‘centros de distribuição’) and consumer centers (‘centros de consumo’) are different things. Thus, they are sentences with meaning change.

Original text

2. DECLARAÇÃO DA ADMINISTRAÇÃO E BASE DE PREPARAÇÃO E APRESENTAÇÃO DAS DEMONSTRAÇÕES FINANCEIRAS

As demonstrações financeiras individuais foram elaboradas em conformidade com as normas internacionais de relatório financeiro (“IFRS”) enunciados pelo International Accounting Standards Board (“IASB”) e interpretações emitidas pelo International Financial

Reporting Interpretations Committee (“IFRIC”), introduzidos no Brasil por meio do Comitê de Pronunciamentos Contábeis (“CPC”) e suas interpretações técnicas (“ICPC”) e orientações (“OCPC”), aprovados pela Comissão de Valores Mobiliários (“CVM”).

As demonstrações financeiras individuais da Companhia estão declaradas em milhares de Reais (“R\$”), já as divulgações de montantes em outras moedas, quando necessário, também foram efetuadas em milhares. Elementos divulgados em Reais estão comunicados quando aplicáveis.

A preparação das demonstrações financeiras individuais da Companhia demanda que a Administração realize julgamentos, utilize estimativas e adote premissas que afetam os valores apresentados de receitas, despesas, ativos e passivos, compreendendo passivos contingentes, contudo, a incerteza relativa a esses julgamentos, premissas e estimativas conseguiria levar a resultados que requeiram um ajuste significativo ao valor contábil de certos ativos e passivos em exercícios futuros.

A Companhia revisa seus julgamentos, estimativas e premissas trimestralmente.

As demonstrações financeiras individuais foram preparadas com base no custo histórico recuperável.

Question 3

*Os relatórios financeiros individuais da XYZ estão expressos em **milhões** de Reais (“R\$”), já as divulgações de somas em outras unidades monetárias, quando preciso, também foram realizadas em **milhões**. Itens divulgados em Reais estão informados quando cabíveis.*

Analysis of question 3:

Again, no underlined word changes the meaning of the sentence. On the other hand, millions (‘*milhões*’) and thousands (‘*milhares*’) are very different, making this, a sentence with meaning change.

Question 4

O preparo dos relatórios financeiros individuais da XYZ requer que a Administração: realize juízos; use estimações; e siga premissas que afetam os valores expostos de receitas, despesas, ativos e passivos, incluindo passivos contingentes.

Analysis of question 4:

The changes from question 4 were only made through synonyms. Therefore, it consists of a paraphrase.

Question 5

*Mas a dúvida relativa a tais juízos, premissas e estimações **resulta** em resultados que pedem um ajuste relevante no montante registrado de certos ativos e passivos em exercícios que estão por vir.*

Analysis of question 5:

The change that alters the meaning of question 5 is related to the verb tense. While on the original passage the idea is that the uncertainty could lead to results (‘consequiria levar a’), on the question, there is no doubt about it (‘resulta’).

Original text

3.8 Contas a pagar e fornecedores – são inicialmente reconhecidos pelo valor nominal e, subsequentemente acrescidos, quando aplicável, dos correspondentes encargos e das variações monetárias e cambiais incorridos até as datas de encerramento das demonstrações financeiras.

3.9 Lucro por ação – a apuração do lucro básico por ação é realizada através da divisão do lucro líquido do exercício, atribuído aos detentores de ações ordinárias da Companhia, pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício, já o lucro diluído por ação é calculado através da divisão do lucro líquido atribuído aos detentores de ações ordinárias da Companhia pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício, mais a quantidade média ponderada de ações ordinárias que seriam emitidas na transformação de todas as ações ordinárias potenciais diluídas em ações ordinárias.

3.10 Apuração do resultado – o resultado das operações é apurado em conformidade com o regime contábil de competência do exercício.

3.11 Receita de vendas – compreendem o valor justo da contraprestação recebida ou a receber pela comercialização de produtos, líquido dos impostos incidentes, das devoluções, dos abatimentos e dos descontos.

São reconhecidas em conformidade com o regime contábil de competência, quando: o valor das vendas é mensurável de maneira confiável; a Companhia não detém mais o controle sobre a mercadoria vendida ou qualquer outra responsabilidade relacionada à

propriedade desta; os custos incorridos ou a incorrer decorrente da transação podem ser mensurados de maneira confiável; é provável que os benefícios econômicos serão recebidos pela Companhia; e, os riscos e os benefícios foram integralmente transferidos ao comprador.

3.12 Julgamentos, estimativas e premissas contábeis – conforme divulgado na nota 2, a Administração realizou os seguintes julgamentos, que possuem efeito significativo sobre os valores reconhecidos nas demonstrações financeiras:

- Análise anual do valor recuperável de ativos não financeiros (consulte nota 8);*
- Perdas estimadas em créditos de liquidação duvidosa (consulte nota 5);*
- Provisão para ajuste a valor realizável dos estoques (consulte nota 6); e*
- Vida útil dos bens do ativo imobilizado e intangíveis com vida útil definida (consulte notas 7 e 8).*

A Companhia revisa trimestralmente as premissas utilizadas em suas estimativas contábeis e o efeito das revisões das estimativas contábeis é reconhecido nas demonstrações financeiras no período em que tais revisões são efetuadas.

3.13 Demonstração do valor adicionado – a Companhia elaborou demonstrações do valor adicionado (“DVA”) individuais nos termos da Deliberação CVM nº 557/08, as quais são apresentadas como componente integrante das demonstrações financeiras conforme BR GAAP, sendo que para IFRS, representam informação financeira adicional.

3.14 Demonstração do Resultado Abrangente – a Companhia não elaborou demonstrações do resultado abrangente porque não possui resultados abrangentes.

Question 6

3.8 Contas a pagar e fornecedores: são primeiramente reconhecidos pelo valor nominal. Depois, somados (se cabível) dos encargos e das variações monetárias e cambiais correlatos incorridos até as datas de fechamento dos relatórios financeiros.

Analysis of question 6:

None of the replacements resulted in meanings changes. It is, thus, just a paraphrase.

Question 7

*3.11 Receita de vendas – incluem o valor justo do montante recebido ou a receber pela venda de bens, **mais** impostos incidentes, das devoluções, dos abatimentos e dos descontos.*

Analysis of question 7:

The idea of a value net of taxes (*‘líquido de impostos’*) is that the taxes were subtracted from the value, and not added to it (*‘mais’*), as in Question 7. So, this question has meaning changes.

Question 8

A XYZ revê todos os trimestres as premissas usadas em suas estimações contábeis. O efeito das revisões das estimações contábeis é reconhecido nas demonstrações financeiras do tempo no qual tais revisões são feitas.

Analysis of question 8:

There is no meaning change on question 8, which is a paraphrase.

Original text

7.2 Período estimado de realização

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados à medida que estas sejam liquidadas ou realizadas e o período de liquidação ou realização de tais diferenças é impreciso e está vinculado a diversos elementos que não estão sob o controle da Administração.

Na estimativa de realização dos créditos fiscais diferidos ativos, constituídos sobre prejuízos fiscais e base negativa de contribuição social, a Administração considera seus planos orçamentário e estratégico, ajustados com base nas estimativas das principais adições e exclusões fiscais e com base nesta estimativa, a Administração acredita que é provável que esses créditos fiscais diferidos sejam realizados, conforme adiante demonstrado:

Question 9

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados ao passo que estas sejam liquidadas ou realizadas. O tempo de liquidação ou realização de tais diferenças é vago e está ligado a muitos fatores que não estão sob o controle da Administração.

Analysis of question 9:

It is a paraphrase with no meaning change.

Original text

As amortizações de fidelização de integrados e relacionamento com fornecedores são registradas no resultado no custo das vendas, a amortização de relacionamento com compradores é registrada no resultado nas despesas comerciais, enquanto que a amortização de software é registrada em conformidade com a sua utilização podendo ser custo das vendas, despesas administrativas ou comerciais.

As marcas registradas no ativo intangível consideram marcas adquiridas (KLK, AAA e KR3), e são considerados ativos com vida útil indefinida, porque se espera que contribuam indefinidamente para os fluxos de caixa da Companhia.

Os ágios apresentados anteriormente estão fundamentados na expectativa de rentabilidade futura e estão suportados por laudos de avaliações, após alocação dos ativos identificados.

O teste de recuperabilidade dos ativos é efetuado anualmente com base no método de fluxo de caixa descontado e em 2015, foram utilizados como base o orçamento e o planejamento estratégico da Companhia com projeções de crescimento até 2018 e perpetuidade a partir de 2019 e estão fundamentados no histórico dos anos anteriores assim como as projeções de mercado de entidades governamentais, tais como bancos, Fundo Monetário Internacional (FMI), Banco Central (BACEN), entre outros, sendo que na opinião da Administração, a utilização de um período de 3 anos para suas projeções demonstra uma melhor percepção do cenário futuro e uma maior segurança em avaliar a expectativa de rentabilidade dos ativos examinados.

Question 10

*As marcas lançadas no ativo intangível contemplam marcas **incorporadas** (KLK, AAA e KR3). São incluídos ativos com vida útil indefinida, pois se crê que ajudem indefinidamente para os fluxos de caixa da XYZ.*

Analysis of question 10:

To incorporate (‘*incorporar*’) and to buy (‘*adquirir*’) are two different concepts, making this question one with meaning changes.

Question 11

Os ágios expostos acima estão baseados na expectativa de rentabilidade futura. Estão suportados por laudos de avaliações, posteriormente à alocação dos ativos verificados.

Question 12

O teste de recuperabilidade dos ativos é feito todos os anos baseados no método de fluxo de caixa descontado. Em 2015, foram usados como fundamentos o orçamento e o planejamento estratégico da XYZ com projeções de crescimento até 2018 e perpetuidade a partir de 2019.

Analysis of questions 11 and 12:

There are no meaning changes on questions 11 and 12, once all alterations were made by using synonyms.

Original text***11. PATRIMÔNIO LÍQUIDO******11.1 Capital social***

Em 31/12/2015, o capital subscrito e integralizado da Companhia era de R\$12.407.053, constituído por 872.473.246 ações ordinárias, escriturais e sem valor nominal, sendo que o valor realizado do capital social no balanço está líquido dos dispêndios com oferta pública no montante de R\$92.947.

A Companhia está autorizada a aumentar o capital social, independentemente de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

11.2 Dividendos

Em 18/06/15, em reunião extraordinária do Conselho de Administração, foi aprovada a distribuição de R\$425.859, relacionada a juros de capital próprio, pagos em 14/08/15.

Em 17/10/15, em reunião ordinária do Conselho de Administração, foi aprovada a distribuição de R\$473.398, relacionada a juros de capital próprio e R\$91.443 no formato de dividendos, pagos em 12/12/15.

Question 13

*Em 31 de dezembro de 2015, o capital subscrito e integralizado da XYZ era de R\$12.407.053. Composto por 872.473.246 ações ordinárias, escriturais e **com** valor nominal. O valor realizado do capital social no balanço está líquido dos gastos com oferta pública no valor de R\$92.947.*

Analysis of question 13:

On question 13, I changed without ('sem') by with ('com'), making the meaning the exact opposite of the original sentence.

Question 14

*A XYZ pode ampliar o capital social, **apesar** de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.*

Analysis of question 14:

The meaning change is caused by the 'even though' ('apesar') that replaced 'regardless' ('independentemente'). The idea of the original sentence is that there is no need for an amendment of bylaws to increase the capital stock, which does not indicate that any amendment had happened. However, question 14 says that even though there is an amendment of bylaws, the capital can be increased, implying that an amendment already happened.

Original text

Reserva legal: Constituída na base de 5% do lucro líquido do exercício nos termos do artigo 193 da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, limitada a 20% do capital social, dado que em 31/12/2015, o saldo desta reserva correspondia a 4,00% do capital social (2,85% em 31/12/2014).

Reserva de incentivos fiscais: Constituída nos termos do artigo 195-A da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, com base no valor de doações ou subvenções governamentais para investimentos.

11.7 Ações em tesouraria

A Companhia possui 62.501.001 ações ordinárias de sua própria emissão em tesouraria, com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação, e com valor de mercado correspondente a R\$3.455.680.

Durante o exercício concluído em 31/12/15, a Companhia vendeu 1.935.296 ações em tesouraria.

Durante o exercício concluído em 31/12/15, conforme autorizado pelo Conselho de Administração, a Companhia adquiriu 59.247.400 de ações de sua própria emissão com custo de R\$3.765.753.

Question 15

Reserva de incentivos fiscais: Formada nos termos do artigo 195-A da Lei nº 6.404/76 (alterada pela Lei nº 11.638/07). Baseada no montante de doações ou subvenções governamentais para investimentos.

Question 16

A XYZ tem 62.501.001 ações ordinárias de sua própria emissão em tesouraria. Com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação. Com valor de mercado igual a R\$3.455.680.

Analysis of questions 15 and 16:

None of the words underlined change the meaning of the sentence from the original text.

Original text

15. NOVAS NORMAS E PRONUNCIAMENTOS AINDA NÃO ADOTADOS

IFRS 15 – Receita de contrato com clientes

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15, que estabelece um modelo de 5 etapas que será aplicado à receita obtida a partir de um contrato com cliente e em conformidade com este pronunciamento, as receitas são reconhecidas em valor que representa a contraprestação à qual uma entidade espera ter direito em troca da transferência de mercadorias ou serviços a um cliente. Os princípios na IFRS 15 consideram uma abordagem mais estruturada para mensurar e reconhecer receita.

Este pronunciamento é aplicável a todas as entidades e substituirá todas as atuais exigências de reconhecimento de receita, nos termos da IFRS. A adoção retrospectiva total ou modificada é exigida para os exercícios iniciados em 01/01/17 ou após essa data, sendo autorizada a adoção antecipada, que está em análise no Brasil. A Companhia está avaliando

o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

IFRS 16 - Arrendamentos

Em janeiro de 2016, o IASB emitiu a versão final do IFRS 16 – Arrendamentos, o qual substitui a IAS 17 – Arrendamentos, vigente para exercícios iniciados em 01/01/19, com adoção antecipada autorizada para entidades que também adotem o pronunciamento IFRS 15 – Receita de contrato com clientes, sendo que a adoção deste pronunciamento terá efeito sobre a classificação e mensuração do ativo imobilizado e dos passivos financeiros, porque os arrendamentos não serão mais diferenciados entre operacional e, financeiro, sendo o tratamento fornecido a todos os arrendamentos mercantis análogo ao arrendamento mercantil financeiro conforme apresentado no IAS 17. A Companhia está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

Question 17

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15. Ele determina um modelo de 5 passos que será empregado à receita adquirida a partir de um contrato com cliente.

Question 18

A adoção deste pronunciamento afetará a classificação e mensuração do ativo imobilizado e dos passivos financeiros. Os arrendamentos não serão mais separados entre operacional e financeiro.

Analysis of questions 17 and 18:

There are no changes in the meaning of the sentence from questions 17 and 18.

Question 19

*O tratamento dado a todos os arrendamentos mercantis será similar ao arrendamento mercantil financeiro, como disposto no IAS 17. A XYZ está avaliando a **prática** e os efeitos da adoção deste pronunciamento em seus relatórios financeiros.*

Analysis of question 19:

The change in meaning is due to the word ‘content’ (‘*conteúdo*’), which was replaced by ‘practice’ (‘*prática*’). In the original text, the sentence meant that the firm is evaluating the content of the new standard, while the question means it is evaluating how practical it is to apply them.

Table 7 summarizes the correct answers for each question of phases 1 and 2.

Table 7 – Correct answers of Phases 1 and 2

#	Correct Answer	#	Correct Answer	#	Correct Answer
1	Different meaning	8	Same meaning	15	Same meaning
2	Different meaning	9	Same meaning	16	Same meaning
3	Different meaning	10	Different meaning	17	Same meaning
4	Same meaning	11	Same meaning	18	Same meaning
5	Different meaning	12	Same meaning	19	Different meaning
6	Same meaning	13	Different meaning		
7	Different meaning	14	Different meaning		

To control for difficulty in understanding related to the participants' previous ability, I also presented pairs of sentences of general subjects that they would have to say which one had the same meaning. I present their analysis below:

703 policiais foram indiciados por crime de revolta no Espírito Santo.

Mais de 700 policiais foram acusados de crime de revolta no Espírito Santo.

Analysis:

Even though one can say that the second sentence contains the first, the opposite cannot be said, once 799 officers would also be right. Thus, the meaning is not the same.

Em 2017, Cristiano Ronaldo foi eleito o melhor estrangeiro do Campeonato Inglês da história pela revista Four Four Two.

Em 2017, a revista Four Four Two considerou Cristiano Ronaldo como o melhor estrangeiro da história do Campeonato Inglês.

Analysis:

The meaning is the same, the difference is related to the order of words, only.

Um voo de uma companhia aérea brasileira decolou com a saída de emergência inoperante.

Voo de companhia aérea brasileira decola com saída de emergência fora de operação.

Analysis:

Again, the order is what changed, not the meaning

Em breve, telefones celulares poderão receber carga de bateria através de luz ambiente.

*Telefones celulares poderão, em alguns anos, ser recarregados por meio de luz **solar**.*

Analysis:

The ‘ambient light’ (‘*luz ambiente*’) could be ‘sunlight’ (‘*luz solar*’), but it could also be moonlight, etc. Thus, the meaning has changed and included a broader word.

O novo filme de Sexta-Feira 13 foi cancelado pelo estúdio.

*Estúdio de Sexta-Feira 13 cancela lançamento **de** novo longa-metragem.*

Analysis:

On the first sentence, it is clear which movie was cancelled by the studio, but the second it is not, it could be anyone, the only thing we know is that it was supposed to be made by the same studio of “Friday the 13th”.

Ao voltar de Nova York, bilionário é preso no Brasil, acusado de participar de esquema de corrupção.

*Ao chegar de Nova York, bilionário **corrupto** é preso no Brasil.*

Analysis:

The first sentence says that the billionaire was accused of being corrupt, while the second asserts that he already is considered as such, making them different in meaning.

O Telescópio Hubble registrou o exato momento em que uma estrela gigante vermelha morreu.

Estrela gigante vermelha morre e o telescópio Hubble captura o momento exato do ocorrido

Analysis:

There is no change in meaning, only modifications on the order of words.

Table 8 summarizes the correct answers to the general questions from phase 3.

Table 8 – Correct answers of Phase 3

#	Correct Answer	#	Correct Answer	#	Correct Answer
1	Different Meaning	4	Different Meaning	7	Same Meaning
2	Same Meaning	5	Different Meaning		
3	Same Meaning	6	Different Meaning		

4.2.3. Experiment Validity

Smith (2003) and Gall, Gall and Borg (2007) indicate many problems that the internal validity of an experiment may present. Internal validity of an experiment is the extension of which the researcher controlled variables beyond the treatment, letting only the treatment to have relation with the observed effect. However, giving the following reasons, I believe they do not seem great threats to my research: each experiment was completely applied with each subject in a single day; all phases were randomized; and, both instruments and techniques are the same for all the treatment groups.

Those authors also mention problems with the external validity of experiments, which shall not be problems to this research once: the subjects were randomly selected for each treatment, then the treatment and selection interaction mentioned by Smith (2003) should be mitigated; this study can be replicated in future researches; treatment is the same in both rounds, but since that the understandability considering the new information presented to them is the effect that I want to capture, I understand that it shall not be a problem.

According to Wooldridge (2002), experimental data are under the paradigm of the fixed explaining variable. Angrist and Piske (2009) understand that experiments can assure interest variables to be independent of possible results, which enables to compare the different treatments.

5. RESULTS

5.1. Archival

Before I could analyze the notes from 2012-2015, I had to verify which of them were more suitable for my research. That happened because Coh-Metrix has a limitation: it is not possible to process texts larger than 15,000 characters. Thus, I had to choose extractions of notes to perform my research. Firstly, I chose seven different notes that usually have more text in it: Operations/Corporate (or General) Information, Presentation of Financial Statements, Accounting policies/practices, New Standards, Financial Instruments/Risk Management, Provisions/Contingencies, and Equity. From those, I verified that some companies present the notes of New Standards and Presentation of Financial Statements with Accounting policies/practices. Therefore, I excluded those two from my analysis.

To verify which of the five remaining notes were more suitable to represent all notes of the financial statements, I compared each one of the intelligibility indexes of the partials with the whole note. However, this comparison can only be made in Portuguese, given the Coh-Metrix limitation aforementioned. Once some of the specific notes have more than 15,000 characters, and that words in Portuguese are usually longer, I opted to analyze the first 15,000 characters of the note in English. Then, I extracted from the notes in Portuguese the equivalent parts of the extractions in English and compared those with the whole document.

It is important to highlight that some of the indexes consider the size of sentences/paragraphs. Accordingly, I could not get the exact 15,000 characters in cases where it would cut a sentence or paragraph. Consequently, I excluded incomplete sentences and or paragraphs. Hence, if the last sentence was a heading, it was also excluded from the analysis.

Moreover, I could only analyze those firms that had information for all four years both in English and in Portuguese, and those that the conversion of documents from pdf to Word® was possible. The remaining sample comprised 44 firms, i.e., a total of 176 firm-year observations. Table 9 presents how I got to this sample.

Table 9 – Research sample

Initial sample	72
I could not find the financial statements for, at least, one of the languages and in, at least, one of the years	(18)
I could not convert at least one statement from pdf to Word®	(10)
Final sample	44

The exclusions I made of Table 9 were necessary to compare firms information in English and Portuguese. Therefore, I was able to perform a paired average test. Thus, I controlled for firms characteristics by using the same companies for both languages.

The final sample comprises the firms of Table 10.

Table 10 – Studied firms

Banco do Brasil	Duke	JBS	Paulista
BRF	Eletropaulo	Klabin	Petrobras
Brmalls	Embraer	Kroton	Qualicorp
CBD	Engie	Light	Sabesp
CEB	Estácio	Localiza	Saraiva
Cemig	Fibria	Lupatech	SLC
CESP	Gafisa	Magnesita	Telefônica
Cielo	Gerdau	Marfrig	Tim
Copel	Gol	Mills	Ultrapar
CSN	Hypermarcas	MRV	Vale
Cyrela	Iochpe-Maxion	Oi	Weg

Coh-Metrix and Coh-Metrix-Port are not very specific about how they separate sentences. I tested it and verified that they do not consider colons and semicolons as sentences separators. So, I removed all commas and converted all colons and semicolons in periods. Similarly, instead of removing headings, as Loughran and McDonald (2014), I put periods in it. This way, the end of the sentence would always be the periods, making all reports comparable. Using those premises allow firms that present their information in topics to have better scores in readability, for instance.

The numbers, including dates, were also excluded from the analysis, as in Loughran and McDonald (2014). Abbreviations such as ‘a.a.’, ‘p.a.’, ‘e.g.’ and ‘i.e.’ were also eliminated. I excluded all dashes and parentheses, once the comments they present may be considered part of the sentence in which they are included. And tables were removed so the only written text would be analyzed.

On Table 9, I present the mean test results from Stata® for each intelligibility index, comparing the difference/similarity between the full note and the partials. I was not able to use all 44 firms of my sample in such test because Coh-Metrix-Port showed an error message³ for 2 of them (CESP and Iochpe-Maxion). The website is not clear on what causes such error. Other firms' notes presented the same error, but on those, I was able to identify what was causing it. Mainly, the error is related to characters of foreign languages, e.g., è, ñ, ö, ä, and even à (when it was inside a word or name, such as "Sàrl"). Besides, markers like ° and ª also caused it. This error is related to some parts of the text, not all of it; thus, even though I did not include these firms on the choice of the notes that will be analyzed, I was able to include them on the analysis by note, once no error message appeared for these partials.

To verify if the mean test should be parametric or not, I performed a Kolmogorov-Smirnov test in each variable. To the pairs where both had a distribution similar to normality, I performed t-tests; to the others, I used a Wilcoxon signed-rank test which, according to Fávero et al. (2009), is an alternative when the t-test assumptions are not verified.

Table 11 – Mean test: Full notes x Partial notes

Variables	Financial				
	Operations	Policies	Instruments	Provisions	Equity
Adjective incidence	$z = 3.427^{***}$	$z = -5.608^{***}$	$z = -1.894^{**}$	$z = -3.389^{***}$	$z = 1.382^*$
Adverb incidence	$z = 3.466^{***}$	$z = -4.270^{***}$	$z = 0.894$	$t = -1.400^*$	$z = 4.745^{***}$
Content word incidence	$z = -4.762^{***}$	$z = -3.883^{***}$	$z = 4.608^{***}$	$z = -1.834^{**}$	$z = 5.083^{***}$
Flesch index	$t = 2.381^{**}$	$z = 5.633^{***}$	$z = -2.870^{***}$	$z = 4.309^{***}$	$z = -4.733^{***}$
Function word incidence	$z = 4.879^{***}$	$z = 3.614^{***}$	$z = -4.420^{***}$	$z = 1.898^{**}$	$z = -5.083^{***}$
Mean sentences / paragraph	$t = -2.695^{***}$	$z = -2.613^{***}$	$z = 0.738$	$t = -3.751^{***}$	$z = 5.052^{***}$
Mean syllables / content word	$z = 3.188^{***}$	$z = -5.377^{***}$	$z = -0.013$	$z = -2.669^{***}$	$z = 2.382^{***}$
Mean words / sentence	$z = -3.324^{***}$	$z = -1.007$	$z = -0.806$	$z = -2.507^{***}$	$z = -0.819$
Noun incidence	$z = -5.579^{***}$	$z = 5.570^{***}$	$z = 2.995^{***}$	$z = -1.510^*$	$z = -1.532^*$
Pronoun incidence	$z = 1.782^{**}$	$z = -3.845^{***}$	$z = -3.182^{***}$	$z = -3.842^{***}$	$z = 5.020^{***}$
Verb incidence	$z = 5.566^{***}$	$z = -5.633^{***}$	$z = 2.257^{**}$	$z = 4.464^{***}$	$z = 4.758^{***}$
Incidence of ANDs.	$z = -3.181^{***}$	$z = -3.870^{***}$	$z = -1.969^{**}$	$z = 0.991$	$z = 4.783^{***}$

³ Coh-Metrix Port showed the following Error Message:

“Internal Server Error

The server encountered an internal error and was unable to complete your request. Either the server is overloaded or there is an error in the application.”

Incidence of IFs.	t = 7.972***	t = -6.047***	t = 2.774***	t = 10.658***	z = 5.233***
Incidence of ORs.	t = -2.314**	z = -4.995***	z = 0.844	t = 8.328***	z = 1.669**
Incidence of negations	t = 10.977***	z = -3.495***	z = 1.357*	z = -0.097	z = 2.745***
Logic operators incidence	t = -2.330**	t = -10.578***	z = -0.656	z = 2.922***	z = 4.808***
Content words frequency	t = -6.398***	t = 9.565***	z = 4.570***	z = -2.171**	z = -2.745***
Min among content wrd freq	t = -0.805	t = 3.486***	t = -1.556*	t = 2.086**	t = -0.805
Mean hypernyms / verb	z = -1.574*	t = 7.386***	z = 0.588	z = -2.060**	z = -4.995***
Personal pronouns incidence	t = 4.718***	t = -2.342**	t = 1.805**	t = 1.095	t = 4.718***
Mean pronouns / noun phrase	t = 6.979***	t = -1.615*	t = 1.476*	t = -0.230	t = 6.979***
Type to token ratio	t = -18.213***	t = -41.290***	t = -22.235***	t = -20.792***	t = -18.213***
Modifiers / Noun Phrase	z = 1.691**	z = -1.594*	z = 2.520***	z = -1.089	z = 4.389***
Noun Phrase Incidence	t = -2.231**	t = -0.613	t = -2.797***	t = 0.389	t = -2.231**
Words before Main Verb	z = 1.289*	t = -1.783**	z = 0.794	z = 1.626*	z = -0.306
Connectives incidence	t = -1.794**	z = -4.708***	z = -2.326	z = 0.654	z = 5.445***
Additive negative connectives	t = 0.484	z = 0.994	z = 2.745***	t = -0.393	t = 0.484
Additive positive connectives	t = -4.066***	t = -4.189***	z = -1.482*	t = -1.177	z = 5.208***
Additive connectives	t = -3.453***	t = -4.231***	t = -1.243	t = -0.340	t = -3.453***
Causal negative connectives	t = 0.827	t = -1.021	t = 1.704**	t = 0.919	t = 0.827
Causal positive connectives	z = 3.078***	z = -1.082	z = -2.770***	t = -0.381	z = 4.220***
Causal connectives	t = 3.363***	t = -1.304*	t = -2.806***	t = 0.264	t = 3.363***
Logical negative connectives	t = 0.051	t = -0.862	t = 2.819***	t = -0.167	t = 0.051
Logical positive connectives	z = 2.676***	z = -3.582***	z = -0.781	t = -1.617*	t = 2.843***
Logical connectives	t = 3.005***	t = -4.299***	t = -0.185	t = -0.985	t = 3.005***
Temporal negative connectives	z = 4.464***	t = 1.340*	t = 3.687***	t = -0.099	z = 2.552***
Temporal positive connectives	z = 1.976**	z = -5.420***	z = 3.970***	z = 1.860**	z = 3.120***
Temporal connectives	t = 1.340*	t = -8.623***	t = 4.992***	z = 2.119**	z = 3.070***
Ambiguity of adjectives	z = 2.222**	t = 0.182	t = -2.980***	z = 5.319***	z = -3.732***
Ambiguity of adverbs	z = -0.816	z = 1.363*	z = 1.957**	z = -1.607*	z = 0.456
Ambiguity of nouns	z = 5.566***	t = -9.473***	z = 1.669**	z = 1.199	z = -5.633***
Ambiguity of verbs	z = -0.823	z = -5.383***	z = 4.395***	z = 2.780***	z = 0.794
Adjacent argument overlap	z = -0.978	z = 0.775	z = -0.219	z = 4.179***	z = -4.007***
Argument overlap	t = -6.485***	t = -9.136***	t = -12.724***	t = -9.581***	t = -6.485***
Adjacent stem overlap	z = 1.043	z = -4.858***	z = -0.656	z = 4.918***	z = -3.220***

Stem overlap	t = -6.192***	z = -5.645***	z = -5.595***	t = -7.586***	z = -5.645***
Adjacent content word overlap	z = 0.279	z = -4.558***	t = 0.665	z = 4.736***	z = -3.576***
Adjacent anaphoric references	t = 1.730**	t = -2.956***	t = 1.704**	t = 0.092	t = 1.730**
Anaphoric references	t = 3.240***	t = -2.843***	t = 2.196**	t = -0.694	t = 3.240***
* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.					

Analyzing Table 11 allowed me to choose two notes for further investigation: Financial Instruments and Provisions. Those are the notes with a greater resemblance to the full report. Financial Instruments is not different from the full report, statistically, in 19 of the 49 indexes, at a 5% significance level, while Provisions is not statistically different from the full notes in 24 indexes. Together, both notes are equal to the full report in 34 different indexes.

Only in a few indexes Operations, Policies, and Equity (Ambiguity of adjectives, Ambiguity of verbs, Temporal connectives, and Temporal negative connectives) were equal to the full report when Financial Instruments and Provisions were not. Thereby, including any of these three notes in this study do not show much value because the chosen notes already capture most of the similarity to the full note.

There are some differences in the calculations of Coh-Metrix and Coh-Metrix-Port. As Pasqualini, Scarton, and Finatto (2011), not all metrics can be compared because each system has its metrics, and some are not compatible given the source of the data used to calculate the indexes. Thus, I only considered the variables that are calculated in the same way in both languages. The chosen variables are presented in Table 12 and represents 28 readability and intelligibility indexes, in out of those, 15 indexes of Financial Instruments and Provisions were significantly equal to the full note.

Table 12 – Variables chosen for this study

Readability indexes		Intelligibility indexes
Flesch index	Adjective incidence	Connectives incidence ^{1 2}
Mean sentences / paragraph ¹	Noun incidence ²	The incidence of additive connectives ^{1 2}
Mean syllables / word	Adverb incidence ¹	The incidence of causal connectives ²
Mean words / sentence ¹	Pronoun incidence	The incidence of logical connectives ^{1 2}
Number of Paragraphs	Verb incidence	The incidence of temporal connectives
Number of Sentences	Mean hypernyms / verb	Adjacent argument overlap ¹

Number of Words	Personal pronouns incidence ²	Argument overlap
	Type to token ratio	Adjacent stem overlap ¹
	Modifiers / Noun Phrase ²	Stem overlap
	Noun Phrase Incidence ²	Adjacent content word overlap ¹
Words before Main Verb ^{1 2}		
¹ Variables that the note of Financial Instruments was indistinguishable from the full note, in a 5% significance level; ² Variables that the note of Provisions was indistinguishable from the full note, in a 5% significance level.		

As previously mentioned, the readability index chosen for this study was the Flesch. Its components are word length, which can be represented by “Mean syllables per word” and sentence length, calculated as “Mean words per sentence”. Other indexes presented in Table 10 related to readability were: “Mean sentences per paragraph” “Number of Paragraphs” “Number of Sentences” and “Number of Words”. All others can be considered indexes for intelligibility.

On the next subsections, I present the analysis for both of the chosen notes, as well as the comparison between notes and languages.

5.1.1. Readability Indexes

Figure 5 presents the classification of the firms from my sample, according to the classification of Flesch and Martins et al. (1996), presented in Table 4.

Figure 5 – Samples classification

Using the classifications of Figure 5, I found that for notes in English, 74.4% of my sample was classified as “Very difficult” for the note of Financial Instruments, while the rest

is considered “Difficult”, and 54.5% was “Very difficult” and 45.5% was “Difficult” for the note of Provisions. The proportion of Financial Instruments is not much different from the sample of Smith and Smith (1971), where 73.5% was “Very difficult”, and 26.5% was “Difficult”.

For notes in Portuguese, the results are similar for Financial Instruments but much different for Provisions. The percentage of “Very difficult” was 72.7% for the first and 93.2% for the second. The rest was classified as “Reasonably difficult”, as the classification of Portuguese diverges from the one in English, as shown in Table 4. It is important to highlight that Coh-Metrix-Port does not directly calculate the variable “Mean syllables per word”; it only calculates “Mean syllables per content word”. To find the first, I had to use the Flesch index formula as follows:

Adapted Flesch index

$$= -84.6 \times (\text{Number of syllables/Number of words}) - 1.015 \\ \times (\text{Number of words/Number of sentences}) + 248.835$$

$$\text{Flesch index} = -84.6 \times \text{Mean syllables per word} - 1.015 \times \text{Mean words per sentence} \\ + 248.835$$

$84.6 \times \text{Mean syllables per word}$

$$= -\text{Flesch index} - 1.015 \times \text{Mean words per sentence} + 248.835$$

Mean syllables per word

$$= \frac{-\text{Flesch index} - 1.015 \times \text{Mean words per sentence} + 248.835}{84.6}$$

I present the Descriptive Statistics of the readability indexes in Table 13, for both languages⁴, which, according to Pasqualini, Scarton, and Finatto (2011), are the lexical metrics. I also tested if both languages had the same scores, on Table 14, in which I tested if

⁴ Documents 2 and 3 of the Appendix present the descriptive statistics by year.

the scores of both languages were, on average, statistically equal (using t-test or Wilcoxon, according to normality tests of differences).

Table 13 – Descriptive statistics: Readability Indexes

Variable	n	Mean	SD	Min	0.25	Median	0.75	Max
Financial Instruments								
Portuguese								
Flesch index	176	23	4.43	13.54	20.43	22.9	25.15	46.93
Mean sentences per paragraph	176	1.55	0.26	1.16	1.4	1.5	1.63	2.9
Mean syllables per word	176	2.41	0.05	2.16	2.37	2.41	2.44	2.54
Mean words per sentence	176	21.96	2.23	14.81	20.55	21.61	23.4	31.89
Number of Paragraphs	176	58.81	16.87	9	47	60	70	102
Number of Sentences	176	90.22	25.52	14	74.5	94	109.5	149
Number of Words	176	1976.98	548.87	271	1580	2105	2434	3267
English								
Flesch index	176	27.98	4	14.1	25.17	28.33	30.04	45.78
Mean sentences per paragraph	176	1.57	0.26	1.18	1.4	1.53	1.69	2.72
Mean syllables per word	176	1.87	0.04	1.69	1.85	1.87	1.9	1.98
Mean words per sentence	176	19.96	2.24	14.12	18.6	19.92	21.25	29.06
Number of Paragraphs	176	58.37	17.3	7	47	60	69.5	102
Number of Sentences	176	90.78	26.75	15	74.5	93.5	112	151
Number of Words	176	1802.53	522.14	272	1424	1895	2262	3165
Provisions								
Portuguese								
Flesch index	176	17.12	5.67	-9.49	13.74	17.19	20.76	30.19
Mean sentences per paragraph	176	1.81	0.41	1.2	1.54	1.7	1.97	3.13
Mean syllables per word	176	2.47	0.06	2.33	2.42	2.46	2.49	2.76
Mean words per sentence	176	22.81	3.53	12.37	21	23.29	24.75	32.28
Number of Paragraphs	176	33.85	16.52	6	21.5	33	43.5	90
Number of Sentences	176	61.6	33.34	9	36	57	86	161
Number of Words	176	1388.03	730.4	175	779.5	1253	2100.5	3968
English								
Flesch index	176	28.8	4.88	13.41	25.99	29.45	32.2	41.25

Mean sentences per paragraph	176	1.83	0.4	1.2	1.57	1.71	2	3.08
Mean syllables per word	176	1.84	0.06	1.73	1.8	1.83	1.88	2.03
Mean words per sentence	176	21.85	3.55	12.59	19.34	22.04	24.25	29.61
Number of Paragraphs	176	33.83	16.31	6	21	33	43	83
Number of Sentences	176	62.49	33.31	9	35.5	58.5	87	156
Number of Words	176	1353.81	708.42	168	747.5	1230	2125	2479

Table 14 – Mean/Median tests Portuguese vs English: Readability Indexes

Table 14: t-test/Median tests Portuguese vs English. Readability indexes					
Variables	Normality (Sigma)		Normality?	t / z	95% CI
	Portuguese	English			
Financial Instruments					
Flesch index	0.018	0.022	No	z = -10.801***	Different
Mean sentences per paragraph	0.000	0.002	No	z = -3.141***	Different
Mean syllables per word	0.042	0.071	No	z = -11.505***	Different
Mean words per sentence	0.026	0.200	No	z = -11.170***	Different
Number of Paragraphs	0.200	0.200	Yes	t = -0.965	Equal
Number of Sentences	0.018	0.200	No	z = -1.707**	Equal
Number of Words	0.000	0.000	No	z = -11.166***	Different
Provisions					
Flesch index	0.200	0.008	No	z = -11.505***	Different
Mean sentences per paragraph	0.000	0.000	No	z = -2.857***	Different
Mean syllables per word	0.000	0.001	No	z = -11.505***	Different
Mean words per sentence	0.001	0.076	No	z = -7.095***	Different
Number of Paragraphs	0.013	0.001	No	z = -1.610*	Equal
Number of Sentences	0.016	0.037	No	z = -4.188***	Different
Number of Words	0.001	0.000	No	z = -4.722***	Different
* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.					

The means of Table 13 present differences between English and Portuguese, but almost all variables have the same behavior when we look at the types of notes. On average, the sample is classified as “Very difficult” once the means of Flesch index are below 30 for English and below 25 for Portuguese.

It is possible to verify that the means of the Flesch index are higher in English, on both types of notes. When looking at the means test, one may conclude that they are, in fact, statistically different in a 5% significance level. These results are in accordance to Pasqualini, Scarton, and Finatto (2011), who analyzed short stories, and found that texts in English were more readable than their versions in Portuguese.

The means of “Mean syllables per word” in both notes have the big differences between English and Portuguese, but the greatest difference between languages belongs to “Flesch index” of the Provision notes. No readability variable showed a great standard deviation, in comparison to the mean (over 35%), in any studied language of Financial Instruments. For Provisions, the variables “Number of paragraphs” “Number of sentences” and “Number of words” have standard deviations that are at least 48% of the mean for both languages.

For Financial Instruments and Provisions, all variables have a median similar to the mean.

Figure 6 – Box-plots: Readability Indexes

Figure 6 presents the boxplots of the readability index. The variables were standardized (subtracted the mean and divided by the standard deviation), so they could be compared and put on the same scale (from -5 to 10).

As it is possible to verify, the outliers of the variables are very different in each one of them, which makes difficult to exclude anyone from the analysis. “Mean sentences per paragraph” has many outliers in both languages and both notes, and, even though they change depending on the type of note, when one look at the languages, many of them appear both in English and in Portuguese. “Mean words per sentence” and “Mean syllables per word” have many outliers in Provisions – Portuguese, however, they do not have as many outliers for the same note in English. “Number of sentences” “Number of words” and “Number of Paragraphs” have few outliers in all cases. The cases of many outliers indicate a distribution with large tails, which is a positive kurtosis (Seltman, 2015). It explains the deviation from normal distribution found in Table 14.

It is possible to verify that the size of the boxes are not very different in all variables, which means that their dispersion is similar. The whiskers, the lines in forms of “T”s, above and below the box, which are the greatest and lowest observations that are not outliers, also do not vary much in all scenarios.

The position of the median, the line that cuts the box in two, and the whiskers show the symmetry of the distribution. The Flesch index seems quite symmetrical, while “Number of sentences” and “Number of Words” are not, being positively skewed, once, as Seltman (2015), the longer whisker is the one in the top.

I also calculated the correlations among those variables, separately for each language. Given the size of the table, I opted to present it as Appendix (Documents 4 and 5). On the overall, all correlations showed similar behaviors in English and Portuguese.

In Financial Instruments and Provisions, the “Flesch index” is highly and negatively correlated with “Mean syllables per word” in both languages. Considering that the last is calculated as the average number of syllables divided by the number of words, the correlation makes sense once one of the components of the Flesch index is the average number of syllables per word, which is subtracted from a constant. Similarly, the variable “Mean words per sentence” is also negatively correlated to the “Flesch index”. In Portuguese, “Flesch index” is negatively correlated with “Adjective incidence”; this may suggest that sentences with more adjectives are less readable in this language.

Other high correlations in both languages and for both types of notes are: type to token ratio to number of sentences, number of words, and number of paragraphs (negatively); number of sentences, number of words, and number of paragraphs are all positively correlated to one another; and mean words per sentence with adjacent argument overlap, argument overlap, adjacent stem overlap, and stem overlap (positively).

For Provisions (Portuguese), “Number of paragraphs”, “Number of sentences”; and “Number of words” are highly and negatively correlated with some connectives (all, causal, and logical) and to some incidences (adjectives and nouns), which may suggest that for longer texts, the incidence of such words was inferior to those of smaller texts.

I also calculated the correlations of each variable in both languages, as shown in table 15, and, representing in images these correlations, on Figure 7 I presented Graphs with the relationship between each variable in both languages.

Table 15 – Correlations Portuguese vs English: Readability Indexes

Variables	Correlations	
	Financial Instruments	Provisions
Flesch index	0.5060	0.5953
Mean sentences per paragraph	0.9368	0.9588
Mean syllables per word	0.4439	0.5829
Mean words per sentence	0.7929	0.8981
Number of Paragraphs	0.9367	0.9812
Number of Sentences	0.9216	0.9846
Number of Words	0.9429	0.9788

It is possible to verify by the slope of Figure 7 and by the signals of Table 13, that all correlations are positive, as expected once it is the same text analyzed in two different languages.

Financial Instruments

Provisions

Figure 7 – Portuguese vs. English: Readability Indexes

The correlation of “Number of Paragraphs” can be explained once the English statement is a translation of the version in Portuguese; thus, it would be unusual to modify too much the number of paragraphs and sentences. It is also supported by the means tests mentioned earlier (Table 14), which compared both languages, and showed that they were indistinguishable in Financial Instruments and Provisions. “Number of Sentences” also showed a high correlation

on both languages, also probably caused by translation, but they are not statistically equal for Provisions. Therefore, these two correlations explain the high correlation of “Mean sentences per paragraph”; which is also statistically different from one language to the other.

“Number of Words” is also highly correlated and different in each language as in the average test. Furthermore, “Mean words per sentence” has a high correlation given the high correlation of its components. The lower correlation of “Mean syllables per word” is in accordance to Martins et al. (1996) that found that words in Portuguese are usually longer than words in English.

Figure 8 presents the evolution of means for each variable in both languages and both studied notes. Each Graph of Figure 8 is on different scales to allow better visualization.

It is important to remember that the OCPC 07 was published at the end of 2014; thus, I expected that if the readability is close to understandability, at least for Portuguese, the indexes should improve for 2014 and 2015, once a better quality of information was now demanded.

Figure 8 – Variables' means evolution: Readability Indexes

It is possible to verify that the lines for each type of note have basically the same shape, thus, even though the indexes have different scores, they present a similar variation, i.e., the shape of the blue (slash-dot) line is similar to the pink (solid), while the green (slash) line has a form similar to the black one (slash-dot-dot).

“Flesch index” has an evolution visually different for each of the four scenarios. It can be explained by how each of its components behaved. “Means sentences per paragraph” shows that the similarity is due to the type of note; thus, the length of the paragraph will depend on the type of note analyzed. In “Mean syllables per word” the relation seems stronger for language, therefore, as in the previous literature (Martins et al., 1996), the size of the word is likely related to the reported language. “Mean words per sentence” has similar shapes on all four lines, but the scores have, at least, 1 point of difference between them.

“Number of paragraphs” “Number of sentences” and “Number of words” present a clear relationship between the lines. In all these cases, the line of Portuguese – Provisions is closer to the line of English - Provisions. It also happens with the lines of Financial Instruments, which indicates that the size of a text depends more on the type of note, and not so much on the language. It, again, can be explained by the fact that the English notes studied are direct translations of the notes in Portuguese.

Even though the indexes “Number of paragraphs” “Number of sentences” and “Number of words” suggested an improvement to their scores while the others did not, I conducted an average test to verify if they were all statistically indistinguishable. As a reminder, an improvement for Flesch index would imply an increase in its scores, on the other hand, an improvement for the other six indexes means a decrease of their scores.

To verify if the graphs of Figure 8 were statistically equal, I performed an Analysis of Variance (ANOVA), when it presented all the assumptions necessary for this test (normality and homogeneity of variance), on the observations of all four years. When any of those two assumptions were not met, I performed a Friedman test. I tested the normality through a Kolmogorov-Smirnov test, and I tested the homogeneity of variances through Levene. I presented the results in Table 16.

Table 16 – Mean test (from 2012 to 2015): Readability indexes

Variables	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	Normality	Sigma	Normality	Sigma	Normality	Sigma	Normality	Sigma
Flesch index	No	0.927	No	0.109	Yes	0.353	Yes	0.805
Mean sentences / paragraph	No	0.685	Yes	0.952	No	0.098	No	0.094
Mean syllables / word	Yes	0.874	No	0.383	No	0.114	No	0.014
Mean words / sentence	No	0.746	Yes	0.503	No	0.658	Yes	0.701
Number of Paragraphs	Yes	0.626	Yes	0.527	Yes	0.952	Yes	0.940
Number of Sentences	Yes	0.685	Yes	0.659	Yes	0.997	Yes	0.974
Number of Words	No	0.283	No	0.189	No	0.342	No	0.659

To all variables I could not reject the hypothesis of homogeneity of variances, that is why I did not present the results in Table 16. At a 5% significance level, I could not reject the hypothesis that all years are equal in any of the readability indexes of Figure 8, except for “Mean syllables per word” (Provisions – English). Only after taking the year of 2012 from the Friedman analysis the hypothesis of equality was not rejected (sigma of 0.252). All other variables presented $\sigma > 0.05$. It is evidence that the readability indexes do not change much from one year to the other. These results conform with the findings of Lewis (1986), who did not find improvements in Flesch index for “Operations review” extract from financial reports to employees.

5.1.2. Intelligibility Indexes

For better display, I analyzed each variable in small groups.

5.1.2.1. Connectives

The connectives are calculated differently in Coh-Metrix and Coh-Metrix-Port, but it is possible to make them equivalent. Coh-Metrix-Port calculates separately negative and positive connectives for each index. Coh-Metrix, on the other hand, calculates negative and positive connectives for all connectives indexes, and for each index, it does not distinguish positive from negative. Thus, I transformed Coh-Metrix-Port connective indexes into those of

Coh-Metrix. The calculation presented applies to all four kinds of connectives (additive, causal, logical, and temporal).

Given that:

$$INC = \frac{NNC}{\frac{NW}{1000}} \rightarrow INC = NNC \times \frac{1000}{NW} \rightarrow NNC = INC \times \frac{NW}{1000}$$

$$IPC = \frac{NPC}{\frac{NW}{1000}} \rightarrow IPC = NPC \times \frac{1000}{NW} \rightarrow NPC = IPC \times \frac{NW}{1000}$$

Where:

INC = Incidence of Negative Connectives;

NNC = Number of Negative Connectives;

IPC = Incidence of Positive Connectives;

NPC = Number of Positive Connectives; and

NW = Number of Words.

It is possible to use these formulas into the calculus of all connectives:

$$C = \frac{(NNC + NPC)}{\frac{NW}{1000}} \rightarrow C = (NNC + NPC) \times \frac{1000}{NW} \rightarrow$$

$$\rightarrow C = \left(INC \times \frac{NW}{1000} + IPC \times \frac{NW}{1000} \right) \times \frac{1000}{NW} \rightarrow$$

$$\rightarrow C = INC + IPC$$

Where C is the connective calculated as in Coh-Metrix. Therefore, to make both software equivalents, I need to sum each negative connective from Coh-Metrix-Port to its positive index.

In Table 17, I present the descriptive statistics for the incidence of all connectives incidence calculated by Coh-Metrix and Coh-Metrix-Port⁵.

⁵ Documents 2 and 3 of the Appendix provides the descriptive statistics by year.

Table 17 – Descriptive statistics: Connectives

Variable	n	Mean	SD	Min	0.25	Median	0.75	Max
Financial Instruments								
Portuguese								
All connectives	176	78.99	6.77	63.72	74.82	78.76	84.05	103.32
Additive connectives	176	45.16	7.37	23.98	40.44	44.97	49.65	70.11
Causal connectives	176	34.5	5.21	23.17	31.59	34.08	37.13	56.11
Logical connectives	176	25.36	5.29	7.38	22.3	26.01	28.1	37.78
Temporal connectives	176	5.7	2.4	0	3.96	5.62	7.23	12.25
English								
All connectives	176	92.07	9.96	49.26	85.3	91.59	98.91	113.4
Additive connectives	176	49.36	7.83	27.09	43.94	49.74	53.71	69.85
Causal connectives	176	31.01	5.53	17.24	27.85	30.97	33.77	54.24
Logical connectives	176	27.16	5.72	2.46	23.63	26.93	30.56	40.91
Temporal connectives	176	14.44	4.82	3.68	10.75	14.69	17.63	34.54
Provisions								
Portuguese								
All connectives	176	74.6	13.09	51.56	65.07	71.52	81.09	110.14
Additive connectives	176	44.39	10.39	26.44	37.33	41.79	50	76.32
Causal connectives	176	32.54	8.57	16.39	27.09	31.15	35.9	66.67
Logical connectives	176	26.92	8.15	15.3	21.56	25.53	30.09	60.78
Temporal connectives	176	6.23	3.38	0	4.21	6.27	8.17	15.97
English								
All connectives	176	94.66	16.95	61.46	83.02	92.67	104.41	138.55
Additive connectives	176	41.61	11.09	17.52	33.81	40.27	48.16	69.28
Causal connectives	176	37.39	9	19.01	29.22	36.72	43.23	62.21
Logical connectives	176	28.81	9.4	10.1	23.02	28.09	32.44	76.04
Temporal connectives	176	17.25	8.58	5.33	11.67	15.62	19.98	60.4

Table 18 – Mean tests Portuguese vs English: Connectives

	Normality (Sigma)				
Variables	Portuguese	English	Normality?	t / z	95% CI
Financial Instruments					
All connectives	0.200	0.200	Yes	t = 18.727***	Different
Additive connectives	0.200	0.091	Yes	t = 11.476***	Different
Causal connectives	0.014	0.005	No	z = -6.632***	Different
Logical connectives	0.001	0.200	No	z = -4.004***	Different
Temporal connectives	0.200	0.200	Yes	t = 24.134***	Different
All connectives	0.200	0.200	Yes	t = 18.727***	Different
Provisions					
All connectives	0.000	0.009	No	z = -11.135***	Different
Additive connectives	0.000	0.200	No	z = -5.156***	Different
Causal connectives	0.000	0.015	No	z = -6.191***	Different
Logical connectives	0.000	0.000	No	z = -3.613***	Different
Temporal connectives	0.200	0.000	No	z = -11.281***	Different

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.

“Incidence of temporal connectives” has an English mean over a 100% greater than the one in Portuguese for both notes. Nevertheless, when I tested if they were, on average, statistically equal (Table 18), I rejected the hypothesis that all connectives variables were equal in both languages, in a 5% significance level. On the overall, English had more connectives than Portuguese, which is different from the findings of Pasqualini, Scarton, and Finatto (2011). As these authors say, connectives make the organization of a text, facilitating reading; thus, through my results, it is possible to say that English is easier to read because it presents a greater cohesion index.

The standard deviations are not as great in comparison to the means, except for “Incidence of temporal connectives”. These deviations showed relevant differences from the mean, i.e., over 40% in Financial Instruments, in Portuguese, and for Provisions, in both languages.

The median is not significantly different from the mean in any variable.

I presented the box plots for each variable and in both languages in Figure 9. As previously done for the readability indexes, the connective variables were standardized; thus, they can be compared. The cases of many outliers that appeared were “Incidence of causal connectives” in three out of four scenarios. “Incidence of logical connectives” and “Incidence of temporal connectives” have many outliers on Provisions for Portuguese and English, respectively. It means that the tails of their distribution are large, once there are many values far from the mean.

As for the readability indexes, all boxes have similar shapes, and the whiskers lines also have the same length, which indicates that the distribution of the variables is a little asymmetric.

Given that the outliers vary in each case, it was not possible to exclude all of them for future analysis without compromising the results.

For Financial Instruments, “Connectives incidence” is positively correlated to “Incidence of additive connectives” in both languages (0.76 in Portuguese, and 0.66 in English), which suggests that the additive connectives are the major portion of all connectives in this note.

For Financial Instruments, “Connectives incidence” is positively correlated to “Incidence of additive connectives” in both languages (0.76 in Portuguese, and 0.66 in English), which suggests that the additive connectives are the major portion of all connectives in this note.

On the other hand, in Provisions, “Connectives incidence “is positively correlated to all connectives types in English (0.74, Additive; 0.46, Causal; 0.48, Logical; and 0.53, Temporal) and to three of them, in Portuguese (0.80, Additive; 0.70, Causal; and 0.74, Logical). It shows an equilibrium of the use of connectives, not present at the Financial Instrument notes.

Furthermore, “Incidence of causal connectives” is positively correlated with “Incidence of logical connectives” in both languages (Financial Instruments: 0.59 in Portuguese, and 0.48 in English; Provisions: 0.83 in Portuguese, and 0.68 in English).

Again, I calculated the correlations of each variable in Portuguese and English (Table 19), and in Figure 10 I presented graphs with the relationship between each variable in both languages.

Table 19 – Correlations Portuguese vs English: Connectives

Variables	Financial Instruments	Provisions
All connectives	0.4397	0.6978
Additive connectives	0.7976	0.8037
Causal connectives	0.2066	0.3894
Logical connectives	0.5599	0.5921
Temporal connectives	0.2559	-0.0440

“Incidence of additive connectives” present high correlations, and translation can explain it. For most variables, Provisions showed a higher correlation between the two languages, in comparison to Financial Instruments.

Financial Instruments

Provisions

Figure 10 – Portuguese vs English: Connectives

Figure 11 presents the evolution of means between 2012 and 2015. The graphs of Figure 11 are on different scales so that they can be better visualized. Plus, in Table 20 I present the results of the tests if they were indistinguishable from each other.

The green (Financial Instruments in Portuguese) and black lines (Financial Instruments in English) have similar shapes but are concentrated in different levels. The other two are not as alike. The means do not change much in any studied year in all connectives indexes, i.e., the lines are almost a straight line in many cases, which may indicate that the use of connectives does not change much on the Financial Instruments notes, in any language. However, on Provisions, there seem to be greater variations. Most of them show an increase of connectives uses for some variables, especially for English, which indicates an improvement on the information provided on this note.

To complement this analysis, in Table 20 I executed an ANOVA or Friedman tests, based on the results of the Kolmogorov-Smirnov test for Normality, and the Levene test for homogeneity of variances.

With the Levene test, I did not reject the hypothesis of homogeneity of variances, so the choice between ANOVA and Friedman was based on the results of the Kolmogorov-Smirnov test of Normality.

Table 20 – Means test (from 2012 to 2015): Connectives

Variables	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	Normality	Sigma	Normality	Sigma	Normality	Sigma	Normality	Sigma
All connectives	Yes	0.776	Yes	0.557	No	0.293	No	0.007
Additive connectives	Yes	0.953	Yes	0.892	No	0.586	No	0.569
Causal connectives	No	0.094	No	0.491	No	0.810	Yes	0.763
Logical connectives	No	0.306	Yes	0.923	No	0.888	No	0.025
Temporal connectives	Yes	0.707	No	0.640	Yes	0.726	No	0.262

Figure 11 – Variables' means evolution: Connectives

In a two-tailed test, I rejected the hypothesis that all years are equal, with a 95% confidence level, only for “Connectives incidence” and “Incidence of logical connectives”, both for Provisions notes in English. All other variables have a sigma above 0.05. These two variables from 2012 to 2014 did not present a normal behavior, thus, I performed a new Friedman test without 2015, and I found that the means of all other years can be considered equal, in a 5% significance level (sigma of 0.084 for the first and of 0.441 for the latter). It means that the year 2015 showed an improvement in the use of these writing tools.

5.1.2.2. Incidences of Content Words and Personal Pronouns

As mentioned earlier, content words are nouns, verbs, adverbs, and adjectives. Moreover, “Personal Pronouns Incidence” is calculated differently on Coh-Metrix and Coh-Metrix-Port. Coh-Metrix opens this index calculations in “First person singular” “First person plural” “Second person” “Third person singular” and “Third person plural”. Coh-Metrix-Port calculates all of them together, thus, to make them equivalent, I performed the same calculations for the connectives, i.e., I summed each index of English to get to the index of Portuguese.

Table 21 presents the descriptive statistics for the incidence of all content words and personal pronouns⁶, and I tested if both languages have the same scores for each variable on Table 22, using t-test or Wilcoxon, according to the results presented of the normality tests of the differences:

Table 21 – Descriptive statistics: Content words and Personal Pronouns incidences

Variable	n	Mean	SD	Min	0.25	Median	0.75	Max
Financial Instruments								
Portuguese								
Adjective	176	88.11	10.31	45.02	82.4	89.59	95.72	119.14
Adverb	176	21.47	4.13	7.11	18.87	21.2	24.06	33.95
Noun	176	360.33	18.73	327.78	347.97	357	371.79	428.91
Pronoun	176	34	6.6	17.1	29.51	33.71	37.58	55.56

⁶ The descriptive statistics by year can be found on Documents 2 and 3 of the Appendix.

Verb	176	120.11	10.3	92.83	113.75	118.44	126.32	151.24
Personal pronouns	176	0.23	0.36	0	0	0	0.44	2.01
English								
Adjective	176	98.31	11.91	55.15	90.75	97.74	105.71	158.64
Adverb	176	21.04	3.68	12.1	18.67	21.2	23.44	36.83
Noun	176	372.84	15.68	325.78	361.64	372	383.94	419.08
Pronoun	176	15.05	5.19	1.82	11.1	14.44	18.2	31.1
Verb	176	108.64	8.63	80.88	103.74	109.45	114.38	125.89
Personal pronouns	176	6.61	3.87	0	4.02	6.07	8.53	34.48
Provisions								
Portuguese								
Adjective	176	91.66	16.62	54.5	79.97	91.22	100.34	155.56
Adverb	176	23.15	7.99	6.83	18.07	21.95	26.83	60.33
Noun	176	373.18	28.98	311.77	354.98	372.52	388.4	460.49
Pronoun	176	38.54	11.35	13.7	31.08	37.64	43.22	77.65
Verb	176	116.26	11.23	79.73	110.29	116.32	123.34	146.38
Personal pronouns	176	0.26	0.52	0	0	0	0.42	3.09
English								
Adjective	176	90.46	15.98	61.55	79.67	89.16	98.15	143.4
Adverb	176	20.57	6.02	7.51	16.97	19.9	23.51	37.7
Noun	176	360.98	21.82	306.45	347.29	360.61	373.55	425.82
Pronoun	176	10.41	5.06	0.96	7.52	9.77	13.05	40.94
Verb	176	108.75	11.38	78.31	100.76	108.95	116.36	139.78
Personal pronouns	176	2.86	3.68	0	1.02	2.16	3.37	38.46

Table 22 – Mean tests Portuguese vs. English: Content words and Personal Pronouns incidences

	Normality (Sigma)				
Variables	Portuguese	English	Normality?	t / z	95% CI
Financial Instruments					
Adjective incidence	0.006	0.200	No	z = -9.408***	Different
Adverb incidence	0.200	0.200	Yes	t = -1.216	Equal
Noun incidence	0.000	0.200	No	z = -8.276***	Different

Pronoun incidence	0.200	0.004	No	$z = -11.505^{***}$	Different
Verb incidence	0.001	0.011	No	$z = -10.434^{***}$	Different
Personal pronouns incidence	0.000	0.016	No	$z = -11.462^{***}$	Different

Provisions

Adjective incidence	0.200	0.029	No	$z = -0.855$	Equal
Adverb incidence	0.002	0.001	No	$z = -3.749^{***}$	Different
Noun incidence	0.016	0.200	No	$z = -6.642^{***}$	Different
Pronoun incidence	0.000	0.000	No	$z = -11.505^{***}$	Different
Verb incidence	0.200	0.200	Yes	$t = -8.18^{***}$	Different
Personal pronouns incidence	0.000	0.000	No	$z = -10.376^{***}$	Different

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.

The means of Table 21 present some differences between English and Portuguese. In Financial Instruments, “Pronoun incidence” has means of Portuguese that are reasonably greater than the ones in English. Oppositely, for this type of note, “Personal pronouns incidence” has means in Portuguese that are a lot greater than those in English. All other variables look similar, however, when I tested if they were, on average, statistically equal (using t-test or Wilcoxon), I found that only to “Adverb incidence” in Financial Instruments and for “Adjective incidence” in Provisions, I could not reject the hypothesis that they were equal in a 5% significance level, thus, to all others they can be considered different. It may imply that the sentences components are different in both languages, which seems reasonable, once its construction is different too. For instance, in Portuguese we do not use as many personal pronouns as in English, so, as Pasqualini, Scarton, and Finatto’s (2011) study results, we would expect a greater usage in the latter.

Regarding the standard deviation, the one that showed the greatest scores in comparison to its mean was the “Personal pronouns incidence” in both languages, in both types of notes, and in all studied years, as in Documents 2 and 3 of the Appendix. Thus, this variable is the one with the greatest variation of all connectives. Another variable that showed relevant differences from the mean (over 35%) was “Pronoun incidence” (for English in both notes), while the variables with the lowest (less than 10%) standard deviations were: “Noun incidence” and “Verb incidence” (in both languages and both types of notes).

In both studied notes, the median is significantly higher than the mean, only for Provisions (in Portuguese) of “Personal pronouns incidence”. All other variables have a median similar to the mean.

I presented the box plots for each variable and in both languages in Figure 12. As in the previous box-plot graphs, the ones in Figure 12 were standardized so they could be compared and put on the same scale.

Again, the outliers are very different in each scenario of each index. The Provisions notes have many outliers for both languages in almost all of the indexes of Figure 10, which indicates positive kurtosis, i.e., large tails. The boxes are similar in most of the indexes too, except for “Personal Pronouns incidence” to which the Financial Instruments in both languages do not have an inferior whisker, showing that is highly negatively skewed (left skewed).

Figure 12 – Box-plots: Content words and Personal Pronouns incidences

The calculated correlations can be found on Documents 4 and 5 of the Appendix. In general, all correlations had similar behaviors in English and Portuguese.

On Financial Instrument presented in Portuguese, “Noun incidence” is negatively correlated to “Adjective incidence” (Portuguese), “Adverb incidence” (Portuguese), and “Verbs incidence” (Portuguese), thus, the more nouns a Portuguese-written-text has, the fewer adjectives, adverbs, and verbs it uses.

On Provisions, “Adjective incidence” in Portuguese is highly and negatively correlated to Flesch index and most of its components presented on section 5.1.1, except for “Mean syllables per content word” which is positively correlated to it. Besides those, it is also positively correlated with “Type to token ratio” “Connectives incidence” “Incidence of causal connectives”, all in Portuguese. These stronger relationships are repeated in English for “Mean syllables per content word” “Number of Words” and “Type to token ratio”. It shows that some of the intelligibility indexes used in this study are somehow related to one another, but not completely, which indicates that each one of them may partially explain understandability.

To verify if a relationship exists in different languages, I calculated the correlations of each pair, as presented in Table 23. Furthermore, these relationships can also be viewed in Figure 13.

Table 23 – Correlations Portuguese vs English: Content words and Personal Pronouns incidences

Variables	Correlations	
	Financial Instruments	Provisions
Adjective incidence	0.5440	0.7430
Adverb incidence	0.2784	0.4391
Noun incidence	0.5764	0.6804
Pronoun incidence	0.5352	0.5780
Verb incidence	0.4143	0.4201
Personal pronouns incidence	-0.0096	0.1904

Except for “Personal pronouns incidence”, all other variables in Portuguese have relevant correlations to English.

The variables from Figure 13 are all in the same scale so they can be compared. None of them showed a straight-line tendency as clear as in Figure 7, but the slope of the fitting line created based on the data is similar in most of them.

Financial Instruments **Provisions**

Figure 13 – Portuguese vs. English: Content words and Personal Pronouns incidences

All graphs in Figure 13 are on a different scale to allow better visualization. It presents the evolution of means for each variable in both languages and both notes. For “Adjectives incidence” the similarity of shapes lies within the same type of notes, regardless of the language. To all other notes, the shape is different in all four scenarios.

To verify if the graphs of Figure 14 were statistically indistinguishable in each year, I did an ANOVA or a Friedman test. To choose between them, I performed a Kolmogorov-Smirnov test for Normality, and a Levene test for homogeneity of variances. I presented the results in Table 24. I could not reject the hypothesis of homogeneity of variances in all variables. Table 24 presents the results for Normality; if it was not rejected, I performed the ANOVA.

I rejected the hypothesis that all years are equal, in two-tailed test and a 5% significance level, for “Adjective incidence” (Provisions – English) and for “Personal Pronouns incidence” (Financial Instruments – Portuguese). Thus, it is not possible to verify any increase or decrease in such indexes. However, it was not expected for such variables to change much

anyway. What influences the understandability is more how these types of words are organized rather than how much they appear in a text.

Figure 14 – Variables' means evolution: Content words and Personal Pronouns incidences

Table 24 – Mean test (from 2012 to 2015): Content words and Personal Pronouns incidences

Variables	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	Normality	Sigma	Normality	Sigma	Normality	Sigma	Normality	Sigma
Adjective incidence	No	0.450	Yes	0.682	Yes	0.267	No	0.015
Adverb incidence	Yes	0.498	Yes	0.886	No	0.420	No	0.443
Noun incidence	No	0.065	Yes	0.908	Yes	0.974	Yes	0.732
Pronoun incidence	Yes	0.763	No	0.667	No	0.820	No	0.721
Verb incidence	No	0.165	No	0.186	Yes	0.956	Yes	0.629
Personal pronouns incidence	No	0.044	No	0.565	No	0.375	No	0.654

5.1.2.3. Overlaps

All overlap indexes are equivalent in Coh-Metrix and Coh-Metrix-Port. Table 25 presents the descriptive statistics for all variables in which an overlap was performed⁷.

Table 25 – Descriptive statistics: Overlaps

Variable	n	Mean	SD	Min	0.25	Median	0.75	Max
Financial Instruments								
Portuguese								
Adjacent argument	176	1.65	0.36	0.64	1.42	1.6	1.86	3.24
Argument	176	0.63	0.22	0.25	0.49	0.63	0.73	2.04
Adjacent stem	176	2.58	0.56	1.28	2.28	2.55	2.82	4.7
Stem	176	1.08	0.31	0.45	0.89	1.06	1.23	2.67
Adjacent content word	176	2.08	0.46	0.84	1.79	2.01	2.35	3.76
English								
Adjacent argument	176	0.66	0.09	0.36	0.62	0.67	0.72	0.84

⁷ Documents 2 and 3 of the Appendix provides the descriptive statistics by year.

Argument	176	0.49	0.07	0.32	0.44	0.51	0.54	0.74
Adjacent stem	176	0.7	0.09	0.38	0.65	0.71	0.76	0.91
Stem	176	0.55	0.07	0.35	0.5	0.55	0.6	0.76
Adjacent content word	176	0.15	0.03	0.07	0.13	0.15	0.16	0.23
Provisions								
Portuguese								
Adjacent argument	176	1.25	0.52	0.25	0.91	1.18	1.47	3.63
Argument	176	0.71	0.3	0.19	0.5	0.69	0.84	1.87
Adjacent stem	176	1.78	0.68	0.5	1.31	1.71	2.21	4.55
Stem	176	1.07	0.45	0.31	0.79	0.99	1.25	3.13
Adjacent content word	176	1.57	0.6	0.38	1.23	1.5	1.93	4.22
English								
Adjacent argument	176	0.56	0.12	0.22	0.48	0.57	0.64	0.85
Argument	176	0.45	0.1	0.19	0.39	0.46	0.52	0.69
Adjacent stem	176	0.61	0.12	0.22	0.53	0.62	0.69	0.87
Stem	176	0.5	0.1	0.22	0.44	0.5	0.56	0.74
Adjacent content word	176	0.11	0.03	0.04	0.09	0.1	0.12	0.19

Means of Table 25 present some differences between English and Portuguese. The variables of this sections have means that are reasonably greater in Portuguese than in English. This evidence is in accordance to what was found by Pasqualini, Scarton, and Finatto (2011). Their study found that indexes in English have smaller scores, which means that there is a lower repetition of words, stems, and arguments, which makes the text more complex. All other variables are similar in both languages.

Table 26 – Means tests Portuguese vs. English: Overlaps

Variables	Normality (Sigma)		Normality?	t/z	95% CI
	Portuguese	English			
Financial Instruments					
Adjacent argument	0.003	0.002	No	z = -11.505***	Different
Argument	0.000	0.001	No	z = -9.736***	Different
Adjacent stem	0.001	0.006	No	z = -11.505***	Different

Stem	0.004	0.010	No	$z = -11.504^{***}$	Different
Adjacent content word	0.005	0.200	No	$z = -11.505^{***}$	Different
Provisions					
Adjacent argument	0.001	0.200	No	$z = -11.372^{***}$	Different
Argument	0.000	0.200	No	$z = -10.701^{***}$	Different
Adjacent stem	0.002	0.002	No	$z = -11.504^{***}$	Different
Stem	0.000	0.200	No	$z = -11.505^{***}$	Different
Adjacent content word	0.021	0.200	No	$z = -11.505^{***}$	Different

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.

To confirm if they are equal, I used a t-test, when the variables had a large and diversified normal distribution, or Wilcoxon, otherwise. I found that all overlap variables were statistically different in both languages at a 5% significance level.

All standard deviations of Financial Instruments overlap indexes are not relevant in comparison to their means. Similarly, all overlap variables have a median similar to the mean in all scenarios (languages and types of notes). However, all overlap variables of Provisions notes, written in Portuguese, showed high standard deviations in comparison to their means (over 35%).

To improve the descriptive analysis, Figure 15 brings the box-plots of the studied overlap variables. These variables were standardized to be comparable.

It is possible to verify that “Argument overlap” and “Stem overlap” (both in Provisions – Portuguese) are variables with many outliers, this means that their distribution deviates from normal with large tails (positive kurtosis). The other variables, however, seem to have a quite symmetrical distribution once their median seem to be in the middle of the boxes and the whiskers have similar sizes. Still, as in previous sections, the outliers are very different in each variable.

Figure 15 – Box-plots: Overlaps

The correlations are presented separately for each language on Documents 4 and 5 of the Appendix. The correlation table shows that all overlap variables are highly correlated to each other in both types of notes. Moreover, “Mean words per sentence” is highly correlated to all overlap variables in both languages and for Financial Instruments and Provisions.

Moreover, Figure 16 represents in images the relationships between variables, and Table 27 presents the correlations of each variable in both languages.

Financial Instruments **Provisions**

Figure 16 – Portuguese vs. English: Overlaps

Table 27 – Correlations Portuguese vs English: Overlaps

Variables	Financial Instruments	Provisions
Adjacent argument	0.5246	0.4514
Argument	0.6141	0.5903
Adjacent stem	0.5816	0.4927
Stem	0.6548	0.6539
Adjacent content word	0.5399	0.5817

Table 27 shows relatively high correlations between the variables in both kinds of notes, but Provisions have lower correlations than Financial Instruments for four out of five variables. It is in accordance to what I presented in the graphs of Figure 16. It shows a slightly greater data dispersion for Provisions. However, it is important to highlight that, even though Financial Instruments has less dispersed data, in any case, they are not much close to the fitted line.

Figure 17 presents the evolution of means from 2012 to 2015. I presented them in different scales, so one must be careful while analyzing their shapes between them. The graph lines do not seem to change much from one year to the other, but to be certain that there was no change, I performed ANOVA or Friedman's tests (based on ANOVA's assumptions of normal distribution and variance homogeneity), as can be seen on Table 28.

No variable showed difference statistically significant at a 5% significance level in any language or type of note, which means that there is no variation from one year to the other.

Figure 17 – Variables' means evolution: Overlaps

Table 28 – Means test (from 2012 to 2015): Overlaps

Variables	Financial Instrument				Provisions			
	Portuguese		English		Portuguese		English	
	Normality	Sigma	Normality	Sigma	Normality	Sigma	Normality	Sigma
Adjacent argument	Yes	0.525	No	0.059	No	0.283	Yes	0.458
Argument	No	0.968	No	0.370	No	0.238	Yes	0.513
Adjacent stem	Yes	0.875	No	0.203	No	0.639	No	0.218
Stem	No	0.969	Yes	0.394	No	0.122	Yes	0.264
Adjacent content word	Yes	0.813	No	0.456	No	0.409	Yes	0.422

5.1.2.4. Other Indexes

Table 29 presents the descriptive statistics of all other variables that were not classified in any other group⁸.

Table 29 – Descriptive statistics: Other indexes

Variable	n	Mean	SD	Min	0.25	Median	0.75	Max
Financial Instruments								
Portuguese								
Mean hypernyms per verb	176	0.78	0.1	0.41	0.72	0.76	0.83	0.99
Type to token ratio	176	0.31	0.04	0.22	0.28	0.31	0.32	0.54
Modifiers per Noun Phrase	176	0.22	0.03	0.15	0.2	0.21	0.23	0.3
Noun Phrase Incidence	176	369.15	26.55	319.65	354.29	367.19	380.98	611.27
Words before Main Verb	176	4.75	0.83	1.77	4.13	4.77	5.36	6.71
English								
Mean hypernyms per verb	176	1.74	0.07	1.58	1.7	1.74	1.8	2.09
Type to token ratio	176	0.29	0.04	0.2	0.26	0.29	0.31	0.49
Modifiers per Noun Phrase	176	1.25	0.08	0.96	1.2	1.25	1.31	1.45
Noun Phrase Incidence	176	390.83	16.22	337.11	380.25	392	401.23	433.21
Words before Main Verb	176	5.01	0.98	2.64	4.29	4.99	5.62	8.32

⁸ Documents 2 and 3 of the Appendix provides the descriptive statistics by year.

Provisions								
Portuguese								
Mean hypernyms per verb	176	0.84	0.17	0.5	0.73	0.83	0.94	1.55
Type to token ratio	176	0.38	0.07	0.25	0.33	0.36	0.43	0.67
Modifiers per Noun Phrase	176	0.24	0.06	0.11	0.21	0.25	0.27	0.41
Noun Phrase Incidence	176	329.93	23.8	262.51	315.55	327.58	346.53	393.26
Words before Main Verb	176	4.62	1.27	1.63	3.87	4.65	5.31	8.27
English								
Mean hypernyms per verb	176	1.86	0.14	1.6	1.75	1.86	1.95	2.36
Type to token ratio	176	0.34	0.07	0.23	0.28	0.31	0.38	0.64
Modifiers per Noun Phrase	176	1.13	0.11	0.76	1.06	1.13	1.21	1.44
Noun Phrase Incidence	176	410.97	21.12	364.46	393.54	412.07	426.51	473.12
Words before Main Verb	176	5.06	1.29	2.33	4.14	5.05	5.91	8.36

The means of Table 29 have differences between the two analyzed languages. The means of English are greater for: “Mean hypernyms per verb” and “Modifiers per Noun Phrase”. The “Modifiers per Noun Phrase” behavior was in accordance to Pasqualini, Scarton, and Finatto (2011), which suggests better results for Portuguese, in comparison to English. Similarly, even though the difference is not as high as the ones from the previous variables, the means of English are also greater for “Words before Main Verb”, which means that, in this case, English requires larger working memory load.

Table 30 – Mean tests Portuguese vs. English: Other Indexes

Variables	Normality (Sigma)		Normality?	t / z	95% CI
	Portuguese	English			
Financial Instruments					
Mean hypernyms per verb	0.200	0.200	Yes	t = 110.443***	Different
Type to token ratio	0.000	0.001	No	z = -10.415***	Different
Modifiers per Noun Phrase	0.008	0.200	No	z = -11.506***	Different
Noun Phrase Incidence	0.000	0.200	No	z = -9.099***	Different
Words before Main Verb	0.200	0.200	Yes	t = 4.684***	Different

Provisions

Mean hypernyms per verb	0.007	0.200	No	$z = -11.505^{***}$	Different
Type to token ratio	0.000	0.000	No	$z = -11.287^{***}$	Different
Modifiers per Noun Phrase	0.200	0.200	Yes	$t = 98.025^{***}$	Different
Noun Phrase Incidence	0.079	0.200	Yes	$t = 36.27^{***}$	Different
Words before Main Verb	0.200	0.200	Yes	$t = 4.14^{***}$	Different

* p-value < 0.1; ** p-value < 0.05; *** p-value < 0.01. The parametric tests are represented by the t, which is calculated according to the t-test. The nonparametric tests are represented by the z, which is calculated by the Wilcoxon test.

To test if these differences were statistically significant, I performed a t-test or Wilcoxon test, according to the normality assumption of the first (Table 30). I rejected the hypothesis that English and Portuguese are equal in all variables classified as ‘others’ at a 5% significance level.

However, the standard deviations of the two aforementioned variables are low in both languages, which means that they have little variation. All medians do not diverge much from the mean, which means that the outliers do not have that much influence on the results. To be sure of that, I made box plots for each variable and in both languages, which I presented in Figure 18. These variables were standardized and put on the same scale.

The outliers are quite varied, again, creating difficulties in excluding them for further investigation.

The only variable with many outliers was “Type to token ratio” in Financial Instruments. It suggests that the distribution of this variable has large tails, a positive kurtosis, which means it has many values away from the mean. Furthermore, the boxes and respective whiskers have similar shape and length in all variables, indicating few differences amongst languages and types of notes regarding distribution and low asymmetry. The only exception

Figure 18 – Box-plots: Other Indexes

to is “Type to token ratio” for both Provisions notes, that is positively skewed, given that the upper whisker is longer.

Figure 19 – Portuguese vs. English: Other indexes

As in previous variables, I also calculated the correlations among those variables, separately for each language, which I presented on Documents 4 and 5 of the Appendix. Again, all correlations were similar in English and Portuguese. The only one that stands out is “Type to token ratio”, whose correlations to “Number of sentences” “Number of words” and “Number of paragraphs” are stronger than -0.59 in both languages and both kinds of studied notes. It can be explained once low “Type to token ratio” means high repetition of words in a text (Graesser et al., 2004), and these findings suggest that it would imply in a greater number of sentences, words, and paragraphs.

The correlations of each variable in both languages are on Table 31, while Figure 19 presents the relationship between them in graphs.

Table 31 – Correlations Portuguese vs English: Financial Instruments

Variables	Financial Instruments	Provisions
Mean hypernyms per verb	0.0870	0.4000
Type to token ratio	0.8859	0.9521
Modifiers per Noun Phrase	0.0281	0.0858
Noun Phrase Incidence	0.0796	0.1333
Words before Main Verb	0.6802	0.3829

“Type to token ratio” has very high correlations in both notes, which I also presented on the graphs of Figure 19, that shows the distribution much closer to the fitted line. However,

“Words before main verb” has a relatively high correlation of languages for Financial Instruments only. All other variables have much lower correlations between languages.

Figure 20 presents the evolution of means for each variable classified as ‘others’ in both languages and for both notes. Again, the variables are presented on different scales to allow better visualization.

Figure 20 – Variables' means evolution: Other Indexes

The shape of the lines of green (dashed) and black (dash-dot-dot), and blue (dash-dot) and pink (solid) seem similar when comparing the languages. Even so, there does not seem to have any changes in any variable that could be related to OCPC 07, once it looks that they did not significantly change after 2014. To be certain of that, I performed an ANOVA or a Friedman test to verify if all years were equal or not (Table 32). I chose the test as the results of the Kolmogorov-Smirnov test for Normality, and the Levene test for homogeneity of variances.

Table 32 – Mean test (from 2012 to 2015): Other indexes

Variables	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	Normality	Sigma	Normality	Sigma	Normality	Sigma	Normality	Sigma
Adjacent argument	Yes	0.789	Yes	0.915	No	0.867	Yes	0.628
Argument	No	0.184	No	0.430	No	0.936	No	0.666
Adjacent stem	No	0.578	Yes	0.718	Yes	0.881	Yes	0.777
Stem	No	0.189	Yes	0.381	Yes	0.490	Yes	0.601
Adjacent content word	Yes	0.934	No	0.541	No	0.460	Yes	0.821

I could not reject the hypothesis of homogeneity of variances for all variables. All other indexes showed no difference statistically significant at a 5% significance level in any language or type of note, which means that there was no improvement on the indexes after OCPC 07.

5.1.3. Readability vs. Intelligibility

To analyze how different readability levels impact on intelligibility, I divided the sample into quartiles, according to its Flesch score. Then I tested if the intelligibility indexes of the first quartile and the data above the third quartile, which I called “4”, could be considered indistinguishable. The first quartile is the one with the worse levels of readability, while the other comprises the best levels. I tested the Flesch index in both to make sure that they were statistically different, and in all cases, this was confirmed: all Sigmas were of < 0.001 in both parametric and non-parametric tests.

I present the means of each group in Table 33. I made the means test according to the normality assumptions of the parametric t-test (normal distribution and homogeneous

variance). In cases where it was rejected, I used the Mann-Whitney test for independent samples. I presented the results of such tests in Table 34.

Table 33 – Means: Quartiles

Variable	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	1	4	1	4	1	4	1	4
Connectives								
All connectives	76.76	77.54	93.27	88	79.97	70.17	94.67	90.98
Additive connectives	44.27	42.26	51.21	46.53	46.74	42.13	43.39	37.15
Causal connectives	33.34	34.93	31.54	30.45	35.52	29.59	37.86	36.15
Logical connectives	25.49	23.66	27.15	25.66	28.66	23.74	30.55	26.86
Temporal connectives	5.93	4.88	13.97	13.25	6.01	6.68	14.76	19.44
Incidences of Content Words and Personal Pronouns								
Adjective	91.88	82.54	100.32	94.16	102.88	86.11	96.58	91.71
Adverb	21.97	20.74	21.84	20.2	25.39	19.34	19.66	20.41
Noun	356.84	365.64	373.88	371.86	366.32	386.81	359.61	361.39
Pronoun	34.07	34.13	15.49	14.94	39.09	35.57	10.21	10.02
Verb	120.82	118.34	106.4	107.56	112.27	113.01	104.82	111.57
Personal pronouns	0.22	0.13	7.34	7.05	0.19	0.3	3.57	2.61
Overlaps								
Adjacent argument	1.82	1.64	0.68	0.62	1.28	1.03	0.57	0.5
Argument	0.72	0.61	0.53	0.45	0.75	0.59	0.47	0.41
Adjacent stem	2.92	2.48	0.73	0.66	1.91	1.44	0.62	0.54
Stem	1.26	1.01	0.58	0.51	1.2	0.86	0.52	0.45
Adjacent content word	2.33	2.06	0.14	0.14	1.63	1.3	0.11	0.09
Other Indexes								
Mean hypernyms per verb	0.78	0.75	1.76	1.73	0.83	0.86	1.88	1.84
Type to token ratio	0.3	0.3	0.29	0.29	0.41	0.35	0.36	0.34
Modifiers per Noun Phrase	0.21	0.22	1.25	1.23	0.26	0.22	1.17	1.11
Noun Phrase Incidence	365.99	371.23	389.12	395.16	324.57	338.09	407.11	413.01
Words before Main Verb	4.95	4.48	5.11	4.67	4.82	4.23	5.11	4.67

Table 34 – Readability vs Intelligibility: Quartiles

Variables	Financial Instruments				Provisions			
	Portuguese		English		Portuguese		English	
	Test	Sigma	Test	Sigma	Test	Sigma	Test	Sigma
Connectives								
All connectives	t-test	0.565	t-test	0.023	Mann	0.002	Mann	0.565
Additive connectives	t-test	0.208	t-test	0.005	Mann	0.071	Mann	0.003
Causal connectives	t-test	0.116	Mann	0.793	Mann	0.003	Mann	0.367
Logical connectives	t-test	0.072	Mann	0.070	Mann	0.004	t-test	0.016
Temporal connectives	t-test	0.030	t-test	0.458	t-test	0.373	Mann	0.105
Incidences of Content Words and Personal Pronouns								
Adjective	Mann	0.000	Mann	0.010	Mann	0.000	Mann	0.537
Adverb	t-test	0.207	t-test	0.043	t-test	0.000	Mann	0.385
Noun	t-test	0.029	Mann	0.967	t-test	0.001	Mann	0.802
Pronoun	Mann	0.980	t-test	0.633	Mann	0.276	t-test	0.851
Verb	Mann	0.676	Mann	0.443	Mann	0.243	t-test	0.013
Personal pronouns	Mann	0.388	Mann	0.179	Mann	0.017	Mann	0.520
Overlaps								
Adjacent argument	Mann	0.007	Mann	0.003	Mann	0.002	t-test	0.008
Argument	Mann	0.101	Mann	0.000	Mann	0.007	t-test	0.006
Adjacent stem	Mann	0.000	t-test	0.001	Mann	0.000	t-test	0.002
Stem	Mann	0.000	Mann	0.000	Mann	0.001	t-test	0.002
Adjacent content word	Mann	0.003	t-test	0.894	Mann	0.000	Mann	0.066
Other Indexes								
Mean hypernyms per verb	Mann	0.176	t-test	0.060	t-test	0.468	t-test	0.152
Type to token ratio	Mann	0.049	t-test	0.692	Mann	0.000	Mann	0.496
Modifiers per Noun Phrase	Mann	0.068	t-test	0.484	Mann	0.005	t-test	0.017
Noun Phrase Incidence	Mann	0.739	t-test	0.111	t-test	0.017	Mann	0.418
Words before Main Verb	t-test	0.005	t-test	0.055	t-test	0.043	Mann	0.234

Mann = Mann-Whitney test

The Sigmas of Table 34 corresponds to a two-tailed test. It is possible to verify that the results are slightly different for each scenario, but it is almost unanimous that, in a 5%

significance level, the Overlaps are all different from one quartile to the other. On overall, the first quartile, the one with the worse readability, showed the highest means in all of these variables. It means, however, that this quartile has more repetition of words, stems, and arguments, which should make the text easier to understand.

Similarly, on the connectives, in all cases where the means were statistically different, the first quartile showed the highest incidence of connectives. Nevertheless, connectives organize a text, which should facilitate reading.

On “Incidences of Content Words and Personal Pronouns”, in five out of the seven cases that had differences between quartiles, the first one showed higher means. Nonetheless, the understandability will depend on the text as a whole.

On “Mean hypernyms per verb” only for Financial Instruments (English), the quartiles showed some difference. However, the first one had the higher mean, and higher levels of this index mean that words are considered more concrete (Graesser et al., 2004), i.e., easier to be understood.

“Noun Phrase Incidence” for Provisions in Portuguese is also statistically different. However, the higher mean belongs to the quartile 4. It suggests that this quartile is informationally dense and has more complex syntax (Coh-Metrix-Port Website, 2017), in comparison to the other.

The other variables with difference statistically significant between quartiles showed the expected behavior, i.e., the greater the readability, the greater the intelligibility.

On the overall, these results show that, when the two quartiles do not have the same understandability, the easier to understand is the first, which has the lower levels of readability, indicating a disconnection between these two measures.

5.2. Results Discussion – Archival Research

The archival research results showed great differences between the intelligibility indexes in Portuguese and English. It was already expected, once as Pasqualini, Scarton, and Finatto (2011), they are languages which grammars work quite differently. Thus, these translation differences may be due to translation problems mentioned by Evans, Baskerville, and Nara (2015), that are related to grammatical and language-specific lexical features.

Another possible explanation is that considering that the native language of the writer was Portuguese, this may have been the reason why the intelligibility indexes were better for this language. It is in accordance with Evans, Baskerville, and Nara (2015), who say that functional translation, such as the one in Accounting, needs, among other translation abilities, a high degree of expertise in source and target languages, in the subject domain and knowledge of both source and target culture and conventions. Further investigation would be necessary on this, with opposite translations, from English to Portuguese, by native speakers of English.

Although it is not possible to affirm that the information in Portuguese is easier to be understood, it is possible to say that readability and intelligibility metrics do measure different things. On the overall, my results showed that the group with less readable information had better scores on a great number of the intelligibility tests. To the other tests, the difference between groups was not statistically significant. As Dreyer (1984), readability formulas do not measure word frequency, concept density, and level of abstraction, thus, as McNamara et al. (2002) believe, the quality of those formulas is severely limited. The intelligibility scores, however, do measure those and other things (Graesser et al., 2004), which makes these metrics better at analyzing understandability.

The archival results are very similar for both types of notes, which may suggest that understandability does not vary much throughout the Financial Statements. Furthermore, the archival results allow us to verify that the means of most readability and intelligibility indexes did not change after the publishing of the OCPC 07, which suggests, that, on average, the firms did not improve the quality of their text information. It is in accordance to Lewis et al. (1986), which found no relevant changes on the readability levels from 1977 to 1980, in any of the five methods he used. On the other hand, these results do not follow what Moreno and Casasola (2014) found, which was an improvement of readability over time, neither to what Soper and Dolphin Junior (1964) found, a decrease of readability from 1948 to 1961. However, the difference between results could be due to the method used, once the first authors only analyzed the evolution of two firms, but through a larger period, and to the period studied for the second.

Thus, I rejected the hypothesis H1, i.e., improving readability does not increase understandability of notes. However, this requires further investigation, which I will present in the next section. Similarly, I also rejected H3A and H4, which means that reporting

language influences on readability and that there is no evidence of improvement of understandability with time, respectively; while I could not reject H3B, i.e., reporting language impacts on notes' understandability.

5.3. Experiment

To verify if the conclusions of the archival research about the relationship between readability and understandability are robust, in this section, I present the results regarding the experimental analysis.

I performed a pre-test with four Ph.D. Students from *Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo* (FEA-USP), and asked for professor Daniel Jones, who has experience in experiments of University of Texas at El Paso (UTEP) to verify my instrument. Their feedback was used to improve some aspects of the instrument and to correct some problems it had.

The experiment was applied using an internet-based tool, Qualtrics®, which was made available to me by UTEP. Qualtrics®, in comparison to other survey tools, showed all the features needed for my research.

Hair et al. (2010) suggest a minimum number of 20 cells per group, in the case of this research, that would be the minimum number of participants per treatment. The final number of participants was 112; however, it was not balanced between treatments. Treatment 1 had 28 responses; Treatment 2 had 25; Treatment 3, 29; and Treatment 4 had 30 responses. The non-respondents caused this. The Qualtrics® system allocated the treatments in a quite balanced way, but some participants did not carry on with the survey, making the responses unbalanced.

The method I used to analyze the data was the Analysis of Covariance (ANCOVA), and I explained it on section 5.2.2.

As a form of motivation for participants to work hard during the experiment, I awarded the best scorer of all phases a *Submarino* 20-dollar gift card. There was a tie, but as informed to the participants, I used the third phase as a tie breaker. The winner was a 29 year-old man of the first year of Accounting at UFSC (*Universidade Federal de Santa Catarina*), graduated in Law on another college, and with an ID number of 9039. I contacted him to proceed with

the awarding on January 4th, 2018, through contact from his University. On January 31st I received an answer, asked for proof of ID and proceeded with the awarding.

5.3.1. Ethical Issues

The University of São Paulo (USP) does not have an ethics committee. The usual procedure in case of experimental research is to ask for the approval of the College's Dean. Following such procedure, I presented to the Dean a short version of my research proposal, explaining the experiment. Document 2 of the Attachments is the approval letter provided by him. As you can see, the title of the current research changed after the approval, once it was initially called "Readability and Understandability of Footnotes of Annual Reports". The change was motivated to explain the studied documents better.

Furthermore, I also asked for the approval of the ethics committee, Institutional Review Board (IRB), of UTEP, where I spent six months of my graduate course. I presented the experiment proposal in Document 4 of the Attachments. It was submitted by Professor Daniel Jones of the Psychology Department, who assisted me with the experiment system used, Qualtrics®.

The proposal was considered 'exempt' and, for that reason, the IRB does not provide a report on that. The print of the IRB's website was sent to me by professor Jones, and I presented it on Document 5 of the Attachments.

As one can see at the experiment proposal sent to the IRB on Document 4, there are some changes compared to the present report. The first change was the target audience. Initially, I would also apply the experiment to UTEP students (in English), however, given the low response rate (only one student participated), I excluded it from the research. Furthermore, to allow a greater response rate for notes in Portuguese, I also included other universities and colleges, besides USP.

The second change I made was for the same reason as before. Originally, I would only use Accounting students, but to allow higher response rate, I included other majors related to business.

Another change I made was regarding the gift card I gave to the best scorer. The proposal said it would be a gift card from Starbucks, but I opted to change it to a 20-dollar gift card from *Submarino*, once I expected it to be more appealing to Brazilian participants.

The last change is, again, the title of the research present on the “Terms of Consent”, which originally was "Readability and Understandability of Accounting Footnotes". I opted to change it to fix the name of the analyzed document to how it is called in English.

These changes do not affect the experiment itself; thus, it would still be considered exempt by the board.

5.3.2. Between Subjects Experiment: ANCOVA

ANCOVA is the Analysis of Covariance, and, according to Seltman (2015), the combination of ANOVA (Analysis of Variance) with a regression. In ANCOVA, firstly the scores of the dependent variable are adjusted for differences associated with one or more covariates – variables that are measured before the dependent variable and which are correlated with it. Then, I performed an ANOVA on the adjusted values (Tabachnik & Fidell, 2013).

This method removes predictable variance related to covariates from the error term, increasing the power of the F test for a main effect or interaction (Tabachnik & Fidell, 2013). Therefore, based on Tabachnik and Fidell (2013), what I want to know is, holding everything else constant, whether changes in scores of understandability associated with different levels of readability are larger than the scores expected through random fluctuations occurring by chance.

This part of the analysis is used to verify if different levels of readability impacts understandability, holding other features constant. Here, I only want to analyze the difference between treatments.

5.3.2.1. Descriptive Analysis

Independent variables are the conditions to which the subjects are exposed, i.e., the treatment; they are predictors of the dependent variables (Hair et al., 2010; Tabachnik & Fidell, 2013). In the case of this study, the independent variables are the four treatments.

The dependent, response or outcome variable is the one being explained by a set of independent variables (Hair et al., 2010). They are used to test the effects of some

intervention (Seltman, 2015). In this study, the dependent variable is the score of understandability from each participant made through the MIT method in phase 1.

The beginning point of Figure 21 presents the mean of scores for Treatment 4, the one with the lowest levels of readability. The lines show the difference between this treatment, used as a parameter, and the other three. It diverged from what I expected and presented in Figure 4 of section 3. I expected that improving each component of readability would improve some of the understandability; however, the increase in scores only happened for Treatment 3, which has fewer words per sentence than Treatment 4 but has the same number of syllables per sentence.

Figure 21 – Readability vs. Understandability: Observed behavior

Even though the means are very similar, I opted to perform a mean test to verify if they are indistinguishable or not. Not all treatments presented a normal distribution, according to the test; thus, I could not use a parametric test to verify if they were all equal. Thus, using a Kruskal Wallis test for independent variables, I could not reject, with 5% of significance level, that the treatments have indistinguishable means (sigma of 0.193).

It suggests that there are no differences between treatments. However, a further investigation is necessary to verify if other factors may affect these results. That is why I performed an ANCOVA analysis, which I described in the next section.

Table 35 presents other descriptive statistics of the dependent variables.

Table 35 – Descriptive Statistics: Dependent Variables (Phase 1)

	All treatments	Treatment 1	Treatment 2	Treatment 3	Treatment 4
N	112	28	25	29	30
Mean	13.77	13.04	13.57	14.48	13.87
Median	14	14	13	15	14
Standard deviation	2.468	2.937	2.168	2.502	2.177
Minimum	7	7	9	9	7
Maximum	18	17	18	18	17
Asymmetry	-0.625	-0.601	0.060	-0.772	-0.999
Kurtosis	-0.054	-0.845	-0.285	-0.214	1.938

It is important to remember that the participants had to answer 19 questions, thus, in all treatments, no participant answered all questions correctly. On average, they correctly answered almost 70% in all treatments, which is similar to Jones and Smith's (2014) 73.9%, but slightly worse than that, which indicates that the text can be considered difficult as their was. If participants had answered all questions at random, on average, they should score 50% (as Jones & Smith, 2014), which is 9.5 points. Only seven of the respondents scored less than random (four from Treatment 1 and one for each of the other treatments), which is a not bad result.

The standard deviation is also similar in all treatments and for both phases, representing around 20% of the mean. The median is not very far from the mean, which suggests an absence of outliers.

Most treatments have negative asymmetries, making the data skewed to the left. The exception is Treatment 2, which is skewed to the right and has positive asymmetry. To help analyze the kurtosis and asymmetry, I made histograms for the dependent variables for all treatments (Figure 22) and each treatment (Figure 23). Once the idea for these histograms is to assess normality, I superimposed the normal curve, as suggested by Hair et al. (2010).

Figure 22 – Histograms: Dependent variables (Score – Phase 1)

Figure 23 – Histograms: Dependent variable by treatment

The distribution of Figures 22 and 23 differ from the normal, once there are many gaps between the normal curve and the bins, and because in some parts, the bins go much higher than the normal curve. It shows a clear skewness to the left.

The covariates are variables used to control for the undesirable variance in a dependent variable (Tabachnik & Fidell, 2013). In this study, they are the scores of the general pair of sentences (Score – Phase 3), age, gender, time of experience working with Accounting, undergraduate major, level of education, university of the undergraduate/graduate course, and time studying Accounting.

The covariates “Age” and “Gender” were included to make a profile of the participants and to verify if there are great differences between treatments. “Score – Phase 3” is the

variable used to control for the overall ability in reading, once, as Graesser et al. (2004), the coherence of the text will depend on the reader's skills and knowledge. University of the undergraduate/graduate course, "Level of education" "Time studying Accounting" and "Time working with Accounting" were used to control for factors such as education and experience, that Smith and Taffler (1992) found to be significant to explain understandability.

Table 36 presents the quantitative covariates of this study.

The variables "Age" "Time of experience working with Accounting" and "Time studying Accounting" are all represented in years. While the first is a discrete variable and has only intergers, the other two are continuous variables, accepting values that are not intergers. All of these variables showed minimums and maximums with high variations; however, for "Time of experience working with Accounting" and "Time studying Accounting", on average, the time spent working or studying Accounting was closer to the minimum. The positive asymmetry also supports that, which means that are many low values.

Table 36 – Descriptive Statistics: Quantitative covariates (Between-subject analysis)

	Age	Experience Working with Accounting	Studying Accounting
Mean	30.75	4.43	4.48
Median	28.00	2.00	4.00
Standard deviation	9.813	6.782	4.048
Minimum	18	0	0
Maximum	69	30	27
Asymmetry	1.472	2.147	2.188
Kurtosis	2.369	4.616	8.924

Figure 24 presents the frequencies of some other covariates, the categorical variables.

Figure 24 – Frequencies: Categorical variables

It is important to highlight that 25 out of the 112 participants had more than one major, and one of them had 3, that is why the statistics of “Course” are over 100%. It will not be a problem for the statistics, once on the models, I only used “Accounting major” as a variable, as will be explained latter.

The average participant of this experiment was male, with major in Accounting, of a public university, studying on an undergraduate course. However, Figure 24 shows some differences between the treatments, especially on the level of education. These differences show the importance of adding these variables as covariates of this research so that I could control for their influence over the dependent variable.

To facilitate the analysis, I separated the Universities in public and private, but Table 37 brings all those who were mentioned by the participants. Some of them mentioned more than one school, but I opted to choose only one of them. I considered the last to be mentioned or the better university/college considering ranking of universities.

Table 37 – Participant’s Colleges/Universities

FGV	IESA	UEMS	UFPB	UFU	UNIP
FIA	IMT	UFBA	UFPI	UMC	USCS
FIPECAFI	Mackenzie	UFES	UFPR	UNB	USM
FMU	PUC	UFF	UFRJ	UNESP	USP
FURB	UCP	UFG	UFSC	UNIBAE	UVV
IEL	UDESC	UFMG	UFMS	UNICAMP	

It is better to exclude any dichotomous variable that shows a proportion like 90-10 (Rummel, 1970, quoted by Tabachnick & Fidell, 2013). The benefits of including these variables do not overcome its costs; therefore, I grouped some of the dummy variables in a different variable. That is the case of the dummy variables related to the major, “Economy” “Law” and “Others”, which were considered all in a single group. It also happened to the variable of Level of education, in which “MBA in process” “MBA completed” “Masters completed” and “Ph.D. completed” were all grouped, even though the characteristics may be different between them.

Furthermore, I also did not use the variable for gender on the main effects analysis. Firstly, because there are no reasons to believe that it can affect understandability of any information if the background is the same. Secondly, as one may see on section 5.2.2.1.3.1, there may be a limit number of covariates on the model, and given that in all models where I included it, it showed no significance, then I opted to exclude it. The utility of this information was solely to verify the characteristics of the participants and also, to make sure that it would not be highly unbalanced for any gender.

5.3.2.2. ANCOVA’s Assumptions

5.3.2.2.1. Normality

ANCOVA assumes that the sampling distributions (and not the raw scores) of means are normal within each treatment. However, there is not a way to test this assumption without knowing the population values or without making actual sampling distributions of means (Tabachnick & Fidell, 2013). Tabachnick and Fidell (2013), say that if the sample sizes are

relatively equal in treatments, if there are not outliers, and if a two-tailed test is used, then robustness shall be expected with 20 degrees of freedom for error.

The histograms of Figure 23 suggest that the dependent variable does not follow a normal distribution. To make sure of that, I performed a Shapiro-Wilk test of normality, which, according to Maroco (2007), is adequate for samples below 50 observations, and presented the results in Table 38.

Table 38 – Normality tests: Dependent Variable (Score – Phase 1)

Treatment	Statistics	df	Sig.
1	0.904	25	0.022
2	0.977	28	0.775
3	0.912	29	0.019
4	0.912	30	0.017

The results of Table 38 confirms that the scores do not have a normal distribution in all treatments, at a significance level of 5%. Thus, a transformation of such variable is required.

I tested many transformations, including logarithm, square root, and box cox, but none of them showed good results. Hair et al. (2010) say that negatively skewed distributions are usually best transformed using cubed or squared transformations. Table 35 showed that this was the case for all treatments. Performing cubed transformation did not improve the normality, but the squared did. I presented the results in Table 39.

Table 39 – Normality tests: Squared Dependent Variables

Treatment	Statistics	df	Sig.
Score – Phase 1			
1	0.922	25	0.055
2	0.965	28	0.445
3	0.940	29	0.099
4	0.945	30	0.124

Therefore, it is possible to say that the squared transformation passed on the assumption of normality for each treatment, and I will use it on further tests.

5.3.2.2.2. Equal Sample Size

As mentioned before, the sample presented unequal size between treatments. It could affect ANCOVA's estimation. Nonetheless, SPSS® when estimating ANCOVA, already uses a method for dealing with unequal sample sizes (Tabachnick & Fidell, 2013). Hence, it shall not be a problem for this study.

The method used is called by Tabachnick and Fidell (2013) as method 1 and is the approach recommended for experimental researches. This method considers all cells equally important, regardless of the sample size. Other methods provide some weighting to cells with larger sample sizes (Tabachnick & Fidell, 2013).

5.3.2.2.3. Absence of Outliers

Figures 24 and 25 present the box plots of the dependent variable and the quantitative covariates, respectively.

Figure 25 – Box plots: Dependent variable

Figure 26 – Box plots: Quantitative covariates

As one can see, in Figure 25 there are no univariate outliers. The lower whisker is slightly longer, which indicates a greater dispersion to that side. In Figure 26 the variables are on different scales; thus the interpretation must be made with caution. The boxes showed that three of the four variables presented outliers.

The variable that showed the greatest numbers of univariate outliers was “Time of experience working with Accounting”, however, as the reader will see on the next section, I excluded it from the analysis, and the existence of outliers in it will not be a problem.

On the overall, the existence of univariate outliers, as shown in the previous figures is not an issue. According to Tabachnick and Fidell (2013), it is allowed to have univariate outliers in the dependent variables and covariates. However, multivariate outliers among the dependent variables and covariates may create heterogeneity of regression, and this leads to rejecting ANCOVA or to an unreasonable adjustment of the dependent variable.

As Hair et al. (2010), to assess multivariate outliers, we must use the Mahalanobis D^2 measure. According to these authors, this method evaluates “the position of each observation compared with the center of all observations on a set of variables” (Hair et al., 2010, p. 68).

This method uses a χ^2 distribution. The degrees of freedom are calculated as the number of variables analyzed, which in this case is twelve⁹. Hair et al. (2010) suggest the use of conservative levels of significance, such as 0.001. By using these two metrics, it is possible to find the critical value of 32.91, any D^2 above that is considered an outlier.

Using SPSS® to calculate the D^2 , I found that only observation number 60 was considered a multiple outlier with a D^2 of 62.56. This observation belongs to Treatment 3, and I excluded it from this analysis. Therefore, this treatment has 28 observations from now on. This exclusion did not change the normality conclusions previously made.

5.3.2.2.4. Absence of Multicollinearity

Tabachnick and Fidell (2013) recommend the covariates should not be highly correlated with each other, and those who are should be eliminated because they have nothing to add to the dependent variable and there may be some computational difficulties. Besides, correlated covariates tend to reduce the power of the statistics. Therefore, they suggest that any covariate with a squared multiple correlation (SMC) over 0.50 are redundant, and excluded from the analysis.

Calculating the SMCs using Stata®, I present the results in Table 40.

Table 40 – Multicollinearity tests: Covariates

Variables	SMC	
	Before exclusions	After Exclusions
Score – Phase 3	0.1343	0.0863
Age	0.4518	0.2620
Male	0.1877	0.1230
Time Working with Accounting	0.6312	
Business major	0.7462	
Accounting major	0.8779	0.3923
Other major	0.8217	

⁹ The variables used in this analysis were: the quantitative variables (“Score – Phase 1”, “Score – Phase 3”, “Age”, “Time studying Accounting”); and the dummy variables (“Business major”, “Accounting major”, “Undergraduate in process”, “Undergraduate completed”, “Masters in process”, and “Masters completed”).

Variables	SMC	
	Before exclusions	After Exclusions
Undergraduate in process	0.9696	0.4680
Undergraduate completed	0.9415	
Masters in process	0.9473	0.2607
PHD in process	0.4700	0.3477
Other Level of Education	0.9693	
Public	0.2456	0.1115
Time Studying Accounting	0.7178	0.4801

As shown in the first SMC column of Table 40, many variables presented a squared multiple correlation above 0.5. Not to exclude all of them, but only those that were causing the multicollinearity, I used a regular Pearson correlation test, which I presented in document 6 of the Appendix. The variables that showed bivariate correlations, positive or negative, superior to 0.5 were: “Age” and “Time of experience working with Accounting”; “Time studying Accounting” and “Time of experience working with Accounting”; the dummy “Accounting major” and “Time studying Accounting”; and the dummy variables of “Accounting major” and “Other major”.

The correlations show that “Time of experience working with Accounting” and the “Accounting major” dummy are highly and significantly correlated with other two variables. The correlations of the first show that the longer someone worked with Accounting, the older he/she is and more time he/she spent studying it. The second variable correlations show that people who studied Accounting spent more time studying the subject and that they did not study other subjects. Therefore, both variables could be considered redundant. I excluded the first from main analysis, given that other variables capture its effects, and kept the second. However, once I believed the two other major related variables “Business major” and “Other major” were causing the multicollinearity, I chose to exclude them instead.

I also excluded “Other levels of education” because it showed a high SMC. However, the variables for “Undergraduate in process” and “Undergraduate completed” still showed high SMC. Given the characteristics of the other variables that stand for the level of education, I tested eliminating the one that was not an “in process” variable. That would mean that “Other level of education” would also include in it the “Undergraduate completed” variable.

All these exclusions allowed the SMC to go under 0.5 to all studied variables (the third column of Table 40), which indicates that the multicollinearity issue was minimized.

5.3.2.2.5. Variances Homogeneity

In a grouped data, homogeneity of variance is the same as homoscedasticity. ANCOVA assumes that the variance of dependent variables scores within each cell and the covariates present homogeneity of variance. If a covariate fails the test, one can use a more stringent test and interactions, or it can be excluded from the analysis (Tabachnick & Fidell, 2013).

Table 41 presents the results for the Levene tests for homogeneity of variances. As one can see, some of the dummy variables were not considered homogeneous for the tests where the mean is the basis. But considering that, as Maroco (2007) says, the measure based on the median is particularly robust and powerful for deviations from normality, which happens for the dummy variables, this is the method chosen.

Table 41 – Homogeneity of Variance

Variables	Test	Levene Statistic	df1	df2	Sig.
Score – Phase 1	Based on Mean	2.076	3	107	0.108
	Based on Median	0.763	3	107	0.517
	Based on Median and with adjusted df	0.763	3	96.507	0.517
	Based on trimmed mean	1.941	3	107	0.127
Score – Phase 3	Based on Mean	2.075	3	107	0.108
	Based on Median	1.572	3	107	0.200
	Based on Median and with adjusted df	1.572	3	102.454	0.201
	Based on trimmed mean	1.982	3	107	0.121
Age	Based on Mean	0.430	3	107	0.732
	Based on Median	0.424	3	107	0.736
	Based on Median and with adjusted df	0.424	3	104.630	0.736
	Based on trimmed mean	0.441	3	107	0.724
	Based on Mean	1.942	3	107	0.127

Variables	Test	Levene Statistic	df1	df2	Sig.
Accounting major	Based on Median	0.567	3	107	0.638
	Based on Median and with adjusted df	0.567	3	105.415	0.638
	Based on trimmed mean	1.942	3	107	0.127
Undergraduate in process	Based on Mean	9.325	3	107	0.000
	Based on Median	1.844	3	107	0.144
	Based on Median and with adjusted df	1.844	3	103.412	0.144
	Based on trimmed mean	9.325	3	107	0.000
	Based on Mean	5.706	3	107	0.001
	Based on Median	1.313	3	107	0.274
Masters in process	Based on Median and with adjusted df	1.313	3	95.948	0.275
	Based on trimmed mean	5.706	3	107	0.001
	Based on Mean	1.151	3	107	0.332
	Based on Median	0.273	3	107	0.845
PHD in process	Based on Median and with adjusted df	0.273	3	104.511	0.845
	Based on trimmed mean	1.151	3	107	0.332
	Based on Mean	4.068	3	107	0.009
Public	Based on Median	0.927	3	107	0.430
	Based on Median and with adjusted df	0.927	3	100.671	0.431
	Based on trimmed mean	4.068	3	107	0.009
	Based on Mean	0.816	3	107	0.487
Time Studying Accounting	Based on Median	0.505	3	107	0.680
	Based on Median and with adjusted df	0.505	3	70.358	0.680
	Based on trimmed mean	0.706	3	107	0.550

df = degrees of freedom

Then, using the method based on the median, it is possible to say that all variables present homogeneity of variance in a 5% significance level. This assumption was not violated.

5.3.2.2.6. Linearity

The last assumption of ANCOVA is that the relationship between the dependent variable with each covariate and the relationships between covariates are all linear. The violation of this assumption reduces the statistical test's power (Hair et al., 2010; Tabachnick & Fidell, 2013).

There is no need to verify the linearity of the dummy variables, once any variable with only two levels can only have linear relationships with other variables (Tabachnick & Fidell, 2013).

To Hair et al. (2010), the usual way of assessing linearity is through scatterplots. To them, use of the scatter can show the straight line of the linear relationship, which allows the better identification of any nonlinear characteristics. Figure 27 presents the scatterplots between the dependent variable, in its squared form, with the three quantitative covariates.

Figure 27 – Scatter plots: Covariates vs. Squared Score – Phase 1 and Covariates

As is possible to verify in Figure 27, the only variables that illustrated a relationship closer to linear were “Score – Phase 1” and “Score – Phase 3”, which shows that higher levels of Score 1 are related to higher levels of Score 3, even for the worst scorers. The other two variables “Age” and “Time studying accounting” did not present a linear relationship.

I tried, as recommended by Hair et al. (2010) and Tabachnick and Fidell (2013), to transform the covariates. I used square root, logarithm, squared, inverse, box cox, reflected, etc., but no transformation improved the relationship shown on the graphs.

Thus, the analysis will be made with and without these two variables, and the power of the test will be verified to account for any loss in it.

5.3.2.2.7. Homogeneity of Regression Slopes

Finally, ANCOVA assumes that the regression slope between dependent variable and covariates within each cell is “an estimate of the same population regression coefficient, that is, that the slopes are equal for all cells” (Tabachnick & Fidell, 2013, p. 204). That means that the slope must be the same for all studied treatments.

To assess this assumption, I tested each of the covariates against the dependent variable “Score – Phase 1” on an ANCOVA model that had only the factor, the covariate and the interaction between them. The interaction represents the difference of slopes, thus, if it is significant, then the difference exists. I presented the results for the interactions in Table 42.

Table 42 – Homogeneity of Regressions: Interactions between Treatments and the Covariates

Variables	Type III Sum of the Squared	df	Mean Squared	F	Sig.
Score – Phase 3	4797.015	3	1599.005	0.434	0.729
Age	211.632	3	70.544	0.016	0.997
Accounting major	7195.329	3	2398.443	0.569	0.637
Undergraduate in process	26919.457	3	8973.152	2.280	0.084
Public School	1711.153	3	570.384	0.136	0.938
Time Studying Accounting	4625.551	3	1541.850	0.365	0.778

Dependent variable = Squared Score – Phase 1

As on Table 42, in all cases, the interaction was not significant with any of the studied variables. It means that there is homogeneity of regression, so this assumption was also maintained.

5.3.2.3. Tests

According to Hair et al. (2010), the maximum number of covariates should be determined by the following formula:

$$\text{Maximum number of covariates} = (0.10 \times \text{Sample Size}) - (\text{Number of groups} - 1)$$

Given that the sample size comprises 111 observations and that the number of groups (treatments) is 4, the maximum number of covariates should be 8.

The covariates “Economy major” “Law major” “Others” “MBA in process” “MBA completed” “Masters completed” and “Ph.D. completed” failed the 90-10 proportion test. I grouped the first three as “Other major” and the other three as “Other Levels of Education”. However, both of these new variables and “Time Working with Accounting” “Business major” and “Undergraduate completed” failed on the multicollinearity tests. “Age” and “Time studying Accounting” failed on the linearity test, even after many attempts at transforming them. The covariates that survived through all the assumptions tests were: “Score – Phase 3”, “Accounting major” “Undergraduate in process” and “Public School”. The last three are dichotomous variables.

5.3.2.3.1. Model 1: Score – Phase 3 plus Dummy Variables

The first model comprises the four covariates that passed on all tests but no interactions between them. This number of covariates follow Hair et al.’s (2010) rule. I presented the results of the ANCOVA of model 1 in Table 43.

Table 43 – ANCOVA test: Model 1

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	85305.684 (a)	7	12186.526	3.348	0.003
Intercept	43547.91	1	43547.91	11.965	0.001
Treatment	6032.398	3	2010.799	0.552	0.648
Score – Phase 3	48114.54	1	48114.54	13.219	0.000
Accounting major	1108.455	1	1108.455	0.305	0.582
Undergraduate in process	3834.286	1	3834.286	1.053	0.307
Public School	6586.746	1	6586.746	1.810	0.181
Error	374887.09	103	3639.68		
Total	4682918	111			
Corrected Total	460192.78	110			

Dependent variable = Squared Score – Phase 1

(a) $R^2 = 0.185$ (Adjusted- $R^2 = 0.130$)

The high values of Type III Sum of Square are due to the fact that the dependent variable is already squared.

The R^2 of this model, 0.185, indicates how much this model can explain the observed data. The adjusted- R^2 was used to compare the results with other models, once it penalizes it by the inclusion of new variables.

Table 43 shows that the only variable that was significant in explaining understandability (Squared Score – Phase 1) was the proxy for previous ability in understanding (Score – Phase 3), in a 1% significance level. This table also shows that the variable that represents the Treatment was not significant, which indicates that there is not a significant difference between them, i.e., different readability levels seem not to affect understandability for Accounting information presented in Portuguese.

I also performed other complementary tests to the model, which I presented in Tables 44 to 46.

Table 44 – Lack of fit test: Model 1

Source	Sum of Squares	df	Mean Square	F	Sig.
Lack of fit	234420.624	60	3907.010	1.196	0.270
Pure Error	140466.467	43	3266.662		

a. Computed using alpha = 0.05

Table 45 – Levene test: Model 1

F	df1	df2	Sig.
0.377	3	107	0.769

Table 46 – Pair comparisons test: Model 1

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
1	2	-4.868	16.697	0.771	-37.982	28.246
	3	-19.405	17.298	0.265	-53.712	14.902
	4	-15.029	16.488	0.364	-47.728	17.671
2	1	4.868	16.697	0.771	-28.246	37.982
	3	-14.537	16.845	0.390	-47.946	18.872
	4	-10.160	15.997	0.527	-41.886	21.565

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
3	1	19.405	17.298	0.265	-14.902	53.712
	2	14.537	16.845	0.390	-18.872	47.946
	4	4.377	16.562	0.792	-28.470	37.223
4	1	15.029	16.488	0.364	-17.671	47.728
	2	10.160	15.997	0.527	-21.565	41.886
	3	-4.377	16.562	0.792	-37.223	28.470

Based on estimated marginal means;

(a) Adjustment for multiple comparisons: Less significant difference (equivalent to no adjustment).

The Lack of Fit test of Table 44 shows that the model of covariance is adjusted, given its non-significant sigma. Furthermore, the Levene test of Table 45 shows that the error variances between treatments are homogeneous. Both tests show that the model is good.

Table 46 makes a paired comparison between treatments, and the sigmas show that there are not any differences between any pairs of treatments, reinforcing the conclusion of Table 43.

Figure 28 – Dispersion plots (Fitted Values and Residuals): Model 1

The dispersion plot of Figure 28 shows that there is no relationship between the residuals and the fitted values. That means that the linearity assumption is validated, confirming the conclusions of section 5.2.2.2.6 - Linearity.

5.3.2.3.2. Model 2: Model 1 plus “Time Studying Accounting” Variable

As mentioned earlier, I expected that the background influenced understandability. This effect may be captured by both the dummy variable of “Accounting major” – which means that the major of the participant was in this course, suggesting that he/she had at least some knowledge about it –, and by the variable “Time studying Accounting” – which suggests that those who studied for longer time may have a better background. To verify if this was true, I tested model 2, and the results are in Table 47.

Table 47 – ANCOVA test: Model 2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	85853.615 (a)	8	10731.702	2.924	0.006
Intercept	44087.598	1	44087.598	12.013	0.001
Treatment	5527.285	3	1842.428	0.502	0.682
Score – Phase 3	48519.801	1	48519.801	13.221	0.000
Accounting major	261.898	1	261.898	0.071	0.790
Undergraduate in process	4367.269	1	4367.269	1.190	0.278
Public School	6936.382	1	6936.382	1.890	0.172
Time Studying Accounting	547.931	1	547.931	0.149	0.700
Error	374339.160	102	3669.992		
Total	4682918.000	111			
Corrected Total	460192.775	110			

Dependent variable = Squared Score – Phase 1

a. $R^2 = 0.187$ (Adjusted- $R^2 = 0.123$)

Including the variable “Time Studying Accounting” made the adjusted- R^2 decrease in comparison to model 1. The interpretation of the results, on the other hand, did not change. “Score – Phase 3” was the only significant, which makes the variable “Treatment” not significant. Again, this suggests that changing readability does not impact understandability for Accounting information presented in Portuguese.

It is important to highlight that I also performed this test without the variable “Accounting major”, once they could be representing the same thing, which could explain the lack of significance in both. However, all results were maintained, the main difference was the adjusted-R² that became 0.131, even so, not much greater than the adjusted-R² of model 2.

The other tests related to this model are on Tables 48 to 50.

Table 48 – Lack of fit test: Model 2

Source	Sum of Squares	df	Mean Square	F	Sig.
Lack of fit	345910.160	94	3679.895	1.036	0.532
Pure Error	28429.000	8	3553.625		

a. Computed using alpha = 0.05

Table 49 – Levene test: Model 2

F	df1	df2	Sig.
0.312	3	107	0.817

Table 50 – Pair comparisons test: Model 2

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
1	2	-5.199	16.788	0.757	-38.497	28.100
	3	-18.718	17.461	0.286	-53.352	15.915
	4	-14.903	16.559	0.370	-47.748	17.942
2	1	5.199	16.788	0.757	-28.100	38.497
	3	-13.520	17.119	0.432	-47.475	20.436
	4	-9.704	16.106	0.548	-41.651	22.243
3	1	18.718	17.461	0.286	-15.915	53.352
	2	13.520	17.119	0.432	-20.436	47.475
	4	3.815	16.694	0.820	-29.297	36.927
4	1	14.903	16.559	0.370	-17.942	47.748
	2	9.704	16.106	0.548	-22.243	41.651
	3	-3.815	16.694	0.820	-36.927	29.297

Based on estimated marginal means;

(a) Adjustment for multiple comparisons: Less significant difference (equivalent to no adjustment).

Model 2 passed on the tests of Tables 48 and 49, so the model is fitted and has homogeneous variances, respectively, but as in the previous test, it showed no significant differences between treatments (Table 50).

Figure 29 – Dispersion plots (Fitted Values and Residuals): Model 2

The dispersion plot of Figure 29 does not show any relationship between the residuals and the fitted values, validating the linearity assumption.

5.3.2.3.3. Model 3: Model 1 without “Score – Phase 3”

On model 3, I tested taking the variable “Score – Phase 3” off the model, to verify if it was not taking the significance of other variables. The results are in Table 51.

Table 51 – ANCOVA test: Model 3

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	37191.144 (a)	6	6198.524	1.524	0.178
Intercept	476689.84	1	476689.84	117.2	0.000
Treatment	17463.485	3	5821.162	1.431	0.238
Accounting major	0.531	1	0.531	0.000	0.991
Undergraduate in process	11048.699	1	11048.699	2.716	0.102
Public School	9199.924	1	9199.924	2.262	0.136
Error	423001.63	104	4067.323		
Total	4682918	111			
Corrected Total	460192.78	110			

Dependent variable = Squared Score – Phase 1

a. $R^2 = 0.081$ (Adjusted- $R^2 = 0.028$)

The results showed that taking the variable “Score – Phase 3” from the model did not only not showed different results but also decreased a lot the adjusted- R^2 , which suggests that this model is not as good as the previous ones. The complementary tests are on Tables 52, 53, and 54.

Table 52 –Lack of fit test: Model 3

Source	Sum of Squares	df	Mean Square	F	Sig.
Lack of fit	103335.463	20	5166.773	1.358	0.168
Pure Error	319666.168	84	3805.550		

a. Computed using alpha = 0.05

Table 53 –Levene test: Model 3

F	df1	df2	Sig.
0.215	3	107	0.886

Table 54 – Pair comparisons test: Model 3

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
1	2	-8.172	17.624	0.644	-43.121	26.778
	3	-34.070	17.782	0.058	-69.333	1.192
	4	-20.881	17.346	0.231	-55.279	13.517
2	1	8.172	17.624	0.644	-26.778	43.121
	3	-25.899	17.498	0.142	-60.599	8.801
	4	-12.709	16.894	0.454	-46.211	20.792
3	1	34.070	17.782	0.058	-1.192	69.333
	2	25.899	17.498	0.142	-8.801	60.599
	4	13.189	17.319	0.448	-21.155	47.534
4	1	20.881	17.346	0.231	-13.517	55.279
	2	12.709	16.894	0.454	-20.792	46.211
	3	-13.189	17.319	0.448	-47.534	21.155

Based on estimated marginal means;

(a) Adjustment for multiple comparisons: Less significant difference (equivalent to no adjustment).

Table 52 shows that the model is not suffering from lack of fit and Table 53 shows that the variances can be considered homogeneous between treatments, as in both previous tests. However, the pair comparison test of Table 54 shows that there could be a difference between treatments 1 (fewer syllables per word and fewer words per sentence) and 3 (more syllables per word and fewer words per sentence) with a sigma of 0.058. That could mean that, marginally, the treatments are different. Even so, model 3 does not seem to be good in comparison to the others given its R^2 and the F statistics of the corrected model, which indicates that all variables together are equal to zero.

5.3.2.3.4. Model 4: Model 1 and Interactions Between Covariates

On Model 4, I included interactions between the dichotomous variables to verify if there was any impact of combined characteristics of the participants over the score they made on phase 1. It resulted in four more covariates in the model, making a total of eight, still respecting the rule of Hair et al. (2010) mentioned in the previous section.

The results of the ANCOVA of Model 4 are in Table 55.

Table 55 – ANCOVA test: Model 4

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	130638.672 (a)	11	11876.243	3.568	0.000
Intercept	47202.374	1	47202.374	14.18	0.000
Treatment	2446.188	3	815.396	0.245	0.865
Score – Phase 3	42504.035	1	42504.035	12.768	0.001
Accounting major	7316.43	1	7316.43	2.198	0.141
Undergraduate in process	21424.554	1	21424.554	6.436	0.013
Public School	8766.122	1	8766.122	2.633	0.108
Accounting major * Undergraduate in process	4939.925	1	4939.925	1.484	0.226
Accounting major * Public School	13502.096	1	13502.096	4.056	0.047
Undergraduate in process * Public School	36985.801	1	36985.801	11.111	0.001
Accounting major * Undergraduate in process * Public School	17513.401	1	17513.401	5.261	0.024
Error	329554.1	99	3328.829		
Total	4682918	111			

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Total	460192.78	110			

Dependent variable = Squared Score = Phase 1

a. $R^2 = 0.284$ (Adjusted- $R^2 = 0.204$)

The adjusted- R^2 shows that even though I included four new variables on the model, its explanatory power increased to 0.204, and can be considered a stronger model.

Again, the “Treatment” variable was not significant, pointing to no difference between treatments. Moreover, “Undergraduate in process” and most interactions were significant at a 5% significance level. Therefore, differences in the level of education, courses and the type of school of the respondent are more significant in explaining understandability rather than readability levels, for Accounting information in Portuguese.

The complementary analysis of the model is present in Tables 56, 57, and 58.

Table 56 – Lack of fit test: Model 4

Source	Sum of Squares	df	Mean Square	F	Sig.
Lack of fit	189087.637	56	3376.565	1.034	0.459
Pure Error	140466.467	43	3266.662		

Table 57 – Levene test: Model 4

F	df1	df2	Sig.
0.554	3	107	0.646

Table 58 – Pair comparisons test: Model 4

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
1	2	-2.662	16.050	0.869	-34.510	29.185
	3	-13.148	16.668	0.432	-46.221	19.925
	4	-7.705	16.009	0.631	-39.471	24.061
2	1	2.662	16.050	0.869	-29.185	34.510
	3	-10.486	16.171	0.518	-42.573	21.601
	4	-5.042	15.534	0.746	-35.865	25.780

(I) Treatment	(J) Treatment	Mean Difference (I-J)	Standard Error	Sig. (a)	95% Confidence Interval to the Difference	
					Lower Bound	Upper Bound
3	1	13.148	16.668	0.432	-19.925	46.221
	2	10.486	16.171	0.518	-21.601	42.573
	4	5.443	15.915	0.733	-26.135	37.022
4	1	7.705	16.009	0.631	-24.061	39.471
	2	5.042	15.534	0.746	-25.780	35.865
	3	-5.443	15.915	0.733	-37.022	26.135

Based on estimated marginal means;

(a) Adjustment for multiple comparisons: Less significant difference (equivalent to no adjustment).

Again, the Lack of Fit test of Table 56 displays that the non-significance of the sigma means that the covariance model is adjusted. The sigma of Levene test of Table 57 denotes a homogeneous variance of errors between treatments.

The paired comparison between treatments of Table 58 confirms the results of the ANCOVA that there are not differences between treatments, and that readability levels do not affect understandability.

Figure 30 – Dispersion plots (Fitted Values and Residuals): Model 4

In Figure 30 it is possible to see the dispersion plots of the fitted values and residuals of this model.

Again, the dispersion plot (Figure 30) does not represent any relationship between the residuals and the fitted values, which allows one to say that the linearity assumption was validated.

5.3.2.3.5. Results Robustness

Other tests were made, trying to further verify if the results are robust to changes in models. For instance, including interactions with “Score – Phase 3” with all the three dummy variables of Model 1 did not improve the results and the significance of this variable became marginally significant at 5% (sigma of 0.058). All the interactions were not significant, and the adjusted-R² fell to 0.111.

I tested the models with only one of the dummy variables and “Score – Phase 3” as covariates, but the conclusions did not change. I also tested versions of Model 1 without one of the dummy variables, but, again, all tests showed similar results to the previous ones. Finally, I tested if taking off one of the dummy covariates and including an interaction between the other remaining two was going to change the results and found that when “Accounting major” is excluded and an interaction between “Undergraduate in process” and “Public School” is included, the adjusted-R² becomes 0.154 and “Undergraduate in process” becomes significant in a 5% significance level (sigma of 0.042); however, this conclusion is not much different from the one obtained on model 4.

Qualtrics® also allows the researcher to know how long a participant took to answer the survey. I tested this new variable and found that, firstly, its bivariate correlation with the dependent variable is considerably low (0.096), as well as, the bivariate correlation with each of the other covariates. Additionally, when used in the models presented, it also did not show any significance or change in the results. Therefore, I chose not to present it in this report.

Moreover, I included the variable “Age” in several of them, and it did not change the results, even when including interactions with other variables such as “Undergraduate in progress” and “Accounting major”. The variable of gender, already mentioned, was not significant in all the tried tests either.

Nonetheless, I expected that variables such as “Time studying Accounting” would be significant, once it represents the reader’s background regarding that subject. The results also suggest that the effect of major is more significant than how long someone studied the subject. The type of institution and the level of education also were significant when controlling with interactions. That means that the combination of characteristics is important to explain the level of a participant’s understanding of notes to the Financial Statements.

5.3.3. Within Subjects Experiment: Means Test and Mediation Analysis

On this part of the analysis, I tested how a glossary can affect the understandability of notes to the Financial Statements. Thus, what I test is how participants scored before and after they had received the glossary. Once it is not a between-subjects analysis, there is no need to control for participant's characteristics.

I performed means test to verify if the scores of Phase 1 (pre-test) and Phase 2 (post-test) were statistically equal. So I could do that, firstly, I had to choose between a parametric and non-parametric test, therefore, I tested both variables for the normality using Kolmogorov-Smirnov, which is recommended for samples greater than 50 (Maroco, 2007).

It is important to highlight that the tests of Table 38 were performed over the variables by treatment, while in here, the tests are over the full sample. The results of such tests are in Table 59.

Table 59 – Normality tests: Scores of phases 1 and 2

Variables	Kolmogorov-Smirnov		
	Statistics	df	Sig.
Score – Phase 1	0.144	111	0.000
Score – Phase 2	0.123	111	0.000

Once the tests showed that the variables are not normally distributed, I performed the Wilcoxon Signed Rank test to verify if they are statistically indistinguishable. I presented the results in Table 60.

Table 60 – Wilcoxon test: Scores of phases 1 and 2

	(Score – Phase 2) - (Score – Phase 1)
Z	-2,176 (a)
Asymp. Sig. (2-tailed)	0.03

a. Based on negative ranks.

Table 60 indicates that the scores of phases 1 and 2 are statistically different in a 5% significance level. Therefore, given that the only difference between this phases is the glossary, it means that it was the probable cause of this difference.

Separately analyzing each treatment changed the findings, whereas in all of them the difference between the scores was not significant at a 5% significance level¹⁰. Then, to be certain that the glossary is the reason why the scores changed and not a better understanding of the text after a closer review, I performed a mediation analysis.

Hayes (2013) defines mediation as a statistical method that helps the researcher answer the question of how Y is affected by X (causal agent). In accordance to him, a simple mediation model is a causal system where X influences Y through a single intervening variable M. Similarly, according to Baron and Kenny (1986), the mediator is a variable that “... accounts for the relation between the predictor and the criterion” (p. 1176).

As requested by Hayes (2013), I assumed that the mediator is located between the independent and the dependent variables. I presented the participants in phase 2, their answers to phase 1, therefore, they could choose between keeping the same answer or changing it. It means that the scores of phase 1 were a great cause to the scores of phase 2. However, the use of glossary could have had some influence over the changes made from phase 1 to 2, even though not completely, given some cases of change were caused by different interpretation. Then, the predictor or independent variable is the score of phase 1, the criterion or dependent variable is the score of phase 2, and the level of use of the glossary indicated by the participants is the mediator, located between the other two variables.

“How much used glossary” was a question to make sure that the glossary had some impact over the dependent variable. This mediator variable was in a sliders question, and the participant had to choose in a type of ruler, how much he/she used the glossary. Therefore, it is used to control for not use of the glossary. The lowest level was 0, which would represent “No use” and the highest level was 100 or “Used in all questions”. Table 61 presents the descriptive statistics of the dependent variable (Score – Phase 2) and the variable used as the mediator.

Table 61 – Descriptive statistics of Mediation analysis: Dependent Variable and Mediator

Variable	Mean	Median	S.d.	Minimum	Maximum	Asymmetry	Kurtosis
Score – Phase 2	13.98	14	2.405	8	18	-0.453	-0.376
Percentage use of glossary	10.13	0	18.44	0	91	2.55	6.90

¹⁰ Treatment 1: p-value of 0.0521; Treatment 2: 0.6987; Treatment 3: 0.1496; and Treatment 4: 0.1154.

As in Table 35, that presented the descriptive statistics of “Score – Phase 1”, it is possible to verify that no participant answered all questions correctly in phase 2 either, given that the number of questions was 19. On the other hand, the statistics of “Score – Phase 2” show little deviation from data and the distribution close to normal.

The median and minimum of the moderator have the same number, which indicates that at least half of the values are equal to zero. That explains the size of the standard deviation and why mean and median are so different. Asymmetry and Kurtosis indicate that this variable is not normally distributed.

The mediation model assumes a system with three variables, with two causal paths that feed into the dependent (outcome) variable, one from the independent variable and the other from the mediator, and one path from the independent variable to the mediator (Baron & Kenny, 1986). The path that goes from the independent variable to the dependent variable is called ‘direct effect of X on Y’; the path that goes from the independent to the dependent variable through the mediator is called ‘indirect effect of X on Y through M’; total effect is the sum of direct and indirect effects (Hayes, 2013).

I expected the scores of phases 1 and 2 to have a great positive relation; therefore, the participants that understood well the text on the first phase would keep their understanding on the second. It is important to highlight that “Score – Phase 1” already comprises any participants prior knowledge.

The relation of scores of phase 1 and the mediator, glossary, is expected to be negative, once good readers may not use much of the glossary¹¹. Finally, the relation between mediator and score of phase 2 is positive, once it is used to improve understanding.

I presented the results of the mediation analysis on the mediation model, in Figure 31.

¹¹ The glossary in this relation works as a dictionary, therefore, people who has no difficulty in understanding would use it less.

Figure 31 – Mediation results: Score of phases 1 and 2 with and without the mediation of “Percentage use of glossary”

According to Baron and Kenny (1986), some conditions are necessary to establish mediation:

1. The mediator must be affected by the independent variable – My results show that this is true with a p-value of 0.001 (Beta of -2.316). The negative Beta indicates a negative relation, as expected. Therefore, it is possible to say that people that understood well the notes on the first phase used less the glossary on the second. The adjusted- R^2 of this regression is 0.087, and the F-statistics is 11.506;
2. The dependent variable must be affected by the independent variable – The p-value of 0 (Beta of 0.891) shows that this is true. Again, the Beta is in accordance to what I expected with a positive relation. Thus, participants who scored well on the first phase kept their scores high in the second, and those who did not understand well the information on the first kept similar understanding on the second. The adjusted- R^2 is 0.827, and the F-statistics is 527.875, suggesting a high correlation between both phases scores;
3. The dependent variable must be affected by the mediator with the presence of the independent variable – A p-value of 0.004 (Beta of 0.015) confirms this condition and the signal of the Beta follows the expected relation. The adjusted- R^2 is 0.838, and the F-statistics is 285.478, suggesting a high correlation between both phases scores.

4. The coefficient that relates only the independent variable to the dependent variable must have a larger absolute value than the coefficient of the same relation of the model with the mediator – Considering that the beta of the regression with the mediator (0.925) is larger than 0.891, this condition was not met.

The total effect of 0.891 comprises the positive direct effect of 0.925 and the negative indirect effect of 0.034 (-2.316 multiplied by 0.015). To calculate the standard error of the indirect effect, I used Sobel (1982) formula:

$$s_{ab} = \sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}$$

Where:

a – is the beta of “Score – Phase 1” of the regression where the mediator is the dependent variable;

b – is the coefficient of “How much used glossary”, the mediator, of the regression with “Score – Phase 2” as the outcome variable and the other score as the independent variable.

s – standard error of each variable in both regressions.

The ab standard error of 0.0164 helps to find the statistics that will be compared to the critical value of ± 1.96 (at a 5% significance level), and which will define if the indirect effect is significant or not. Dividing the indirect effect of 0.034 by the standard error results on a statistics of -2.1348, which is smaller than the critical value. Therefore, it is possible to say that the indirect effect is significant at a 5% significance level. These results were consistent with the Wilcoxon test and suggested that the glossary was a partial mediator, implying that its presence affected the outcome.

Considering that the mediation analysis consists of linear regressions, one of the assumptions is of normality. I tested my variables and found that the residuals do not follow a normal distribution. Therefore, I performed bootstrapping with a 1,000 sample, to verify if the results were the same. As Preacher and Hayes (2004), bootstrapping is a nonparametric approach that does not have assumptions regarding the shape of the distributions. The results showed that the variables lost some of the significance, but only for “How much used glossary” on the mediated regression it was not significant at 5% significance level, but it was still significant at a 10% significance level (0.087, using a bias corrected accelerated bootstrap). The conclusions did not change with the bootstrapping.

5.3.4. Other Analysis

5.3.4.1. Combination of Between and Within Analysis

Table 62 presents the scoring rate for each question, treatment, and phase of the experiment.

Table 62 – Score rate

Questions	Phase 1				Phase 2			
	T1	T2	T3	T4	T1	T2	T3	T4
1	0.560	0.429	0.821	0.667	0.560	0.500	0.857	0.767
2	0.720	0.750	0.786	0.833	0.640	0.786	0.857	0.833
3	0.520	0.714	0.893	0.667	0.600	0.750	0.893	0.733
4	0.760	0.714	0.929	0.867	0.800	0.679	0.893	0.900
5	0.440	0.357	0.607	0.500	0.440	0.429	0.714	0.400
6	0.800	0.857	0.821	0.833	0.960	0.821	0.821	0.833
7	0.720	0.786	0.857	0.833	0.800	0.786	0.857	0.833
8	0.760	0.857	0.750	0.833	0.800	0.857	0.786	0.867
9	0.840	0.857	0.714	0.800	0.920	0.821	0.750	0.800
10	0.400	0.286	0.500	0.500	0.360	0.250	0.464	0.533
11	0.840	0.750	0.679	0.733	0.880	0.786	0.679	0.733
12	0.960	0.857	0.821	0.867	0.880	0.821	0.821	0.900
13	0.800	0.821	0.893	0.833	0.800	0.750	0.893	0.833
14	0.480	0.536	0.679	0.467	0.560	0.464	0.679	0.467
15	0.800	0.964	0.821	0.900	0.840	0.929	0.821	0.900
16	0.880	0.964	0.893	0.900	0.920	0.929	0.893	0.900
17	0.880	0.786	0.857	0.767	0.880	0.857	0.857	0.767
18	0.640	0.750	0.786	0.633	0.680	0.750	0.786	0.667
19	0.240	0.536	0.321	0.433	0.360	0.536	0.286	0.433

Table 62 shows that the level of scores between treatments was not the same, but have great similarities. The questions with the lowest scores were 5, 10, and 19 (notes of Basis of Preparation, Intangible Assets, and New Standards, respectively), and the questions with the

highest scores were 6, 12, 15 and 16 (notes of Basis of Preparation, Intangible Assets, and Equity, respectively). It shows that the type of note does not seem to impact understanding.

Another analysis to verify if there is any relationship between readability and understandability was to calculate the correlation between the Flesch index of each question and the scores of both phases¹². Some questions belonged to the same passage, therefore, I repeated the readability level for the questions of the same passage. For instance, questions 1 and 2 were related to the same passage, on the first analysis I kept the scoring rate for each of them (0.560 and 0.720, respectively) and paired with the same readability level for the passage they belonged to, which was 18.514 for Treatment 1.

The general correlation between scores and readability is of 0.2342. Plus, separating by phase changes little this result. Separating it by treatment does not change it much either, the highest correlation is of treatment 4, 0.3143. It corroborates previous results of the little relationship between readability and understandability.

To test if the changes from phase 1 to phase 2 were the same between groups, I performed a Wilcoxon test, once the variables did not have a normal distribution, and presented the results on Table 63.

Table 63 – Wilcoxon test: Scores comparison of phases 1 and 2

	Treatment 1	Treatment 2	Treatment 3	Treatment 4
Z	-2.025 ^a	-0.029 ^b	-1.292 ^a	-1.481 ^a
Sig. Asympt. (2-tailed)	0.043	0.977	0.196	0.139

a. Based on negative ranks; b. Based on positive ranks.

The results of Table 63 show that, except for Treatment 1, to the other three, phase 1 and phase 2 are indistinguishable in a 5% significance level.

I also performed the mediation test by treatment, and I presented the results in Table 64.

Table 64 – Indirect Effect by Treatment

Treatment	A	B	S_a	S_b	ab	S_{ab}	Statistics
1	-2.316	0.024	0.683	0.009	-0.055	0.027	-2.057
2	1.017	0.002	0.088	0.017	0.002	0.017	0.139

¹² I analyzed the readability of the passage presented to the participants and not the paraphrase.

Treatment	A	B	S _a	S _b	ab	S _{ab}	Statistics
3	1.017	-0.010	0.047	0.008	-0.010	0.008	-1.350
4	0.941	-0.011	0.062	0.014	-0.010	0.014	-0.742

Only on Treatment 1, the most readable, the statistics were not between 1.96 and -1.96, thus, to all other treatments, the indirect effect of the glossary is not significant. That reinforces the results obtained on the Wilcoxon test of table 63 that there are no differences with or without the glossary.

Moreover, I performed this test excluding all the observations whose level of use of glossary was equal to zero. The results did not change much, for instance, the statistics of Table 64 for Treatment 1 also became not significant, but all others were still not significant. The statistics changed slightly, but the conclusions remained the same.

However, the small sample in each cell may have impacted on these results, making them different from those found on section 5.2.3.

5.3.4.2. Confidence

It is important to remember that Table 61 shows that most participants did not even use the glossary, which is possibly related to the fact that they were all students of business related courses and believed they did not need it. That is why I included the questions regarding confidence level, to verify if the difference in scores is due to the use of glossary or their confidence regarding their answers.

The “Confidence level” are variables that represent how much confidence the respondent had on his/her answer. The minimum that could be answered was 1, which meant “No confidence at all” and the maximum was 7, which meant “Really confident”. I did not establish the other labels of this could be a quantitative and discrete variable.

Firstly, I present in Table 65 the Descriptive Statistics of the confidence levels of both phases.

Table 65 – Descriptive Statistics: Quantitative covariates (Within-subject analysis)

	Confidence level – phase 1	Confidence level – phase 2
Mean	5.59	5.53
Median	6.00	6.00
Standard deviation	0.982	1.123
Minimum	2	2
Maximum	7	7
Asymmetry	-0.545	-0.885
Kurtosis	0.655	1.160

Both mean and median are high, showing that the participants were quite confident in their answers. Their standard deviation shows that there were not many differences amongst the answers. And the asymmetry shows that they are concentrated in higher values.

It is important to highlight that, curiously, the mean confidence decreased with the presentation of the glossary. However, the amounts are close, demanding a mean test to say if they are equal or not. I performed a Wilcoxon test, once the variables are not normally distributed, and presented the results in Table 66.

Table 66 – Wilcoxon test: Confidence levels of phases 1 and 2

	Confidence level 2 - Confidence_level_1
Z	-1.163 ^a
Sig. Asympt. (2-tailed)	0.245

a Based on positive ranks.

Table 66 shows that I cannot reject the null hypothesis of equality, i.e., the confidence levels can be considered indistinguishable in a 5% significance level, for a 2-tailed test. Thus, the decrease in confidence from phase 1 to phase 2 is statistically irrelevant. It is evidence that using the glossary did not improve the participants' confidence over the understanding of notes.

To verify if there is a relation between the confidence levels and the scores, I firstly calculated the correlation between variables.

Table 67 – Correlations: Scores and Confidence levels of phases 1 and 2

	Score – Phase 1	Score – Phase 2	Confidence level – Phase 1	Confidence level – Phase 2
Score_ - Phase 1	1			
Score_ - Phase 2	0.910**	1		
Confidence_level – Phase 1	0.207*	0.180	1	
Confidence_level – Phase 2	0.296**	0.304**	0.851**	1

* Correlations is significant at 0.05 (2-tailed); ** Correlations is significant at 0.01 (2-tailed).

Table 67 shows that the correlations of scores and confidence levels are highly correlated between phases, but not much correlated to each other. That is evidence that the confidence levels did not affect the scores and vice-versa.

To further investigate this, I performed a mediation analysis, as in Figure 29, using Structural Equations Model (SEM), and the variable “Confidence level – Phase 1” as another mediator. The reason why I did not use “Confidence level – Phase 2” was because the question regarding confidence was asked after the participant answered the understandability questions (in both phases), therefore, the score may affect confidence in the same phase, even though they did not receive any feedback regarding their score, but the score of phase 2 will probably not be affected by confidence of that phase. “Confidence level – Phase 1” was, then, a proxy for previous confidence.

The “Confidence level – Phase 1” is explaining the use of glossary because I believed that people who were confident about their answers on the first phase would feel less inclined to need the glossary, i.e., I expect a negative relation between these variables.

I presented the results in Figure 32.

Figure 32 – Mediation model: Score of phases 1 and 2, “How much used glossary”, and the confidence level from phase 1

The expected signals were confirmed. Nevertheless, “Confidence level – Phase 1” is not significant to explain “Score – Phase 2” or “How much used glossary”. That suggests that it is not a good mediator. To be certain of that, I analyzed its indirect effect. The p-value of the indirect effect of “Confidence level – Phase 1” is 0.111; thus, I confirmed that it is not a good mediator. These findings suggest that the confidence level did not affect the results of the second phase.

Even when only the data used was of participants who did use some part of the glossary (“How much used glossary” > 0), the evidence did not change. I also included “Accounting major” as a covariate, but the results remained the same.

Therefore, the evidence proposes that Confidence did not affect the understandability of notes to the Financial Statements.

Again, the normality assumption of the mediation analysis was not met; thus, I used the bias corrected accelerated bootstrapping with 1,000 samples. Only for the regression on “Score – Phase 2” the significance for “How much used glossary” is not significant at 5%, but it is for a 10% significance level (0.079). Consequently, it is possible to say that the conclusions over the results do not change.

5.3.4.3. Results Discussion – Experimental Research

On the overall, in all models tested on the between-subjects analysis, there was no significant difference between treatments. Therefore, even though the cohesion of the text changed, once it is a text related characteristic as explained by Graesser et al. (2004), the coherence, which is related to the mental representation of the reader, was not modified. As Dryer (1984), longer words or sentences can be correlated to reading difficulty, as my archival results show, but they may not cause it, once, in some cases, longer words or sentences are easier understood, as shown by my experiment results.

My results show that, as in Peirce’s theory, all different signs used (synonyms with a different number of syllables), which are representing a single object (accounting information), result on the same interpretant (the conclusion that the meaning is the same). Therefore, it is possible to say that changing the legi-signs, i.e., signs that follow the rules, in this case, words that follow grammar and cohesion rules, did not change the argument, which,

according to Deledalle (2001), is the sign inferred by the interpretant. That, however, goes against what Soper and Dolphin Jr (1964) found, which was a relation between readability and understandability. This difference could have been due to the language of the tests, once mine was carried out in Portuguese and theirs, in English; but also, it could have been due to the instrument used, which was two different firms, with different levels of readability, and the participants had to answer true or false to questions.

On the other hand, while “Score – phase 3” was significant to explain the dependent variable. It suggests that prior text understanding skills are more significant than readability itself when explaining understandability of accounting information in Portuguese. It is accordance to Jones (1997), which stated that the understandability of a text is more than readability, being contingent to a reader`s general ability reading.

Additionally, Model 4 of the between-subjects analysis brought light to the fact that other readers characteristics like the level of education, courses and the type of school can also be significant to explain understandability. I did not expect the significance of these variables as in Smith and Taffler (1992), the authors found that understandability is related to education and complexity of context. Jones` (1997) paper supports these findings, once he believed that the reader`s background, prior knowledge, and interest were necessary to allow understandability.

The results of the experiment reinforce the evidence of no understandability differences between notes.

Moreover, the findings of the within-subjects analysis suggest that the glossary use affected understandability, as expected by the OCPC 07. Oppositely to the between-subjects analysis, in this one, cohesion did not change, but the coherence to the reader did. This means that, when the knowledge of the reader is in a similar level to the writer`s (in this case, the accountant who prepared the notes), the information will be better understood, or as Graesser et al. (2004), this allows the reader to make a coherent mental representation of the text. It is in accordance to Peirce`s idea of collateral experience regarding an object, which to Santaella (2007) relates to previous knowledge regarding the object, and to Leffa`s (1996) idea that reading is possible when you know the world that is being represented by the text. Therefore, the communication was effective, because the attributed meaning was the same for preparer and user (Dias Filho & Nakagawa, 2001).

As it is important to remember, based on the literature of Semeiotics, the information of notes and Financial Statements are signs that represent the object (equity and its quantitative and qualitative variations), then, they are not the object itself. For a receiver of the sign understand what the sender intended to inform, they must have common knowledge regarding that particular subject. Like the view of Dias Filho and Nakagawa (2001), the disclosure limits must be established by the needs and characteristics of the user, therefore, as suggested by my results, in the case where the user of Accounting information already has prior knowledge, the glossary will be, as Leffa (1996) would say, redundant, bringing more information than the reader needs. Thus, as my results showed, it may not be useful, and it will not be used at all. But, for those where the Accounting terminology is not known or partially known, it may be convenient to equalize the collateral experience with the presentation of that information. That confirms Fiske's (2002) ideas that a larger and heterogeneous audience requires a more redundant message, while a small, specialist and homogeneous audience demands a less redundant message.

Finally, these results show that more importantly than readability, the common ground between user and preparer is more important to achieve understandability.

Therefore, I rejected H1 as in the archival research, and so were its variants, so improving any of the two components of Flesch index does not increase understandability, and there is no evidence that one is better than the other to that end. On the other hand, I could not reject H2, thus increasing the collateral experience of accounting vocabulary increases the understandability of notes.

6. CONCLUDING REMARKS

6.1. Conclusion

The main purpose of this research was to verify how readability impacts on the understandability of the information from the notes to the financial statements and to verify whether the distance between these concepts is due to the reporting language.

To reach such goals I performed two different types of research methods. The first was the archival research applied to 44 firms that presented their notes both in Portuguese and in English. Based on a statistical test, I chose to study the notes of Financial Instruments and Provisions. To find the relation between readability and understandability, I used indexes of intelligibility as proxies to understandability and compared the results. Furthermore, to verify how the reporting language can change such indexes, I compared the scores on both languages.

The second method was an experiment applied to 112 students in Brazil of graduate and undergraduate courses related to business. To verify how readability impacts on understandability, I manipulated readability components of the Flesch index and tested through an MIT test based on Jones and Smith (2014), how that changed the comprehension of the participants. To make sure that the effect was due to the manipulations made, I controlled for some characteristics of each participant and the technicality of accounting information.

Below, I present the answers found to the specific purposes of this research and the hypothesis related to it.

1. Verify whether different readability levels have an impact on the notes to the financial statements' understandability (Hypothesis 1)

Previous literature indicates that there might be a relation between readability and understandability, that increasing readability may improve understandability (Razik, 1969; Dreyer, 1984; Graesser et al., 2004). Hence, the Hypothesis 1 “Improving readability increases the understandability of notes to the financial statements” was created to test whether this happens in accounting information. To verify which component of readability affected more the understandability, I created some variants to H1: H1A “Reducing the sentences extension increases notes’ understandability”; H1B “Reducing the use of words

length increases notes' understandability"; and H1C "Reducing sentence extension increases notes' understandability more than reducing words length".

Using the archival analysis, I separated the observations in quartiles in accordance to their Flesch index score. Then, I compared the intelligibility indexes of the first and fourth (the area above the third quartile) quartiles, which are the worst and best readability, respectively. By doing this, I found that, for most indexes where the two quartiles were statistically different, the first one had the better levels of intelligibility, which goes against what one would expect. It is evidence that readability indexes are not good enough to measure reading ease of a text.

To make sure this evidence is validated, I used the experimental research. The results of the experiment were robust to models alterations, and I found that there was no significant difference between treatments, and a variable called "Score – phase 3", that measures the participant's ability in understanding, was significant to explain the dependent variable in all models tested. This variable represents general understandability. Furthermore, one of the models showed that level of education, courses and the type of school are also significant to explain understandability.

Therefore, I rejected H1. I also rejected all the other variants of this hypothesis; thus, it is not possible to say that reducing the sentences extension nor reducing the use of words length increases notes' understandability. Moreover, there is no evidence that "reducing sentence extension increases notes' understandability more than reducing words length".

These findings suggest that general text understanding skills and personal characteristics are more significant than readability when explaining understandability of accounting information in Portuguese. These findings bring evidence that, at least for Portuguese, readability measures are not good enough to evaluate understandability of notes, confirming the results found on the archival part of this research.

2. Verify whether the understandability levels are due to accounting specific terms (Hypothesis 2)

In accordance to Peirce's idea of the collateral experience of Semeiotics, both writer and reader are expected to have a common ground of the referred object so that the sign can be understood. Previous literature in Accounting indicated that this area might face some problems of understanding due to its specific terms (Worthington, 1977; Rush, 1985; Hendriksen & Breda, 1999; OCPC 07). OCPC 07 suggests that a glossary should be presented

with financial statements to assist not so much the sophisticated users. Therefore, I created the second hypothesis, “Increasing collateral experience of accounting vocabulary increases notes’ understandability”.

To allow me to test that, I used a within-subjects experiment to verify if, taking off the technicality of the text, by providing a glossary, affected the understandability. The evidence suggests that the use of a glossary to assist the reader affected understandability. Therefore, I could not reject the Hypothesis 2.

However, that evidence suggest that the glossary may be used only by those who have less prior knowledge regarding notes to the financial statements, but even though, it does not make them feel more confident when using it.

3. Verify if those notes’ understandability and readability are different for different languages (Hypothesis 3)

Most of the readability studies were applied to information in English (Klare (1974-1975; Martins et al., 1996; Moreno & Casasola, 2015), in Accounting, this use drops even more. Translation has problems in Accounting due to its specialized and culture-specific terminology (Evans, Baskerville, & Nara, 2015). The readability metrics, however, should not be affected by the translation if the metric adapted to the language was used. Meanwhile, when looking at intelligibility metrics, Pasqualini, Scarton, and Finatto (2011) found differences in Portuguese and English, which is evidence that translation can affect understandability. Thus, I formulated the following hypothesis: H3A: Reporting language has no impact on notes’ readability, and H3B: Reporting language has impacts on notes’ understandability.

To test both Hypothesis 3, I used the archival research to compare the levels of readability and understandability between languages, which I calculated using intelligibility measures in English and Portuguese.

My results show that with few exceptions, the readability and intelligibility indexes do statistically differ in Portuguese and English, as expected according to previous studies. Except for the indexes of connectives, for the others, English showed worse scores. Then, one may conclude that for the notes to the financial statements of the studied firms, understandability, measured by intelligibility, is higher in Portuguese, even though English showed better readability indexes.

Thus, I rejected Hypothesis 3A while the 3B was not, which means that language impacts both readability and understandability.

4. Verify if the levels of readability and understandability changed after OCPC 07 (Hypothesis 4)

Even after the adoption of the IFRS is expected that firms will continually improve their financial information. In Brazil, with the publishing of OCPC 07, a better understandability was required, which demanded from firms to improve their information. Therefore, I created the last hypothesis “The understandability of notes to the financial statements improved after OCPC 07”.

To test hypothesis 4, I used the archival research. I analyzed the evolution of readability and intelligibility indexes from 2012 to 2015, and, on overall, I found that there was no change statistically significant in all studied years, which suggests that OCPC 07 did not impact on the readability and intelligibility indexes of these companies. Therefore, I rejected Hypothesis 4.

The limitation of the archival research is that the results may not be generalizable to other years or to other firms that do not have to present their information in English. Furthermore, the databases used by each software, Coh-Metrix, and Coh-Metrix-Port, are not the same, which can impact the results.

One limitation related to the experiment is that the participants may have read only the excerpts that appeared on the paraphrase and not the whole text. To minimize this problem, instead of only presenting the extraction of the notes that they would have to analyze, I presented a larger text with paragraphs before and/or after the analyzed sentence. I used the gift card as an incentive for participants to pay attention to the task, thus, to mitigate any attention issues. Furthermore, the results cannot be generalized to other types of audiences, such as current investors or analysts, neither to other financial information.

I suggest for future researches: comparisons with other languages besides Portuguese and English; use of other target audience as participants, nonprofessional investors or analysts, for instance; apply similar experiment in other languages or other financial information, such as the Management Report or the Independent Auditors' Report; test through an experiment how different levels of intelligibility impact understandability; and use

a between-subjects experiment to verify the impact of the glossary on understanding, so I can compare it to the results of the within-subjects experiment I performed.

6.2. Study Implications

This research showed the relation between readability and understandability of notes to the financial statements, findings that may be useful for some groups:

- Firms/Accountants – the intelligibility indexes may be used to analyze the ease comprehension of texts, improving their quality. The utility of glossary, however, is questionable. Its use and apparent benefits to the user may be too low to the actual benefits it generates to the firms. Thus, the presentation of a glossary should be analyzed by each firm individually.
- Researchers – many studies have been using readability and its metrics as ways of measuring understandability. This study finds that other measures should be considered, such as the intelligibility indexes, once readability is not good for it. Additionally, this study shows that there may be other ways of analyzing these concepts, making this a very fertile ground of study, especially in languages apart from English.
- Standard setters and regulators – The findings suggest that maybe presenting the glossary as an attempt to improve understandability is not the best option, once it will increase the information overload that already exists and most users will probably not even look at it. Furthermore, the evolution over the years showed that, at least in the writing quality, there is no evidence that firms have been improving their information after the OCPC 07. These results can be used to demand better information quality from firms.
- Investors – this research was entirely based on the effort to find ways to measure the investors' possible understandability. These findings can be used by them to require from standard setters, regulators, and firms, better ways of measuring text quality and presenting good quality information, which is necessary for proper decision making.

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¹³ In accordance with the APA (American Psychological Association) style.

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APPENDIX

DOCUMENT 1 – ARCHIVAL RESEARCH VARIABLES' NAMES AND ITS ACRONYMS

Variables	Acronyms
Flesch index	rdfre
Mean sentences per paragraph	despl
Mean syllables per word	deswlsy
Mean words per sentence	dessl
Number of Paragraphs	despc
Number of Sentences	dessc
Number of Words	deswc
Connectives incidence	cncall
Incidence of additive connectives	cncadd
Incidence of causal connectives	cnccaus
Incidence of logical connectives	cnclogic
Incidence of temporal connectives	cnctemp
Adjective incidence	wrdadj
Adverb incidence	wrdadv
Noun incidence	wrdnoun
Pronoun incidence	wrdpro
Verb incidence	wrdverb
Personal pronouns incidence	wrdprp
Adjacent argument overlap	crfao1
Argument overlap	crfaoa
Adjacent stem overlap	crfso1
Stem overlap	crfsoa
Adjacent content word overlap	crfcwo1
Mean hypernyms per verb	wrdhypv
Type to token ratio	ldttra
Modifiers per Noun Phrase	synnp
Noun Phrase Incidence	drnp
Words before Main Verb	synle

DOCUMENT 2 – FINANCIAL INSTRUMENTS NOTES – DESCRIPTIVE STATISTICS OF ARCHIVAL RESEARCH BY YEAR

	Means				S.D.				Medians			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Portuguese												
rdfre	0.04	0.00	-0.09	0.06	0.91	0.91	0.89	1.27	-0.08	-0.02	-0.01	0.02
despl	-0.02	0.04	0.00	-0.01	1.03	1.02	0.98	0.99	-0.10	-0.16	-0.29	-0.11
deswlsy	2.40	2.40	2.41	2.41	0.04	0.05	0.04	0.06	2.42	2.42	2.41	2.41
dessl	-0.01	0.11	0.03	-0.12	0.91	1.00	1.15	0.95	-0.16	-0.01	-0.08	-0.31
despc	0.16	-0.03	-0.02	-0.12	0.99	0.86	1.06	1.09	0.40	0.10	0.04	-0.08
dessc	0.15	-0.01	-0.02	-0.11	1.00	0.86	1.04	1.10	0.21	0.11	0.17	0.05
deswc	0.12	0.01	0.00	-0.13	0.94	0.86	1.05	1.15	0.35	0.21	0.45	0.02
cncall	-0.13	0.04	0.09	0.00	0.99	0.96	0.96	1.10	-0.03	-0.10	0.01	-0.12
cncadd	-0.05	0.01	0.06	-0.03	0.96	0.98	1.04	1.04	-0.05	0.01	0.02	-0.02
cnccaus	-0.05	0.11	-0.01	-0.06	0.99	1.04	0.87	1.10	-0.16	0.03	0.02	-0.13
cnclogic	0.01	0.02	0.09	-0.12	0.95	0.94	1.01	1.11	0.04	0.05	0.23	0.12
cnctemp	-0.08	-0.04	0.15	-0.03	0.92	1.07	0.96	1.06	-0.08	-0.08	0.16	-0.06
wrddadj	0.08	-0.02	0.02	-0.07	0.97	0.95	0.93	1.16	0.17	0.11	0.10	0.06
wrddadv	0.18	0.03	-0.08	-0.13	1.03	0.83	0.93	1.18	0.16	0.06	-0.29	-0.26
wrdsnoun	-0.08	0.09	0.02	-0.03	0.91	0.94	1.05	1.11	-0.18	-0.10	-0.28	-0.21
wrddpro	0.13	0.00	-0.10	-0.02	1.05	0.97	1.02	0.97	-0.02	-0.05	-0.19	0.04
wrddverb	0.06	-0.16	-0.04	0.14	0.83	0.97	1.04	1.13	-0.04	-0.23	-0.21	0.04
wrddprp	-0.03	0.05	0.03	-0.05	1.03	0.99	0.87	1.12	-0.63	-0.63	-0.63	-0.63
crfao1	0.03	0.17	-0.07	-0.13	0.93	1.21	0.95	0.88	-0.10	0.02	-0.19	-0.16
crfaoa	-0.05	0.12	0.05	-0.12	0.82	1.16	1.23	0.71	-0.03	0.07	0.03	-0.15
crfso1	0.00	0.09	0.00	-0.09	1.03	0.97	1.00	1.02	-0.06	-0.01	-0.11	-0.08
crfsoa	-0.06	0.06	0.06	-0.06	0.90	1.03	1.18	0.89	-0.10	-0.01	-0.02	-0.23
crfcwo1	0.03	0.11	-0.06	-0.08	0.97	1.09	0.97	1.00	-0.01	-0.14	-0.19	-0.15
wrddhypv	0.00	-0.12	0.04	0.09	1.00	1.10	1.01	0.90	-0.12	-0.16	-0.03	0.00
ldttra	-0.11	-0.05	0.04	0.12	0.84	0.76	1.10	1.25	-0.24	-0.04	0.05	-0.04
synnp	-0.07	0.00	0.03	0.03	1.09	0.97	0.97	0.99	-0.17	-0.11	-0.17	-0.03
drnp	-0.13	-0.02	-0.11	0.27	0.82	0.69	0.68	1.54	-0.29	-0.03	-0.21	0.03
synle	0.04	-0.04	0.06	-0.06	0.92	0.95	0.96	1.18	-0.09	0.06	-0.06	0.11

	Means				S.D.				Medians			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
English												
rdfre	0.04	-0.18	-0.15	0.29	0.83	0.95	0.91	1.24	0.17	0.02	-0.05	0.18
despl	-0.06	0.07	-0.01	0.00	0.98	1.07	1.01	0.96	-0.19	-0.15	-0.19	-0.07
deswlsy	-0.02	0.10	0.14	-0.22	0.80	0.85	0.99	1.28	-0.13	0.07	0.06	-0.12
dessl	-0.04	0.16	0.03	-0.16	0.90	1.05	1.15	0.89	-0.08	0.08	0.11	-0.08
despc	0.19	-0.10	-0.03	-0.06	0.97	0.92	1.05	1.06	0.38	0.01	-0.08	0.01
dessc	0.16	-0.09	-0.03	-0.04	0.97	0.92	1.03	1.09	0.21	0.01	0.10	0.06
deswc	0.14	-0.05	0.00	-0.09	0.95	0.94	1.04	1.09	0.31	0.12	0.27	0.11
cncall	0.00	0.11	0.07	-0.18	0.94	1.02	0.96	1.09	0.02	0.07	0.06	-0.32
cncadd	0.02	0.07	0.01	-0.10	0.97	1.00	0.95	1.10	0.08	0.22	0.11	-0.17
cnccaus	-0.02	0.14	-0.01	-0.11	0.94	1.19	0.86	1.00	-0.04	0.03	0.00	-0.04
cnclogic	0.01	0.05	0.03	-0.09	0.92	0.98	0.99	1.13	0.00	0.11	-0.03	-0.05
cnctemp	0.03	0.03	0.11	-0.17	0.83	0.93	1.20	1.01	0.25	0.21	0.10	-0.30
wrdadj	0.04	0.05	0.07	-0.16	0.89	0.96	1.15	1.00	-0.06	0.03	0.00	-0.25
wrdadv	0.01	0.00	0.08	-0.09	0.95	0.90	1.11	1.05	-0.13	0.15	0.22	-0.09
wrdnoun	-0.07	0.06	-0.04	0.05	0.91	0.99	1.11	1.02	-0.22	-0.03	-0.11	0.09
wrdpro	0.08	0.09	-0.10	-0.07	1.00	0.99	0.97	1.06	0.16	-0.06	-0.17	-0.25
wrdverb	0.02	-0.13	0.05	0.06	0.92	1.00	0.95	1.13	0.17	0.04	0.11	0.09
wrdprp	0.08	-0.05	0.02	-0.05	0.82	0.74	0.90	1.42	0.19	-0.12	-0.08	-0.31
crfaol	0.02	0.09	0.05	-0.16	0.92	1.01	1.18	0.87	0.26	0.19	0.24	-0.10
crfaoa	-0.04	0.05	0.11	-0.12	0.97	1.07	1.13	0.82	0.11	0.33	0.47	-0.11
crfso1	-0.01	0.14	0.03	-0.15	0.92	1.01	1.19	0.86	0.14	0.44	0.32	-0.07
crfsoa	-0.08	0.18	0.06	-0.16	1.01	1.02	1.11	0.85	0.05	0.34	0.35	-0.11
crfcwo1	0.03	-0.02	0.01	-0.02	0.92	1.05	1.09	0.96	0.03	0.01	0.21	0.01
wrdhypv	0.03	0.03	0.04	-0.09	0.84	0.95	1.19	1.01	-0.12	-0.01	-0.05	-0.16
ldttra	-0.09	0.06	-0.01	0.04	0.89	0.89	1.06	1.17	-0.17	0.05	-0.05	-0.19
synnp	0.11	-0.05	0.06	-0.12	0.88	1.04	1.09	1.01	0.05	-0.15	-0.02	-0.15
drnp	-0.13	0.05	-0.11	0.20	0.87	0.94	1.06	1.10	-0.01	0.09	-0.09	0.18
synle	0.11	-0.03	0.07	-0.15	0.93	0.99	1.00	1.09	0.07	0.01	-0.05	-0.16

**DOCUMENT 3 – PROVISIONS NOTES – DESCRIPTIVE STATISTICS OF
ARCHIVAL RESEARCH BY YEAR**

	Means				S.D.				Medians			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Portuguese												
rdfre	0.23	-0.05	-0.11	-0.08	0.84	0.89	1.21	1.01	0.26	-0.01	-0.03	-0.03
despl	0.20	0.07	-0.15	-0.12	1.15	1.04	0.82	0.95	-0.01	-0.23	-0.34	-0.31
deswlsy	2.45	2.46	2.47	2.47	0.05	0.06	0.08	0.07	2.44	2.46	2.46	2.47
dessl	0.02	0.11	-0.04	-0.09	0.93	1.02	1.01	1.06	0.17	0.16	0.13	-0.01
despc	-0.06	-0.02	0.03	0.06	0.91	0.92	1.08	1.10	0.01	-0.14	-0.11	-0.02
dessc	0.01	0.02	-0.03	0.00	0.97	0.97	1.04	1.05	-0.06	-0.14	-0.24	-0.12
deswc	0.03	0.05	-0.04	-0.05	0.98	0.99	1.08	0.98	-0.13	-0.21	-0.26	-0.12
cncall	-0.10	-0.03	0.04	0.08	0.93	0.96	1.08	1.05	-0.22	-0.24	-0.35	-0.19
cncadd	-0.15	-0.02	0.07	0.11	0.85	0.98	1.07	1.09	-0.24	-0.25	-0.27	-0.30
cnccaus	0.03	-0.06	0.03	0.00	0.95	0.96	1.11	1.00	0.04	-0.24	-0.24	-0.15
cnclogic	-0.02	0.03	0.00	-0.02	0.99	1.03	1.03	0.98	-0.21	-0.13	-0.15	-0.18
cnctemp	-0.05	0.15	-0.08	-0.02	1.04	1.00	0.90	1.07	-0.06	0.22	-0.01	-0.08
wrddadj	-0.19	-0.11	0.14	0.15	0.83	0.98	1.10	1.06	-0.03	-0.15	0.06	0.02
wrddadv	0.04	-0.06	0.03	-0.01	1.09	1.00	1.07	0.86	0.07	-0.22	-0.23	-0.17
wrdnoun	0.02	0.05	-0.03	-0.04	1.04	1.02	0.99	0.98	-0.03	-0.02	-0.02	-0.03
wrdpro	0.04	-0.02	-0.01	-0.01	1.03	0.98	0.98	1.04	-0.13	-0.08	-0.02	0.00
wrdverb	-0.02	-0.03	0.07	-0.03	1.22	0.97	0.88	0.92	0.07	0.08	0.05	-0.10
wrdprp	-0.03	0.01	0.07	-0.05	0.85	0.91	1.11	1.14	-0.51	-0.51	-0.51	-0.51
crfao1	0.08	0.14	-0.09	-0.14	1.05	1.09	0.87	0.98	-0.18	0.03	-0.14	-0.31
crfaoa	0.11	0.11	-0.08	-0.14	1.20	1.04	0.90	0.83	-0.04	0.02	-0.07	-0.25
crfso1	0.06	0.12	-0.04	-0.14	1.02	1.07	0.91	1.00	-0.13	-0.07	0.05	-0.21
crfsoa	0.08	0.09	-0.05	-0.12	1.08	1.06	0.95	0.91	-0.16	0.10	-0.16	-0.31
crfcwo1	0.07	0.13	-0.07	-0.12	1.02	1.07	0.93	0.99	-0.15	-0.10	0.00	-0.21
wrdhypv	0.07	-0.09	-0.01	0.03	0.98	0.88	1.08	1.07	0.01	-0.12	-0.12	-0.09
ldttra	-0.09	-0.09	0.11	0.06	0.90	0.97	1.03	1.10	-0.16	-0.32	-0.15	-0.20
synnp	0.05	0.04	0.02	-0.11	1.00	0.93	1.05	1.04	0.24	0.14	0.03	-0.03
drnp	-0.04	-0.12	-0.04	0.20	0.95	0.92	1.02	1.10	-0.07	-0.08	-0.27	0.05
synle	-0.01	0.01	0.05	-0.04	0.89	1.04	1.07	1.02	0.14	-0.01	0.03	-0.11

	Means				S.D.				Medians			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
English												
rdfre	0.10	-0.05	0.04	-0.09	0.87	0.95	1.16	1.02	0.21	0.09	0.23	0.09
despl	0.20	0.08	-0.13	-0.14	1.16	1.00	0.85	0.96	-0.09	-0.09	-0.32	-0.37
deswlsy	-0.09	-0.05	-0.04	0.18	0.89	0.95	1.07	1.09	-0.15	-0.15	-0.16	-0.13
dessl	-0.02	0.14	-0.01	-0.12	0.94	0.97	1.06	1.04	0.15	0.19	0.05	-0.03
despc	-0.05	-0.01	-0.02	0.08	0.93	0.95	1.00	1.13	0.01	-0.17	-0.08	-0.02
dessc	0.03	0.02	-0.06	0.01	0.99	0.98	0.98	1.08	-0.06	-0.10	-0.21	-0.12
deswc	0.05	0.07	-0.07	-0.04	1.02	1.02	0.99	1.00	-0.13	-0.08	-0.30	-0.16
cncall	-0.15	-0.06	0.07	0.13	0.97	1.01	1.03	1.00	-0.15	-0.17	-0.11	0.07
cncadd	-0.11	-0.01	0.04	0.09	0.89	0.94	1.02	1.16	-0.17	-0.09	-0.21	-0.09
cnccaus	-0.09	-0.07	0.05	0.11	1.06	1.02	0.98	0.96	-0.22	-0.10	-0.17	0.16
cnclogic	-0.03	-0.10	0.00	0.13	0.96	1.05	1.04	0.96	-0.05	-0.18	-0.19	0.05
cnctemp	0.00	-0.01	0.01	0.00	0.93	0.95	1.24	0.87	-0.09	-0.19	-0.28	-0.18
wrddadj	-0.16	-0.13	0.16	0.13	0.90	0.91	1.12	1.05	-0.21	-0.26	0.08	-0.05
wrddadv	-0.03	-0.04	0.02	0.05	1.08	1.01	0.97	0.97	-0.21	-0.11	-0.22	-0.01
wrdsnoun	-0.03	-0.05	-0.06	0.15	0.91	1.02	1.02	1.06	-0.01	-0.03	-0.18	0.10
wrddpro	0.13	0.02	-0.10	-0.06	1.28	0.91	0.85	0.93	-0.11	-0.10	-0.05	-0.18
wrddverb	0.11	0.09	-0.10	-0.09	0.99	0.99	0.94	1.09	0.10	0.08	-0.18	0.03
wrddprp	0.17	-0.03	-0.08	-0.05	1.55	0.80	0.68	0.72	-0.08	-0.31	-0.27	-0.19
crfao1	0.11	0.11	-0.04	-0.18	0.88	0.96	1.04	1.12	0.06	0.25	0.14	-0.05
crfaoa	0.07	0.10	0.02	-0.19	0.91	0.95	1.07	1.07	0.10	-0.07	0.04	-0.18
crfso1	0.06	0.13	-0.03	-0.16	0.90	0.90	1.09	1.11	0.09	0.21	0.11	-0.11
crfsoa	0.03	0.20	0.00	-0.22	0.95	0.90	1.08	1.05	0.09	0.06	0.03	-0.23
crfcwo1	0.11	0.13	-0.05	-0.18	1.02	0.94	1.03	1.01	0.00	0.12	-0.19	-0.23
wrddhypv	0.05	0.14	-0.10	-0.09	1.03	1.00	1.01	0.97	-0.03	0.15	-0.02	0.06
ldttra	-0.09	-0.09	0.08	0.11	0.94	0.97	1.02	1.09	-0.34	-0.53	-0.33	-0.29
synnp	-0.11	0.04	0.10	-0.03	1.05	0.91	1.03	1.02	-0.16	0.07	0.07	-0.03
drnp	0.03	-0.12	-0.06	0.15	1.12	0.95	0.92	1.01	0.09	0.01	0.00	0.24
synle	-0.11	0.05	0.08	-0.02	0.88	1.01	1.02	1.10	-0.15	0.02	0.17	-0.22

DOCUMENT 4 – FINANCIAL INSTRUMENTS NOTES – VARIABLES CORRELATIONS OF ARCHIVAL RESEARCH¹⁴

	rdfre	despl	deswlsy	dessl	despc	dessc	deswc	cncall	cncadd	cnccaus	cnclogic	cnctemp	wrdadj	wrdadv
rdfre	1.000	-0.019	-0.752**	-0.426**	0.045	0.034	-0.114	-0.024	-0.181*	0.115	-0.217**	-0.201**	-0.427**	-0.217**
despl	-0.019	1.000	-0.040	0.018	-0.197**	0.294**	0.298**	0.043	0.136	-0.078	-0.024	-0.145	-0.191*	-0.023
deswlsy	-0.861**	0.011	1.000	-0.033	-0.075	-0.091	-0.099	0.191*	0.275**	-0.071	0.090	0.221**	0.378**	0.117
dessl	-0.426**	0.018	-0.033	1.000	-0.083	-0.080	0.266**	-0.183*	-0.104	-0.056	-0.016	-0.231**	-0.062	-0.100
despc	0.045	-0.197**	-0.075	-0.094	1.000	0.872**	0.802**	-0.174*	-0.201**	-0.037	0.231**	0.367**	0.134	0.175*
dessc	0.034	0.294**	-0.091	-0.003	0.872**	1.000	0.933**	-0.152*	-0.154*	-0.056	0.225**	0.310**	0.053	0.151*
deswc	-0.114	0.298**	-0.099	0.008	0.802**	0.933**	1.000	-0.193*	-0.176*	-0.061	0.232**	0.219**	0.030	0.111
cncall	-0.024	0.043	0.191*	-0.025	-0.174*	-0.152*	-0.193*	1.000	0.756**	0.373**	0.327**	0.149*	0.112	0.122
cncadd	-0.181*	0.136	0.275**	0.129	-0.201**	-0.154*	-0.176*	0.756**	1.000	-0.234**	-0.020	0.008	0.084	0.126
cnccaus	0.115	-0.078	-0.071	0.258**	-0.037	-0.056	-0.061	0.373**	-0.234**	1.000	0.582**	0.026	0.119	0.019
cnclogic	-0.217**	-0.024	0.090	-0.095	0.231**	0.225**	0.232**	0.327**	-0.020	0.582**	1.000	0.481**	0.468**	0.275**
cnctemp	-0.201**	-0.145	0.221**	0.247**	0.367**	0.310**	0.219**	0.149*	0.008	0.026	0.481**	1.000	0.324**	0.248**
wrdadj	-0.427**	-0.191*	0.378**	0.351**	0.134	0.053	0.030	0.112	0.084	0.119	0.468**	0.324**	1.000	0.257**
wrdadv	-0.217**	-0.023	0.117	0.505**	0.175*	0.151*	0.111	0.122	0.126	0.019	0.275**	0.248**	0.257**	1.000
wrdnoun	0.272**	0.143	-0.428**	0.295**	-0.009	0.050	0.049	-0.186*	0.020	-0.271**	-0.495**	-0.292**	-0.674**	-0.406**
wrdpro	-0.031	0.132	0.178*	-0.325**	-0.270**	-0.189*	-0.143	0.085	0.082	0.018	-0.248**	-0.215**	-0.215**	0.031

¹⁴ The correlations beneath the central line correspond to those in Portuguese, while, above the line is the correlations of the variables in English.

wrdverb	-0.137	-0.062	0.079	-0.012	-0.085	-0.099	-0.129	0.028	-0.142	0.151*	0.400**	0.314**	0.287**	0.336**
wrdprp	-0.085	0.184*	0.100	0.243**	-0.100	-0.012	-0.062	-0.057	0.116	-0.251**	0.013	0.062	-0.086	0.116
crfao1	-0.168*	0.168*	-0.159*	0.184*	-0.129	-0.047	0.192*	-0.168*	-0.176*	0.079	-0.041	-0.254**	-0.096	-0.134
crfaoa	-0.191*	0.049	-0.121	-0.199**	-0.350**	-0.325**	-0.079	0.135	0.132	0.100	-0.073	-0.297**	-0.153*	-0.305**
crfso1	-0.272**	0.062	-0.108	-0.156*	-0.112	-0.077	0.172*	-0.124	-0.186*	0.162*	0.200**	-0.157*	0.182*	0.047
crfsoa	-0.304**	-0.009	-0.077	-0.084	-0.359**	-0.354**	-0.092	0.038	-0.008	0.184*	0.150*	-0.252**	0.155*	-0.123
crfcwo1	-0.213**	0.131	-0.132	-0.047	-0.091	-0.026	0.200**	-0.180*	-0.209**	0.133	0.102	-0.230**	0.113	0.031
wrdhypv	-0.097	-0.042	0.194*	-0.130	-0.089	-0.103	-0.103	0.083	0.065	-0.121	-0.074	0.078	-0.145	0.043
ldttra	0.008	-0.312**	0.215**	0.112	-0.592**	-0.724**	-0.808**	0.237**	0.201**	0.023	-0.233**	-0.091	-0.103	-0.031
synnp	-0.046	0.079	-0.097	0.180*	0.205**	0.239**	0.304**	-0.127	-0.176*	0.125	0.178*	-0.091	-0.069	0.063
drnp	0.110	0.111	0.018	-0.040	-0.166*	-0.121	-0.171*	0.017	0.103	-0.077	-0.089	-0.159*	0.002	-0.033
synle	-0.238**	0.060	0.165*	-0.030	0.017	0.048	0.174*	0.132	0.119	0.047	0.094	-0.009	0.269**	-0.034
	wrdnoun	wrdpro	wrdverb	wrdprp	crfao1	crfaoa	crfso1	crfsoa	crfcwo1	wrdhypv	ldttra	synnp	drnp	synle
rdfre	0.272**	-0.031	-0.137	-0.085	-0.168*	-0.191*	-0.272**	-0.304**	-0.213**	-0.097	0.008	-0.046	0.110	-0.238**
despl	0.143	0.132	-0.062	0.184*	0.168*	0.049	0.062	-0.009	0.131	-0.042	-0.312**	0.079	0.111	0.060
deswlsy	-0.428**	0.178*	0.079	0.100	-0.159*	-0.121	-0.108	-0.077	-0.132	0.194*	0.215**	-0.097	0.018	0.165*
dessl	0.046	0.083	-0.165*	-0.161*	0.682**	0.651**	0.681**	0.677**	0.648**	-0.010	-0.335**	0.160*	-0.161*	0.367**
despc	-0.009	-0.270**	-0.085	-0.100	-0.129	-0.350**	-0.112	-0.359**	-0.091	-0.089	-0.592**	0.205**	-0.166*	0.017
dessc	0.050	-0.189*	-0.099	-0.012	-0.047	-0.325**	-0.077	-0.354**	-0.026	-0.103	-0.724**	0.239**	-0.121	0.048
deswc	0.049	-0.143	-0.129	-0.062	0.192*	-0.079	0.172*	-0.092	0.200**	-0.103	-0.808**	0.304**	-0.171*	0.174*
cncall	-0.186*	0.085	0.028	-0.057	-0.168*	0.135	-0.124	0.038	-0.180*	0.083	0.237**	-0.127	0.017	0.132

cncadd	0.020	0.082	-0.142	0.116	-0.176*	0.132	-0.186*	-0.008	-0.209**	0.065	0.201**	-0.176*	0.103	0.119
cnccaus	-0.271**	0.018	0.151*	-0.251**	0.079	0.100	0.162*	0.184*	0.133	-0.121	0.023	0.125	-0.077	0.047
cnclogic	-0.495**	-0.248**	0.400**	0.013	-0.041	-0.073	0.200**	0.150*	0.102	-0.074	-0.233**	0.178*	-0.089	0.094
cnctemp	-0.292**	-0.215**	0.314**	0.062	-0.254**	-0.297**	-0.157*	-0.252**	-0.230**	0.078	-0.091	-0.091	-0.159*	-0.009
wrdadj	-0.674**	-0.215**	0.287**	-0.086	-0.096	-0.153*	0.182*	0.155*	0.113	-0.145	-0.103	-0.069	0.002	0.269**
wrdadv	-0.406**	0.031	0.336**	0.116	-0.134	-0.305**	0.047	-0.123	0.031	0.043	-0.031	0.063	-0.033	-0.034
wrdsnoun	1.000	0.013	-0.646**	0.138	0.131	0.255**	-0.170*	-0.090	-0.092	-0.071	0.007	-0.123	0.052	-0.308**
wrdpro	0.013	1.000	-0.161*	-0.129	0.299**	0.246**	0.197**	0.166*	0.238**	0.263**	0.070	-0.106	0.152*	0.082
wrdverb	-0.646**	-0.161*	1.000	-0.029	-0.177*	-0.256**	0.081	0.064	-0.013	0.087	0.146	0.338**	-0.165*	0.083
wrdprp	0.138	-0.129	-0.029	1.000	-0.086	-0.155*	-0.075	-0.133	-0.098	-0.030	0.133	0.022	0.069	-0.271**
crfao1	0.131	0.299**	-0.177*	-0.086	1.000	0.721**	0.877**	0.718**	0.932**	-0.018	-0.421**	0.039	-0.079	0.224**
crfaoa	0.255**	0.246**	-0.256**	-0.155*	0.721**	1.000	0.570**	0.866**	0.580**	-0.059	-0.147	-0.039	-0.028	0.109
crfso1	-0.170*	0.197**	0.081	-0.075	0.877**	0.570**	1.000	0.768**	0.951**	-0.029	-0.394**	0.113	-0.065	0.345**
crfsoa	-0.090	0.166*	0.064	-0.133	0.718**	0.866**	0.768**	1.000	0.729**	-0.090	-0.202**	0.076	-0.052	0.206**
crfcwo1	-0.092	0.238**	-0.013	-0.098	0.932**	0.580**	0.951**	0.729**	1.000	-0.053	-0.464**	0.064	-0.082	0.287**
wrdhypv	-0.071	0.263**	0.087	-0.030	-0.018	-0.059	-0.029	-0.090	-0.053	1.000	0.058	-0.147	-0.032	-0.127
ldttra	0.007	0.070	0.146	0.133	-0.421**	-0.147	-0.394**	-0.202**	-0.464**	0.058	1.000	-0.173*	0.089	-0.162*
synnp	-0.123	-0.106	0.338**	0.022	0.039	-0.039	0.113	0.076	0.064	-0.147	-0.173*	1.000	-0.224**	0.057
drnp	0.052	0.152*	-0.165*	0.069	-0.079	-0.028	-0.065	-0.052	-0.082	-0.032	0.089	-0.224**	1.000	-0.044
synle	-0.308**	0.082	0.083	-0.271**	0.224**	0.109	0.345**	0.206**	0.287**	-0.127	-0.162*	0.057	-0.044	1.000

* Correlation is significant at the level of 0.05 (2-tailed); ** Correlation is significant at the level of 0.01 (2-tailed).

DOCUMENT 5 – PROVISIONS NOTES – VARIABLES CORRELATIONS OF ARCHIVAL RESEARCH¹⁵

	rdfre	despl	deswlsy	dessl	despc	dessc	deswc	cncall	cncadd	cnccaus	cnclogic	cnctemp	wrdadj	wrdadv
rdfre	1.000	0.047	-0.725**	-0.385**	0.145	0.148*	0.066	-0.107	-0.239**	-0.065	-0.143	0.193*	-0.274**	0.024
despl	0.264**	1.000	-0.043	-0.006	0.093	0.484**	0.431**	-0.091	-0.013	0.003	-0.055	-0.112	-0.235**	-0.064
deswlsy	-0.794**	-0.297**	1.000	-0.357**	-0.120	-0.077	-0.234**	-0.031	0.052	-0.014	-0.008	-0.122	0.467**	-0.140
dessl	-0.367**	0.037	-0.274**	1.000	-0.036	-0.098	0.224**	0.187*	0.255**	0.106	0.205**	-0.097	-0.254**	0.155*
despc	0.220**	0.058	-0.163*	-0.099	1.000	0.900**	0.876**	-0.400**	-0.261**	-0.163*	-0.212**	-0.213**	-0.284**	0.071
dessc	0.332**	0.462**	-0.248**	-0.147	0.895**	1.000	0.928**	-0.403**	-0.234**	-0.179*	-0.238**	-0.225**	-0.292**	0.029
deswc	0.206**	0.421**	-0.321**	0.166*	0.870**	0.930**	1.000	-0.385**	-0.229**	-0.136	-0.175*	-0.251**	-0.412**	0.082
cncall	-0.297**	-0.071	0.121	0.285**	-0.527**	-0.490**	-0.471**	1.000	0.734**	0.458**	0.475**	0.529**	0.182*	0.240**
cncadd	-0.156*	-0.142	0.027	0.206**	-0.343**	-0.334**	-0.350**	0.795**	1.000	-0.023	0.220**	0.173*	0.276**	0.260**
cnccaus	-0.257**	-0.071	0.151*	0.176*	-0.601**	-0.583**	-0.542**	0.702**	0.252**	1.000	0.684**	-0.126	-0.117	0.024
cnclogic	-0.216**	-0.039	0.025	0.303**	-0.512**	-0.505**	-0.447**	0.744**	0.430**	0.831**	1.000	-0.093	0.063	0.044
cnctemp	0.029	0.123	-0.112	0.126	0.272**	0.315**	0.323**	0.208**	0.202**	-0.214**	-0.023	1.000	0.112	0.149*
wrdadj	-0.459**	-0.427**	0.561**	-0.133	-0.491**	-0.559**	-0.620**	0.468**	0.391**	0.429**	0.232**	-0.133	1.000	0.085
wrdadv	-0.314**	0.000	0.260**	0.099	-0.060	-0.052	-0.025	0.227**	0.168*	0.077	0.114	0.195**	0.133	1.000
wrdnoun	0.234**	0.150*	-0.065	-0.270**	0.504**	0.501**	0.422**	-0.594**	-0.440**	-0.534**	-0.486**	-0.009	-0.510**	-0.329**
wrdpro	-0.054	-0.030	-0.102	0.242**	-0.157*	-0.174*	-0.113	0.225**	0.088	0.295**	0.353**	-0.082	0.095	0.271**
wrdverb	0.110	0.145	-0.199**	0.131	0.005	0.024	0.126	-0.075	-0.103	-0.096	0.011	0.075	-0.289**	0.056

¹⁵ The Pearson correlations beneath the central line correspond to those in Portuguese, while, above the line is the correlations of the variables in English.

wrdrpr	0.079	-0.110	-0.035	-0.071	0.056	0.006	-0.001	-0.065	-0.040	-0.121	-0.157*	0.089	0.053	-0.019
crfao1	-0.129	0.058	-0.280**	0.632**	0.100	0.049	0.279**	-0.116	-0.043	-0.157*	-0.010	0.027	-0.392**	-0.103
crfaoa	-0.121	0.050	-0.238**	0.555**	-0.338**	-0.322**	-0.173*	0.214**	0.203**	0.280**	0.359**	-0.212**	0.003	-0.165*
crfso1	-0.239**	0.055	-0.232**	0.735**	-0.018	-0.060	0.184*	0.072	0.110	-0.017	0.131	0.007	-0.248**	-0.029
crfsoa	-0.215**	0.057	-0.171*	0.603**	-0.408**	-0.382**	-0.232**	0.328**	0.298**	0.368**	0.433**	-0.245**	0.131	-0.069
crfcwo1	-0.177*	0.016	-0.250**	0.664**	-0.007	-0.057	0.176*	0.017	0.108	-0.088	0.059	0.028	-0.258**	-0.059
wrdhypv	0.011	0.174*	0.097	-0.165*	0.106	0.165*	0.103	0.029	0.067	-0.131	-0.193*	0.065	-0.118	0.189*
ldttra	-0.388**	-0.453**	0.487**	-0.133	-0.678**	-0.758**	-0.787**	0.471**	0.235**	0.528**	0.367**	-0.159*	0.647**	0.178*
synnp	-0.249**	0.197**	0.110	0.225**	-0.220**	-0.162*	-0.052	0.096	-0.275**	0.378**	0.312**	-0.123	-0.025	0.208**
drnp	0.150*	0.085	-0.043	-0.172*	-0.041	0.031	-0.092	0.129	0.254**	-0.031	0.054	0.108	0.035	-0.142
synle	-0.112	-0.065	-0.262**	0.579**	-0.218**	-0.236**	-0.076	0.346**	0.356**	0.161*	0.232**	0.141	0.102	0.056
	wrdsnoun	wrdpro	wrdverb	wrdprp	crfao1	crfaoa	crfso1	crfsoa	crfcwo1	wrdhypv	ldttra	synnp	drnp	synle
rdfre	-0.008	0.017	0.310**	-0.124	-0.163*	-0.199**	-0.237**	-0.250**	-0.148	-0.137	-0.202**	-0.196**	0.131	-0.098
despl	0.125	-0.037	0.193*	-0.024	-0.047	-0.077	-0.119	-0.081	-0.061	0.193*	-0.437**	-0.026	-0.129	0.013
deswlsy	0.292**	-0.152*	-0.171*	0.047	-0.210**	-0.215**	-0.154*	-0.199**	-0.126	0.040	0.358**	0.088	-0.007	-0.264**
dessl	-0.381**	0.182*	-0.190*	0.105	0.502**	0.558**	0.527**	0.605**	0.368**	0.131	-0.206**	0.149*	-0.169*	0.486**
despc	0.339**	-0.153*	0.096	-0.080	-0.361**	-0.397**	-0.419**	-0.398**	-0.268**	0.143	-0.689**	0.115	0.004	0.003
dessc	0.384**	-0.147	0.152*	-0.094	-0.369**	-0.411**	-0.434**	-0.413**	-0.290**	0.175*	-0.745**	0.083	-0.014	-0.011
deswc	0.221**	-0.105	0.149*	-0.068	-0.191*	-0.222**	-0.258**	-0.216**	-0.159*	0.214**	-0.793**	0.143	-0.064	0.159*
cncall	-0.395**	0.149*	-0.130	0.062	0.277**	0.257**	0.345**	0.279**	0.228**	-0.063	0.193*	-0.295**	-0.052	0.139
cncadd	-0.191*	0.203**	-0.323**	0.105	0.171*	0.108	0.254**	0.171*	0.179*	0.050	0.137	-0.097	0.010	0.134

cnccaus	-0.238**	-0.009	0.163*	-0.004	0.201**	0.170*	0.167*	0.143	0.154*	-0.070	0.142	-0.252**	-0.035	0.037
cnclogic	-0.405**	0.082	-0.031	0.092	0.182*	0.063	0.128	0.046	0.209**	-0.152*	0.222**	-0.184*	-0.004	0.056
cnctemp	-0.237**	0.046	-0.028	-0.013	0.106	0.160*	0.144	0.143	0.052	-0.099	-0.019	-0.167*	-0.082	0.076
wrdadj	-0.215**	0.073	-0.330**	0.024	-0.174*	-0.083	-0.085	-0.056	-0.152*	-0.110	0.474**	0.112	0.102	-0.179*
wrdadv	-0.253**	0.219**	0.145	0.039	0.207**	0.161*	0.257**	0.191*	0.112	0.147	-0.029	0.129	-0.272**	0.107
wrdnoun	1.000	-0.282**	-0.174*	-0.116	-0.353**	-0.370**	-0.387**	-0.385**	-0.219**	0.065	-0.143	0.132	0.143	-0.099
wrdpro	-0.502**	1.000	-0.232**	0.603**	0.261**	0.260**	0.217**	0.212**	0.206**	-0.294**	0.069	-0.035	-0.041	0.054
wrdverb	-0.260**	0.279**	1.000	-0.185*	-0.049	-0.041	-0.040	-0.043	-0.093	0.163*	-0.087	-0.118	-0.198**	-0.123
wrdprp	-0.069	0.212**	0.153*	1.000	0.196**	0.122	0.129	0.088	0.181*	-0.080	0.060	-0.075	-0.112	-0.001
crfao1	0.132	0.111	0.192*	-0.049	1.000	0.829**	0.935**	0.789**	0.800**	-0.040	0.063	0.100	-0.192*	0.246**
crfaoa	-0.205**	0.285**	0.087	-0.040	0.553**	1.000	0.831**	0.971**	0.593**	0.034	0.046	0.103	-0.176*	0.219**
crfso1	0.006	0.072	0.114	-0.058	0.920**	0.557**	1.000	0.844**	0.740**	-0.009	0.141	0.082	-0.177*	0.250**
crfsoa	-0.291**	0.245**	0.041	-0.054	0.437**	0.940**	0.547**	1.000	0.560**	0.078	0.061	0.084	-0.160*	0.221**
crfcwo1	0.022	0.038	0.125	-0.045	0.948**	0.548**	0.962**	0.494**	1.000	-0.069	0.013	0.077	-0.127	0.200**
wrdhypv	0.164*	-0.388**	-0.044	-0.200**	-0.036	-0.196**	-0.044	-0.202**	0.015	1.000	-0.100	0.156*	-0.167*	0.117
ldttra	-0.398**	0.145	-0.132	-0.039	-0.321**	-0.121	-0.227**	-0.060	-0.270**	-0.140	1.000	-0.060	0.086	-0.184*
synnp	-0.143	0.174*	0.258**	-0.033	0.017	0.062	0.082	0.124	-0.017	-0.212**	0.254**	1.000	-0.516**	0.249**
drnp	0.004	0.058	-0.123	0.036	-0.111	-0.064	-0.125	-0.099	-0.103	-0.063	0.008	-0.406**	1.000	-0.067
synle	-0.307**	-0.011	0.026	-0.042	0.249**	0.308**	0.406**	0.375**	0.354**	-0.047	0.057	-0.013	-0.034	1.000

* Correlation is significant at the level of 0.05 (2-tailed); ** Correlation is significant at the level of 0.01 (2-tailed).

DOCUMENT 6 – COVARIATES CORRELATIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Score – Phase 3 (1)	1.000													
Age (2)	0.075	1.000												
Male (3)	0.085	0.134	1.000											
Time Working with Accounting (4)	0.138	0.507**	0.031	1.000										
Business major (5)	-0.060	-0.051	0.228*	-0.093	1.000									
Accounting major (6)	0.142	-0.118	-0.173	0.212*	-0.454**	1.000								
Other major (7)	0.051	0.358**	0.181	0.115	-0.220*	-0.559**	1.000							
Undergraduate in process (8)	-0.227*	-0.462**	-0.085	-0.413**	0.106	-0.074	-0.190*	1.000						
Undergraduate completed (9)	0.178	0.107	0.245**	-0.111	0.089	0.122	.020	-0.285**	1.000					
Masters in process (10)	-0.002	0.137	-0.030	0.360**	-0.213*	-0.047	0.223*	-0.328**	-0.180	1.000				
PHD in process (11)	0.130	0.194*	-0.126	0.076	-0.026	0.007	-0.089	-0.328**	-0.180	-0.207*	1.000			
Other Level of Education (12)	-0.004	0.150	0.039	0.181	0.024	0.021	0.085	-0.338**	-0.185	-0.213*	-0.213*	1.000		
Public (13)	0.028	-0.121	-0.214*	-0.080	-0.120	0.105	-0.179	0.121	-0.002	0.046	0.106	-0.296**	1.000	
Time Studying Accounting (14)	0.167	0.193*	-0.102	0.558**	-0.182	0.534**	-0.325**	-0.374**	-0.213*	0.036	0.357**	0.266**	0.116	1.000

* Correlation is significant at the level of 0.05 (2-tailed); ** Correlation is significant at the level of 0.01 (2-tailed).

DOCUMENT 1 – Coh-Metrix 3.0 and Coh-Metrix-Port 2.0 pages

Created: September 1, 2012

Coh-Metrix 3.0

Last updated: June 02, 2014

Title

Genre

Source

Job Code

LSA Space

Science

CollegeLevel

1. Enter the "Title" you wish to give to your study.

2. Select the genre you feel most closely describes your work.

3. Enter the source of the document. Where did you get this text?

4. Enter a "Jobcode". You may make up your own job code. You need to remember this job code to later retrieve your results.

5. Coh-Metrix uses Latent Semantic Analysis (LSA) in some of its indices. Your text will be analyzed slightly differently depending on the space (discourse type) that you choose. Please select a LSA Space you feel most closely describes your work. If you are not sure which space to use, we recommend you select "College Level".

Entering your Text

1. You may write OR cut and paste text.

2. Please try to limit text to a maximum of 15,000 characters and remove irregular characters.

3. Paragraphs are marked by hard returns.

4. Press "Submit" and Coh-Metrix will analyze your text.

Viewing and Understanding your Results

1. When Coh-Metrix has analyzed your text the results will appear on the right side of the screen.

2. You may continue to enter and submit text on this screen. The results will continue to appear on the right side of the screen.

Viewing Past Results

To view past results, Click the "Data Viewer" link at the bottom left of the screen (next to the Submit button). You will then be directed to a new page where you can retrieve your past data.

DataViewer

Submit

Reset

Submit a text

Title

Hansel and Gretel

Author

Brothers Grimm

Source

http://en.wikipedia.org/wiki/Hansel_and_Gretel

Date

dd/mm/yyyy

Genre

Fairy tale

Content

Once upon a time, ...

Clear

Close

Submit text

Submit text

DOCUMENT 2 – Invitation letter for undergraduate and graduate courses' coordinators

Prezado(a) Coordenador(a),

Meu nome é Samantha Valentim Telles, sou doutoranda do curso de Ciências Contábeis da FEA-USP (Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo). Estou desenvolvendo minha tese de doutorado relacionada à compreensibilidade e legibilidade das notas explicativas, orientada pelo Prof. Bruno Meirelles Salotti. Essa pesquisa será aplicada a alunos de graduação e MBA do Brasil e dos Estados Unidos. Gostaria de contar com a sua colaboração para encaminhar essa pesquisa aos seus alunos.

Ressalto que não haverá qualquer identificação dos participantes e aquele que melhor pontuar irá receber um vale presente do Submarino no valor de 20 dólares, conforme a cotação da data do recebimento.

Segue o link do questionário:

https://utep.qualtrics.com/jfe/form/SV_cGYda09XjSWUF2l

Agradeço o vosso auxílio.

Atenciosamente,

Samantha Valentim Telles
Doutoranda de Ciências Contábeis - FEA-USP
sam_vt_89@hotmail.com / samantha.telles@usp.br

DOCUMENT 3 – Research Authorization of FEA-USP's Dean for the experiment**(In English)**

UNIVERSITY OF SÃO PAULO
COLLEGE OF ECONOMICS, BUSINESS AND ACCOUNTING

RESEARCH AUTHORIZATION

The University of São Paulo (USP) authorizes the research entitled 'Readability and Understandability of Footnotes of Annual Reports' developed by the Ph.D. student, Samantha Valentim Telles, under the supervision of professor Bruno Meirelles Salotti, Ph.D., to collect data and develop the doctoral dissertation, under the demands of the resolution #4,871 (altered by the Resolution #7,197), of the Ethical Code of USP, in all necessary procedure to be applied in organizations and with individuals.

Considering the absence of an Ethical Committee, this authorization is given by the Dean of the College of Economics, Business and Accounting of USP.

Prof. Adalberto Américo Fischmann, Ph.D.
Dean of the College of Economics, Business
and Accounting

(In Portuguese)

UNIVERSIDADE DE SÃO PAULO
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO, CONTABILIDADE E
ATUÁRIA

AUTORIZAÇÃO DE PESQUISA

A Universidade de São Paulo (USP) autoriza a pesquisa intitulada 'Readability and Understandability of Footnotes of Annual Reports', desenvolvida pela doutoranda, Samantha Valentim Telles, sob a orientação do professor doutor Bruno Meirelles Salotti, para coletar dados e desenvolver a tese de doutorado, sob as demandas da resolução n. 4.871 (alterada pela resolução n. 7.197) do código de ética da USP, em todos os procedimentos necessários para aplicar em organizações e com indivíduos.

Considerando a ausência de um comitê de Ética, essa autorização é dada pelo diretor da Faculdade de Economia, Administração, Contabilidade e Atuária da USP.

Prof. Dr. Adalberto Américo Fischmann
Diretor da Faculdade de Economia,
Administração, Contabilidade e Atuária

Document 4 – Experiment proposal sent to UTEP’s IRB (Institutional Review Board)

I. Accounting Comprehension

II. Investigators: Samantha Valentim Telles, Daniel N. Jones, Ph.D.

III. Research Goals and Hypotheses

Specific Aim #1:

To see how different levels of “readability” affect the comprehension of different definitions in accounting among accounting students.

Specific Aim #2:

To see if adding a glossary of definitions to a population of accounting students improves understanding accounting information.

Hypothesis 1: Passages that are both more readable and used in conjunction with a glossary will result in more accurate understanding and more confidence in one’s accounting comprehension.

IV. Background and Significance

Accounting uses complicated language, and at times, terms that are difficult to understand and remember. Often, intelligent accounting students may get lost in legal or formal language associated with accounting documents, and they may not fully comprehend the meaning of those documents. Here, we will be asking students how closely different wordings of a document match each other as a measure of comprehension. We argue that two key factors, readability and the presence of a glossary, will enhance critical understanding of accounting students.

V. General Method

Participants will be students from accounting classes and will complete all research online. They will be provided with different accounting documents, which will vary in how readable they are. Students will then be given a glossary and asked to go over the notes again. Students will be assessed on whether they change their answers once they have the glossary available.

I. Human Subject Interactions

Participants will be completing the study completely online. No human interactions will take place.

A. Identify the sources of potential participants, derived materials, or data.

Participants will be recruited from accounting classes (both undergraduate and graduate level) here at UTEP and / or in Sao Paulo, Brazil. We will recruit a maximum of 500 from both Universities (UTEP & USP).

- B.** Describe the **procedures for the recruitment of the participants**. Append copies of fliers and the content of newspaper or radio advertisements. If potential participants will be screened by an interview (either telephone or face-to-face) provide a script of the screening interview.

Participants will be asked if they wish to participate in a study on “accounting comprehension” and will be told, “The study involves reading different accounting forms and determining the meaning of the language on the form” Students will also be told that a Starbucks Gift Card will be awarded to the highest scorer (one per university).

- C.** Describe the **procedure for obtaining informed consent**.

Participants will indicate their consent on the first page of the online survey in order to continue onto the rest of the questionnaire and study.

- D.** **Research Protocol**. What will you ask your participants to do? When and where will they do it? How long will it take them to do it? Describe the type of research information that you will be gathering from your subjects, i.e., the data that you will collect. *Append copies of all surveys, testing materials, questionnaires, and assessment devices. Append copies of topics and sample questions for non-structured interviews and focus group discussions.*

Participants will first be asked to read a series of documents that are common in accounting. They will be asked for their comprehension of those documents.

Total study time should take between 30-45 minutes and can be done using a home computer or laptop device. Participants will then be given a randomized ID at the end of the study and will be told to write down that ID. The student with the ID matching the highest score will be given a gift card.

- E.** How will you protect the **privacy and confidentiality of participants**? Privacy can be defined in terms of having control over the extent, timing, and circumstances of sharing oneself (physically, behaviorally, or intellectually) with others. Confidentiality pertains to the treatment of information or data that an individual has disclosed in a relationship of trust with the expectation that it will not be divulged to others in ways that are inconsistent with the understanding of

the original disclosure. Note that ensuring privacy of participants is different from confidentiality of data.

All data are anonymous. Participants will merely pass through a consent window and be given a randomized ID for data analysis.

- F.** Discuss the procedures that will be used to maintain the **confidentiality of the research data**. Specifically, how will data be stored to ensure that it is secure and remains confidential? How will the investigator handle that data?

N/A

- G.** Please describe your research resources.

All data collection will take place through Qualtrics. Upon agreeing to participate in the study, participants will be directed to the consent form and study through an online server.

- H.** Describe any **potential risks** (physical, psychological, social, legal, or other) and assess their likelihood and seriousness. Describe alternative and potentially less risky methods, if any, that were considered as possible methods and why they were not used. If the research methods impose risks on the subjects, include evidence that may justify their use (such as previous experience with the procedures). Most studies pose some degree of risk, even though the risk may be minimal. For example, one common risk is the loss of the confidentiality of the participants' responses.

There is no more than minimal risk in this study. Participants may become bored reading accounting documents.

- I.** Describe and assess the **potential benefits** to be gained by participants (if any) and the benefits that may accrue to society in general as a result of the planned work. Discuss the risks in relation to the anticipated benefits to the participants and to society.

The research conducted in the proposed studies will allow greater understanding of accounting terms and definitions and learn how to read accounting files.

Participants may receive course credit, extra credit, or a gift card as compensation.

- J.** Indicate the specific **sites or agencies involved in the research project** besides The University of Texas at El Paso. Demonstrate that PI has the resources and facilities necessary to conduct proposed research. These agencies may include school districts, day care centers, nursing homes, etc. Include, as an attachment, approval letters from these institutions or agencies on their letterhead. The letter should grant you permission to use the agency's facilities or resources; it should indicate knowledge of the study that will be conducted at the site. If these letters are not available at the time of IRB review, approval will be contingent upon their receipt.
- K.** If the project has had or will receive **review by another IRB**, indicate this.

TERMS OF CONSENT

I agree to participate, as a volunteer, in the research entitled "Readability and Understandability of Accounting Footnotes", which has as responsible researcher Samantha Valentim Telles, student at the Faculty of Economics, Business Administration and Accounting of the University of São Paulo, supervised by Bruno Meirelles Salotti, which can be contacted by email samantha.telles@usp.br or telephone +1 (915) 300-4097. The purpose of this paper is to verify how conceptually close are the readability and understandability of the financial statements' notes. My participation will consist in participating in a controlled experiment conducted by internet, which activities are not related to any kind of physical effort. I understand that this study is for research purposes, and that the data obtained will be disseminated according to the ethical guidelines of the research, thus ensuring my privacy. I know that I can withdraw my consent whenever I want, and that I may not receive any payment for this participation.

- ☐ I agree
- ☐ I do not agree

Document 5 – Final opinion of UTEP’s IRB regarding the Experimental Proposal

9/12/2017

IRBNet: Review Details

IRBNet ID: 1058228-1
USER PROFILE LOGOUT

Welcome to IRBNet
Daniel Jones

- [Help](#)
- [My Projects](#)
- [Create New Project](#)
- [My Reminders \(744\)](#)
- Project Administration**
 - [Project Overview](#)
 - [Designer](#)
 - [Share this Project](#)
 - [Sign this Package](#)
 - [Submit this Package](#)
 - [Delete this Package](#)
 - [Send Project Mail](#)
- [Reviews](#)
- [Project History](#)
- [Create a New Package](#)
- [Messages & Alerts \(6\)](#)
- Other Tools**
 - [Forms and Templates](#)

Review Details

[1058228-1] Accounting survey
[University of Texas at El Paso IRB, El Paso, TX](#)

Submission Details

Submitted To University of Texas at El Paso IRB, El Paso, TX
Submitted by Daniel Jones
Submission Date 04/12/2017
Submission Type New Project
Local Board Reference Number College of Liberal Arts

Review Details:

Agenda	Review Type	Board Action	Effective Date	Project Status	Expiration Date
08/21/2017 03:00 PM	Exempt Review	Exempt	08/01/2017	Exempt	

Board Documents:

There are currently no documents from University of Texas at El Paso IRB.

Document 6 – The Survey on Qualtrics®**Block 1****TERMO DE CONSENTIMENTO**

Concordo em participar, como voluntário/a, da pesquisa intitulada “Readability and Understandability of Accounting Footnotes”, que tem como pesquisadora responsável Samantha Valentim Telles, aluna da Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo, orientada por Bruno Meirelles Salotti, os quais podem ser contatados pelo e-mail samantha.telles@usp.br ou telefone (11) 3091-5820. O presente trabalho tem por objetivo verificar o quão próximo conceitualmente estão a legibilidade e a compreensibilidade das notas explicativas. Minha participação consistirá em participar de um experimento controlado realizado pela internet, cujas atividades não estão relacionadas a qualquer tipo de esforço físico de minha parte. Compreendo que esse estudo possui finalidade de pesquisa, e que os dados obtidos serão divulgados seguindo as diretrizes éticas da pesquisa, assegurando, assim, minha privacidade. Sei que posso retirar meu consentimento quando eu quiser, e que não receberei nenhum pagamento por essa participação.

Concordo

Não concordo

Instruções para realização das etapas 1 e 2

Pedimos muita atenção na realização das tarefas seguintes.

Informamos que o participante que mais pontuar nas Etapas 1 e 2 receberá um vale-presente Submarino no valor de US\$ 20,00 (vinte dólares).

Em caso de empate, a Etapa 3 será utilizada como quesito desempate.

Questão para mandar para os blocos

Essa questão serve apenas para que você seja encaminhado de forma aleatória para um de nossos questionários e não faz parte do experimento em si.

Selecione esta alternativa

Etapa 1 – Treatment 1

Você vai receber agora as seguintes informações sobre a empresa XYZ: Balanço Patrimonial, DRE, DFC, DMPL, DVA e Notas Explicativas. Utilizando todas as informações que você possui, sua tarefa é dizer se as frases apresentadas após cada

segmento possuem o mesmo significado das frases da passagem original das Notas Explicativas.

Para baixar o documento com todas as demonstrações, clique em [Demonstrações Financeiras da XYZ](#).

Qual o valor do lucro líquido em 2015 da empresa estudada? (Ex: Se for 1.000.000, coloque sem os pontos: 1000000)

1. CONTEXTO OPERACIONAL

A XYZ S.A. (“XYZ”), é uma das maiores firmas brasileiras do ramo alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”). Com foco na industrialização e venda de bens processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

A Empresa opera só no Brasil. Conta com 20 itens de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja. Localizadas perto de seus fornecedores de insumos ou dos principais centros de consumo.

A Empresa conta com 20 centros de distribuição. Servem supermercados, lojas de varejo, atacadistas, restaurantes e outros clientes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

1

A XYZ atua somente no Brasil e possui 20 unidades de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas nas proximidades de seus fornecedores de matérias-primas ou dos mais importantes centros de distribuição.

2

A XYZ possui 20 centros de consumo e atendem supermercados, lojas de varejo, atacadistas, restaurantes e outros compradores.

2. DECLARAÇÃO DA ADMINISTRAÇÃO E BASE DE PREPARO E EXPOSIÇÃO DAS DEMONSTRAÇÕES FINANCEIRAS

As demonstrações financeiras individuais foram feitas de acordo com: as normas internacionais de relato financeiro (“IFRS”), emitidos pelo International Accounting Standards Board (“IASB”); e interpretações emitidas pelo International Financial Reporting Interpretations Committee (“IFRIC”), introduzidos no Brasil por meio do

Comitê de Pronunciamentos Contábeis (“CPC”) e suas interpretações técnicas (“ICPC”) e orientações (“OCPC”), aceitos pela Comissão de Valores Mobiliários (“CVM”).

As demonstrações financeiras individuais da Empresa estão expressas em milhares de Reais (“R\$”). As divulgações de somas em outras moedas, quando preciso, também foram feitas em milhares. Itens divulgados em Reais estão informados quando cabíveis.

O preparo das demonstrações financeiras individuais da Empresa requer que a Administração: faça juízos; use estimações; e segue premissas que afetam os valores expostos de receitas, despesas, ativos e passivos, incluindo passivos contingentes. Mas, a dúvida relativa a esses juízos, premissas e estimações poderia levar a resultados que pedem um ajuste relevante ao valor contábil de uns ativos e passivos em exercícios futuros.

A Empresa revê seus juízos, estimações e premissas trimestralmente.

As demonstrações financeiras individuais foram feitas com base no custo histórico recuperável.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

3

Os relatórios financeiros individuais da XYZ estão declarados em milhões de Reais (“R\$”). As divulgações de montantes em outras unidades monetárias, quando necessário, também foram realizadas em milhões. Elementos divulgados em Reais estão comunicados quando aplicáveis.

4

A preparação dos relatórios financeiros individuais da XYZ demanda que a Administração: realize julgamentos; utilize estimativas; e adote premissas que afetam os valores apresentados de receitas, despesas, ativos e passivos, compreendendo passivos contingentes.

5

Contudo, a incerteza relativa a tais julgamentos, premissas e estimativas resulta em resultados que requerem um ajuste significativo no montante registrado de certos ativos e passivos em exercícios que estão por vir.

3.8 Contas a pagar e fornecedores: são primeiramente reconhecidos pelo valor nominal. Depois somados (quando cabível) dos encargos e das variações monetárias e cambiais correlatos incorridos até as datas de fechamento das demonstrações financeiras.

3.9 Lucro por ação – o cálculo do lucro básico por ação é feito através da divisão do lucro líquido do exercício, referente aos donos de ações ordinárias da Empresa, pela quantia média ponderada de ações ordinárias disponíveis durante o exercício. O lucro diluído por ação é medido através da divisão do lucro líquido referente aos donos de ações ordinárias da Empresa pela quantia média ponderada de ações ordinárias

disponíveis durante o exercício, mais a quantia média ponderada de ações ordinárias que seriam emitidas na conversão de todas as ações ordinárias potenciais diluídas em ações ordinárias.

3.10 Cálculo do resultado – o resultado das operações é apurado de acordo com o regime contábil de competência do exercício.

3.11 Receita de vendas – incluem o valor justo do montante recebido ou a receber pela venda de bens, líquido dos impostos incidentes, das devoluções, dos abatimentos e dos descontos.

São reconhecidas de acordo com o regime contábil de competência, quando: o valor das vendas é medido de forma confiável; a Empresa não tem mais o controle sobre o bem vendido ou qualquer outra obrigação vinculada à posse desta; os custos incorridos ou a incorrer decorrente da transação podem ser medidos de forma confiável; é provável que os benefícios econômicos serão obtidos pela Empresa; e, os riscos e os benefícios foram totalmente passados ao comprador.

3.12 Juízos, estimações e premissas contábeis – como divulgado na nota 2, a Administração fez os seguintes juízos, que têm efeito relevante sobre os valores reconhecidos nas demonstrações financeiras:

- Exame anual do valor recuperável de ativos não financeiros (vide nota 8);
- Perdas estimadas em créditos de liquidação duvidosa (vide nota 5);
- Provisão para ajuste a valor realizável dos estoques (vide nota 6); E
- Vida útil dos bens do ativo imobilizado e intangíveis com vida útil definida (vide notas 7 e 8).

A Empresa revê trimestralmente as premissas usadas em suas estimações contábeis. O efeito das revisões das estimações contábeis é reconhecido nas demonstrações financeiras no tempo em que tais revisões são feitas.

3.13 Demonstração do valor adicionado – a Empresa fez demonstrações do valor adicionado (“DVA”) individuais nos termos da Deliberação CVM nº 557/08. São expostas como parte integrante das demonstrações financeiras como BR GAAP. Para IFRS, é informação financeira extra.

3.14 Demonstração do Resultado Abrangente – a Empresa não fez demonstrações do resultado abrangente pois não tem resultados abrangentes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

6

3.8 Contas a pagar e fornecedores: são inicialmente reconhecidos pelo valor nominal e, subsequentemente acrescidos, se aplicável, dos correspondentes encargos e das variações monetárias e cambiais incorridos até as datas de encerramento dos relatórios financeiros.

7

3.11 Receita de vendas – compreendem o valor justo da contraprestação recebida ou a receber pela comercialização de produtos, mais impostos incidentes, das devoluções, dos abatimentos e dos descontos.

8

A XYZ revisa todos os trimestres as premissas utilizadas em suas estimativas contábeis e o efeito das revisões das estimativas contábeis é reconhecido nas demonstrações financeiras do período no qual tais revisões são efetuadas.

7.2 Tempo previsto de realização

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados ao passo que estas sejam liquidadas ou realizadas. O tempo de liquidação ou realização de tais diferenças é vago e está ligado a muitos fatores que não estão sob o controle da Administração.

Na estimação de realização dos créditos fiscais diferidos ativos, formados sobre prejuízos fiscais e base negativa de contribuição social, a Administração inclui seus planos orçamentário e estratégico, ajustados com base nas estimações das principais adições e exclusões fiscais. Com base nesta estimação, a Administração crê que é provável que esses créditos fiscais diferidos sejam realizados, como abaixo exposto:

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

9

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados à medida que estas sejam liquidadas ou realizadas e o período de liquidação ou realização de tais diferenças é impreciso e está vinculado a diversos elementos que não estão sob o controle da Administração.

As amortizações de fidelização de integrados e relação com fornecedores são lançadas no resultado no custo das vendas. A amortização de relação com clientes é lançada no resultado nas despesas comerciais. Enquanto que a amortização de software é lançada de acordo com o seu uso podendo ser custo das vendas, despesas administrativas ou comerciais.

As marcas lançadas no ativo intangível contemplam marcas obtidas (KLK, AAA e KR3). São incluídos ativos com vida útil indefinida, pois se crê que ajudem indefinidamente para os fluxos de caixa da Empresa.

Os ágios expostos acima estão baseados na expectativa de rentabilidade futura. Estão suportados por laudos de avaliações, após alocação dos ativos verificados.

O teste de recuperabilidade dos ativos é feito anualmente com base no método de fluxo de caixa descontado. Em 2015, foram usados como base o orçamento e o planejamento

estratégico da Empresa com projeções de crescimento até 2018 e perpetuidade a partir de 2019. Estão baseados no histórico dos últimos anos bem como as projeções de mercado de órgãos governamentais, tais como bancos, Fundo Monetário Internacional (FMI), Banco Central (BACEN), entre outros. Na visão da Administração, o uso de um tempo de 3 anos para suas projeções mostra uma melhor noção do cenário futuro e uma maior convicção ao medir a expectativa de rentabilidade dos ativos testados.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

10

As marcas registradas no ativo intangível consideram marcas incorporadas (KLK, AAA e KR3), e são considerados ativos com vida útil indefinida, porque se espera que contribuam indefinidamente para os fluxos de caixa da XYZ.

11

Os ágios apresentados anteriormente estão fundamentados na expectativa de rentabilidade futura e estão suportados por laudos de avaliações, posteriormente à alocação dos ativos identificados.

12

O teste de recuperabilidade dos ativos é efetuado todos os anos baseados no método de fluxo de caixa descontado e em 2015, foram utilizados como fundamentos o orçamento e o planejamento estratégico da XYZ com projeções de crescimento até 2018 e perpetuidade a partir de 2019.

11. PATRIMÔNIO LÍQUIDO

11.1 Capital social

Em 31/12/2015, o capital subscrito e integralizado da Empresa era de R\$12.407.053. Composto por 872.473.246 ações ordinárias, escriturais e sem valor nominal. O valor realizado do capital social no balanço está líquido dos gastos com oferta pública no valor de R\$92.947.

A Empresa está autorizada a aumentar o capital social, independentemente de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

11.2 Dividendos

Em 18/06/15, em reunião extraordinária do Conselho de Administração, foi aceita a distribuição de R\$425.859, referente a juros de capital próprio, pagos em 14/08/15.

Em 17/10/15, em reunião ordinária do Conselho de Administração, foi aceita a distribuição de R\$473.398, referente a juros de capital próprio e R\$91.443 na forma de dividendos, pagos em 12/12/15.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

13

Em 31 de dezembro de 2015, o capital subscrito e integralizado da XYZ era de R\$12.407.053, constituído por 872.473.246 ações ordinárias, escriturais e com valor nominal, sendo que o valor realizado do capital social no balanço está líquido dos dispêndios com oferta pública no montante de R\$92.947.

14

A XYZ pode ampliar o capital social, apesar de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

Reserva legal: Formada na base de 5% do lucro líquido do exercício nos termos do artigo 193 da Lei nº 6.404/76, alterada pela Lei nº 11.638/07. Restrita a 20% do capital social. Em 31/12/2015, o saldo desta reserva correspondia a 4,00% do capital social (2,85% em 31/12/2014).

Reserva de incentivos fiscais: Formada nos termos do artigo 195-A da Lei nº 6.404/76 (alterada pela Lei nº 11.638/07). Com base no valor de doações ou subvenções governamentais para investimentos.

11.7 Ações em tesouraria

A Empresa tem 62.501.001 ações ordinárias de sua própria emissão em tesouraria. Com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação. Com valor de mercado igual a R\$3.455.680.

Durante o exercício findo em 31/12/15, a Empresa vendeu 1.935.296 ações em tesouraria.

Durante o exercício findo em 31/12/15, como permitido pelo Conselho de Administração, a Empresa comprou 59.247.400 de ações de sua própria emissão com custo de R\$3.765.753.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

15

Reserva de incentivos fiscais: Constituída nos termos do artigo 195-A da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, baseada no montante de doações ou subvenções governamentais para investimentos.

16

A XYZ possui 62.501.001 ações ordinárias de sua própria emissão em tesouraria, com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação, e com valor de mercado correspondente a R\$3.455.680.

15. NOVAS NORMAS E PRONUNCIAMENTOS AINDA NÃO SEGUIDOS IFRS 15 – Receita de contrato com clientes

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15. Ele determina um modelo de 5 passos que será aplicado à receita obtida a partir de um contrato com cliente. De acordo com este pronunciamento, as receitas são reconhecidas em valor que reflete o montante ao qual uma entidade crê ter direito em troca da transferência de bens ou serviços a um cliente. Os princípios na IFRS 15 contemplam uma abordagem mais estruturada para medir e reconhecer receita.

Este pronunciamento é cabível a todas as entidades e substituirá todos os atuais quesitos de reconhecimento de receita, nos termos da IFRS. A adoção retrospectiva total ou modificada é exigida para os exercícios iniciados em 01/01/17 ou após essa data. É permitida a adoção antecipada, que está em exame no Brasil. A Empresa está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

IFRS 16 - Arrendamentos

Em janeiro de 2016, o IASB emitiu a versão final do IFRS 16 – Arrendamentos, o qual substitui o IAS 17 – Arrendamentos, vigente para exercícios iniciados em 01/01/19. A adoção antecipada é permitida para entidades que também seguem o pronunciamento IFRS 15 – Receita de contrato com clientes. A adoção deste pronunciamento terá efeito sobre a classificação e mensuração do ativo imobilizado e dos passivos financeiros. Os arrendamentos não serão mais diferenciados entre operacional e financeiro. Sendo o tratamento dado a todos os arrendamentos mercantis similar ao arrendamento mercantil financeiro, como disposto no IAS 17. A Empresa está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

17

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15, que estabelece um modelo de 5 etapas que será empregado à receita adquirida a partir de um contrato com cliente.

18

A adoção deste pronunciamento afetará a classificação e mensuração do ativo imobilizado e dos passivos financeiros, porque os arrendamentos não serão mais separados entre operacional e financeiro.

19

O tratamento fornecido a todos os arrendamentos mercantis será análogo ao arrendamento mercantil financeiro conforme apresentado no IAS 17. A XYZ está

avaliando a prática e os efeitos da adoção deste pronunciamento em seus relatórios financeiros.

De 1 a 7, qual o seu grau de confiança em relação às suas respostas? (1 = Nada confiante; 7 = Muito confiante)

Etapa 1 - Treatment 2

Etapa 1/4

Você vai receber agora as seguintes informações sobre a empresa XYZ: Balanço Patrimonial, DRE, DFC, DMPL, DVA e Notas Explicativas. Utilizando todas as informações que você possui, sua tarefa é dizer se as frases apresentadas após cada segmento possuem o mesmo significado das frases da passagem original das Notas Explicativas.

Para baixar o documento com todas as demonstrações, clique em: Demonstrações Financeiras - XYZ

Qual o valor do lucro líquido em 2015 da empresa estudada? (Ex: Se for 1.000.000, coloque sem os pontos: 1000000)

1. CONTEXTO OPERACIONAL

A XYZ S.A. (“XYZ”), é uma das maiores firmas brasileiras do ramo alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), com foco na industrialização e venda de bens processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

A Empresa opera só no Brasil e conta com 20 itens de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, localizadas perto de seus fornecedores de insumos ou dos principais centros de consumo.

A Empresa conta com 20 centros de distribuição, os quais servem supermercados, lojas de varejo, atacadistas, restaurantes e outros clientes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

1

A XYZ atua somente no Brasil e possui 20 unidades de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas nas proximidades de seus fornecedores de matérias-primas ou dos mais importantes centros de distribuição.

2

A XYZ possui 20 centros de consumo e atendem supermercados, lojas de varejo, atacadistas, restaurantes e outros compradores.

2. DECLARAÇÃO DA ADMINISTRAÇÃO E BASE DE PREPARO E EXPOSIÇÃO DAS DEMONSTRAÇÕES FINANCEIRAS

As demonstrações financeiras individuais foram feitas de acordo com as normas internacionais de relato financeiro (“IFRS”) emitidos pelo International Accounting Standards Board (“IASB”) e interpretações emitidas pelo International Financial Reporting Interpretations Committee (“IFRIC”), introduzidos no Brasil por meio do Comitê de Pronunciamentos Contábeis (“CPC”) e suas interpretações técnicas (“ICPC”) e orientações (“OCPC”), aceitos pela Comissão de Valores Mobiliários (“CVM”).

As demonstrações financeiras individuais da Empresa estão expressas em milhares de Reais (“R\$”), já as divulgações de somas em outras moedas, quando preciso, também foram feitas em milhares. Itens divulgados em Reais estão informados quando cabíveis.

O preparo das demonstrações financeiras individuais da Empresa requer que a Administração faça juízos, use estimações e siga premissas que afetam os valores expostos de receitas, despesas, ativos e passivos, incluindo passivos contingentes, mas a dúvida relativa a esses juízos, premissas e estimações poderia levar a resultados que pedem um ajuste relevante ao valor contábil de uns ativos e passivos em exercícios futuros.

A Empresa revê seus juízos, estimações e premissas trimestralmente.

As demonstrações financeiras individuais foram feitas com base no custo histórico recuperável.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

3

Os relatórios financeiros individuais da XYZ estão declarados em milhões de Reais (“R\$”). As divulgações de montantes em outras unidades monetárias, quando necessário, também foram realizadas em milhões. Elementos divulgados em Reais estão comunicados quando aplicáveis.

4

A preparação dos relatórios financeiros individuais da XYZ demanda que a Administração: realize julgamentos; utilize estimativas; e adote premissas que afetam os valores apresentados de receitas, despesas, ativos e passivos, compreendendo passivos contingentes.

5

Contudo, a incerteza relativa a tais julgamentos, premissas e estimativas resulta em resultados que requerem um ajuste significativo no montante registrado de certos ativos e passivos em exercícios que estão por vir.

3.8 Contas a pagar e fornecedores – são primeiramente reconhecidos pelo valor nominal e, depois somados, quando cabível, dos encargos e das variações monetárias e cambiais correlatos incorridos até as datas de fechamento das demonstrações financeiras.

3.9 Lucro por ação – o cálculo do lucro básico por ação é feito através da divisão do lucro líquido do exercício, referente aos donos de ações ordinárias da Empresa, pela quantia média ponderada de ações ordinárias disponíveis durante o exercício, já o lucro diluído por ação é medido através da divisão do lucro líquido referente aos donos de ações ordinárias da Empresa pela quantia média ponderada de ações ordinárias disponíveis durante o exercício, mais a quantia média ponderada de ações ordinárias que seriam emitidas na conversão de todas as ações ordinárias potenciais diluídas em ações ordinárias.

3.10 Cálculo do resultado – o resultado das operações é apurado de acordo com o regime contábil de competência do exercício.

3.11 Receita de vendas – incluem o valor justo do montante recebido ou a receber pela venda de bens, líquido dos impostos incidentes, das devoluções, dos abatimentos e dos descontos.

São reconhecidas de acordo com o regime contábil de competência, quando: o valor das vendas é medido de forma confiável; a Empresa não tem mais o controle sobre o bem vendido ou qualquer outra obrigação vinculada à posse desta; os custos incorridos ou a incorrer decorrente da transação podem ser medidos de forma confiável; é provável que os benefícios econômicos serão obtidos pela Empresa; e, os riscos e os benefícios foram totalmente passados ao comprador.

3.12 Juízos, estimações e premissas contábeis – como divulgado na nota 2, a Administração fez os seguintes juízos, que têm efeito relevante sobre os valores reconhecidos nas demonstrações financeiras:

- Exame anual do valor recuperável de ativos não financeiros (vide nota 8);
- Perdas estimadas em créditos de liquidação duvidosa (vide nota 5);
- Provisão para ajuste a valor realizável dos estoques (vide nota 6); e
- Vida útil dos bens do ativo imobilizado e intangíveis com vida útil definida (vide notas 7 e 8).

A Empresa revê trimestralmente as premissas usadas em suas estimações contábeis e efeito das revisões das estimações contábeis é reconhecido nas demonstrações financeiras no tempo em que tais revisões são feitas.

3.13 Demonstração do valor adicionado – a Empresa fez demonstrações do valor adicionado (“DVA”) individuais nos termos da Deliberação CVM nº 557/08, as quais

são expostas como parte integrante das demonstrações financeiras como BR GAAP, sendo que para IFRS, é informação financeira extra.

3.14 Demonstração do Resultado Abrangente – a Empresa não fez demonstrações do resultado abrangente pois não tem resultados abrangentes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

6

3.8 Contas a pagar e fornecedores: são inicialmente reconhecidos pelo valor nominal e, subsequentemente acrescidos, se aplicável, dos correspondentes encargos e das variações monetárias e cambiais incorridos até as datas de encerramento dos relatórios financeiros.

7

3.11 Receita de vendas – compreendem o valor justo da contraprestação recebida ou a receber pela comercialização de produtos, mais impostos incidentes, das devoluções, dos abatimentos e dos descontos.

8

A XYZ revisa todos os trimestres as premissas utilizadas em suas estimativas contábeis e o efeito das revisões das estimativas contábeis é reconhecido nas demonstrações financeiras do período no qual tais revisões são efetuadas.

7.2 Tempo previsto de realização

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados ao passo que estas sejam liquidadas ou realizadas e o tempo de liquidação ou realização de tais diferenças é vago e está ligado a muitos fatores que não estão sob o controle da Administração.

Na estimação de realização dos créditos fiscais diferidos ativos, formados sobre prejuízos fiscais e base negativa de contribuição social, a Administração inclui seus planos orçamentário e estratégico, ajustados com base nas estimações das principais adições e exclusões fiscais e com base nesta estimação, a Administração crê que é provável que esses créditos fiscais diferidos sejam realizados, como abaixo exposto:

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

9

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados à medida que estas sejam liquidadas ou realizadas e o período de liquidação ou realização de tais diferenças é impreciso e está vinculado a diversos elementos que não estão sob o controle da Administração.

As amortizações de fidelização de integrados e relação com fornecedores são lançadas no resultado no custo das vendas, a amortização de relação com clientes é lançada no resultado nas despesas comerciais, enquanto que a amortização de software é lançada de acordo com o seu uso podendo ser custo das vendas, despesas administrativas ou comerciais.

As marcas lançadas no ativo intangível contemplam marcas obtidas (KLK, AAA e KR3), e são incluídos ativos com vida útil indefinida, pois se crê que ajudem indefinidamente para os fluxos de caixa da Empresa.

Os ágios expostos acima estão baseados na expectativa de rentabilidade futura e estão suportados por laudos de avaliações, após alocação dos ativos verificados.

O teste de recuperabilidade dos ativos é feito anualmente com base no método de fluxo de caixa descontado e em 2015, foram usados como base o orçamento e o planejamento estratégico da Empresa com projeções de crescimento até 2018 e perpetuidade a partir de 2019, e estão baseados no histórico dos últimos anos bem como as projeções de mercado de órgãos governamentais, tais como bancos, Fundo Monetário Internacional (FMI), Banco Central (BACEN), entre outros, sendo que na visão da Administração, o uso de um tempo de 3 anos para suas projeções mostra uma melhor noção do cenário futuro e uma maior convicção ao medir a expectativa de rentabilidade dos ativos testados.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

10

As marcas registradas no ativo intangível consideram marcas incorporadas (KLK, AAA e KR3), e são considerados ativos com vida útil indefinida, porque se espera que contribuam indefinidamente para os fluxos de caixa da XYZ.

11

Os ágios apresentados anteriormente estão fundamentados na expectativa de rentabilidade futura e estão suportados por laudos de avaliações, posteriormente à alocação dos ativos identificados.

12

O teste de recuperabilidade dos ativos é efetuado todos os anos baseados no método de fluxo de caixa descontado e em 2015, foram utilizados como fundamentos o orçamento e o planejamento estratégico da XYZ com projeções de crescimento até 2018 e perpetuidade a partir de 2019.

11. PATRIMÔNIO LÍQUIDO

11.1 Capital social

Em 31/12/2015, o capital subscrito e integralizado da Empresa era de R\$12.407.053, composto por 872.473.246 ações ordinárias, escriturais e sem valor nominal, sendo que o valor realizado do capital social no balanço está líquido dos gastos com oferta pública no valor de R\$92.947.

A Empresa está autorizada a aumentar o capital social, independentemente de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

11.2 Dividendos

Em 18/06/15, em reunião extraordinária do Conselho de Administração, foi aceita a distribuição de R\$425.859, referente a juros de capital próprio, pagos em 14/08/15.

Em 17/10/15, em reunião ordinária do Conselho de Administração, foi aceita a distribuição de R\$473.398, referente a juros de capital próprio e R\$91.443 na forma de dividendos, pagos em 12/12/15.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

13

Em 31 de dezembro de 2015, o capital subscrito e integralizado da XYZ era de R\$12.407.053, constituído por 872.473.246 ações ordinárias, escriturais e com valor nominal, sendo que o valor realizado do capital social no balanço está líquido dos dispêndios com oferta pública no montante de R\$92.947.

14

A XYZ pode ampliar o capital social, apesar de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

Reserva legal: Formada na base de 5% do lucro líquido do exercício nos termos do artigo 193 da Lei nº 6.404/76, alterada pela Lei nº 11.638/07, restrita a 20% do capital social, dado que em 31/12/2015, o saldo desta reserva correspondia a 4,00% do capital social (2,85% em 31/12/2014).

Reserva de incentivos fiscais: Formada nos termos do artigo 195-A da Lei nº 6.404/76, alterada pela Lei nº 11.638/07, com base no valor de doações ou subvenções governamentais para investimentos.

11.7 Ações em tesouraria

A Empresa tem 62.501.001 ações ordinárias de sua própria emissão em tesouraria, com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação, e com valor de mercado igual a R\$3.455.680.

Durante o exercício findo em 31/12/15, a Empresa vendeu 1.935.296 ações em tesouraria.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

15

Reserva de incentivos fiscais: Constituída nos termos do artigo 195-A da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, baseada no montante de doações ou subvenções governamentais para investimentos.

16

A XYZ possui 62.501.001 ações ordinárias de sua própria emissão em tesouraria, com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação, e com valor de mercado correspondente a R\$3.455.680.

15. NOVAS NORMAS E PRONUNCIAMENTOS AINDA NÃO SEGUIDOS

IFRS 15 – Receita de contrato com clientes

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15, que determina um modelo de 5 passos que será aplicado à receita obtida a partir de um contrato com cliente e de acordo com este pronunciamento, as receitas são reconhecidas em valor que reflete o montante ao qual uma entidade crê ter direito em troca da transferência de bens ou serviços a um cliente. Os princípios na IFRS 15 contemplam uma abordagem mais estruturada para medir e reconhecer receita.

Este pronunciamento é cabível a todas as entidades e substituirá todos os atuais quesitos de reconhecimento de receita, nos termos da IFRS, sendo que a adoção retrospectiva total ou modificada é exigida para os exercícios iniciados em 01/01/17 ou após essa data, sendo permitida a adoção antecipada, que está em exame no Brasil. A Empresa está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

IFRS 16 - Arrendamentos

Em janeiro de 2016, o IASB emitiu a versão final do IFRS 16 – Arrendamentos, o qual substitui o IAS 17 – Arrendamentos, vigente para exercícios iniciados em 01/01/19, com adoção antecipada permitida para entidades que também seguem o pronunciamento IFRS 15 – Receita de contrato com clientes. A adoção deste pronunciamento terá efeito sobre a classificação e mensuração do ativo imobilizado e dos passivos financeiros, pois os arrendamentos não serão mais diferenciados entre operacional e, financeiro, sendo o tratamento dado a todos os arrendamentos mercantis similar ao arrendamento mercantil financeiro, como disposto no IAS 17. A Empresa está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

17

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15, que estabelece um modelo de 5 etapas que será empregado à receita adquirida a partir de um contrato com cliente.

18

A adoção deste pronunciamento afetará a classificação e mensuração do ativo imobilizado e dos passivos financeiros, porque os arrendamentos não serão mais separados entre operacional e financeiro.

19

O tratamento fornecido a todos os arrendamentos mercantis será análogo ao arrendamento mercantil financeiro conforme apresentado no IAS 17. A XYZ está avaliando a prática e os efeitos da adoção deste pronunciamento em seus relatórios financeiros.

De 1 a 7, qual o seu grau de confiança em relação às suas respostas? (1 = Nada confiante; 7 = Muito confiante)

Etapa 1 – Treatment 3

Você vai receber agora as seguintes informações sobre a empresa XYZ: Balanço Patrimonial, DRE, DFC, DMPL, DVA e Notas Explicativas. Utilizando todas as informações que você possui, sua tarefa é dizer se as frases apresentadas após cada segmento possuem o mesmo significado das frases da passagem original das Notas Explicativas.

Para baixar o documento com todas as demonstrações, clique em: Demonstrações Financeiras XYZ

Qual o valor do lucro líquido em 2015 da empresa estudada? (Ex: Se for 1.000.000, coloque sem os pontos: 1000000)

1. CONTEXTO OPERACIONAL

A XYZ S.A. (“XYZ”), é uma das maiores empresas brasileiras do segmento alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”). Com foco na industrialização e comercialização de produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

A Companhia opera somente no Brasil. Conta com 20 unidades de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja. Estabelecidas

próximas aos seus fornecedores de matérias-primas ou dos principais centros de consumo.

A Companhia conta com 20 centros de distribuição. Atendem a supermercados, lojas de varejo, atacadistas, restaurantes e outros compradores.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

1

A XYZ atua apenas no Brasil e possui 20 itens de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas nas proximidades de seus fornecedores de insumos ou dos mais importantes centros de distribuição.

2

A XYZ possui 20 centros de consumo e atendem supermercados, lojas de varejo, atacadistas, restaurantes e outros clientes.

2. DECLARAÇÃO DA ADMINISTRAÇÃO E BASE DE PREPARAÇÃO E APRESENTAÇÃO DAS DEMONSTRAÇÕES FINANCEIRAS

As demonstrações financeiras individuais foram elaboradas em conformidade com: as normas internacionais de relatório financeiro (“IFRS”), enunciados pelo International Accounting Standards Board (“IASB”); e interpretações emitidas pelo International Financial Reporting Interpretations Committee (“IFRIC”), introduzidos no Brasil por meio do Comitê de Pronunciamentos Contábeis (“CPC”) e suas interpretações técnicas (“ICPC”) e orientações (“OCPC”), aprovados pela Comissão de Valores Mobiliários (“CVM”).

As demonstrações financeiras individuais da Companhia estão declaradas em milhares de Reais (“R\$”). As divulgações de montantes em outras moedas, quando necessário, também foram efetuadas em milhares. Elementos divulgados em Reais estão comunicados quando aplicáveis.

A preparação das demonstrações financeiras individuais da Companhia demanda que a Administração: realize julgamentos; utilize estimativas; e adote premissas que afetam os valores apresentados de receitas, despesas, ativos e passivos, compreendendo passivos contingentes. Contudo, a incerteza relativa a esses julgamentos, premissas e estimativas conseguiria levar a resultados que requeiram um ajuste significativo ao valor contábil de certos ativos e passivos em exercícios futuros.

A Companhia revisa seus julgamentos, estimativas e premissas trimestralmente.

As demonstrações financeiras individuais foram preparadas com base no custo histórico recuperável.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

3

Os relatórios financeiros individuais da XYZ estão expressos em milhões de Reais (“R\$”), já as divulgações de somas em outras unidades monetárias, quando preciso, também foram realizadas em milhões. Itens divulgados em Reais estão informados quando cabíveis.

4

O preparo dos relatórios financeiros individuais da XYZ requer que a Administração: realize juízos; use estimações; e siga premissas que afetam os valores expostos de receitas, despesas, ativos e passivos, incluindo passivos contingentes.

5

Mas a dívida relativa a tais juízos, premissas e estimações resulta em resultados que pedem um ajuste relevante no montante registrado de certos ativos e passivos em exercícios que estão por vir.

3.8 Contas a pagar e fornecedores – são inicialmente reconhecidos pelo valor nominal. Subsequentemente acrescidos (quando aplicável) dos correspondentes encargos e das variações monetárias e cambiais incorridos até as datas de encerramento das demonstrações financeiras.

3.9 Lucro por ação – a apuração do lucro básico por ação é realizada através da divisão do lucro líquido do exercício, atribuído aos detentores de ações ordinárias da Companhia, pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício. O lucro diluído por ação é calculado através da divisão do lucro líquido atribuído aos detentores de ações ordinárias da Companhia pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício, mais a quantidade média ponderada de ações ordinárias que seriam emitidas na transformação de todas as ações ordinárias potenciais diluídas em ações ordinárias.

3.10 Apuração do resultado – o resultado das operações é apurado em conformidade com o regime contábil de competência do exercício.

3.11 Receita de vendas – compreendem o valor justo da contraprestação recebida ou a receber pela comercialização de produtos, líquido dos impostos incidentes, das devoluções, dos abatimentos e dos descontos.

São reconhecidas em conformidade com o regime contábil de competência, quando: o valor das vendas é mensurável de maneira confiável; a Companhia não detém mais o controle sobre a mercadoria vendida ou qualquer outra responsabilidade relacionada à propriedade desta; os custos incorridos ou a incorrer decorrente da transação podem ser mensurados de maneira confiável; é provável que os benefícios econômicos serão recebidos pela Companhia; e, os riscos e os benefícios foram integralmente transferidos ao comprador.

3.12 Julgamentos, estimativas e premissas contábeis – conforme divulgado na nota 2, a Administração realizou os seguintes julgamentos, que possuem efeito significativo sobre os valores reconhecidos nas demonstrações financeiras:

- Análise anual do valor recuperável de ativos não financeiros (consulte nota 8);
- Perdas estimadas em créditos de liquidação duvidosa (consulte nota 5);
- Provisão para ajuste a valor realizável dos estoques (consulte nota 6); e
- Vida útil dos bens do ativo imobilizado e intangíveis com vida útil definida (consulte notas 7 e 8).

A Companhia revisa trimestralmente as premissas utilizadas em suas estimativas contábeis. O efeito das revisões das estimativas contábeis é reconhecido nas demonstrações financeiras no período em que tais revisões são efetuadas.

3.13 Demonstração do valor adicionado – a Companhia elaborou demonstrações do valor adicionado (“DVA”) individuais nos termos da Deliberação CVM nº 557/08. São apresentadas como componente integrante das demonstrações financeiras conforme BR GAAP. Para IFRS, representam informação financeira adicional.

3.14 Demonstração do Resultado Abrangente – a Companhia não elaborou demonstrações do resultado abrangente porque não possui resultados abrangentes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

6

3.8 Contas a pagar e fornecedores: são primeiramente reconhecidos pelo valor nominal. Depois, somados (se cabível) dos encargos e das variações monetárias e cambiais correlatos incorridos até as datas de fechamento dos relatórios financeiros.

7

3.11 Receita de vendas – incluem o valor justo do montante recebido ou a receber pela venda de bens, mais impostos incidentes, das devoluções, dos abatimentos e dos descontos.

8

A XYZ revê todos os trimestres as premissas usadas em suas estimações contábeis. O efeito das revisões das estimações contábeis é reconhecido nas demonstrações financeiras do tempo no qual tais revisões são feitas.

7.2 Período estimado de realização

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados à medida que estas sejam liquidadas ou realizadas. O período de liquidação ou realização de tais diferenças é impreciso e está vinculado a diversos elementos que não estão sob o controle da Administração.

Na estimativa de realização dos créditos fiscais diferidos ativos, constituídos sobre prejuízos fiscais e base negativa de contribuição social, a Administração considera seus planos orçamentário e estratégico, ajustados com base nas estimativas das principais

adições e exclusões fiscais. Com base nesta estimativa, a Administração acredita que é provável que esses créditos fiscais diferidos sejam realizados, conforme adiante demonstrado:

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

9

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados ao passo que estas sejam liquidadas ou realizadas. O tempo de liquidação ou realização de tais diferenças é vago e está ligado a muitos fatores que não estão sob o controle da Administração.

As amortizações de fidelização de integrados e relacionamento com fornecedores são registradas no resultado no custo das vendas. A amortização de relacionamento com compradores é registrada no resultado nas despesas comerciais. Enquanto que a amortização de software é registrada em conformidade com a sua utilização podendo ser custo das vendas, despesas administrativas ou comerciais.

As marcas registradas no ativo intangível consideram marcas adquiridas (KLK, AAA e KR3). São considerados ativos com vida útil indefinida, porque se espera que contribuam indefinidamente para os fluxos de caixa da Companhia.

Os ágios apresentados anteriormente estão fundamentados na expectativa de rentabilidade futura. Estão suportados por laudos de avaliações, após alocação dos ativos identificados.

O teste de recuperabilidade dos ativos é efetuado anualmente com base no método de fluxo de caixa descontado. Em 2015, foram utilizados como base o orçamento e o planejamento estratégico da Companhia com projeções de crescimento até 2018 e perpetuidade a partir de 2019. Estão fundamentados no histórico dos anos anteriores assim como as projeções de mercado de entidades governamentais, tais como bancos, Fundo Monetário Internacional (FMI), Banco Central (BACEN), entre outros. Na opinião da Administração, a utilização de um período de 3 anos para suas projeções demonstra uma melhor percepção do cenário futuro e uma maior segurança em avaliar a expectativa de rentabilidade dos ativos examinados.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

10

As marcas lançadas no ativo intangível contemplam marcas incorporadas (KLK, AAA e KR3). São incluídos ativos com vida útil indefinida, pois se crê que ajudem indefinidamente para os fluxos de caixa da XYZ.

11

Os ágios expostos acima estão baseados na expectativa de rentabilidade futura. Estão suportados por laudos de avaliações, posteriormente à alocação dos ativos verificados.

12

O teste de recuperabilidade dos ativos é feito todos os anos baseados no método de fluxo de caixa descontado. Em 2015, foram usados como fundamentos o orçamento e o planejamento estratégico da XYZ com projeções de crescimento até 2018 e perpetuidade a partir de 2019.

11. PATRIMÔNIO LÍQUIDO

11.1 Capital social

Em 31/12/2015, o capital subscrito e integralizado da Companhia era de R\$12.407.053. Constituído por 872.473.246 ações ordinárias, escriturais e sem valor nominal. O valor realizado do capital social no balanço está líquido dos dispêndios com oferta pública no montante de R\$92.947.

A Companhia está autorizada a aumentar o capital social, independentemente de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

11.2 Dividendos

Em 18/06/15, em reunião extraordinária do Conselho de Administração, foi aprovada a distribuição de R\$425.859, relacionada a juros de capital próprio, pagos em 14/08/15.

Em 17/10/15, em reunião ordinária do Conselho de Administração, foi aprovada a distribuição de R\$473.398, relacionada a juros de capital próprio e R\$91.443 no formato de dividendos, pagos em 12/12/15.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

13

Em 31 de dezembro de 2015, o capital subscrito e integralizado da XYZ era de R\$12.407.053. Composto por 872.473.246 ações ordinárias, escriturais e com valor nominal. O valor realizado do capital social no balanço está líquido dos gastos com oferta pública no valor de R\$92.947.

14

A XYZ pode ampliar o capital social, apesar de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

Reserva legal: Constituída na base de 5% do lucro líquido do exercício nos termos do artigo 193 da Lei nº 6.404/76 (modificada pela Lei nº 11.638/07). Limitada a 20% do

capital social. Em 31/12/2015, o saldo desta reserva correspondia a 4,00% do capital social (2,85% em 31/12/2014).

Reserva de incentivos fiscais: Constituída nos termos do artigo 195-A da Lei nº 6.404/76 (modificada pela Lei nº 11.638/07). Com base no valor de doações ou subvenções governamentais para investimentos.

11.7 Ações em tesouraria

A Companhia possui 62.501.001 ações ordinárias de sua própria emissão em tesouraria. Com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação. Com valor de mercado correspondente a R\$3.455.680.

Durante o exercício concluído em 31/12/15, a Companhia vendeu 1.935.296 ações em tesouraria.

Durante o exercício concluído em 31/12/15, conforme autorizado pelo Conselho de Administração, a Companhia adquiriu 59.247.400 de ações de sua própria emissão com custo de R\$3.765.753.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

15

Reserva de incentivos fiscais: Formada nos termos do artigo 195-A da Lei nº 6.404/76 (alterada pela Lei nº 11.638/07). Baseada no montante de doações ou subvenções governamentais para investimentos.

16

A XYZ tem 62.501.001 ações ordinárias de sua própria emissão em tesouraria. Com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação. Com valor de mercado igual a R\$3.455.680.

15. NOVAS NORMAS E PRONUNCIAMENTOS AINDA NÃO ADOTADOS

IFRS 15 – Receita de contrato com clientes

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15. Ele estabelece um modelo de 5 etapas que será aplicado à receita obtida a partir de um contrato com cliente. Em conformidade com este pronunciamento, as receitas são reconhecidas em valor que representa a contraprestação à qual uma entidade espera ter direito em troca da transferência de mercadorias ou serviços a um cliente. Os princípios na IFRS 15 consideram uma abordagem mais estruturada para mensurar e reconhecer receita.

Este pronunciamento é aplicável a todas as entidades e substituirá todas as atuais exigências de reconhecimento de receita, nos termos da IFRS. A adoção retrospectiva total ou modificada é exigida para os exercícios iniciados em 01/01/17 ou após essa data. É autorizada a adoção antecipada, que está em análise no Brasil. A Companhia

está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

IFRS 16 - Arrendamentos

Em janeiro de 2016, o IASB emitiu a versão final do IFRS 16 – Arrendamentos, o qual substitui o IAS 17 – Arrendamentos, vigente para exercícios iniciados em 01/01/19. A adoção antecipada é autorizada para entidades que também adotem o pronunciamento IFRS 15 – Receita de contrato com clientes. A adoção deste pronunciamento terá efeito sobre a classificação e mensuração do ativo imobilizado e dos passivos financeiros. Os arrendamentos não serão mais diferenciados entre operacional e financeiro. Sendo o tratamento fornecido a todos os arrendamentos mercantis análogo ao arrendamento mercantil financeiro, conforme apresentado no IAS 17. A Companhia está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

17

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15. Ele determina um modelo de 5 passos que será empregado à receita adquirida a partir de um contrato com cliente.

18

A adoção deste pronunciamento afetará a classificação e mensuração do ativo imobilizado e dos passivos financeiros. Os arrendamentos não serão mais separados entre operacional e financeiro.

19

O tratamento dado a todos os arrendamentos mercantis será similar ao arrendamento mercantil financeiro, como disposto no IAS 17. A XYZ está avaliando a prática e os efeitos da adoção deste pronunciamento em seus relatórios financeiros.

De 1 a 7, qual o seu grau de confiança em relação às suas respostas? (1 = Nada confiante; 7 = Muito confiante)

Etapa 1 – Treatment 4

Você vai receber agora as seguintes informações sobre a empresa XYZ: Balanço Patrimonial, DRE, DFC, DMPL, DVA e Notas Explicativas. Utilizando todas as informações que você possui, sua tarefa é dizer se as frases apresentadas após cada segmento possuem o mesmo significado das frases da passagem original das Notas Explicativas.

Para baixar o documento com todas as demonstrações, clique em: Demonstrações Financeiras - Empresa XYZ.

Qual o valor do lucro líquido em 2015 da empresa estudada? (Ex: Se for 1.000.000, coloque sem os pontos: 1000000)

1. CONTEXTO OPERACIONAL

A XYZ S.A. (“XYZ”), é uma das maiores empresas brasileiras do segmento alimentício. A XYZ é uma sociedade anônima de capital aberto, listada no segmento Novo Mercado da Bolsa de Valores, Mercadorias e Futuros (“BM&FBOVESPA”), com foco na industrialização e comercialização de produtos processados, massas, molhos, maioneses, vegetais congelados e derivados de soja.

A Companhia opera somente no Brasil e conta com 20 unidades de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas próximas aos seus fornecedores de matérias-primas ou dos principais centros de consumo.

A Companhia conta com 20 centros de distribuição, os quais atendem a supermercados, lojas de varejo, atacadistas, restaurantes e outros compradores.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

1

A XYZ atua apenas no Brasil e possui 20 itens de processamento de carnes, 2 de margarinas, 4 de massas e 3 de esmagamento de soja, estabelecidas nas proximidades de seus fornecedores de insumos ou dos mais importantes centros de distribuição.

2

A XYZ possui 20 centros de consumo e atendem supermercados, lojas de varejo, atacadistas, restaurantes e outros clientes.

2. DECLARAÇÃO DA ADMINISTRAÇÃO E BASE DE PREPARAÇÃO E APRESENTAÇÃO DAS DEMONSTRAÇÕES FINANCEIRAS

As demonstrações financeiras individuais foram elaboradas em conformidade com as normas internacionais de relatório financeiro (“IFRS”) enunciados pelo International Accounting Standards Board (“IASB”) e interpretações emitidas pelo International Financial Reporting Interpretations Committee (“IFRIC”), introduzidos no Brasil por meio do Comitê de Pronunciamentos Contábeis (“CPC”) e suas interpretações técnicas (“ICPC”) e orientações (“OCPC”), aprovados pela Comissão de Valores Mobiliários (“CVM”).

As demonstrações financeiras individuais da Companhia estão declaradas em milhares de Reais (“R\$”), já as divulgações de montantes em outras moedas, quando necessário, também foram efetuadas em milhares. Elementos divulgados em Reais estão comunicados quando aplicáveis.

A preparação das demonstrações financeiras individuais da Companhia demanda que a Administração realize julgamentos, utilize estimativas e adote premissas que afetam os valores apresentados de receitas, despesas, ativos e passivos, compreendendo passivos contingentes, contudo, a incerteza relativa a esses julgamentos, premissas e estimativas conseguiria levar a resultados que requeiram um ajuste significativo ao valor contábil de certos ativos e passivos em exercícios futuros.

A Companhia revisa seus julgamentos, estimativas e premissas trimestralmente.

As demonstrações financeiras individuais foram preparadas com base no custo histórico recuperável.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

3

Os relatórios financeiros individuais da XYZ estão expressos em milhões de Reais (“R\$”), já as divulgações de somas em outras unidades monetárias, quando preciso, também foram realizadas em milhões. Itens divulgados em Reais estão informados quando cabíveis.

4

O preparo dos relatórios financeiros individuais da XYZ requer que a Administração: realize juízos; use estimações; e siga premissas que afetam os valores expostos de receitas, despesas, ativos e passivos, incluindo passivos contingentes.

5

Mas a dívida relativa a tais juízos, premissas e estimações resulta em resultados que pedem um ajuste relevante no montante registrado de certos ativos e passivos em exercícios que estão por vir.

3.8 Contas a pagar e fornecedores – são inicialmente reconhecidos pelo valor nominal e, subsequentemente acrescidos, quando aplicável, dos correspondentes encargos e das variações monetárias e cambiais incorridos até as datas de encerramento das demonstrações financeiras.

3.9 Lucro por ação – a apuração do lucro básico por ação é realizada através da divisão do lucro líquido do exercício, atribuído aos detentores de ações ordinárias da Companhia, pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício, já o lucro diluído por ação é calculado através da divisão do lucro líquido atribuído aos detentores de ações ordinárias da Companhia pela quantidade média ponderada de ações ordinárias disponíveis durante o exercício, mais a quantidade média

ponderada de ações ordinárias que seriam emitidas na transformação de todas as ações ordinárias potenciais diluídas em ações ordinárias.

3.10 Apuração do resultado – o resultado das operações é apurado em conformidade com o regime contábil de competência do exercício.

3.11 Receita de vendas – compreendem o valor justo da contraprestação recebida ou a receber pela comercialização de produtos, líquido dos impostos incidentes, das devoluções, dos abatimentos e dos descontos.

São reconhecidas em conformidade com o regime contábil de competência, quando: o valor das vendas é mensurável de maneira confiável; a Companhia não detém mais o controle sobre a mercadoria vendida ou qualquer outra responsabilidade relacionada à propriedade desta; os custos incorridos ou a incorrer decorrente da transação podem ser mensurados de maneira confiável; é provável que os benefícios econômicos serão recebidos pela Companhia; e, os riscos e os benefícios foram integralmente transferidos ao comprador.

3.12 Julgamentos, estimativas e premissas contábeis – conforme divulgado na nota 2, a Administração realizou os seguintes julgamentos, que possuem efeito significativo sobre os valores reconhecidos nas demonstrações financeiras:

- Análise anual do valor recuperável de ativos não financeiros (consulte nota 8);
- Perdas estimadas em créditos de liquidação duvidosa (consulte nota 5);
- Provisão para ajuste a valor realizável dos estoques (consulte nota 6); e
- Vida útil dos bens do ativo imobilizado e intangíveis com vida útil definida (consulte notas 7 e 8).

A Companhia revisa trimestralmente as premissas utilizadas em suas estimativas contábeis e o efeito das revisões das estimativas contábeis é reconhecido nas demonstrações financeiras no período em que tais revisões são efetuadas.

3.13 Demonstração do valor adicionado – a Companhia elaborou demonstrações do valor adicionado (“DVA”) individuais nos termos da Deliberação CVM nº 557/08, as quais são apresentadas como componente integrante das demonstrações financeiras conforme BR GAAP, sendo que para IFRS, representam informação financeira adicional.

3.14 Demonstração do Resultado Abrangente – a Companhia não elaborou demonstrações do resultado abrangente porque não possui resultados abrangentes.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

6

3.8 Contas a pagar e fornecedores: são primeiramente reconhecidos pelo valor nominal. Depois, somados (se cabível) dos encargos e das variações monetárias e cambiais correlatos incorridos até as datas de fechamento dos relatórios financeiros.

7

3.11 Receita de vendas – incluem o valor justo do montante recebido ou a receber pela venda de bens, mais impostos incidentes, das devoluções, dos abatimentos e dos descontos.

8

A XYZ revê todos os trimestres as premissas usadas em suas estimações contábeis. O efeito das revisões das estimações contábeis é reconhecido nas demonstrações financeiras do tempo no qual tais revisões são feitas.

7.2 Período estimado de realização

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados à medida que estas sejam liquidadas ou realizadas e o período de liquidação ou realização de tais diferenças é impreciso e está vinculado a diversos elementos que não estão sob o controle da Administração.

Na estimativa de realização dos créditos fiscais diferidos ativos, constituídos sobre prejuízos fiscais e base negativa de contribuição social, a Administração considera seus planos orçamentário e estratégico, ajustados com base nas estimativas das principais adições e exclusões fiscais e com base nesta estimativa, a Administração acredita que é provável que esses créditos fiscais diferidos sejam realizados, conforme adiante demonstrado:

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

9

Os ativos fiscais diferidos decorrentes de diferenças temporárias serão realizados ao passo que estas sejam liquidadas ou realizadas. O tempo de liquidação ou realização de tais diferenças é vago e está ligado a muitos fatores que não estão sob o controle da Administração.

As amortizações de fidelização de integrados e relacionamento com fornecedores são registradas no resultado no custo das vendas, a amortização de relacionamento com compradores é registrada no resultado nas despesas comerciais, enquanto que a amortização de software é registrada em conformidade com a sua utilização podendo ser custo das vendas, despesas administrativas ou comerciais.

As marcas registradas no ativo intangível consideram marcas adquiridas (KLK, AAA e KR3), e são considerados ativos com vida útil indefinida, porque se espera que contribuam indefinidamente para os fluxos de caixa da Companhia.

Os ágios apresentados anteriormente estão fundamentados na expectativa de rentabilidade futura e estão suportados por laudos de avaliações, após alocação dos ativos identificados.

O teste de recuperabilidade dos ativos é efetuado anualmente com base no método de fluxo de caixa descontado e em 2015, foram utilizados como base o orçamento e o planejamento estratégico da Companhia com projeções de crescimento até 2018 e perpetuidade a partir de 2019 e estão fundamentados no histórico dos anos anteriores assim como as projeções de mercado de entidades governamentais, tais como bancos, Fundo Monetário Internacional (FMI), Banco Central (BACEN), entre outros, sendo que na opinião da Administração, a utilização de um período de 3 anos para suas projeções demonstra uma melhor percepção do cenário futuro e uma maior segurança em avaliar a expectativa de rentabilidade dos ativos examinados.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

10

As marcas lançadas no ativo intangível contemplam marcas incorporadas (KLK, AAA e KR3). São incluídos ativos com vida útil indefinida, pois se crê que ajudem indefinidamente para os fluxos de caixa da XYZ.

11

Os ágios expostos acima estão baseados na expectativa de rentabilidade futura. Estão suportados por laudos de avaliações, posteriormente à alocação dos ativos verificados.

12

O teste de recuperabilidade dos ativos é feito todos os anos baseados no método de fluxo de caixa descontado. Em 2015, foram usados como fundamentos o orçamento e o planejamento estratégico da XYZ com projeções de crescimento até 2018 e perpetuidade a partir de 2019.

11. PATRIMÔNIO LÍQUIDO

11.1 Capital social

Em 31/12/2015, o capital subscrito e integralizado da Companhia era de R\$12.407.053, constituído por 872.473.246 ações ordinárias, escriturais e sem valor nominal, sendo que o valor realizado do capital social no balanço está líquido dos dispêndios com oferta pública no montante de R\$92.947.

A Companhia está autorizada a aumentar o capital social, independentemente de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

11.2 Dividendos

Em 18/06/15, em reunião extraordinária do Conselho de Administração, foi aprovada a distribuição de R\$425.859, relacionada a juros de capital próprio, pagos em 14/08/15.

Em 17/10/15, em reunião ordinária do Conselho de Administração, foi aprovada a distribuição de R\$473.398, relacionada a juros de capital próprio e R\$91.443 no formato de dividendos, pagos em 12/12/15.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

13

Em 31 de dezembro de 2015, o capital subscrito e integralizado da XYZ era de R\$12.407.053. Composto por 872.473.246 ações ordinárias, escriturais e com valor nominal. O valor realizado do capital social no balanço está líquido dos gastos com oferta pública no valor de R\$92.947.

14

A XYZ pode ampliar o capital social, apesar de reforma estatutária, até o limite de 1.000.000.000 de ações ordinárias, escriturais e sem valor nominal.

Reserva legal: Constituída na base de 5% do lucro líquido do exercício nos termos do artigo 193 da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, limitada a 20% do capital social, dado que em 31/12/2015, o saldo desta reserva correspondia a 4,00% do capital social (2,85% em 31/12/2014).

Reserva de incentivos fiscais: Constituída nos termos do artigo 195-A da Lei nº 6.404/76, modificada pela Lei nº 11.638/07, com base no valor de doações ou subvenções governamentais para investimentos.

11.7 Ações em tesouraria

A Companhia possui 62.501.001 ações ordinárias de sua própria emissão em tesouraria, com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação, e com valor de mercado correspondente a R\$3.455.680.

Durante o exercício concluído em 31/12/15, a Companhia vendeu 1.935.296 ações em tesouraria.

Durante o exercício concluído em 31/12/15, conforme autorizado pelo Conselho de Administração, a Companhia adquiriu 59.247.400 de ações de sua própria emissão com custo de R\$3.765.753.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

15

Reserva de incentivos fiscais: Formada nos termos do artigo 195-A da Lei nº 6.404/76 (alterada pela Lei nº 11.638/07). Baseada no montante de doações ou subvenções governamentais para investimentos.

16

A XYZ tem 62.501.001 ações ordinárias de sua própria emissão em tesouraria. Com custo médio de R\$63,17 (Sessenta e três reais e dezessete centavos) por ação. Com valor de mercado igual a R\$3.455.680.

15. NOVAS NORMAS E PRONUNCIAMENTOS AINDA NÃO ADOTADOS IFRS 15 – Receita de contrato com clientes

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15, que estabelece um modelo de 5 etapas que será aplicado à receita obtida a partir de um contrato com cliente e em conformidade com este pronunciamento, as receitas são reconhecidas em valor que representa a contraprestação à qual uma entidade espera ter direito em troca da transferência de mercadorias ou serviços a um cliente. Os princípios na IFRS 15 consideram uma abordagem mais estruturada para mensurar e reconhecer receita.

Este pronunciamento é aplicável a todas as entidades e substituirá todas as atuais exigências de reconhecimento de receita, nos termos da IFRS. A adoção retrospectiva total ou modificada é exigida para os exercícios iniciados em 01/01/17 ou após essa data, sendo autorizada a adoção antecipada, que está em análise no Brasil. A Companhia está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

IFRS 16 - Arrendamentos

Em janeiro de 2016, o IASB emitiu a versão final do IFRS 16 – Arrendamentos, o qual substitui a IAS 17 – Arrendamentos, vigente para exercícios iniciados em 01/01/19, com adoção antecipada autorizada para entidades que também adotem o pronunciamento IFRS 15 – Receita de contrato com clientes, sendo que a adoção deste pronunciamento terá efeito sobre a classificação e mensuração do ativo imobilizado e dos passivos financeiros, porque os arrendamentos não serão mais diferenciados entre operacional e, financeiro, sendo o tratamento fornecido a todos os arrendamentos mercantis análogo ao arrendamento mercantil financeiro conforme apresentado no IAS 17. A Companhia está avaliando o conteúdo e os impactos da adoção deste pronunciamento em suas demonstrações financeiras.

Você deve dizer se as frases abaixo têm o mesmo significado da Nota Explicativa apresentada acima:

17

Em maio de 2014, o IASB emitiu o pronunciamento IFRS 15. Ele determina um modelo de 5 passos que será empregado à receita adquirida a partir de um contrato com cliente.

18

A adoção deste pronunciamento afetará a classificação e mensuração do ativo imobilizado e dos passivos financeiros. Os arrendamentos não serão mais separados entre operacional e financeiro.

O tratamento dado a todos os arrendamentos mercantis será similar ao arrendamento mercantil financeiro, como disposto no IAS 17. A XYZ está avaliando a prática e os efeitos da adoção deste pronunciamento em seus relatórios financeiros.

De 1 a 7, qual o seu grau de confiança em relação às suas respostas? (1 = Nada confiante; 7 = Muito confiante)

Etapa 2 – Glossário¹⁶

Você vai receber agora, além das mesmas informações sobre a empresa XYZ da Etapa 1 (Balanço Patrimonial, DRE, DFC, DMPL, DVA e Notas Explicativas), um glossário com as palavras técnicas de contabilidade presentes no texto. Utilizando todas as informações que você possui, sua tarefa é dizer se as frases apresentadas após cada segmento possuem o mesmo significado das frases da passagem original das Notas Explicativas.

Para baixar o documento com todas as demonstrações, clique em Demonstrações Financeiras - XYZ.

Para baixar o glossário, clique em Glossário.

Ao final dessa etapa você será questionado sobre os motivos de qualquer alteração nas suas respostas da etapa 1 para a etapa 2. Assim, pedimos que anote em um documento extra o número da questão em que você fez a alteração e o motivo, copie e cole na área ao final dessa etapa. Para facilitar, deixamos disponível as respostas que você deu na etapa 1 logo abaixo de cada questão.

O quanto você utilizou do glossário para responder as questões dessa seção?

0 = não usei

100 = usei em todas

De 1 a 7, qual o seu grau de confiança em relação às suas respostas? (1 = Nada confiante; 7 = Muito confiante)

Você alterou alguma de suas respostas da etapa 1 para a etapa 2?

¹⁶ As perguntas são as mesmas da etapa anterior, assim não serão repetidas aqui. Ressalto que os participantes tinham acesso às respostas da etapa anterior e poderiam decidir mantê-la igual ou não.

Sim

Não

Quais as razões para alterações das respostas? (Se as alterações forem por motivos diferentes, pedimos que identifique quais alterações se referem a quais frases)

Etapa 3 – MIT gerais (Para controlar dificuldade prévia de leitura)

Abaixo são apresentados pares de frases sobre assuntos em geral.

Selecione aqueles que possuem o mesmo significado.

703 policiais foram indiciados por crime de revolta no Espírito Santo.

Mais de 700 policiais foram acusados de crime de revolta no Espírito Santo.

Em 2017, Cristiano Ronaldo foi eleito o melhor estrangeiro do Campeonato Inglês da história pela revista Four Four Two.

Em 2017, a revista Four Four Two considerou Cristiano Ronaldo como o melhor estrangeiro da história do Campeonato Inglês.

Um voo de uma companhia aérea brasileira decolou com a saída de emergência inoperante.

Voo de companhia aérea brasileira decola com saída de emergência fora de operação.

Em breve, telefones celulares poderão receber carga de bateria através de luz ambiente.

Telefones celulares poderão, em alguns anos, ser recarregados por meio de luz solar.

O novo filme de Sexta-Feira 13 foi cancelado pelo estúdio.

Estúdio de Sexta-Feira 13 cancela lançamento de novo longa-metragem.

Ao voltar de Nova York, bilionário é preso no Brasil, acusado de participar de esquema de corrupção.

Ao chegar de Nova York, bilionário corrupto é preso no Brasil.

O Telescópio Hubble registrou o exato momento em que uma estrela gigante vermelha morreu.

Estrela gigante vermelha morre e o telescópio Hubble captura o momento exato do ocorrido.

Etapa 4/4

Perfil do Participante

Idade (em anos completos)

Gênero

Masculino

Feminino

Tempo de experiência de trabalho em Contabilidade (em anos)

Curso de Graduação

Administração

Contabilidade

Economia

Direito

Outro

Nível de escolaridade (em caso de mais de uma opção, escolha aquela de maior nível)

Graduação em andamento

Graduação completa

MBA em andamento

MBA completo

Mestrado em andamento

Mestrado completo

Doutorado em andamento

Doutorado completo

Outro

Faculdade/Universidade em que cursou graduação/pós-graduação.

Tempo de estudos em Contabilidade, em anos (considerando graduação, especialização e pós-graduação)

Etapa 5 - Número para premiação

Abaixo você receberá um número aleatório.

Nós não temos acesso aos seus dados. Após a finalização desta pesquisa, você receberá um e-mail com o número do vencedor. Caso tenha sido você, será solicitado que nos envie um print da tela como comprovante. Assim, antes de ir para a próxima tela, guarde um print em que apareça: o número aleatório que lhe foi atribuído e a data em que preencheu esse formulário.

Seu número é:

Copie aqui o número aleatório que você recebeu acima para validar sua participação na premiação:

Document 7 – Glossary used in the Experimental Research**GLOSSÁRIO TERMOS CONTÁBEIS**

Amortização: Alocação sistemática do valor amortizável de ativo ao longo de sua vida útil.

Aplicação prospectiva (aplicação de mudança em política contábil): Aplicação de nova política contábil para transações, outros eventos e condições que ocorram após a data em que a política foi alterada.

Aplicação retrospectiva (aplicação de mudança em política contábil): Aplicação de nova política contábil para transações, outros eventos e condições como se essa política tivesse sempre sido aplicada.

Arrendamento mercantil: Acordo por meio do qual o arrendador transfere ao arrendatário, em troca de pagamento, ou série de pagamentos, o direito de uso de ativo por um período de tempo acordado entre as partes. Também conhecido como *leasing*.

Arrendamento mercantil financeiro: Arrendamento que transfere substancialmente todos os riscos e benefícios inerentes à propriedade do ativo. O título de propriedade pode ou não ser futuramente transferido. O arrendamento que não é arrendamento financeiro é arrendamento operacional.

Atividade de financiamento: Atividade que resulta em alterações no tamanho e na composição do patrimônio integralizado e dos empréstimos da entidade.

Atividade de investimento: Aquisição e alienação de ativos de longo prazo e de outros investimentos não incluídos em equivalentes de caixa.

Atividade operacional: As principais atividades geradoras de receita da entidade e de outras atividades que não sejam atividades de investimento ou de financiamento.

Ativo: Recurso controlado pela entidade como resultado de eventos passados do qual se esperam benefícios econômicos futuros para a entidade.

Ativo fiscal diferido: Tributo recuperável em períodos futuros, referente a:

- (a) diferenças temporárias;
- (b) compensação de prejuízos fiscais não utilizados; e
- (c) compensação de créditos fiscais não utilizados.

Ativo imobilizado: Ativos tangíveis que:

- (a) são disponibilizados para uso na produção ou fornecimento de bens ou serviços, ou para locação por outros, para investimento, ou para fins administrativos; e
- (b) espera-se que sejam usados por mais de um período contábil.

Ativo intangível: Ativo identificável não monetário sem substância física. Tal ativo é identificável quando:

(a) é separável, isto é, capaz de ser separado ou dividido da entidade e vendido, transferido, licenciado, alugado ou trocado, tanto individualmente ou junto com contrato, ativo ou passivo relacionados; ou

(b) origina direitos contratuais ou outros direitos legais, independentemente de esses direitos serem transferidos ou separáveis da entidade ou de outros direitos e obrigações.

Balanco patrimonial: Demonstração que apresenta a relação de ativos, passivos e patrimônio líquido de uma entidade em data específica.

Benefício a empregado: Todas as formas de retribuição dada pela entidade em troca dos serviços prestados pelo empregado.

Caixa: Dinheiro em caixa e depósitos à vista.

Combinação de negócios: União de entidades ou negócios separados produzindo demonstrações contábeis de uma única entidade que reporta. Operação ou outro evento por meio do qual um adquirente obtém o controle de um ou mais negócios, independentemente da forma jurídica da operação.

Custos de empréstimo: Juros e outros custos incorridos pela entidade com empréstimo de recursos.

Demonstrações contábeis: Representação estruturada da posição patrimonial e financeira, do desempenho financeiro e dos fluxos de caixa da entidade.

Demonstração das mutações do patrimônio líquido: Demonstrações que apresentam lucro ou prejuízo do período, itens de receita e despesa reconhecidos diretamente no patrimônio líquido do período, os efeitos das alterações na política contábil e correção de erros reconhecidos no período, e as quantias das transações com sócios em sua condição de sócios durante o período.

Demonstração do resultado: Demonstração contábil que apresenta todos os itens de receita e despesa reconhecidos no período, excluindo os itens de outros resultados abrangentes.

Demonstração do resultado abrangente: Demonstração que começa com lucro ou prejuízo do período e a seguir mostra os itens de outros resultados abrangentes do período.

Demonstração dos fluxos de caixa: Demonstração que oferece informações sobre as alterações em caixa e equivalentes de caixa da entidade por um período, mostrando alterações separadamente durante o período em atividades operacionais, de investimento e de financiamento.

Depreciação: Alocação sistemática do valor depreciável de ativo durante a sua vida útil.

Despesa: Redução de benefícios econômicos durante o período contábil, na forma de saídas ou redução de ativos ou inclusão de passivos que resultam em reduções no patrimônio líquido, com exceção daqueles relativos a distribuições de capital ou lucros a proprietários.

Diferenças temporárias: Diferenças entre o valor contábil de ativo, passivo ou outro item nas demonstrações contábeis e sua base de cálculo fiscal que a entidade espera que vá afetar o lucro tributável quando o valor contábil do ativo ou passivo for recuperado ou liquidado

(ou, no caso de itens que não sejam ativos ou passivos, que afetarão o lucro tributável no futuro).

Empréstimo a pagar: Passivos financeiros que não obrigações comerciais de curto prazo a pagar em condições de crédito normais.

Equivalente de caixa: Investimentos de curto prazo, altamente líquidos, que são prontamente conversíveis em dinheiro, e que estão sujeitos a risco insignificante de alterações no seu valor até sua efetiva conversão em caixa.

Estoques: Ativos mantidos:

- (a) para a venda no curso normal dos negócios;
- (b) no processo de produção para venda; ou
- (c) na forma de materiais ou suprimentos a serem consumidos no processo de produção ou na prestação de serviços.

Fluxos de caixa: Entradas e saídas de caixa e equivalentes de caixa.

Ganhos: Aumentos em benefícios econômicos e, como tais, não são diferentes em sua natureza das receitas.

Lucro tributável (prejuízo fiscal): O lucro (prejuízo) para um período contábil sobre o qual tributos sobre o lucro são pagáveis ou recuperáveis, determinados de acordo com as regras estabelecidas pelas autoridades tributárias. Lucro tributável é igual à receita tributável menos quantias dedutíveis da receita tributável.

Mensuração: Processo de determinação de quantias monetárias com que os elementos das demonstrações contábeis devem ser reconhecidos e apresentados no balanço patrimonial, na demonstração do resultado e na demonstração do resultado abrangente.

Moeda funcional: Moeda do ambiente econômico principal em que a entidade opera.

Mudança em estimativa contábil: Ajuste do valor contábil de ativo ou passivo, ou a quantia da baixa periódica de ativo, que resulte da estimativa da situação de ativos e passivos, bem como de benefícios futuros esperados e obrigações a eles relacionadas. Mudanças nas estimativas contábeis resultam de novas informações ou novos desdobramentos e, por isso, não são correção de erros.

Normas Internacionais de Contabilidade: Normas e Interpretações adotadas pela Junta Internacional de Normas Contábeis (IASB). Elas englobam: Normas Internacionais de Relatórios Financeiros (IFRS);

- (a) Normas Internacionais de Contabilidade (IAS); e
- (b) Interpretações desenvolvidas pelo Comitê de Interpretações das Normas Internacionais de Relatórios Financeiros (IFRIC) ou pelo antigo Comitê Permanente de Interpretações (SIC).

Notas explicativas (para demonstrações contábeis): Notas explicativas contêm informações além daquelas apresentadas no balanço patrimonial, na demonstração do resultado abrangente, na demonstração do resultado, nas demonstrações dos lucros ou prejuízos acumulados e do valor adicionado (se apresentadas), na demonstração das mutações do patrimônio líquido e na demonstração dos fluxos de caixa. As notas

explicativas oferecem descrições narrativas ou composição de valores apresentados nessas demonstrações e informações sobre itens que não se qualificam para o reconhecimento nessas demonstrações.

Outros resultados abrangentes: Itens de receita e despesa (incluindo ajustes de reclassificação de receita) que não são reconhecidos como resultado.

Passivo: Obrigação presente da entidade, derivada de eventos já ocorridos, cuja liquidação se espera resulte em saída de recursos capazes de gerar benefícios econômicos.

Passivo contingente:

- (a) obrigação possível que resulta de acontecimentos passados e cuja existência será confirmada apenas pela ocorrência ou não de um ou mais acontecimentos futuros incertos não totalmente sob controle da entidade; ou
- (b) obrigação presente que resulta de acontecimentos passados, mas que não é reconhecida porque:
 - (i) não é provável que desembolso de recurso que incorpora benefícios econômicos seja exigido para liquidar a obrigação; ou
 - (ii) o valor da obrigação não pode ser mensurado de maneira suficientemente confiável.

Passivo financeiro: Qualquer passivo que seja:

- (a) obrigação contratual:
 - (i) de entregar dinheiro ou outro ativo financeiro para outra entidade; ou
 - (ii) de trocar ativos ou passivos financeiros com outra entidade sob condições que são potencialmente desfavoráveis à entidade; ou
- (b) contrato que será ou poderá vir a ser liquidado por meio de instrumentos patrimoniais da própria entidade e:
 - (i) pelo qual a entidade é ou pode ser obrigada a receber um número variável de instrumentos patrimoniais da própria entidade; ou
 - (ii) será ou poderá vir a ser liquidado exceto pela troca de quantia fixa de dinheiro ou outro ativo financeiro por um número fixo de instrumentos patrimoniais da própria entidade. Para esse fim, os instrumentos patrimoniais da própria entidade não incluem instrumentos que sejam eles mesmos contratos para recebimento futuro ou transmissão futura dos instrumentos patrimoniais da própria entidade.

Patrimônio líquido: é o valor residual dos ativos da entidade após a dedução de todos os seus passivos.

Perdas por desvalorização (*impairment*): Valor contábil do ativo que excede (a) no caso de estoques, seu preço de venda menos o custo para completá-lo e despesa de vendê-lo ou (b) no caso de outros ativos, seu valor justo menos a despesa para a venda.

Provável: Possibilidade de ocorrer um evento é maior do que a de não ocorrer.

Provisão: Acréscimo de exigibilidade cujo valor e/ou prazo de pagamento ainda não está totalmente definido.

Receita: Aumento de benefícios econômicos durante o período contábil na forma de entradas ou aumentos de ativos ou reduções de passivos que resultam em aumento no patrimônio líquido, com exceção daqueles relativos a contribuições de capital feitas por proprietários.

Reconhecimento: O processo de incorporação ao balanço patrimonial ou à demonstração do resultado e do resultado abrangente de item que atende à definição de elemento e satisfaz aos seguintes critérios:

(a) é provável que benefício econômico futuro associado com o item flua para ou da entidade; e

(b) o item tem custo ou valor que pode ser mensurado com confiança.

Regime de competência: Efeitos das operações e de outros eventos são reconhecidos quando ocorrem (e não quando são recebidos ou pagos como caixa ou equivalente de caixa) e são registrados na contabilidade e divulgados nas demonstrações contábeis dos períodos aos quais se referem.

Resultado abrangente: Mutação no patrimônio líquido durante um período resultante de transações e outros eventos, exceto mutações resultantes de transações de capital com proprietários e em sua condição de proprietários (igual à soma do lucro ou prejuízo líquido do período com os outros resultados abrangentes).

Resultado do período: Total das receitas menos as despesas, excluindo os itens de outros resultados abrangentes.

Transação com partes relacionadas: Transferência de recursos, serviços ou obrigações entre partes relacionadas, independentemente do preço cobrado.

Tributo corrente: Tributo a pagar (recuperável) referente ao lucro tributável (prejuízo fiscal) para o período corrente e períodos passados.

Tributo diferido: Tributo a pagar (recuperável), referente ao lucro tributável (prejuízo fiscal) para períodos de declaração futuros, em decorrência de transações ou eventos passados.

Tributos sobre o lucro: Todos os impostos nacionais e estrangeiros que têm como base lucros tributáveis. Imposto de renda também inclui impostos tais como impostos retidos na fonte, que são pagos por controlada, coligada ou empreendimento controlado em conjunto em distribuições de resultado para a entidade.

Unidade geradora de caixa: Menor grupo de ativos identificáveis que gera entradas de caixa que são, em grande parte, independentes de entradas de caixa de outros ativos ou grupos de ativos.

Valor contábil: Valor em que um ativo ou passivo é reconhecido no balanço patrimonial.

Valor depreciável: custo do ativo, ou outra quantia substituta do custo (nas demonstrações contábeis), menos o seu valor residual.

Valor em uso: Valor presente de fluxos de caixa futuros que se espera venha a ser gerado com um ativo ou uma unidade geradora de caixa.

Valor justo: Valor pela qual um ativo pode ser trocado, um passivo liquidado, ou um instrumento patrimonial concedido, entre partes conhecedoras e dispostas a isso, em uma transação em que não haja relação de privilégio entre elas.

Valor justo menos despesa para vender: Valor que pode ser obtido com a venda de ativo ou unidade geradora de caixa, em uma transação entre as partes, isentas de interesse, que devem ser conhecedoras e dispostas a isso, menos as despesas da venda.

Valor presente: Estimativa do valor presente descontado de fluxos de caixa líquidos no curso normal dos negócios.

Valor recuperável: O maior valor entre o valor justo diminuído das despesas de venda de um ativo e seu valor em uso.

Valor residual de ativo: Valor estimado que a entidade obterá no presente com a alienação do ativo, após deduzir as despesas estimadas da alienação, se o ativo já estivesse com a idade e com a condição esperada no fim de sua vida útil.

Vida útil: Período ao longo do qual se espera que um ativo esteja disponível para uso pela entidade, ou o número de unidades de produção ou de unidades similares que se espera obter do ativo pela entidade.